Response to David King
Dan Gibson
September 2017

The Muslim Heritage website recently published an article by Dr. David King, a respected professor who reviewed my book Early Islamic Qiblas in an article titled: From Petra back to Makka, - from “Pibla” back to Qibla. (http://www.muslimheritage.com/article/from-petra-back-to-makka). No address or place was given for response, so I decided to release my response to that article on academia.edu.

Needless to say Dr. King disagreed with my book, my research, my findings and thoroughly roasted me in the process. I was surprised at this, as I felt that I agreed with most of what Dr. King writes, outside of his view of how primitive the early Arabs were. I was not expecting such a volatile response, but I was expecting someone, somewhere to disagree with my findings. So it is a relief to finally face some serious academic criticism. Dr. King’s article is a long one, but I will try and keep my response as brief as possible.

In his opening paragraph, Dr. King is correct in stating that “Most Muslims and most Westerners who know anything about the subject would say that his (my) “findings” are absurd.” Dr. King repeats this line of arguing throughout his article.

From the very beginning I have faced criticism that the very idea of Petra being the original Mecca is so absurd that it cannot be true. It goes against everything that we know about Islam, and everything that Islam says about itself. However, absurdity does not negate the possibility, nor does it create a strong opposing argument.

Dr. King ends the second paragraph stating that my arguments were weak, and that my bibliography in Qur’anic Geography did not include a single work on the Qibla, especially no mention of his own books and articles. So, please note that Dr. King is the author of the article “ḳibla” in the Encyclopedia of Islam, and he is the author of various articles and books on the subject. (See the bibliography for David King in my later book: Early Islamic Qiblas.) In effect, he is one of the world’s leading scholars on the Qibla.

Dr. King then points out: the authoritative Encyclopaedia of Islam has no entry for the city of Petra, as nothing of consequence in early Islamic history happened there. Of course, I totally agree, and this is why I wrote the books and made the videos, to demonstrate that something did indeed happen there.
King goes on to state that: *Such revolutionary findings, if true, would challenge both historical studies and also the Muslim community at large.* Again, this is absolutely true, but it is not an argument against my finding, but simply pointing out what is obviously the case.

Then Dr. King boldly states that *Gibson comes from a family of Christian missionaries who have lived in the Near East for three generations.* This is news to me. My grandfather and father collected a great deal of information on the Near East, including archeological reports, books and journals of the period. But my grandfather, Henry Gibson never traveled to the Middle East. He was an electrical engineer from the UK, a holder of multiple patents, and a fan of Flinders Petrie, the noted Egyptologist. My father, David Gibson, never traveled to the Middle East. He was restricted to a wheelchair from the age of 12, after a bout with polio. He did, however, continue his pursuit of understanding Near East history and amassed a sizable library. My family has boxes of his correspondence with many leading thinkers of his day. Sorry, no Christian missionaries in my family history. Not that I would find that offensive. I wonder where Dr. King got this information from? I have no idea why he invents missionaries at this point, or even mentions Christians. Perhaps it is meant to demean my character? He does claim later in the paragraph that the *“Christian lunatic fringe” has already adopted this very useful arsenal of “weaponry” from Gibson.*” You can learn more about my family history by seeing the YouTube video: https://www.youtube.com/watch?v=-Wm7Ka4bHck&t=5s.  This video was recorded before I read Dr. King’s review.

In the section called “Gibson discovers the opposition” Dr. King reveals more of his thinking. He claims that I undertook a survey of early mosques because of my pro-Petra inclinations. Actually, I was undertaking a study to discover how many mosques pointed to Jerusalem, when I discovered that many pointed to Petra. I then put that aside until I had time to do a more complete study.

King then states that I began my book, *Early Islamic Qiblas* by *quoting from my very technical 1986 article “Kibla (astronomical aspects)” in the Encyclopaedia of Islam (without attributing it to me)!* Dr. King, please accept my apologies. I did fail to mention who wrote the actual words. I quoted the source simply as: Encyclopedia of Islam, Volume 5, page 88, 1986. However the bibliography clearly states that the article was by Dr. King.

Dr. King then goes on to emphasize from his research that: *the qibla of the Companions of the Prophet (who built the first mosque in Egypt)” was toward winter sunrise, not Petra.* This is a good summary of the difference of opinions between myself and Dr. King. Basically it is an “Astronomical Orientation Theory versus the Petra Qibla Theory.” As you will see in the following pages, Dr. King and I use many of the same sources for our research but we each arrive at a different conclusion.
Now Dr. King presents his strong arguments. They begin with:

1. Gibson’s book is *not a scholarly work, it is the kind of text one would expect from a first-year college student.* (Thank you for your keen assessment of my writing style, I strive to write simply, so that school age students can understand what I am saying.)

