# NOT FOR CIRCULATION

# The Ottoman mosque fallacy

## Places of worship facing the Kaaba or "Monuments of jihad"?

## A. J. Deus has got it all hopelessly wrong *

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* A critique of A. J. Deus, "Monuments of Jihad – The thought process of determining qibla orientations by Turks", at www.academia.edu/37688323/ (text) and "Raw Analysis Turkish Mosque Orientations 'Monuments of Jihad'", at www.academia.edu/37688075/ (graphics), and "Flipbook for Turkish Mosque orientations" (data flipped), at www.academia.edu/37688045/, all accessed Nov., 2018.

## Abstract

If one wants to begin to understand the way in which historical mosques were laid out toward the Kaaba in Mecca or anywhere else, the best way is to study what medieval Muslim scholars wrote about the determination of the sacred direction (*qibla*). The medievals did not always use the methods we think they might have used to determine the *qibla*, and they did not have access to modern geographical coordinates. As a result, **HISTORICAL *qibla*-values are not the same as MODERN ones**. Or to put it another way, the directions for the *qibla* derived by Muslim scientists or chosen by Muslim architects centuries ago are not going to be the **MODERN** directions of Mecca. But we have useful aides. For example, for Ottoman cities we have an Ottoman list of *qibla*-directions for 90 cities in the Empire published 20 years ago. It might be a good idea to compare orientations of Ottoman mosques with that Ottoman list of *qibla*-values for Ottoman cities. Nobody has done that yet.

Simply comparing **HISTORICAL** mosque orientations with **MODERN** directions of Mecca (which were not available to medieval Muslims) is not a good idea. It exposes one to the danger of reaching all manner of absurd conclusions. For example, one might be tempted to think along with the amateur archaeologiost Dan Gibson that early mosques face the **MODERN** direction of Petra (a place where there were no Muslims anyway) rather than the direction of Mecca; that silly idea has now been demolished although Gibson and his disciples will not stop believing in it because it suits their purpose. More recently, economist and amateur space archaeologist A. J. Deus in "Monuments of Jihad – The thought process of determining qibla orientations by Turks" (2018)* wants us to believe that Ottoman mosques are not aligned toward Mecca but rather toward specific places in Ukraine or Somalia or Armenia or Tunisia where the Ottomans were involved in military operations at the time just before the mosques were being built.

In this document we try to penetrate the thought process of someone who has written about the orientations of Ottoman mosques without having a clue how the Ottomans determined the *qibla*.** Inevitably Deus has compared **HISTORICAL** mosque orientations with **MODERN** directions of Mecca. He wrongly thinks that accurate medieval mathematical tables giving the *qibla* for each degree of longitude (from Mecca) and each degree of latitude could have been used by Muslims in the past to determine the **MODERN** direction of Mecca! Not only is he clueless about medieval *qibla* determinations, but he has no background in Ottoman architecture and its history, Ottoman astronomy, mathematics and geography. He mistakenly thinks that the Ottomans when building a mosque wherever could orient it accurately with places no-one has ever heard of on the Empire's frontier. The results

of his labours are not only absurd but they are also insulting to those who built the mosques and to those who worship in them. This seems to have been his objective and he can certainly claim to have been successful. And he will find readers who are innumerate and have no time for Islam who will fall for this rubbish 'hook, line and sinker', not least because, like the Petra nonsense, they will find it useful.

Mosques in the Turkish world do indeed constitute a particularly interesting sub-group of historical mosques as far as orientations are concerned. For these the Ottoman list of *qibla*-values for Ottoman cities could be rather useful. If these mosque orientations do not correspond to the *qibla*s in this or other sources, we have to use our wits but at least we have access to a wide corpus of medieval Islamic material on astronomy, mathematics and geography to keep us in the 'holy corridor' of truth and save us from making fools of ourselves.

* Available at www.academia.edu/37688323/ (text) and www.academia.edu/37688075/ (graphics), and "Flipbook for Turkish Mosque orientations" (data flipped), at www.academia.edu/37688045/, all accessed Nov., 2018.

** I tend to use the term 'medieval' in the context of Islamic science for the entire period from the 7th to the 19th century because traditional Islamic science continued to be practiced throughout this period. So medieval here means post-classical and pre-modern. From the 9th to the 15th century, the Muslims were the leaders in science, although thereafter Islamic science declined and eventually aspects of European science were introduced in the Muslim world. Also, in this paper, I refer to the mosques (mis)treated by Deus as 'Ottoman' even though some predate the Ottoman period. They are not 'Turkish' and some of them are not in 'Turkey' anyway. Likewise, there is no such thing as an Arab mosque or an Arabic mosque.

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Technical note: This text was prepared on an Apple MacOS Sierra 10.12.6 with soft-ware called PAGES 7.1. The software creates unwanted spaces in the text and lacks many of the useful features which MSWord had 20 years ago.

## Table of contents



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# Introductory remarks

> "ما بين المشرق والمغرب قبلة" "What is between the east and the west is a *qibla*." Statement attributed to the Prophet Muḥammad.
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> Sinan handed over the building to Suleiman: "Oh, my Sultan, I have built this mosque for you, which will stand upon the earth till the day of the Last Judgment." Quoted in Péter Rabb, "Sinan – Architect of the Ottoman Empire", p. 24.
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> "The calculation of mosque orientations must have been among the most strictly guarded military secrets [*sic*]. In consequence, modern researchers are in the dark about their methods [*sic*]. We now know that they were able to accurately compute the orientation toward distant places [*sic*]." Deus, p. 30.

One of my favourite places is the 16th-century Süleymaniye Mosque complex in Istanbul. It is not only a magnificent architectural masterpiece crowning one of the seven hills of the city but it includes one of the most beautiful and imposing mosques in the city.[1] This is a sublime and peaceful place of worship, erected for people to pray facing the holiest sanctuary of Islam, the Kaaba in Mecca; this direction is called *qibla* in all languages of the Islamic commonwealth. The former *madrasa*s or schools in the complex house an incredibly rich library of medieval Arabic, Persian and Turkish manuscripts essentially documenting much of the history of Islamic civilization, gathered from collections around the former Ottoman Empire and indeed from numerous mosque libraries all over Turkey.[2] Together with the Topkapı Library and Istanbul University Library it constitutes a goldmine for generations of historians.

I used to go to the these libraries frequently when I worked in Cairo in the 1970s, following leads of one sort or another and finding enough new materials in Cairo and Istanbul but also in libraries from Princeton to

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1 A reasonable, inspired account is in www.lonelyplanet.com/turkey/istanbul/attractions/suleymaniye-mosque/a/poi-sig/401910/360887, possibly written by Thomas Goltz, one of my former students at New York University, now an expert on Central Asia. The account mentions the Library only in passing.

2 For a brief introduction to the Library see http://hazine.info/suleymaniye-library/. For more information on this and other libraries see İsmail E. Erünsal, *A Survey of the history, development and organization of Ottoman foundation libraries*, (Sources of Oriental languages and literatures 84, Turkish sources 74), Harvard University, Department of Near Eastern Languages and Literatures, 2008.

Hyderabad and from Dublin to Taiz, to write a new chapter in the history of Islamic science. My chapter was called "Astronomy in the service of Islam", and the reason nobody had written it previously was that most investigators in the history of Islamic science have been mainly interested in transmission – what the Europeans learned of Islamic science and what the Muslims preserved for 'us' of the Greek heritage –, not what the Muslims did for themselves.[3]

Why did I do this? When I was a still a graduate student I discovered in an Arabic manuscript preserved in the Bibliothèque nationale de France a mathematical table compiled by Shams al-Dīn al-Khalīlī, an astronomer at the Umayyad Mosque in Damascus in the mid-14th-century. The table was unknown to the scholarly world and it blew my mind: one feeds the latitude of any locality along the top of the table and the longitude down the side of the table, and the entry in the table is the *qibla* in degrees and minutes, given with such astounding accuracy that we have not yet fathomed how the 2,880 entries in the table were computed. It was the discovery of this table, and of many other remarkable texts, tables, instruments, and maps, that has been my reward over half a century. These findings included some earlier *qibla*-tables located in Istanbul manuscripts. It was also at the Bibliothèque nationale de France that I found an Ottoman list of calculated *qibla*-directions for 90 cities in the Ottoman Empire. And then around 1990 I discovered three brass maps of the world centred on Mecca each with an ingenious grid preserving direction and distance to the centre. Some of my colleagues could not believe these remarkable maps from 17th-century Isfahan were an Islamic invention, especially when I stated that no European could have conceived them, but the mathematics underlying the grids is found already in Arabic texts on conic sections from 10th-century Baghdad and 11th-century Isfahan.

Some of these sources – scientific texts and instruments and legal texts – enabled me to explain some of the reasons why medieval mosques often face directions that we moderns sometimes find surprising. I dutifully published all of this material. I tried to draw wider attention to it in the articles "Ḳibla"

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3 Apart from reprints of my papers in the Variorum series – *Islamic Mathematical Astronomy* (1986/1993); *Islamic Astronomical Instruments* (1987/1995); *Astronomy in the Service of Islam* (1993); and *Islamic Astronomy and Geography* (2012) – the two main works dealing with this topic are *World-maps for finding the direction and distance to Mecca – Innovation and tradition in Islamic science* (Leiden, *etc*.: Brill & London: Furqan Foundation, 1999), and *In Synchrony with the Heavens – Studies in astronomical timekeeping and instrumentation in medieval Islamic civilization* (2 vols., Leiden, *etc*.: Brill, 2004-05). All of these materials are accessible on the site www.davidaking.academia.edu.

and "Makka as the centre of the world" in the *Encyclopaedia of Islam*. I knew that historians of Islamic architecture, especially those who write about 'sacred space', have a singularly poor reputation regarding orientations, and that they would be the last to recognize the potential importance of these materials. The scholars who were interested were those in ethnoastronomy and archaeoastronomy, not least because the Islamic tradition is the only tradition in world history for which we have written sources.[4] Ultimately, whether anybody other than my students was interested in these discoveries has always been for me of little consequence; in this way, I avoided inevitable disappointment. But this study is not about me, it is about mosques and what they can offer ... .

The Süleymaniye Library is a place where you could consult priceless manuscripts of works previously undocumented in modern times and where you would meet enthusiastic Turkish and international scholars with similar historical interests. And you could drink tea in the garden or enjoy a lamb-chop with green beans in one of the little kitchens overlooking the main mosque.

## Imagine my surprise and horror at reading a few days ago absurd claims that the Süleymaniye Mosque was DELIBERATELY BUILT NOT FACING TOWARD MECCA and that it was DELIBERATELY BUILT AS A MONUMENT OF HOLY WAR, accurately facing directions associated with contemporaneous distant Ottoman military campaigns.