2. Gibson is *not competent to write on early Islamic history and often misinterprets the few serious sources he does consult.* (No comment, as there are no specific examples given at this point.)

3. Gibson fails to mention *the astronomical orientation of the Ka’ba.* (This refers to the study done by Dr. King and also Gerald Hawkins. I failed to mention this, not out of ignorance, but because it was not in the scope of my study. However, since we are on this topic, please note that these astronomical orientations are not unique to the Ka’ba building in Mecca in Saudi Arabia but also apply to Petra, and have been studied by many others including Juan Antonio Belmonte, with whom I have had personal correspondence.)

4. Gibson fails to understand that the qibla was determined by some using folk astronomical techniques *from the 7th century forward* and not just till the 9th century *and* that mathematical methods were from 9th Century. In reading this section of my book again, I realize that I was not as clear as I should have been, and that the illustration could have been misleading. I tried to present the idea that once the Arabs lost their initial methods of determining the Qibla direction, other folk-astronomical techniques were developed. We have records of these starting in the 8th century. Many of these are explained in King’s books and articles. I do point out that the development of these methods resulted from an interpretation of a Qur’anic verse that states that the stars were given to guide mankind. *(Qur’ān, 16:15&16)* Therefore some Muslim clerics shied away from using mathematical solutions. I also apologize to Dr. King for insulting him with my hinting that the Arabs knew something of mathematical methods as early as the 7th century. This opinion seems to have touched a raw nerve.

5. Dr. King then complains that Gibson only *mentions Jan Hogendijk’s research in passing.* In response, my search for qibla-finding methods focused on methods of finding the qibla, before the medieval books that Dr. Hogendijk used. Therefore I felt justified in only mentioned him in passing, but in no means want to lessen the importance of his work.

6. Dr. King then noted that Gibson claims that King claims that early Qiblas were “wildly inaccurate.” OK, I concede this point. Dr. King calls them “approximate solutions.” I used the words “wildly inaccurate.” I was summarizing what Dr. King wrote in the section *(2.3 The sacred geography of Islam)* where Dr. King describes the various “sectors of the Ka’ba” concept resulting in different directions spreading out from the Ka’ba. Again. I was summarizing what I felt Dr. King was presenting, in order to demonstrate that my interest lies in earlier methods used by the Arabs, before those described in 8-9th century and later manuscripts. My question
in my mind was: “Could the qibla accurately be determined before mathematical solutions were introduced?”

Dr. King then introduces us to his purpose for writing his review: “The ultimate purpose of this essay review is to demolish the Petra thesis for all time.” He attempts to do this by claiming that the necessary technical equipment – trigonometry, geometry, geographical coordinates, astronomical instrumentation, and so forth became available to the Muslims in Iraq only in the late 8th and early 9th century. Gibson’s attempt to fabricate the evidence for an earlier epoch falls flat.

Somehow Dr. King seems to miss the whole point of this chapter of my book. It is all about how the Qibla was determined without the use of mathematics. I agree with him that mathematical solutions came from the late 8th century forward. I readily accept that he is one of the world experts on these mathematical solutions. I have no argument with what Dr. King presents in his books, which explain how these mathematical solutions worked. The only place I differ with him, is that I believe the Arabs were able to accurately determined the Qibla direction before mathematical solutions became popular; and that once the Arab armies enter the west where Roman roads gave directions, they slowly lost their ability to navigate by the stars, and thus calculate their qiblas using the stars. I base this on my research of the Qiblas, which demonstrate that there were four Qiblas in the first 200 years, and all of the mosques in the first 200 years of Islam show a great deal of accuracy when measured against these four qiblas, but slowly the accuracy drops until mathematics comes to aid the mosque builders. Dr. King seems to be convinced that the Qibla could not be determined without mathematical solutions, therefore he rejects everything I present and simply claims that it could not be done.

King goes on to state: The first thing to make clear is that early mosques cannot be expected to be oriented in the modern direction of Makka (or Petra), and they should not be labeled “incorrect” if they do not face that direction. This is Dr. King’s escape hatch, and he seems willing to accept many different qiblas, such as the solstice to the east, a solstice to the west, a qibla facing north, or a qibla facing south and so on. King goes further to state categorically that: there were several qibla directions used over the centuries, sometimes associated with particular interest groups.

He then states: that even the basics of how the qibla was determined and how it was applied to religious architecture over the centuries are not generally known. Here I agree completely. This is what my book is all about. This is what I am researching. I demonstrate the accuracy of the qiblas through the survey and try to reconstruct how they did it.
But King claims that the answer comes from astronomical alignments of buildings, since the Ka’ba was also astronomically aligned. It is a wonderful theory, and I heartily agree that the Arabs were keenly aware of astronomical alignments. The Ka’ba in Mecca was indeed astronomically aligned, a unique feature in the city of Mecca in Saudi Arabia. But as Juan Antonio Belmonte has demonstrated, in the city of Petra almost all of the major monuments were astronomically aligned.

King then spends several paragraphs arguing for the astronomical alignment of the Ka’ba, such as summer sunrises and the rising of Canopus. King infers that this was important to earlier traditional astronomy and is the key to understanding Qibla direction. This is where he and I have differing opinions. I see the descriptions given in 8th-9th century writers (and some later ones) as trying to suggesting solutions to how the earlier Arabs managed to set their qiblas. That is the way I read Arab history. Of course I could be wrong, but Dr. King seems to point to the trigonometrical or geometrical solutions of the 9th centuries and following as the only acceptable solutions.

Dr. King then points to various 12th to 14th century treatise and notes that these writers were “clueless about orientations, not knowing what people in past centuries thought was the Qibla.” This seems to me to say that they were clueless about Dr. King’s astronomical alignment theory. This is why I turned to the Arab navigational books, rather than the architectural writings that Dr. King uses.

Dr. King then accuses me of trying to make the mosques face either Petra of Mecca. I wish he had read more closely that I set out to determine which mosques faced Jerusalem, as I had visited a number of mosques where the custodians made this claim, and I wanted to check them. At that time I had no idea that Petra was even an option.

There are so many things I could comment on in the following sections but I will attempt to be brief. Dr. King suggests that different parts of the Islamic world set their Qiblas differently. While this may have been true from the 8th century forward, I specifically am trying to establish how it was done during the previous two centuries.

In my book I quote a section of Al Tabari which tells the story of how they went about establishing the Qibla for Al Aqsa mosque. They approached Ka’b, who had the knowledge to determine the qibla direction. This knowledge was not generally known. As the Muslim armies expanded the Arabian empire into the Roman empire, men like Ka’b moved with the armies, and established the qiblas of the new major mosques. However, in time these men died and this knowledge was lost, and qibla finding went through a difficult time until mathematical solutions were suggested in the 9th century. I think this all fits the scenario that King is setting out.
Dr. King just seems to have trouble accepting the solutions I present, and feels that they could not be known or reconstructed from earlier materials. He then points to the poorly aligned churches of the time as an example of how poorly they knew how to orient churches. Of course, the Christians did not have the years of celestial navigation that the Arabs caravans had, but King seems to not accept this.

Dr. King then classifies me as a “revisionist” along with Wansbrough, Crone, and Cook, and points to Serjeants’ brilliant and devastating review of Crone’s book “Hagarism.” He seems to suggest that the same devastating reviews reflects on my own research in some way. Or perhaps he is hoping to write just such a devastating review of my work.

Much to my surprise Dr. King then claims that I used the same starting point as the long-disproven premise of Crone & Crook, and that I “played around” with orientations, was unaware of astronomically-defined directions that mosques may have faced, and that I was clearly out of my depth.

He then claims that my new book *Early Islamic Qiblas*, was based on articles that appeared on the website www.nabataea.net over the past few years. This is very strange indeed. I began writing these articles in August of 2016, after the release of the documentary film “The Sacred City.” Several scholars wrote me and asked me to publish my data in greater detail. I agreed, and began to organize my data into a number of articles that addressed different questions that were being raised about qiblas and determining Qibla direction. These articles never appeared on www.nabataea.net. I have no idea where Dr. King got this idea. I only wish that he did his research a bit more thoroughly before writing such things.

Early in 2017 copies of my papers were circulated as ‘drafts’ among a number of scholars before publication. Over 170 scholars and interested people read them, and many replied with excellent suggestions. I am greatly indebted to them and their interest, encouragement, and comments. If you happen to come across a copy of one of these draft articles, please ignore it, as changes were made before they were released under one cover: *Early Islamic Qiblas*.