These claims are a slap in the face to anybody who knows anything about Islamic history and, in particular, Ottoman history, as they are to anybody who knows anything about historical mosques. They deliberately ignore completely everything that Muslim scholars have written over the centuries about the *qibla*, and they ignore everything my teachers and colleagues and I myself have written about the way the *qibla* was determined over the

4 See Clive N. Ruggles, ed., *Handbook of archaeoastronomy and ethnoastronomy*, 3 vols., New York, *etc.*,: Springer, 2015, which contains the following articles: King, "Astronomy in the service of Islam", pp. 181-196; Clemency Montelle, "Islamic mathematical astronomy", pp. 1909-1916; Tofigh Heidarzadeh, "Islamic astronomical instruments and observatories", pp. 1917-1926; Petra G. Schmidl, "Islamic folk astronomy", pp. 1927-1934; and Daniel Martin Varisco, "Folk astronomy and calendars in Yemen", pp. 1935-1940.

centuries. But, the reader may rest assured, this affront will be less painful when we establish that it is based on totally false assumptions and complete ignorance of Islamic customs regarding the building of mosques.

It is not my intention to discuss whether or not a given mosque was built to commemorate a particular victory somewhere. Deus would have certain mosques built before a victory occurred, which would have put considerable strain on the astrologers. My purpose here is simply to show that some of the mosques which Deus thinks point in all sorts of funny directions, actually face the Kaaba in Mecca. In fact, all the mosques he considered face the Kaaba. One just has to learn how this was achieved.

## Some basics

> "The overwhelming guiding principle of academia rests on selective interpretation of traditions and wishful thinking." Deus, p. 31.

As most readers should know, mosques are oriented toward Mecca. Certainly, every Muslim knows that. But actually mosques are oriented toward the sacred Kaaba in Mecca, a direction called *qibla* in Arabic.[5] There is, in medieval Islamic practice, a subtle but significant difference between facing a distant edifice and facing a distant city. This is something we moderns should take the trouble to learn if we want to begin to understand the orientation of historical mosques.

Mosques have been built facing the Kaaba for over 1,400 years. The way this was achieved varied according to time and place. The earliest methods involved astronomical alignments – the cardinal directions – north and south, sunrise and sunset at the equinoxes (east and west) – or solstitial directions (sunrise or sunset at the summer or winter solstices). The reason for this was that people wanted to face a distant edifice that was itself astronomically aligned. The major axis of the rectangular base of the Kaaba faces the rising of Canopus and the setting point of the stars of the Plough; the minor axis faces summer sunrise and winter sunset – for the latitude of Mecca these two axes happen to be perpendicular. Whether it was planned that way we shall never

5 A complete bibliography of modern writings on medieval *qibla* determinations and mosque orientations is appended to my essay "The Petra fallacy", on which see below.

know; what we do know is that it is that way and that this has been of important to Muslims over the centuries.[6]

From the 9th century onwards the Muslims had access to geographical coordinates and they developed trigonometric and geometric methods for finding the *qibla,* towards a 'point' on the terrestrial globe, Mecca. But throughout history the Muslims have used different methods for finding the *qibla*, which are documented in treatises on the sacred law, folk science, and astronomy and mathematics and geography.[7] In particular, Muslims developed a sacred geography with the world divided into sectors around the Kaaba, with each sector facing a segment of the perimeter of the Kaaba.[8] Such simple approximate notions were used alongside the mathematically-computed *qibla*s, whose accuracy of course depended on the accuracy of the

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6 This was rediscovered almost 40 years ago. See Gerald S. Hawkins & David A. King, "On the astronomical orientation of the Kaaba", *Journal for the History of Astronomy* 13 (1982), pp. 102-109, repr. in King, *Astronomy in the Service of Islam*, Aldershot & Burlington VT: Variorum, 1993, XII. The discovery was made about the same time by GSH from satellite images and by DAK from a medieval Yemeni astronomical manuscripts: the results were the same, so we published them together.

The main audience for this discovery were the archaeoastronomers and ethnoastronomers. It turned out that the Islamic tradition of orientations was the only one in human history for which we have any documentation. See various relevant chapters in Clive N. Ruggles, *Handbook of archaeoastronomy and ethnoastronomy*, 3 vols., New York, *etc.*, Springer, 2015: King, "Astronomy in the service of Islam', pp. 181-196; Clemency Montelle, "Islamic mathematical astronomy'', pp. 1909-1916; Tofigh Heidarzadeh, "Islamic astronomical instruments and observatories'', pp. 1917-1926; Petra G. Schmidl, "Islamic folk astronomy", pp. 1927-1934; & Daniel Martin Varisco, "Folk astronomy and calendars in Yemen", pp. 1935-1940.

7 King, "The sacred direction in Islam: A study of the interaction of religion and science in the Middle Ages", *Interdisciplinary Science Reviews* 10 (1985), pp. 315-328; and "The determination of the sacred direction in Islam", in *World-maps for finding the direction and distance to Mecca*, ch. 2, pp. 47-127.

8 King, article "Makka. iv. As centre of the world [sacred geography and orientation of mosques]", in *Encyclopaedia of Islam*, 2nd edn., 13 vols., Leiden: E. J. Brill, 1960-1980, vol. VI, pp. 180-187, repr. in *Astronomy in the Service of Islam*, X; and *idem*, "The sacred geography of Islam", in T. Koetsier and L. Bergmans, eds., *Mathematics and the Divine – A Historical Study*, Dordrecht: Elsevier, 2005, pp. 161-178, repr. in *Islamic Astronomy and Geography*, Aldershot & Burlington VT: Variorum, VIII.

Of some relevance to the topic of Ottoman mosque orientations is my paper "Some Ottoman schemes of sacred geography", *Proceedings of the II. International Symposium on the History of Turkish and Islamic Science and Technology, Istanbul, 1986*, 2 vols., Istanbul: Istanbul Technical University, 1986, I, pp. 45-57, also article "Makka as centre of the world", in *Encyclopedia of Islam*, 2nd edn., fig. 5.

available geographical coordinates, longitude and latitude, which were not always satisfactory.

To take a given historical mosque orientation and say this is in error, or this is not facing Mecca, overlooks the fact that we can never know how the orientation was decided upon, unless we are told in some treatise (which we can believe or not). Particularly if one knows nothing about the ways in which Muslims determined the *qibla* over the centuries it is rather arrogant to make any pronouncements. In all cases we cannot expect that the *qibla* used for some mosque will be the same as the **MODERN** *qibla* except by coincidence. So to pronounce, based on orientations alone, that a given mosque doesn't even face Mecca, or that it deliberately faces some other locality, is not a good idea. Even if the *qibla* was calculated by a competent mathematician or astronomer, it might be derived using an approximate formula rather than an exact one, and it will surely have to be based on medieval geographical coordinates: the result would not necessarily correspond to the **MODERN** *qibla*. So, under no circumstances should orientations of buildings erected hundreds of years ago be investigated using **MODERN** data. It's about 'them', not about 'us'.

## Misinterpretations of orientations

The one aspect of Islamic architecture which historians have persistently neglected if not completely ignored is orientations. I could write a whole article on uninformed pronouncements about the orientation of Islamic religious architecture by 'the specialists'. The latter boldly state this or that without having a clue about what people at the time thought was the *qibla* (which is not the **MODERN** *qibla*). These historians of Islamic architecture have opened the flood-gates to the latest wave of fanatics who have just discovered that mosques do not actually face Mecca (in the **MODERN** sense) and who think that they can use this to their advantage.

Historical mosque orientations serve as a happy hunting ground for people with no idea about historical *qibla* determinations (or those who deliberately choose to ignore what is already known) and they will keep on coming up with all sorts of ridiculous theories. Usually the folk proposing such theories

will be comparing **MEDIEVAL** mosque orientations with **MODERN** *qibla*-directions.[9]

One of my favourites is Ehsan Butt, who has shown, using orientations, that not a few European cathedrals were originally built as mosques.[10] Marvin Mills has proposed that the city of Córdoba was built by people from Atlantis and that the Grand Mosque was built as an observatory.[11] This is not much more absurd than what some professional historians of Islamic architecture have claimed, namely, that Grand Mosque, built by Syrian émigrés and facing

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9 There is no reliable overview of the history of Islamic science. For a start the reader might try the essays on different topics in Roshdi Rashed, ed. in collaboration with Régis Morelon, *Encyclopedia of the History of Arabic Science*, 3 vols., London & New York: Routledge, 1996. Works on Islamic geography, are usually interested only in maps and they ignore mathematical geography. Likewise, the monumental *opus* of the late Fuat Sezgin (*Mathematische Geographie und Kartographie im Islam ...* , 4 vols., Frankfurt, 2000-07) ignores Islamic sacred geography altogether.

On astronomy in general, which includes mathematical geography, see Carlo Alfonso Nallino, "[Islamic Astronomy]", in *Encyclopaedia of Religion and Ethics*, James Hastings, ed., 12 vols., Edinburgh: T. & T. Clark, vol. 12 (1921), pp. 88-101; David A. King, "Islamic astronomy", in Christopher Walker, ed., *Astronomy before the Telescope*, London: British Museum Press, 1996, pp. 143-174, repr. in *Islamic Astronomy and* Geography, I, also available on www.muslimheritage.com/article/islamic-astronomy; and Robert G. Morrison, "Islamic astronomy and astrology", in Robert Irwin, ed., *New Cambridge History of Islam*, vol. 4, Cambridge, etc.: Cambridge University Press, 2010, pp. 589-613.

The scholar who inspired three generations of students in this field was E. S. Kennedy (1912-2009), on whom see *Suhayl – International Journal for the History of the Exact and Natural Sciences in Islamic Civilisation* 9 (2009-2010), pp. 185-214, available at www.ub.edu/arab/suhayl/. For some publications of the Beirut school, see Kennedy, Colleagues and Former Students, *Studies in the Islamic Exact Sciences*, David A. King and Mary Helen Kennedy, eds., Beirut: American University of Beirut, 1983.

Biographies of individual Muslim scientists biographies are available at *The Biographical Encyclopedia of Astronomers*, Thomas Hockey *et al*., eds., New York: Springer, 2007, available at http://islamsci.mcgill.ca/RASI/BEA/.

For a brief survey of Ottoman science see Salim Aydüz, "Ottoman contributions to science and technology", at www.muslimheritage.com/article/ottoman-contributions-science-and-technology (accessed 2018). See also below on the publications of Ekmeleddin İhsanoğlu and his colleagues at IRCICA.

10 Ehsan Butt, "Did Gothic cathedrals of Dark Age Europe begin as Islamic mosques?", at www.arfaglobal.com/p/islamic-mosqe-cathedrals-of-europe.html (accessed 2017).

11 Marvin H. Mills, *The Origin of the Mosque of Cordoba: Secrets of Andalusia*, Sarasota FL, privately distributed, 2006, printed Universe, 2007.

south, symbolized a sentimental attachment to the Umayyad Mosque in Damascus, which also faces south. Cute this is, but actually the Mosque in Córdoba does not face south – it faces the deserts of Algeria and we know very well why.[12]

In the last few years Dan Gibson, an amateur archaeologist without a clue how Muslims actually determined the *qibla* or how they thought they could face the Kaaba, has proposed that numerous mosques from the 7th to the 9th century from al-Andalus to China accurately face the **MODERN** direction of the "rose red city" of Petra rather than any direction toward Mecca.[13] This, he thinks, proves his theory that Islam started in Petra rather than Mecca. This goes against everything we know about Petra and about Islam, but Gibson happily finds a dozen references to Petra in the *Qur'ān* which nobody had every noticed before. Of course, he does not seriously address the question how these (imaginary) early Muslims in Petra could have been able to orient mosques precisely toward Petra, but instead proposes that the early Muslims of/from Petra must have been scientifically advanced and particularly gifted at determining directions from one place to another, distant one, which is not a trivial mathematical problem on the surface of a sphere. Therefore he needed to create a mythical scenario in which these early Muslims were wandering about with astrolabes and applying spherical trigonometry to any spherical triangle they encountered. However, astrolabes, introduced to Muslims in the 8th century, were used for many purposes but were not used for finding the *qibla*, and it was plane trigonometry which served for the first mathematical determinations of the *qibla* using simple approximate methods.

What I like most about Gibson's theory is that he happily includes mosques erected on the foundations of former cardinally-aligned Jewish and Roman temples as well as Christian churches facing east (يـعني), and no less on Roman orthogonal street-plans, either cardinally or solstitially aligned, and he finds that these are accurately facing Petra too. What I like least about it is that he has the audacity to encourage Muslims to now, on the strength of his discoveries, to abandon the "false" *qibla* toward Mecca - اعوذ بالله – and go back

12 Robert Hillenbrand, "The Great Mosque of Córdoba", an appendix to "'The Ornament of the World'. Medieval Cordoba as a cultural centre", in S. K. Jayyusi, ed., The Legacy of Muslim Spain, Leiden, New York & Cologne: Brill, 1992, pp. 112-135, esp. pp. 129-135. See now King, "The enigmatic orientation of the Great Mosque of Córdoba", at davidaking.academia.edu.

13 Dan Gibson, *Early Islamic Qiblas: A Survey of mosques built between 1AH/622 C.E. and 263 AH/876 C.E. (with maps, charts and photographs)*, 296 pp., Vancouver BC: Independent Scholars Press, 2017, and now "Qibla Tool" (2018), available at http://thesacredcity.ca/data/index.html.

to the true *pibla* (my term) toward Petra. I have discussed Gibson's scatterbrain theories elsewhere,[14] but there are many people who will fall for them and many who will welcome them. So what next?

## Enter A. J. Deus

> "The orientations of the Turkish mosques in this data collection unmask Islam of the Turk dynasts' flavors as militarily aggressive in its core religious fabric. Most Turkish mosques of this data set are identified as Monuments of Jihad. Tradition of Mecca as a focal point for the Muslim prayer direction serves merely as a cover-up." Deus, p. 30.

A splendid example of this kind of new approach to mosque orientations is a study entitled

**"Monuments of Jihad –**
**The thought process of determining qibla orientations by Turks"**

and it is written by Amod Jason Deus (www.ajdeus.org).[15] This was put online on 1 Nov 2018, the day I finished a paper entitled "The Petra fallacy". The author, by training an economist, previously wrote in a review of Gibson's *Qur'ânic Geography* that

"one can make a confident case that Petra has nothing to do
with the emergence of Islam".

With this I can agree most heartily; it is, of course, obvious. On the matter of the *qibla*, however, Deus has decided to go it alone, scorning all established

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14 King, "From Petra back to Mecca – From *pibla* back to *qibla*" (2017), available at www.davidaking.academia.edu, also www.muslimheritage.com/article/from-petra-back-to-makka. Since Gibson persists on writing about the significance of the **MODERN** directions of Petra for early Islamic mosques I have written a further critique entitled "The Petra fallacy – Early Islamic mosques do face the Sacred Kaaba in Mecca but Dan Gibson does not know how or why" (2018), at davidaking.academia.edu. The latter includes a full biography of modern writings on medieval *qibla* determinations and mosque orientations.

15 A. J. Deus, "Monuments of Jihad – The thought process of determining qibla orientations by Turks", at www.academia.edu/37688323/ (text) and "Raw Analysis Turkish Mosque Orientations 'Monuments of Jihad'", at www.academia.edu/37688075/ (graphics), and "Flipbook for Turkish Mosque orientations" (data flipped), at www.academia.edu/37688045/, all accessed Nov., 2018.

scholarship on the subject to the extent of omitting any mention of it,[16] and ignoring all historical evidence other than the mosques themselves.[17] Alas, in his misunderstandings have produced a document that is as odious as it is presumptuous and insulting. Few have previously sought to penetrate the thought processes of the Turks, and Deus has got it very wrong. However, Ottoman Studies have progressed substantially in recent years,[18] and I am pleased to have been able to contribute.[19]

All of what I have written about Gibson's fixation on **MODERN** directions applies also to Deus, because neither of them is able to understand that medieval people didn't use **MODERN** directions from one place to another.[20] And Deus doesn't understand that if the greatest scientist of medieval Islam was to calculate the *qibla* of any locality, his result would be mathematically correct but it would inevitably be different from the **MODERN** *qibla* because

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16 King, "Astronomical alignments in medieval Islamic religious architecture", *Annals of the New York Academy of Sciences* 385 (1982), pp. 303-312, repr. in *Astronomy in the Service of Islam*, XIII; *idem*, "The orientation of medieval Islamic religious architecture and cities", *Journal for the History of Astrono*my 26 (1995), pp. 253-274, with a new version in *In Synchrony with the Heavens*, VIIa: 741-771; and *idem*, "The determination of the sacred direction in Islam", in *idem*, *World-maps for finding the direction to Mecca*, ch. 2, pp. 47-127.

17 Deus' earlier writings on the qibla and orientations are his "Sura 2: Many qibla – The qibla in the Koran, Abu Lahab, and the birth of Islam" (2016), at www.academia.edu/28111367/, and "Orientation of structures in early islam" (2016), at www.academia.edu/28103240/Orientation_of_Structures_in_Early_Islam. The latter already reveals the author's penchant for investigating orientations **SOLELY** by means of **MODERN** maps incorporating **MODERN** geographical data and finding directions by **MODERN** methods. Obviously nothing of any historical interest can be expected from such *Spielerei*.

18 See Leslie Peirce, "Changing perceptions of the Ottoman Empire: The early centuries, *Mediterranean Historical Review* 19:1 (2004), pp. 6-28.

19 With surveys of Ottoman astronomical timekeeping and regulation of the prayers; Ottoman sacred geography and instruments for finding the *qibla*; astronomy and instrumentation during the reign of Sultan Bāyazīt II and an analysis of the spherical astrolabe of Mūsà Jālīnūs (1480); and a catalogue of Ottoman astrolabes.

20 The longitudes and latitudes in some 80 Islamic geographical and astronomical lists of localities with their positions, some 14,000 pairs of coordinates, are collected in E. S. Kennedy & Mary Helen Kennedy, *Geographical coordinates of localities from Islamic sources*, Frankfurt: IGAIW, 1987. Most of these tables do not give *qibla*-values alongside the coordinates. The ones that do are discussed and analyzed in King, *World-Maps for finding the direction of Mecca*.

he would be using geographical coordinates that were inaccurate by modern standards. Is that really so hard to understand? One difference between Gibson and Deus is that in Gibson's time (7th to early 9th centuries) nobody computed the *qibla*, and in Deus' time (12th to 19th centuries) some did compute it, others simply adopted *qibla*s favoured by tradition. Another difference is that for Gibson's mosques, textual evidence is later; for Deus' mosques, textual evidence is either contemporaneous or later. What the two have in common beyond a common motive is that innumerate revisionists and other hapless souls will fall for their pronouncements. Deus is far less generous than Gibson in what he divulges, and the reader may well be annoyed that he gives neither the actual orientation of his mosques, nor the (**MODERN**) *qibla* for the locality in which they are situated, but occasionally he gives the divergence between the two, which is of no use to anybody. His information on the mosques is minimal, sometimes a location, the name of the mosque, and the date of completion. He is generous only in the military campaigns which he associates with each mosque, for which he merits no thanks. His information on the Ottoman campaigns is pathetic, especially when a vast literature is available, including a very useful atlas published almost 50 years ago that is still available.[21]

## Mosque orientations in the Turkish world

Of all the many authors who have written on Ottoman mosques, the vast majority ignore orientations altogether.[22] They have opened the way to Deus.

In this new study, our author has examined over 250 'Turkish' mosques using Google Earth and compared their orientations, which are nowhere stated in his analysis (!), with **MODERN** directions toward Mecca, Medina, Axum (!), Nineveh (!), and wherever.

Deus does not mention the variety of medieval *qibla* determinations and is singularly weak on bibliography; in particular there is nothing on Ottoman

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21 See Donald Edgar Pitcher, *An historical geography of the Ottoman Empire from the earliest times to the end of the sixteenth century, with detailed maps to illustrate the expansion of the Sultanate*, Leiden: E. J. Brill, 1972.

22 Thus, for example, the article "Islamic architecture" on Wikipedia (https://en.wikipedia.org/wiki/Islamic_architecture), obviously written by a Westerner, contains a paragraph on the qibla and mosque orientation which is unexpurgated nonsense. The source for this was purportedly my 1995 article "The orientation of medieval Islamic religious architecture and cities", which the author obviously had not read.

architecture,[23] Ottoman astronomy or Ottoman astrology or Ottoman mathematics or Ottoman geography or Ottoman cartography or Ottoman sacred geography or Ottoman scientific treatises on the *qibla* or Ottoman legal texts on the *qibla* or Ottoman instruments displaying the *qibla* for cities all over the Empire or lists of *qibla*s of Ottoman cities.[24] Deus appears never to have heard of Ottoman *qibla*-indicators, handy instruments which show the *qibla*s of hundreds of places in the Muslim world, including, of course, places in Anatolia and Ottoman provinces even in Europe; the *qibla*-directions shown on these were, however, not calculated, they were based on Ottoman schemes of sacred geography.[25]

Since he does not reveal that he knows anything about the history of *qibla*-determinations in general, let alone in the Ottoman world, Deus is singularly ill-equipped to investigate Ottoman mosques. He does not state the orientation of a single mosque, only occasionally the deviation of that mosque to the **MODERN** *qibla*, which is of no **HISTORICAL** interest. He starts off by mocking certain medieval Muslim legal scholars who advocated an entire quadrant for acceptable *qibla*-directions, which was actually not a bad idea at the time, and which would ensure that every mosque that Deus has investigated was adequately, from the point of view of Islamic law, facing the Kaaba. The treatise on the legal aspects of facing the Kaaba (كتاب دلائل القبلة) by the 12th-century Egyptian legal scholar al-Dimyāṭī is the most detailed and the most sensible discussion of the subject by a legal scholar that I have come across; in addition, it is illustrated. He discusses facing the Kaaba straight on (عين الكعبة) or facing the general direction of the edifice (جهة الكعبة),

23 Reliable introductions are in John D. Hoag, *Islamic architecture,* Milan: Electaarchitecture, 2004, and John Freely, *A history of Ottoman architecture*, Southampton & Boston: WITpress, 2011.