King then goes to to claim that my study of early mosques is flawed because I measure the qiblas of early mosques and then compare them with Mecca, Jerusalem and Petra. I suppose Dr. King would have been happier if I had included such things as the direction of the sunrise at the solstices, sunrise during various seasons, the orientation of nearby churches, and the orientation of major landscape items such as nearby roads, mountain slopes, Roman ruins, etc.
I admit that my survey was limited to the qibla direction of the first two hundred years of Islam, and
that I only compared mosques with other mosques. I find no command in the Qur’an for Muslims to
face the solstice, or to face east or west. The Qur’an is very clear that they are to face Masjid al Harâm.
That was the entire purpose of the survey, and I apologize if I offended Dr. King by not including his
“astronomical projections. This is the area of study that Juan Antonio Belmonte and his team are
doing. I have had some excellent exchanges with him without either of us feeling threatened in any
way.

Dr. King then returns to his major thesis: Gibson’s “discovery” that most early mosques face accurately
toward Petra is fortuitous because the first generations of Muslims had no means whatsoever for finding the
direction of Petra accurately to within a degree or two, not least because they had no access to any
geographical coordinates.

Again this is why chapter five exists, and I invite readers to examine this chapter to see if I have not
provided several methods of determining the qibla direction without using geographical coordinates.
Again it is my opinion versus Dr. Kings opinion.

Dr. King then returns to his argument that the more than 30 medieval Arabic, Persian and Turkish
manuscripts that he has identified, all focus on the Ka’ba in Mecca, and that not one mentions Petra.
And again I agree with Dr. King. My research demonstrates that the Petra Qibla was changed around
70 AH. The above mentioned writers wrote centuries later. I think we have labored these arguments
over and over again.

Some pages later, Dr. King sets out to demonstrate his point, using several of the mosques I refer to.
Unfortunately, each of these will have to be dealt with separately.

**China**

Dr. King claims that the Muslims must have come to China on flying carpets! He claims they had no
boats. He says: “But how did they know where they were? Where Petra was? Did they really know about
great circles on the terrestrial globe?” I point out several methods in the book of how they knew where
Petra was. And of course they knew the world was round. In my earlier book *Qur’anic Geography* I note
that by 24 BC Nabataean boats were moving incense on the Red Sea, and that Agatharchides (130 BC)
records Nabataeans involved in Maritime trade. This is why the study of navigation is so important,
and why it is important to establish general dates when Nabataeans and Chinese began direct trade.
In *Early Islamic Qiblas* I spend considerable time giving dates and charts of connections between the Arabs and China dating back to before the time of Christ. I point out a specific instance around 25 - 55 CE when a group of Arabs traveled to China and then returned. I spent years chasing down these connections, and writing many letters, and even traveling to meet scholars of Chinese history. I worked with one scholar, carefully tracing the route that a Chinese explorer and envoy took as he crossed the Middle East, visiting Petra on his way to Rome. I personally traveled that route while in communication with this scholar on the other side of the world. Somehow Dr. King must have missed this section of the book, and suggests that communication between Arabia and China was impossible. The current Guangzhou mosque was built on the foundation of a previous mosque, and it points to within 3° of Petra. If it was the only mosque in my study it could have been a coincidence. But there are over a dozen good examples that point to Petra, and others that seem to have pointed to Petra from their descriptions in early manuscripts.

**Egypt**

Dr. King then picks out one of the more difficult mosques to measure. All we have is the record of Ahmad ibn al-Maqrizi who writes that the original direction of this mosque pointed east (which happens to be the direction of Petra. It was later corrected towards Mecca. Dr. King claims that the original qibla was towards the eastern winter sunrise, which I have not measured and cannot comment on.

**Yemen**

I do not understand Dr. King's argument here. He is correct in that the mosque points at Petra, and that its major axis is parallel (within 2°) of the Ka’ba in Mecca. I lived Sana’a in Yemen for 3 ½ years, and visited and passed this mosque many times.

**Jerusalem**

I am unsure why Dr. King mentions the al-Aqsa mosque. I see no argument, other than perhaps the qibla measurements he mention are different than mine.

**Jordan, Syria and Lebanon**

I have tried to carefully measure these mosques and their qiblas. Dr. King quotes my measurements and then states that the qibla was obviously intended to face due south. I wonder how he knows what was in the builder's minds? Couldn't they use the Arab compass that I so carefully describe in detail and find the opposite direction from the North Star? Finding due south is very easy. But pointing to Petra is much more difficult. So how could they manage to miss due south, and end up facing Petra? For instance Khirbit al Mina points within 0.8° of Petra, yet Dr. King explains that it was supposed to
face south, and they missed, and again, pointed almost exactly towards Petra. What a coincidence! Dr. King must be a mind reader to know what they intended, and failed to do!