24 The basic works, listing the available manuscript sources, are Ekmeleddin İhsanoğlu *et al*., *Osmanlı astronomi literatürü tarihi – History of Astronomy Literature during the Ottoman Period*, 2 vols., *Osmanlı matematik literatürü tarihi – History of Mathematics Literature during the Ottoman Period*, 2 vols.; and *Osmanlı coğrafya literatürü tarihi – History of Geography Literature during the Ottoman Period*, 2 vols., Istanbul: Research Centre for Islamic History, Art and Culture (IRCICA), 1997, 1999, 2000. The overviews in İhsanoğlu, *Science, technology and learning in the Ottoman Empire*, Aldershot & Burlington VT: Variorum, 2004, deal mainly with the later period and the introduction of Western science.

25 On qibla-indicators in general see King & Ricard P. Lorch, "Qibla charts, qibla maps, and related instruments", in J. B. Harley & David Woodward, eds., *The History of Cartography*, vol. 2, bk. I: *Cartography in the traditional Islamic and South Asian Societies*, Chicago & London: University of Chicago Press, 1992, pp. 189-20; King, *World-Maps for finding the direction of Mecca*, pp. 89-124; and *idem*, *In Synchrony with the Heavens*, I: 94-99.

stating that *qibla* within the quadrant about the former is acceptable.[26] But Islamic law is another topic that Deus knows nothing about, so he brands this particular pronouncement as being for "fools". I actually thought al-Dimyāṭī's pronouncement was rather clever.[27]

Deus needs to create an Ottoman world in which everybody could find the *qibla* correctly for any locality in order that they would not use that *qibla* for their mosques. So he invents the myth everybody in Turkey had access to the universal *qibla* table of my friend, the 14th-century Damascus astronomer al-Khalīlī, from which one can find the *qibla* accurately for all practical purposes for all longitudes and latitudes in the Muslim world.[28] He claims this was "published" in Damascus in 1365 and available all over the Ottoman Empire, whereas in fact still only three manuscript copies are known, all from late-14th-century Damascus. He neglects to inform his readers precisely what this table is or where he found it, and wrongly assumes that it was widely known over the centuries. But although this table gave mathematically accurate *qibla*-values it would not give the **MODERN** 'accurate' *qibla* because the medievals did not have **MODERN**, that is, 'accurate' geographical data at their disposal to feed into the table. Deus neglects to inform his readers how his Ottoman builders could have known the exact directions from places all over the Ottoman Empire where they wanted to build mosques toward specific frontier localities in Iran, Armenia, Crimea, Hungary, Serbia, Crete, Tunisia, Egypt, Hejaz, Yemen and Iraq. And if there ever had been a military campaign connection with any of these mosques, one might have expected a reference or two in the inscriptions within the mosques, but, of course, there

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26 King, *In Synchrony with the Heavens*, VII: 758 & 817, also article "Makka as centre of the world" in *Encyclopaedia of Islam*, 2nd edn., pls. 1-2.

27 It would certainly have saved Muslims in North America a lot of wasted energy, for there are those who believe the *qibla* is north-east and those who believe it is south-east, and the decades-old controversy is not resolved.

28 King, "al-Khalīlī's *qibla* table", *Journal of Near Eastern Studies* 34 (1975), pp. 81-122, repr. in *idem*, *Islamic Mathematical Astronomy*, London: Variorum, 1986, repr. 1993, XIII, also available at http://muslimheritage.com/article/al-khalili-spherical-astronomy. Deus' comments on this table (p. 6), which conveniently omits to mention my 1975 article, are weird and confirm that he can handle neither scientific literature nor historical literature. He mentions that al-Khalīlī's table is based on that of Ibn Yūnus, but these are tables for astronomical timekeeping, not for the *qibla*. He speculates about the existence of earlier *qibla*-tables, without knowing that these have all been published.

is no such thing.[29] And if there had ever been a mosque associated with a campaign we might have found a reference to this in an illustrated campaign itinerary report, but again, of course, we do not.[30] Or one might haver expected to find some Ottoman tables displaying such directions, whereas in fact, and unbeknown to Deus, we have only found an Ottoman table of calculated directional values for 90 cities in the Empire and – lo and behold! – the directions are toward Mecca and they correspond to some of the mosque orientations he has misinterpreted as not being toward Mecca.[31]

## The *qibla*s derived by medieval Muslim scholars were not the MODERN *qibla*s

One might think that any Turkish astronomer worth his salt could have calculated the *qibla* of his location to within a degree or two if he had wanted. His results would, of course, not necessarily correspond with the **MODERN**, 'accurate' *qibla*s because **MODERN** geographical coordinates were not available. Also, we cannot be sure that he would have applied any exact mathematical method. Deus appears not to know that the Ottoman astronomers' favourite texts[32] were two 13th-century books that were widely

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29 Gülru Necipoğlu, "Religious Inscriptions on the Great Mosques of the Ottoman, Safavid and Mughal Empires", *Hadeeth Ad-Dar* حديث الدار (Dar al-Athar al-Islamiyyah, Kuwait National Museum) 25 (2008), pp. 34-40.

30 J. Michael Rogers, "Itineraries and town views in Ottoman histories", in J. B. Harley & David Woodward, eds., *The History of Cartography*, vol. 2, bk. I: *Cartography in the traditional Islamic and South Asian Societies*, Chicago & London: University of Chicago Press, 1992, pp. 228-255.

31 As I wrote 20 years ago, there must be many more such lists in the vast sources still available for the study of Ottoman science. This particular one, from MS Paris BnF ar. 2544, fol. 106v, must be rather early because it is based on the standard locations of classical Islamic geographical tables with a few significant additions, namely, Larnaka, Belgrade, Sofia, Plovdiv, Rhodes, Skopje, Athens and Salonika. I have not investigated the entries because no longitudes and latitudes are given, but some entries, such as that for Cairo (see below), give the impression of being based on an exact mathematical procedure. See King, *World-Maps for finding the direction to Mecca*, pp. 149-161 & 456-477, esp. p. 461, no. 72.

32 On Ottoman astronomical activity in Istanbul around 1500 see now Ahmet Tunç Şen, *Astrology in the service of the Empire – Knowledge, prognostication, and politics at the Ottoman Court 1450s-1550s*, PhD dissertation, University of Chicago, Department of Near Eastern Languages and Civilizations, 2016, and King, "Two spherical astrolabes from Tunis and Istanbul" (2018), esp. Ch. 7: "Sultan Bāyazīt II and his interest in astronomy", available at www.davidaking.academia.edu.

taught in *madrasa*s for centuries – al-Jaghmīnī's الملخص في الهيئة , *al-Mulakhkhaṣ fi 'l-haya* and Naṣīr al-Dīn al-Ṭūsī's التذكرة في علم الهيئة , *al-Tadhkira fī ʿilm al-hay'a,* both are published with English translation[33] – and each proposed an approximate method for finding the *qibla* that was obviously less accurate than the exact method; the method dates probably from the 8th century and was used for over a millennium.[34] The divergence between the results using these two methods and **MODERN** geographical data for Western Anatolia might be a few degrees, and even for Eastern Anatolia the same might be true. So Deus' astronomers would not have computed the *qibla* exactly (even by medieval standards); nor would they have been able to compute the directions of all the other places he imagines to be relevant, namely battle-grounds all around the borders of the Empire (since no geographical coordinates were available for any but the major cities). And if they used an approximate formula for finding the *qibla*, they would not be using a complicated exact formula to find the directions of battle-sites whose geographical coordinates they had never measured.

Furthermore, those who laid out mosques were not always in touch with the astronomers; rather, they would use astronomical alignments or *qiblas* derived from diagrams of sacred geography or traditional methods popular in the region or the standard approximate geometrical procedure / trigonometric formula which was widely used from the 8th century to the 19th. None of these methods are mentioned by Deus, who prefers to refer occasionally to al-Khalīlī's universal *qibla* table but never asks what longitudes and latitudes the Ottomans would have used as arguments in such a table. To make myself clear, if one enters **MEDIEVAL** geographical coordinates into a medieval table that gives a mathematically accurate value of the *qibla*, then the *qibla* given by the table will not be the **MODERN** *qibla*. And one should keep in mind that medieval geographical coordinates,

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33 Sally P. Ragep, *Jaghmīnī's* Mulakhkhaṣ – *An Islamic introduction to Ptolemaic astronomy*, New York, *etc.*: Springer, 2016. pp. 165-169 & 277-278; and F. Jamil Ragep, *Naṣīr al-Dīn al-Ṭūsī's Memoir on astronomy (al-Tadhkira fī ʿilm al-hay'a),* Berlin & New York: Springer, 1993, vol. I, pp. 306-309 & vol. II, pp. 496-499. (The other method presented, namely, finding the azimuth of the sun when it is at the zenith of Mecca, is somewhat impractical.)

34 King, "The earliest Islamic mathematical methods and tables for finding the direction of Mecca", *Zeitschrift für Geschichte der arabisch-islamischen Wissenschaften* 3 (1986), pp. 82-149 & 4 (1987/88), p. 270, repr. in *Astronomy in the Service of Islam*, XIV. This paper analyzes materials from the 8th and 9th centuries, including simple approximate procedures and already sophisticated tables displaying the *qibla* as an approximate function of longitude and latitude difference from Mecca.

especially longitudes, were not particularly accurate. For example, Byzantine and Ottoman values even for the latitude of the capital Constantinople / Istanbul varied between 41° and 48°,[35] although most 15th-century Ottoman values were more appropriately in the range 41°-42°.[36]

Deus' stated premise is that (p. 6):

**"The Turkish builders were able to orient mosques precisely toward Mecca – but they did not."**

**Both of these claims are incorrect.** First, there was no way an Ottoman astronomer, let alone a builder, could find the **MODERN** *qibla*. The words "precisely toward Mecca" mean for Deus nothing other than the **MODERN** *qibla* because he knows no other. Second, all of the mosques under discussion were oriented toward the Kaaba in ways Deus does not understand, some calculated using approximate mathematical methods, others using exact procedures, and others derived by folk astronomical techniques or using Ottoman sacred geography or simply relying on tradition. If any of these orientations agree with the modern *qibla*s of the localities in question, then it is by coincidence.

Innocent of any Ottoman mathematics, Ottoman astronomy and astrology, Ottoman geography and cartography, and of any Ottoman procedures or instruments for finding the *qibla*, Deus presents page after page / slide after slide with monotonous, presumptuous *Besserwisserei*, falsely believing that the orientations can be allowed to speak for themselves, completely out of all contexts except a military one.

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35 The reason for this was that instead of bothering to measure the latitude, the Byzantines placed their capital in the 5th or 6th or even 7th climate, with corresponding latitudes 41°, 45° and 48°. See King, "[Notes on Byzantine astronomy]", *ISIS* 82 (1991), pp. 116-118, and "Spherical astrolabes from Tunis and Istanbul" (2018), on davidaking.academia.edu. The climates (Arabic اقليم ج. اقاليم , *iqlīm*, pl. *aqālīm*) were very important in ancient and medieval geography but their influence has been underestimated in modern times. But the unhappy situation regarding the latitude of Constantinople resulted from an excess of reliance on the climates and total scientific incompetence on the part of the Byzantine astronomers who would favour latitudes other than 41°. Also Islamic astrolabes from al-Andalus to Central Asia show latitudes for Constantinople in the range 41°-48°, but those with values in excess of 42° were relying on tradition.

36 King, "Turkish tables for timekeeping", Ch. 14 in *In Synchrony with the Heavens*, pp. 437-456. All known Ottoman astrolabes have the more realistic range 41°-42° for the latitude of Istanbul.

Deus considers the Turkish mosques chronologically because the dates of construction of the mosques are important for him to link with Ottoman military campaigns.[37] The point of the exercise seems essentially to show how Turkish mosques are oriented in **four directions**, one (maybe) more or less toward Mecca (but not always), but backwards or sideways (and even forwards) also in directions that can be associated with Turkish military campaigns. Thus Deus is happy to point out that some of his mosques face not only Mecca (maybe) but also toward goals of *jihād* such as Moldavia or Bulgaria or Iraq or Djibouti. He seems not to take very seriously the fact that the Ottoman Sultans were the guardians of the two sacred cities of Mecca and Medina and would have reacted strongly against anybody who deliberately erected a mosque other than in the direction of the Kaaba.

It is not in question that the Ottomans were rather active militarily. It is known that on festive occasions mosques in Istanbul associated with sultans were sometimes decorated with, amongst many other things, with panels bearing the name of the particular sultan and a list of their successful campaigns.[38] Furthermore, we do hear of occasional excesses on the part of military folk. For example, Kılıç Ali Paşa was a Grand Admiral and the cannons captured by his troops in 1574 when they conquered La Goulette, the port of Tunis, were displayed in front of the mosque which bears his name (see below).[39] This is a far cry from erecting a mosque in the direction of La Goulette.

One aspect that Deus has not pursued is the prowess of Turkish astrologers. They were always present to choose an auspicious day for laying the foundations of a new mosque, especially one associated with the Sultan. But

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37 One can follow the Ottoman campaigns on https://en.wikipedia.org/wiki/List_of_Ottoman_conquests,_sieges_and_landings.

38 Gülru Necipoğlu, *The Age of Sinan: Architectural culture in the Ottoman Empire*, Princeton NJ & Oxford: Princeton University Press, 2005, p. 67, and Selen Bahriye Morkoç, *A Study of Ottoman narratives on architecture – Text, context and hermeneutics*, PhD dissertation, University of Adelaide, 2006, p. 200.

39 Necipoğlu, *The Age of Sinan*, p. 68, and Morkoç, *Ottoman narratives on architecture,* p. 201.

many of Deus' mosque-campaign associations occur before the campaign has achieved its goal.[40]

An Ottoman gentleman, perhaps a *zaʿīm*, measuring
the time of day by means of shadows.
(See King, "A survey of arithmetical shadow-schemes for
time-reckoning", in *In Synchrony with the Heavens*, III: 457-528.)

40 On Ottoman astronomical activity in Istanbul around 1500 we have Ahmet Tunç Şen, *Astrology in the service of the Empire – Knowledge, prognostication, and politics at the Ottoman Court 1450s-1550s* (2016). None of Tunç's astrologers was predicting military campaigns in order to erect a mosque somewhere.

## Dozens of absurd claims

There is no real need for any commentary on Deus' treatment of mosque orientations save to repeat that it is absurd. To compare **HISTORICAL** orientations with **MODERN** *qibla*-values is a waste of time unless one nothing else to do. To think that anybody 500 years ago could find the **EXACT MODERN** direction to a distant locality is worthy of ridicule. To then build on this fragile base a scaffolding of claims that each mosque was oriented exactly, sometimes in four directions, toward some distant location, is *la folie totale*. Nevertheless, Deus' attempts to demonstrate, nay prove, that every mosque really faced some military campaign are so off-the-wall that it is rather fun to watch the scaffolding collapse. And I feel a duty to posterity to discuss at least a few examples, mainly for the innumerate *revisionistas* who will welcome Deus' discoveries.

In the sequel I have deliberately rounded all orientations to the nearest degree.

### From Diyarbakır ...

In 1998 I edited the collected papers of my friend Donald Hill, the world's leading expert on the history of Islamic technology. The subtitle of the book was *From Philo to al-Jazarī – from Alexandria to Diyār Bakr,*[41] and many of Hill's publications dealt with the engineer al-Jazarī, who worked for 25 years in the service of the Turkoman Artuqid kings of the region of Diyār Bakr, and who authored in 1206 what was to become the most widely-known Arabic work on automata. Little did I think that 20 years later I would be writing about Diyarbakır again.

Deus writes the following nonsense (كلام فارغ) about the Mosque (#001 in his list):

> "The first mosque of this study, the Great Mosque of Diyarbakır, is also said to be the oldest in present day Turkey. **Luck of the researcher** has it that it can be demonstrated with this mosque that the intent was to orient it toward Medina. A second layer (the main complex) points toward Mecca or Negash and a third toward the second Nabatean capital, Madain Saleh. The main complex of the Great Mosque of

41 Donald R. Hill, *Studies in medieval Islamic technology: From Philo to al-Jazarī – from Alexandria to Diyār Bakr*, David A. King, ed., Aldershot & Burlington VT: Ashgate-Variorum, 1998.

> Diyarbakır could be oriented toward Mecca/Negash by sheer chance of the 'long search.' After all, its foundations are supposed to be from a converted Christian church. Could it be that these Christians were part of an alliance in early Islam?"

I love the way the Mosque faces Medina and Negash, the first Muslim settlement in Africa, and why not the Nabataean site of Madā'in Ṣāliḥ too? **Unfortunately for Deus, none of these exotic places has anything to do with the Mosque.**

The Diyarbakır Mosque complex, considered by some Muslims as the fifth holiest site in Islam, is apparently oriented at **182**°, that is, roughly south, which is hardly surprising because it is based on the foundation of a significant church that was probably facing east.[42] The modern *qibla* at Diyarbakır is **181**° because the city is only about $^1/_2$° east of the meridian of Mecca, but this is irrelevant to any historical investigation. For if anybody had ever calculated the *qibla* in medieval times they would not have come up with a direction so close to due south, and their result would not have been west of south. Medieval Islamic geographical tables mainly show Diyarbekır between 2° and 10° west of the meridian of Mecca so the calculated *qibla* would be noticeably east of south. So, for example, the geographical table of al-Khāzinī of Marw (*ca*. 1125), derived from that of the well-known scientist al-Bīrūnī of Ghazna (*ca*. 1025), gives **142**° for Amid, an earlier name for the city.[43] The imposing early-15th-century Timurid geographical table from Kish near Samarqand gives the calculated *qibla* as **169°.**[44] Attribute this to the **luck of the reviewer**. The good folk who erected the Mosque in Diyarbakır used no calculation at all to orient their Mosque. Surely they were happy that it was more or less aligned (or so they thought) toward the Syrian Corner of the Kaaba, and so it is (more or less). And Deus should have known that certain mosques from al-Andalus to Central Asia face south because the Prophet (was believed to have) prayed south (toward Mecca) when he was in Medina.

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42 Readers might be surprised how many churches, early and medieval, do not face east. See various articles in Ruggles, ed., *Handbook of archaeoastronomy and ethnoastronomy*, such as Stephen McCluskey, "Astronomy in the service of Christianity", pp. 169-180, and "Orientation of Christian churches", pp. 1703-1710; Peter G. Hoare, "Orientation of English medieval parish churches", pp. 1711-1718; Saša Čaval, "Church orientation in Slovenia", pp. 1719-1726; Rimvydas Laužikas, "Church orientation in Central and Eastern Europe", pp. 1727-1732.

43 King, *World-Maps for finding the direction to Mecca*, pp. 71-75 & 564-585, esp. 574, no. 121.

44 King, *World-Maps for finding the direction to Mecca*, pp. 149-161 & 456-477, esp. p. 461, no. 72.

## The two early mosques at Samarra

> " ... if neither the Abbasids, nor the Seljuks, nor the Ottomans habitually oriented their mosques toward Mecca, the sect that first did so has yet to be named." Deus, p. 31.

Deus (pp. 13-14) refers to these two Abbasid monuments – the Great Mosque of Samarra (#002) and the Mosque of Abū Dulaf (#003) – in order to discuss (and dismiss) the 'theory' that Abbasid mosques might have been oriented toward Mecca. So Deus (p. 13):

> "Despite uncontested consensus that the Great Mosque of Samarra (#013) points to Mecca (with a deviation of Δ 1.3°), it may be focused on Messina in Sicily (with a deviation of less than Δ 0.2° to its city center). The mosque is believed to have been completed around 848 AD, at a time during which Muslim tradition was created. Messina was sacked around the construction of Samarra and was used as a bridgehead for the occupation of Rome in 846 AD. It does not need explaining to the audience of this paper that prophesy puts by far more weight on a conquest of Rome than on a hypothetical importance of Mecca."

The orientation of the Great Mosque of Samarra is about **198**°. This was one of the first mosques to be oriented according to a mathematical procedure. The famous astronomer Ḥabash al-Ḥāsib worked there in the 9th century and devised a brilliant universal geometrical mathematically-exact procedure for finding the *qibla*, but, alas, he presented no worked examples.[45] The 14th-century Timurid table with (earlier) coordinates and calculated *qibla*s for 274 cities has **188**° for Samarra. (The **MODERN** *qibla* for Samarra is **197**°, coincidentally virtually identical to the orientation of the Mosque, and I would not call it irrelevant because however it was laid out, the result is brilliant.)

In any case, to call into question the Mecca orientation and propose instead a deliberate orientation toward Messina is nothing short of perverse. Let me assure readers that the splendid 9th-century Mosque at Samarra has absolutely nothing to do with Messina, let alone with Rome.