When I deal with Ba’albeck in Lebanon, I see that mosque as one of eight that point to the same qibla, directly between Petra and Mecca. I go to great lengths in the book to establish who was responsible for building these mosques and setting their Qiblas. I explain why this builder refused the Petra and the Mecca Qiblas. But Dr. King notices that this mosque misses due south by 3° and therefore the builders must have intended for it to face south. He does this with several other mosques that are generally north of Mecca, noting that while they miss pointing directly south they were off by several degrees, which he claims is “not bad for that time.” I on the other hand note that all eight mosques point to exactly the same location.

Asia
King does the same thing for mosques that are east of Mecca, claiming that they point a “careless” west. Again it seems that the major argument here is: Did the mosques point to specific places or were they simply “careless” about where they pointed. I see very carefully set qiblas, that fit an overall pattern, while Dr. King sees carelessness.

Spain
Dr. King insists that “at that time these folk had very limited geographical and mathematical knowledge” so they couldn’t get it accurate. They simply built on top of the 1st century Roman street plan. Again, we both see the same information, and we come up with two different conclusions. As these builders were very opposed to the ruling Abbasid rules in the east, I suggest that they deliberately chose to use a parallel Qibla. Dr. King sees it as chance.

North Africa
Dr. King claims I could have spared myself considerable embarrassment by consulting the works of Rius and Ronine. He notes that we claim slightly different qibla directions, but that they claim that the qiblas were established by a pre-existing Roman system and not set by celestial measurements. Again I suggest that these builders were in rebellion with the rest of Islam and chose to use a Qibla that was similar to the one used in Spain. They are all very similar.

Syria, Jordan and Lebanon
Dr. King agrees that the ‘Anjar Palace mosque points almost directly at Petra. King concludes: “So it does, but nobody could have planned that at the beginning of the 8th century, toward Petra or anywhere else.” Again, his option versus my opinion.
Regarding the Raqqa mosque, I claim it points almost directly between Petra and Mecca, as do 7 other mosques, but Dr. King states: “...there is no evidence that anyone ever tried to align an edifice “between” two distant goals, and that is certainly not what has happened here.” He goes on to guess that the direction was not calculated, nor derived from the rising and setting of the sun at solstices, nor even of a bright star. So Dr. King would rather accept the unknown and state that it was not calculated, rather than deal with an observation from the data that there were eight mosques that faced the exact same place, which happened to be directly between Petra and Mecca. He does not accept that General Ḥajjāj was responsible for the construction of these eight mosques, nor that General Ḥajjāj had reasons to refuse both a Petra and a Mecca Qibla.

Then King suggests that the orientation of later mosques would have been useful in my research. It seems he doesn’t like that I stopped surveying mosques, which are all before his focus of research. However, in the book I give some examples of major mosques up until 260 years after the founding of Islam to establish that Mecca ended up as the accepted qibla.

King now turns to chapter five, where I give explanations of how the Qibla could have been established. I use materials drawn from al-Najdi’s writings, where he recalls how early navigation was done. I also use materials drawn from how modern Arab navigators use many of the same tools to navigate their dhows and find their direction over the empty ocean. But Dr. Smith calls it “a desperate hopelessly-muddled and utterly-puerile chapter” among other things. I guess he sees no connection between navigation that pinpoints a port over the horizon and Qibla-finding techniques that pinpoint the Ka’ba over the horizon.

He then argues that the Arab compass (windrose) was used only in Arab navigation and not for finding the Qibla. The point in my book is that Arab navigators of the time clearly had the ability to use their navigational knowledge to set their qiblas.

I spend many pages describing how this works, but King dismisses it and calls it utterly-puerile (childish). He claims that I should be better acquainted with those writers who much later used mathematics.

Dr. King seems disappointed that I did not include many more articles of his and his colleagues. I am sorry but they deal with the methods of finding the Qiblas much later in history than I am interested in. He is sorry that do not give anything on the history of Islamic mathematics. Here I must point out that this is the focus of Dr. King’s research, but not mine. He does seem happy that I include G.
Tibbetts’ translation of Aḥmad ibn Mājid al-Najdi’s book: Kitāb al-Fawā'id fi ʿusul al-bahr waʾl-qawā'id. Indeed I have spent many hours in this book, trying to get an understanding of what knowledge al-Najdi says the Arabs had before they used mathematics.