The Mosque of Abū Dulaf in Samarra, built during 847-861, is, for Deus, "possibly oriented toward the eastern surrounds of Tiflis." That city was

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45 E. S. Kennedy & Yusuf 'Id, "A letter of al-Bīrūnī: Ḥabash al-Ḥāsib's analemma for the *qibla*", *Historia Mathematica* 1 (1973), pp. 3-11, repr. in E. S. Kennedy, Colleagues and Former Students, *Studies in the Islamic Exact Sciences*, David A. King and Mary Helen Kennedy, eds., Beirut: American University of Beirut, 1983, pp. 621-629.

burned to the ground in 851/52 in response to a rebellion. Deus states emphatically "this mosque is not oriented toward Mecca".

The difference in orientation of the two mosques built less than a decade apart, is some 4°. For Deus this eliminates the possibility that they were both oriented toward Mecca and that *qibla*-tables existed in the mid 9th century. If they were built toward the same target by the same men, he says, then the calculation method – if there was one – must have been different for each of the two mosques. Now we can perhaps attribute to the **luck of the serious researcher** the fact that these two mosques were indeed both oriented toward Mecca and that the *qibla*-table of al-Khwārizmī (*ca*. 825) based on an approximate formula was discovered in Cairo in the 1970s.[46] The 'calculation method' used to derive the orientations was probably one and the same, but the procedure used may have been exact or approximate, and the difference may also result from the use of slightly different geographical coordinates for Samarra and/or Mecca or both.[47]

## The Shāh-i Zinde complex in Samarqand

This complex, of which most surviving monuments date from the 14th and 15th centuries, is mentioned in passing by Deus (p. 12), who says it is "of course, not oriented toward Mecca". I would prefer to say that the basic orientation of the complex is "north-south, with most *miḥrāb*s facing south, according with Shāfiʿī practice". Yes, the Shāfiʿīs' *qibla* was to the south (after the Prophet when he was in Medina) and the Ḥanafīs' *qibla* was to the west (in the direction of the road leaving toward Mecca). This is what I wrote in 1983 in an article on *qibla*-directions in Central Asia, based mainly on an 11th-

46 King, "al-Khwârizmî and new trends in mathematical astronomy in the ninth century", *Occasional Papers on the Near East* (New York University, Hagop Kevorkian Center for Near Eastern Studies) 2 (1983), 43 pp., esp. pp. 12-16, analyzed further and set in context in *idem*, "Earliest Islamic methods and tables ... ", pp. 85, 110, 111.

47 See King, "Earliest methods and tables ... ", pp. 126-129, for an Abbasid text presenting an example of the use of an Abbasid *qibla*-table to find the *qibla* at Baghdad (result 13°13′ E of S); and also Jan P. Hogendijk, "Al-Nayrīzī's mysterious determination of the azimuth of the qibla at Baghdad", *SCIAMVS* 1 (2000), pp. 49-70, which is particularly interesting from a mathematical point of view.

century legal text written in Samarqand.[48] The complex is facing the *qibla* even if it is not facing Mecca as we might like; it is facing both the *qibla* of the Shāfiʿīs' and the *qibla* of the Prophet. Q.E.D.

## To Istanbul ...

> •GET ORIGINAL TEXT FROM NECIPOGLU BOOK• "... specific dates were selected for the start of construction in accordance with astrological and cosmological references. The anecdote relating that the first stone to be laid was the cornerstone of the mihrab and that it was put in place by the highest religious authority of the state further attests to the significance given to the sacred Islamic references such as orientation towards the Ka'ba and endowment with *baraka* (divine blessing) ... ." Selen B. Morkoç, *Studies of Ottoman narratives on architecture ...* , PhD dissertation, University of Adelaide, 2006, pp. 201-202.

Let us have a look at my favourite Süleymaniye Mosque (#191), built during 1550-1558 by the most famous of all Ottoman architects, Miʿmār Sinān.[49] Fortunately, we have historical accounts about the construction of this mosque.[50] The orientation of the Mosque is about **138**°. (I had to measure this myself because Deus doesn't divulge mosque orientations.) Deus would compare this with the modern *qibla* for Istanbul, which is **152**°, but this is irrelevant because the mosque was built almost 500 years ago; nevertheless it enables him to show the directional indicator for the Mosque does not pass through Mecca but rather goes down the middle of the Arabian Peninsula.

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48 King, "Al-Bazdawī on the *qibla* in early Islamic Transoxania", *Journal for the History of Arabic Science* 7 (1983/1986), pp. 3-38, repr. in *Islamic Astronomy and Geography*, 2012, IX. Text, translation and analysis of a highly significant and informative Arabic text by the late-11th-century judge and Ḥanafī legal scholar Abu 'l-Yusr al-Bazdawī.

49 The literature is vast. See, for example, Gülru Necipoğlu, The Süleymaniye Complex in Istanbul: An Interpretation", *Muqarnas* 3 (1985), pp. 92-117, *eadem*, "Creation of a national genius: Sinan and the historiography of 'classical' Ottoman architecture", *Muqarnas* 24 (2007), pp. 141-183; and *eadem*, *The Age of Sinan: Architectural culture in the Ottoman Empire*, Princeton NJ & Oxford: Princeton University Press, 2005; also Péter Rabb, ""We are all servants here!" Mimar Sinan – architect of the Ottoman Empire", *Periodica Polytechnica - Architecture* 44 (2013), pp. 17-37, at www.pp.bme.hu/ar/article/view/7444.

50 See also Morkoç, *A Study of Ottoman narratives on architecture*, pp. 201-202.

But it suits Deus' purpose that the Mosque is some 14° off the *qibla*, or rather off the **MODERN** *qibla*.

It makes more sense to compare the Mosque at **138**° with the *qibla* for Constantinople / Istanbul given in various relevant Ottoman and related sources. The reader should keep in mind that the values there will depend on (a) which geographical coordinates were used (all inaccurate by modern standards); and (b) which method was used to calculate the *qibla* (unless it was not calculated at all).

So, for example, the geographical table of al-Khāzinī of Marw (*ca*. 1125), derived from that of the well-known scientist al-Bīrūnī of Ghazna (*ca*. 1025), gives **144**° for Constantinople.[51] The imposing early-15th-century Timurid geographical table from Kish near Samarqand gives the calculated *qibla* as **142°.**[52] The geographical table of Taqi 'l-Dīn, the most significant astronomer in Istanbul in the second half of the 16th century and director of the short-lived observatory there, would give **139**°.[53] On a *qibla*-indicator made by Bayrām ibn Ilyās in Istanbul in the year 1582, representing an Ottoman scheme of sacred geography with 72 equal divisions (5° each) of the world about the Kaaba, there is no circumferential scale but Istanbul is shown facing the centre in the 8th sector along with Bursa and Edirne, that is, at about 36°-39° E of S, or **141°-144°**; this direction was not calculated.[54] **In the Ottoman table of *qibla*-values of some 90 localities in the Ottoman Empire, the *qibla* of Qusṭanṭiniyya is again 138**°.[55] Also, the popular almanac of Darendeli (d. 1739), which contains tables for the times of the prayers for the latitude of Istanbul, these tables being clearly earlier than their compiler, has

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51 King, *World-Maps for finding the direction to Mecca*, pp. 71-75 & 564-585, esp. 567, no. 35.

52 King, *World-Maps for finding the direction to Mecca*, pp. 149-161 & 456-477, esp. p. 460, no. 52.

53 The table gives only longitudes and latitudes. For Istanbul we have 60°0′ / 41°15′, and for Mecca 77°0′ / 21°30′. I have calculated the *qibla* as 41°10′ E of S using the exact method. See King, *In Synchrony with the Heavens*, II: 447 & 448-450.

54 On this instrument see King, *World-Maps for finding the direction of Mecca*, pp. 115-117, and *idem*, *In Synchrony with the Heavens*, I "Astronomical instrumentation in the medieval Islamic world": 98-99; also www.britishmuseum.org/research/collection_online/collection_object_details.aspx?objectId=235572&partId=1&images=true (accessed 2018).

55 King, *World-Maps for finding the direction of Mecca*, pp. 86-87, p. 75 n. 63, and p. 622, no. 25.

a *qibla* for Istanbul of **138°**.[56] How about that? Attribute this to the **luck of somebody who knows something about the history of Islamic science**. In brief, I can happily confirm that

**Sinān oriented his most famous mosque precisely in the direction of the *qibla* for Istanbul that was known at that time.**

The fact that it does not face the **MODERN** direction of Mecca is Deus' problem. He could solve it by studying the history of medieval Islamic astronomy, mathematics and geography.

Deus' solution to the (obvious) fact that the Süleymaniye Mosque does not face the (**MODERN**) *qibla* is the following. He maintains that it was oriented

(1) "questionably" toward Söğüt, (the modest settlement in the Marmara district which was the capital of the Ottomans before Bursa);

(2) "possibly" toward As Sultan (السلطان, Al-Sulṭān) near Sirte, Libya, where in 1551, he says, there was an Ottoman invasion on the coast of the Gulf of Gabès; and

(3) "likely" toward Szolnok which he says is in Rumania and which he thinks fell to the Ottomans in 1552. Actually Szolnok is in Hungary but معليش, *maʿlēsh,* it was indeed the focus of a lot of Ottoman military activity at the time.

Deus' mastery of Ottoman military history is not under discussion here, though the activity in the Gulf of Gabès is not well documented, and perhaps he refers to the Ottoman capture of Tripoli in 1551. However, his curve emanating from the mosque and representing the perpendicular to its main axis goes through As Sultan at the middle of the Gulf rather than Sirte a little to the west and certainly rather than Tripoli at the western end of the Gulf. Deus actually takes seriously the precise location where the minor axis of a mosque in Istanbul, extended thousands of miles, intersects a coastline or a river or whatever.

His feverish attempt to link any mosque orientation which he is incapable of understanding with contemporaneous Ottoman military campaigns is happily squashed by the fact that all of the mosques he discusses have a *miḥrāb* facing the Kaaba, whether they face Mecca in the modern sense or not.

## Another mosque by Sinān

56 On the *Rūznāme* of Darendeli see King, *In Synchrony with the Heavens*, II: 442 & 444-445.

The Mosque of Banya Başı in Sofia (#215) was built by Sinān in 1566. Deus claims that the Mosque is 4° too far north of the (**MODERN**) *qibla*, so he reckons it was not built to face Mecca but rather

- possibly to Bucharest
- possibly to Belgrad (staging for Hungarian campaign 1566, imprecise)
- possibly to Lanzenkirchen / Wiener Neustadt, Austria (planned assault on Vienna?)
- likely to Cospicua, Malta (Great Siege of Malta 1565, Ottoman artillery battery in order to bombard Fort St. Elmo).