Somehow Dr. King managed to disqualify everything I present in chapter five, because he felt that the Arabs of the 6th and 7th centuries could not have known what I claim they knew. He even disqualifies the possibility that homing pigeons could have been used to set Qiblas. I guess my research and discussion with academics who study homing-pigeons was all in vain then.

In the end, Dr. King dismisses the book as the babbling of an amateur who has no knowledge of classical Arabic, and is without critical training in Islamic Studies.

However, from my point of view, I highly respect Dr. King, and find his research on the mathematical methods used for Qibla finding in later years to be excellent. He is one of the top world experts, if not the greatest expert on mathematical methods used to establish the Qibla. He has done a wonderful job of researching the medieval Arab mathematicians.

I am disappointed, however, that he so strongly believes that earlier Arabs were clueless in their ability to guide their caravans over the trackless desert, and later to guide their small boats over the trackless India Ocean. Dr. King seems convinced that the early qiblas were all approximations, and that my research has uncovered nothing. I guess, in the end, the reader will have to decide.

Was it just chance that those setting the Qibla direction in ‘Anjar missed pointing south by multiple degrees and ended up pointing to Petra within less than one degree? Is this scenario repeated over and over again in other mosques, that missed their target and just happened to end up pointing to Petra?

Was it by chance that Armenian writers placed Mecca as a location in Paran, in the Roman province of Arabia Petrea, which is a good description of where Petra is today? (Brosset, M., Collection d’Historiens Armeniens, 1847, Volume 1, page 88-99, especially page 89)

Was it by chance that all of the descriptions of ancient Mecca can be found in ancient Petra?

I personally do not think these things were all by chance. The qibla directions in my book speak for themselves. If I was able to only located one or two Petra Qiblas, then my interpretation could easily be wrong. But if the pattern is repeated over and over again, what are the chances that they are closer
to the truth than builders who just missed their original targets? And what are the chances that so many historical and archeological anomalies support a Petra Qibla?

I apologize for upsetting Dr. King. I am not trying to support my theory at all costs. I am simply making observations from what I found. In the end, I see four Qiblas: first Petra, followed by Mecca, then Ḥajjaj’s between Qibla, and finally the Spain and North Africa rebellion using parallel qiblas. I am willing to change my opinions if something else becomes evident. Dr. King on the other hand is convinced that the sloppy qiblas actually intended to point: east, west, solstices, sunrises and so forth. I have not come across anything in Islamic religious manuscripts that support these Qiblas. But perhaps in time someone, somewhere will stumble across something that will change our understanding of Qiblas. All I have found so far, is that every Muslim expects the Qibla to point to Mashjad Al Harām.

My research set out to find this place based on the Qiblas of all of the mosques of the first two centuries of Islam. I have tried to make myself available to interested people through the film, the YouTube channel, www.academica.edu, and many other venues. Many people have reached me by email or through comments on YouTube. And I welcome them, as I learn so much, and appreciate that I now have hundreds of pairs of eyes combing Islamic manuscripts. While many people have disagreed with some aspect of my research, Dr. King’s article is the first that has been written in such a tone. I trust that we can come to some sort of understanding in the near future.

Dan Gibson
5 September 2017
From Petra back to Makka – From “Pibla” back to Qibla

By: David A King


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Preliminary note: Dan Gibson’s new book claims to turn upside down all of what we know about one aspect of early Islamic practice, namely, the sacred direction (qibla) toward the Kaaba in Makka. He believes that Islam began in Petra, not Makka, and that the focus of Muslim prayer for the first two centuries was toward Petra, not Makka. As evidence for this he attempts to shows that dozens of early mosques face Petra with remarkable accuracy. Since his revolutionary ideas ignore what modern scholarship has established about the early qibla, I present an overview of how things actually were. I then show how Gibson has misunderstood most of the data at his disposal, comparing medieval mosque orientations with modern directions of Petra and Makka, and why his interpretation is completely flawed. In brief, he has wrought havoc with information that he cannot master, and has – wittingly or unwittingly – produced an amateurish, non-scholarly document that is both offensive to Muslims and also an insult to Muslim and Western scholarship. None of the mosques investigated by Gibson has anything to do with Petra. Nor, indeed, has early Islam.