*Oy veh*! Now the Mosque faces about **136**°. The **MODERN** *qibla* is 142°, which almost explains the figure of 4° divergence, but that is irrelevant anyway. What is more significant is that the *qibla* of Sofia in the Ottoman list of *qibla*-values is **138°**.[57] So I would say that the Mosque faces Mecca, adequately by Ottoman standards, if not by Deus' exigencies.

## Yet another

The Mosque of Grand Admiral Kılıç Ali Paşa in Istanbul (#232) was constructed in 1578-1580 by Sinān, already in his 90s. It faces about **120**°, closer to winter sunrise than to any mathematically computed *qibla*. (The **modern** *qibla* of **152**° is, as usual, irrelevant.) There was a tradition of supposing the Kaaba to be rhomboid in shape, with each of the four sides being solstitially aligned, but that may not necessarily underlie the orientation here.[58] Maybe Sinān knew of this; certainly he had visited the Kaaba and was surely aware of local traditions concerning it.[59] Other features should be considered in trying to interpret mosque orientations, if information is available, such as the street-plan and the horizon. In this case, however, the Mosque was built on an artificial island of landfill off the coast and the south-east horizon was surely unencumbered. The coastline has since changed and the Mosque complex is now in the Tophane neighbourhood of the Beyoğlu district. Deus has this mosque at *ca*. 30° off the irrelevant **MODERN** *qibla*, perhaps facing Wiener Neustadt but "likely" facing the campaign focus of Benghazi, 1578. عونك يا رب .

57 King, *World-Maps for finding the direction of Mecca*, pp. 86-87, and 622, no. 26.

58 Hawkins & King, "On the astronomical orientation of the Kaaba", pp. 104-105, also article "Makka. As centre of the world", in *Encyclopedia of Islam*, 2nd edn., fig. 1.

59 Necipoğlu, *The Age of Sinan*, p. ••, and Morkoç, *Ottoman narratives on architecture,* pp. 196-•••.

## Curiouser and curiouser

The Muradiye Mosque in Manisa (#236) was built in 1583-86, again by Sinān. It faces ***ca*. 145°**. Now the **MODERN** *qibla* of Manisa is **145°**. Did Sinān know that? No, of course he didn't. The *qibla* for Manisa given in the Ottoman *qibla* –list is **135°**. Thus Sinān aligned this Mosque 10° too far to the south by contemporaneous standards. How this came about we can only speculate. Maybe someone will one day figure this out. Certainly it was not for the reasons that Deus proposes:

- Possibly to Bad Deutsch-Altenburg (for Vienna?).
- Possibly to Ikreny (for Györ 1593).
- Possibly to Mecca [!!!].
- Likely to Uspenskoye, Armenia (for Armavir 1585).

This is absolute madness. "Possibly to Mecca" !!!

## The Green Mosque of Bursa

Deus' use of the **MODERN** *qibla* to investigate **HISTORICAL** *qibla*s can get him into a lot of trouble. For his results give the impression that Deus will go to any lengths to twist historical fact to his advantage.

The Green Mosque in Bursa (#089) was built in 1419. The orientation of the Mosque is **148°** and the (irrelevant **MODERN**) *qibla* for Bursa is 151°.

Deus decides that this Mosque does not face Mecca but that it does face (the **MODERN** directions of) Jerusalem and Medina. This is cute, and he invents the charming expression "holy corridor". But why should the Mosque face those two sacred cities? Deus says the accepted date of construction of the Mosque is false; it must have been built around 1517, not 1419, because that was when the Ottomans wrested these cities from the Mamluks. His argumentation is balderdash.

The *qibla* for Bursa given in the anonymous Ottoman list of *qibla*s of 90 Ottoman cities is **135°**, but that list may post-date the Green Mosque. One could easily check using various sets of medieval coordinates whether or not Bursa, Jerusalem and Medina could ever have been in a straight line, but this would be a complete waste of time. It would be equally ridiculous to claim that Bursa was chosen for the Green Mosque because the city is in on a line from Medina to Jerusalem produced to the Ulu Dağ, but Deus has done precisely that because he thinks the very site of the Mosque in Bursa was chosen so that it would constitute the end of the 'holy corridor'.

If there is any 'holy corridor' it is between the Green Mosque and the Kaaba. One of several possible explanations for the orientation of the former is that it is the same as the direction as the major axis of the Kaaba. More luck! This would mean that it is 'parallel' to the axes of the Mosques of Kairouan, Tunis, and Córdoba, which face that same direction. Although these western mosques were built in accordance with Roman street-plans they were fortuitously aligned so that their *qibla*-walls were 'parallel' to the NW wall of the Kaaba. The same is true about the Green Mosque. And such arrangements were proposed in the schemes of Islamic sacred geography.[60]

## Two mosques in Edirne

Deus singles out this pair of mosques to show how the orientation 'improved' over time,

First the Üç Şerefeli (Three Minaret) Mosque (#102) in Edirne built in 1438. It is oriented about **130°**. The Ottoman list and of *qibla*s gives **135°** for Edirne.[61] The correspondence is reasonable.

Deus presents a *pot-pourri*, in every sense, of speculations regarding this Mosque:

- 1438-1447
- 1363-1453 Edirne
- 1444 Battle of Varna to Murat II
- Meets with Bursa
- Possibly to Varna
- Possibly to Grocka, for surrender of Smederevo in 1439 on the way to Belgrade
- Likely to besieging of Belgrade 1440
- Mamluk Karamanids

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60 Michael E. Bonine, "The sacred direction and city structure: A preliminary analysis of the Islamic cities of Morocco", *Muqarnas* 7(1990): 50-72, and *idem*, "Romans, astronomy and the *qibla*: urban form and orientation of Islamic cities of Tunisia", in J. C. Holbrook & R. T. Medupe & J. O. Urama, eds., *African Cultural Astronomy – Current Archaeoastronomy and Ethnoastronomy Research in Africa*, Berlin (?): Springer, 2008, pp. 145-178; also King, "The enigmatic orientation of the Great Mosque of Córdoba", *Suhayl – International Journal for the History of the Exact and Natural Sciences in Islamic Civilisation* (2018), to appear, preprint available on www.davidaking.academia since 2016.

61 King, *World-Maps for finding the direction to Mecca*, p. 622, no. 27.

The reader can work his/her way through this garbage. For me it is enough that the Mosque faces Mecca, whether Deus and the revisionists like it or not.

Second, the Selimiye Mosque (#218) in Edirne, by Sinān, dates from 1569. It is oriented at about **135**°. The Ottoman *qibla*-table gives **135**° for Edirne. Howzat! The modern *qibla*, which is irrelevant, is 147°**.** Deus, of course, is happy to find an error in the *qibla* of some 10° (compared with the **MODERN** value), and this enables him to postulate that the Mosque is oriented

- Possibly to Nicosia, Cyprus (falls to Ottomans 1570)
- Likely to Larnaca, Cyprus (harbor, falls to Ottomans 1570, Cyprus falls 1571)

I prefer to propose simply that the Mosque faces Mecca. The proof is in its orientation. I hope that the reader by now realizes that such a mosque could be erected in the *qibla* that was accepted at the time and thus be facing Mecca, even though it may not be facing Mecca by modern criteria. Again, it's about them, not about us.

## A mosque in Greece facing the Cairo Citadel (!)

So Deus (p. 17):

> "For doubters (that the data can potentially identify the footsteps of Turkish sultans on Jihad or grand viziers after the battlefields had long been cleared), the Fethiye Mosque (#138) in Nafpaktos [= Lepanto], Greece, for example, was built in 1499 after the Ottomans had lost a series of fights with the Mamluks. This mosque points to the Cairo Citadel [!!] with a deviation of Δ 0.0°. Eighteen years later, Selim I entered the Cairo Citadel. Under the condition that its construction history is correct, the Fethiye Mosque is testament to the Ottomans' advance planning. The adventure was postponed because of the Ottoman-Venetian War. Thereafter, the goal was pursued by first eliminating the Karamanids in the east and then facing the Mamluks head-on through Syria."

This is all rubbish. A mosque in Greece pointing toward the **MODERN** direction of the Cairo Citadel??

The Mosque in Nafpaktos apparently faces ***ca*. 140**°, and the Ottoman *qibla*-list has 122° for Salonika and 124° for Athens so that we could imagine a *qibla* for Nafpaktos of ***ca*. 125**°. This measurement of the mosque orientation is not secure, and it may be that the Mosque has been oriented approximately south-east (**135**°), which would not have been a bad idea. The **MODERN** *qibla*

of Nafpaktos is 133°, and Deus claims the Mosque is -2° off this, which is not the case. There is more of a problem here than elsewhere.

The Ottoman astrologers may have been pretty good at predicting future events – there is always a 50% chance of success – but I have never heard of one who could predict an event 18 years ahead, although see below.

## The summit of absurdity

Consider the Ottoman-style Mosque of Sulaymān Pāshā (#165) on the Citadel on the Muqaṭṭam Hills overlooking Cairo. It was built in 1528 for the then Viceroy (*beylerbey*) of Egypt. Its orientation is about **130°**, whereas the irrelevant **MODERN** *qibla* is 136°. Deus would have us believe, and we would have to be pretty stupid to do so, that the Mosque is not facing Mecca but is somehow facing the three following directions:

- Chioggia (Venice?).
- Possibly to Baku.
- Note: passes by Caesarea, Capernaum and Mt. of Beatitudes at the Sea of Galilee (south of Safed: center of Jewish revival), also Palmyra.

Deus claims that he has "insufficient historical information" on this Mosque, but that holds only for him. We know that the Mosque was built on the ruins of the earlier Mosque of Abū Manṣūr Qusṭah, governor of Alexandria, which had been built in 1141. The orientation of that Mosque was most likely the same as that of the new Mosque of Sulaymān Pāshā, because the *qibla*-value for Cairo which was used there from the late 10th century onwards was the direction calculated by the great late-10th-century astronomer Ibn Yūnus, namely **127°**. He worked for the Fatimid Caliphs al-ʿAzīz and al-Ḥākim, and the major mosques built in his time, namely, the al-Azhar and the al-Ḥākim Mosques, face this direction as opposed to the earlier *qibla* of the Companions of the Prophet, which was toward winter sunrise at **117°**.

Since the roughly orthogonal street plan of the new city of al-Qāhira, founded in 969, was built alongside the Pharaonic / Roman Red Sea Canal, which happened to be at **27°** at that location, the entire city was aligned in the *qibla* of the Companions at **27°+90°=117°**.[62] The Azhar and Ḥākim Mosques are both at **10°** skew to the new city plan, and various later Mamluk religious architecture is aligned externally with the city-plan at **117°** and internally

62 On *qibla*-determinations and orientations in medieval Cairo see King, "Architecture and astronomy: The ventilators of medieval Cairo and their secrets", *Journal of the American Oriental Society* 104 (1984), pp. 97-133, with a revised version in *In Synchrony with the Heavens*, VIIb: 773-823.

with 'new' *qibla* of **127**°. The latter was used in Cairo until the introduction of modern geographical coordinates and a new modern *qibla* was determined by the Department of Surveying.