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Introduction

The Qur’ân enjoins Muslims to pray toward the sacred precincts, which they have considered to mean the Kaaba in Makka. This direction is called qibla in all the languages of the Muslim commonwealth. Thus mosques should face Makka, the mihrâb or prayer-niche indicating the qibla. In fact, Muslims all over the world have been praying toward Makka for over 1,400 years. Imagine how they might feel if somebody comes along and tells them they should have been praying all this time toward a Kaaba somewhere else, namely, in Petra. They would consider such a person deranged, to say the least.
Yet suppose that person, the Canadian amateur historian Dan Gibson, produced what he thought was evidence to show that the earliest mosques – say from the first century and a half of Islam, that is, from the early 7th century to the late 9th century – were actually facing Petra, not Makka. Gibson purports to document when the qibla was changed away from (his true) Kaaba at Petra to (everybody else’s true) Kaaba at Makka. Most Muslims and most Westerners who know anything about the subject would say that his “findings” are absurd. And indeed they are.

Gibson published his book Qurʾānic Geography in 2011. In it he proved to his own satisfaction that the Qurʾān contains so few references to actual locations, including Makka, that its origins must lie elsewhere, namely, Petra. (Funnily enough, the authoritative Encyclopaedia of Islam has no entry for Petra, for nothing of consequence in early Islamic history happened there.) Gibson then briefly discussed some 30 early mosques which, according to him, face toward Petra and not toward Makka; his argumentation was weak indeed, not least because he did not present any orientations. The bibliography included not a single work on the qibla.

Gibson’s new book contains a dazzling array of information and plans of some 60 early mosques, treated more or less in chronological order, but therefore not by region, and is intended to show how the earliest mosques faced Petra, then between Petra and Makka, then the “false” qibla toward Makka, with variations on this theme.

Such revolutionary findings, if true, would challenge both historical studies and also the Muslim community at large. However, Gibson comes from a family of Christian missionaries who have lived in the Near East for three generations. He disdains the few modern studies on the qibla that have come to his attention, but he has a strong conviction and an ultimate purpose: to show that Muslims are misguided and naïve enough to have prayed in the wrong direction for over a millennium. Gibson appears on the scene at the same time as the English historian Tom Holland, the self-styled “leading writer on the Ancient World”, who has claimed on the basis of one very dubious late medieval non-Arabic text, that Muslims have been praying at the wrong times for over a millennium. Both Gibson and Holland write in total ignorance of research on the institutions of the qibla and prayer times over the past century. The Christian lunatic fringe has already adopted this very useful arsenal of “weaponry” from Gibson and Holland in its fight against Islam.

Gibson discovers the opposition

Gibson was inspired to undertake his survey of early mosques not only because of his pro-Petra inclinations but because he wanted to disprove a claim I made some 40 years ago that medieval mosques are not always oriented toward Makka as we moderns think they should be. He begins his book by quoting from my very technical 1986 article “Kibla (astronomical aspects)” in the Encyclopaedia of Islam (without attributing it to me), first omitting what I wrote that even though the qibla might have been calculated by a competent mathematician the accuracy of the result would depend on the accuracy of
the geographical data he had at his disposal. He then quotes me, again not by name, as follows (p. 1):

“Another reason why mosques may be incorrectly aligned is that their qiblas were not computed from geographical data at all but were inspired by tradition. Thus, for example, mosques in the Maghrib and the Indian subcontinent generally face due east or due west, respectively. Likewise, in early Muslim Egypt the qibla adopted was the azimuth of the rising sun at the winter solstice. Several mosques in Cairo face this direction, which was favored as the qibla al-saḥāba, but which is about 10° off the qibla computed mathematically using mediaeval geographical coordinates … . No survey has yet been made of the orientation of mediaeval mosques. Such a survey would be of considerable interest for the history of Islamic architecture as well as the history of science.”

Gibson wishes to ingratiate himself with Muslim readers by showing by means of a survey of early mosque orientations that these early mosques are correctly aligned, but the catch is that they are correctly aligned toward Petra. But they are not. The quoted passage asserts that “the qibla of the Companions of the Prophet (who built the first mosque in Egypt)” was toward winter sunrise, not Petra. Gibson errs in thinking that the qibla is toward the Black Stone, rather than toward the Kaaba itself. III

Gibson completely misunderstands my findings on the determination of the qibla and mosque orientations. Essentially I found that the Muslims for the first two centuries used folk astronomy, particularly astronomical horizon phenomena, the cardinal directions and solar risings and settings at the solstices. Thereafter they also used qiblas based on geographical coordinates and mathematical procedures. I claim that all mosques face the qibla in ways most of which we can only now understand. I also say that early mosques do not always face the directions we moderns think they should. Now comes Gibson to claim that they face Petra – and accurately at that.