Thus the splendid Mosque on the Cairo Citadel has nothing to do with Chioggia, Baku or the traditional site of the 'Sermon on the Mount', and Nabataean Palmyra is as important for this Mosque as Petra is for any other! Rather, the Mosque of Sulaymān Pāshā, like all mosques in Fusṭāṭ and Cairo before it, and in Cairo after it and up to the present, faces the Kaaba in Mecca. That does not mean they are all oriented in the same direction.

## Some mosques in the Balkans

The Emperor's Mosque in Sarajevo (#111) was completed in 1457, very early in post-1453 era. It was the first mosque I ever saw, during a visit to Yugoslavia in 1957. The Mosque apparently faces ***ca*. 163**°. Sarajevo alas does not feature in the Ottoman *qibla*-list. The modern *qibla* is 135°, although Deus has Mecca at 155°. In any case, he is able to state that this splendid mosque faces

- possibly to Smederevo, Serbia (falls to Ottomans 1459)
- likely to Patras (falls 1458).

The Farhad-Begova Mosque (#205) in Sarajevo, built in 1561, is, writes Deus, the first in his data set that appears to be oriented toward Mecca (Δ 0.2°), over forty years after the incorporation of Mecca into the Ottoman realm, and he associates it with a "likely push toward northern Romania at this time".

The Divan-katiba Hajdar (#186) in Sarajevo, dated 1545, faces

- possibly to Suakin, Sudan (Selim I 1517?)
- possibly to Castelvolturno (for 1544 attacks on Pozzuoli and Naples)
- possibly to Sesvete (for Zagreb?)

The Gazi Husrev-Beg Mosque (#172) in Sarajevo was built in 1530-32. Deus says it is "oriented straight to downtown Vienna", which was under siege in 1532. Yes, and the Sachertorte was invented in downtown Vienna in 1832.

It is time to stop.

## Multiply this nonsense by 200

I would happily look at a few more of Deus' 200-odd Turkish mosques, just for the fun of it, but he does not give any mosque orientations, and I do like numbers. He just gives maps with curves all over them, two orthogonal sets, one for the *qibla*-axis for each mosque and one for the perpendicular axis. The reader must simply believe me when I summarize Deus' findings for over 200

mosques. The following is not a quote but it is typical of his analyses, which I make bold to interpret.

> For the Mosque of Ali Baba in a small town in Anatolia which you have never heard of and whose geographical coordinates were never measured by anyone in the medieval or pre-modern period, Deus finds that the orientation of the mosque is, say, 30° off the **MODERN** direction of Mecca. [This does not surprise DAK at all because the *qibla* used to orient this mosque was obviously not calculated by anybody.] But now comes the icing on the cake. **Deus claims that the mosque was deliberately built in this direction; it was deliberately built not to face the direction of Mecca.** We are told that looking out of the window on the wall to the left of the *qibla*-wall, we are deliberately facing accurately somewhere unheard of in the Ukraine which the Turks had just occupied, and out of the window to the right we are facing directly toward somewhere in Tunisia where they just going to win a battle, and out of the back door beyond the ablution fountain we are exactly facing some village in Albania which they were about to attack.

Thus for Deus this mosque becomes, like all the others, a "**monument of jihad**" – أعـــوذ بـــالله . Curiously, over the centuries no Turk ever realized this. I shall be interested to see how my colleagues in Ottoman Studies react to this nonsense, let alone the Turkish press, albeit momentarily deprived of their best reporters.

I will grant that many of the mosques investigated by Deus face strange directions, but it is rather arrogant for any modern to claim that one can understand them all, especially if one knows nothing about the context and methodology of historical *qibla*-determinations.

## Why do people write rubbish about orientations nowadays?

> "The vast majority of humans want to live under a concept of love, peace and charity. In unexpected ways, this research brings to the surface that Islam under medieval and pre-modern Turkish leaders was a religion of war. It may have been so even before the arrival of Turkish dynasts," Deus, p. 30.

A lot of nonsense can be written about orientations, especially if one looks sideways and backwards as well as forwards to what is obviously the principal orientation of a given edifice. I think Deus may be the first to apply this four-pronged or quadri-axial approach to any pre-modern buildings, looking way over the horizon at the two ends of the two principal axes.

Certainly interest in orientations is not lacking, nor are interesting projects. Maybe someone should investigate whether Westminster Abbey, founded by Benedictine monks in 960 with it major axis facing about 5° S of E (why?), also faces Cluny to the south south-east. Also, check out the Cathedral of Santa Maria Maior in Lisbon, started in 1147, to see whether it faces the future colonies of Goa or Macau. And so on ... . Why do people write such nonsense about orientations?

We do not have to look far for a reason why Deus would publish this kind of rabid anti-Muslim, anti-Turkish, ahistorical, non-scientific nonsense. His study was conducted "in collaboration with" a revisionist outfit named "Inarah – Institute for Research on Early Islamic History and the Koran" based in Saarbrücken, Germany.[63] If this is the best that Inarah (انـــارة , *ināra*, 'enlightenment', from نـــور , *nūr*, 'light') can do with mosque orientations, it is rather sad but hardly surprising. Revisionists are people who don't believe any of the earliest written sources of the Muslims and want to rewrite the traditional history of the origins of Islam. The 'Saarbrücken school' is well-known amongst specialists in Islamic Studies for some very weird ideas, as formulated in Günter Lüling's 1977 book on the pre-Islamic Kaaba as a Christian church with an apse facing Jerusalem, and more recently the proposal that the term 'Muḥammad' was a Christian honorific title that referred to Jesus. The light of Deus' contribution to Ottoman Studies and studies of mosque orientations is, however, in my humble opinion, already مـطفأ , *muṭfa'*, extinguished. But the *revisionistas* will love it, and many innocent innumerates will fall for it too.

The ultimate goal of some of these revisionists is often to demonstrate that Islam is a false religion, whose founder did not exist, whose scriptures are suspect, and whose early history has been forged. Muslims, they would maintain, are basically clueless, blinded by their religion, and most orientalists have fallen for the Muslim version of early Muslim history documented in the earliest Arabic sources. Some of the revisionists were very clever orientalists like Michael Cook & Patricia Crone, who thought they had proved, using mosque orientations, that Islam began in N. W. Arabia, Others are hapless amateurs like Dan Gibson, whose life's mission has been to show that the earliest mosques face Petra. They all desperately sought/seek to reestablish the origins of this, for them, dubious Judaeo-Christian sect in

63 Their website, at first sight quite innocent, is at www.inarah.net. On this school of revisionism and others see the overview in https://en.wikipedia.org/wiki/Revisionist_school_of_Islamic_studies.

places like Petra (actually there's nowhere else reasonable in N. W. Arabia), even though there were no Muslims there.

Happily, none of the revisionists has yet questioned the early Arabic sources relating to folk astronomy.[64] But others have claimed that the very remarkable orientation of the Kaaba might have been changed when the edifice was rebuilt over the centuries so the 'discoveries' of Hawkins & King may not be valid for the early history of the Kaaba. At least Lüling conceived of the Kaaba as a church with an apse facing Jerusalem, that apse being still visible in the low semi-circular wall (الحجـــر) attached to the NW wall of the edifice. Gibson thinks the 'real' Kaaba was in Petra.

Several unhelpful reviews of Gibson's claim about early mosques facing Petra and of my rebuttal thereof have been published by 'colleagues', mainly innumerate, who do not understand that **HISTORICAL** mosque orientations should not be investigated using **MODERN** *qibla*-values. So, for example, they will claim that Gibson's evidence for this particular mosque facing (the **MODERN** direction of) Petra appears irrefutable, or that King seems unable to explain the orientation of that particular mosque. It is difficult to escape the conclusion that their ultimate goal is to make sure Gibson's claims 'succeed' because, for them, it sounds like a great idea which certainly assists them in their mission.[65] Muslim reaction to these claims so far has no solid foundation. One enlightened Western investigator has weighed the different claims for Mecca against those for Petra and at the end of the game the score is **Mecca 7, Petra 0**.[66]

Deus will surely come up with another group of mosques and afford it similar treatment. Maghribi mosques? Iranian mosques? Why not investigate

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64 See King, "The Petra fallacy" for a bibliography on Islamic (and pre-Islamic Arabian) folk astronomy.

65 See Al Fadi & Jay Smith, "The earliest mosques don't face Mecca! Gibson's new research" (*ca*. 30 mins.), available at https://www.youtube.com/watch?v=0ZKcpDEEJnA. This video reveals the utility of Gibson's 'findings'.

66 Mark Anderson, "Is Petra Islam's true birthplace—or Mecca?", at https://understandingislam.today/ui3/wp-content/uploads/2018/09/Is_Petra_Islams_true_birthplace.pdf. This should be required reading for anyone interested in the subject. Unfortunately I am reported to have said that the earliest Muslims "calculated" the *qibla* but this is what Gibson falsely claims for directions to Petra, whereas in fact I had stated that they "determined" it. They calculated nothing.

mosques in Mecca, of which same 200 are, according to the Saudi authorities, supposedly not facing the Kaaba?[67]

## To end on a positive note

Fortunately for historical Turkish mosques, many of them beautiful, elegant and serene, and all of them facing the sacred Kaaba in one way or other, we now have a much more sensible new study of the orientations of at least the major ones by Mustafa Yilmaz & Ibrahim Tiryakioglu.[68] The authors, unlike Deus, know how Muslims found the *qibla* centuries ago, they state what the mosque orientations are, and they show graphically their wide range. Alas, they did not know about the published Ottoman list of *qibla*s for Ottoman cities. But guess what: they do not mention a single Ottoman military campaign.

So much for Deus and his pathetic meddling with mosque orientations and his outrageous conclusions. For him and his ilk I have a message: The only worthwhile *jihād* is a *jihād* against ignorance.

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67 "More than 200 Mecca mosques 'face wrong direction'", available at www.telegraph.co.uk/news/worldnews/middleeast/saudiarabia/5110754/More-than-200-Mecca-mosques-face-wrong-direction.html (accessed 2017), citing an official Saudi pronouncement.

68 Mustafa Yilmaz & Ibrahim Tiryakioglu, "The astronomical orientation of the historical Grand mosques in Anatolia (Turkey)", *Archive for History of Exact Sciences* 72 (2018), pp. 565–590 (https://doi.org/10.1007/s00407-018-0215-1). Earlier studies were Frank E. Barmore, "Turkish mosque orientation and the secular variation of the magnetic declination", *Journal of Near Eastern Studies* 44 (1985), pp. 81-98, and Yilmaz, "Historical mosque orientation in Turkey: Central-Western Anatolia Region, 1150-1590", *Journal of Historical Geography* 38 (2012) 359-371.