Gibson’s book is not a scholarly work, for its text is of the kind one would expect from a first-year college student. Where my works are quoted and misquoted it is unclear who is the author. Gibson is not competent to write on early Islamic history, and often misinterprets the few serious sources he does consult. He writes (p. 127) that:

Much has been written over the last thousand years on the topic of how Muslims can correctly identify the qibla direction when they pray. From about 900 until 1800 thousands of Arabs [!] wrote thousands [!] of books and articles on how this could be done using astronomy and geography. Despite this, there is still disagreement on the technique used by the earliest Muslims.”

In relation to finding the qibla direction, King and Hawkings [sic] divide Islamic history into two parts. First, they suggest that the earliest Muslims used “folk astronomy” to determine the qibla, and King claims they were wildly inaccurate. For the second section (9th-16th century), King and Hawkings [sic] note that: the techniques of folk astronomy were employed by the legal scholars to determine the qibla ….” but the era really belongs to the mathematicians. It is on this second era that King, Kawkings [sic!], Hogendijk and others focus most of their attention.”

First, what I actually wrote is that there are altogether some 10,000 medieval manuscripts, in Arabic, Persian and Turkish still surviving which deal with astronomy and mathematics, and that we know of some 1,000 scholars who worked on these two vast subjects over the centuries. Those remarks of mine did not refer to the qibla at all.

Second, there is no disagreement about the qibla techniques used by the first generations of Muslims. It is obvious that, without knowledge of mathematics and geography, they would have used simple techniques of folk astronomy, knowledge of which was
widespread before the advent of Islam. No-one has ever objected to what I have written on this (until Gibson).

Third, Gerald Hawkins (famous for his astronomical analysis of Stonehenge) had nothing to do with the qibla. He and I wrote a joint paper on the astronomical alignment of the Kaaba, Gerald using satellite images and I using medieval texts. We did this because we had found that our conclusions from the two sources were the same! Modern measurements confirmed medieval documents; or medievals already knew what moderns had just discovered. **Gibson fails even to mention the astronomical orientation of the Kaaba, which was of prime importance for mosque orientations, because mosques are oriented toward the Kaaba, not toward Makka.** (For Gibson, of course, the “real” Kaaba was in Petra!)

Fourth, Gibson cannot understand that the qibla was determined either using **folk astronomical techniques from the 7th to the 21st century** (not just till the 9th century!) or using **mathematical methods from the 9th to the 21st** (certainly not from the 7th century!). For example, a controversy has raged in recent years between two factions of Muslims in the US, one who believe that the qibla is toward south-east (look at a map of the world) and the other who believe that it is toward north-east (fly Saudia to KSA from JFK!).

Fifth, Jan Hogendijk’s contribution is worth more than a passing mention. As a leading historian of Islamic mathematics he has contributed a great deal to our understanding of how Muslim scientists worked on the qibla-problem, always using medieval manuscripts.

Finally, Gibson claims that I wrote that mosque orientations were “wildly inaccurate”. But I never wrote this, not least because it is not true.

**An old-school orientalist and historian of science reacts**

The ultimate purpose of this essay review is to demolish the Petra thesis for all time. I counter Gibson’s agnotological *tour de force* with the simple argument that the earliest Muslims could never have aligned mosques accurately toward Petra, or, for that matter, toward Makka either. It is even easier to demolish Gibson’s necessary back-up thesis, which is that the first generations of Muslims had all of the necessary technical equipment – trigonometry, geometry, geographical coordinates, astronomical instrumentation – to derive the direction of Petra accurately for any locality from al-Andalus* to China. Since this equipment in fact became available to the Muslims in Iraq only in the late 8th and early 9th century, Gibson’s attempt to fabricate the evidence for an earlier epoch falls flat.

(* The term *al-Andalus* refers to that part of the Iberian Peninsula under Muslim hegemony at any time.*)
The first thing to make clear is that early mosques cannot be expected to be oriented in the modern direction of Makka (or Petra), and they should not be labelled “incorrect” if they do not face that direction. Alas, we still find an occasional architectural historian who dares to write something as naïve as: “this mosque is incorrectly aligned toward Makka”, when he or she has no idea what the medieval qibla was in that location, and which qibla? or whose qibla? For in each major centre there were several qibla directions used over the centuries, sometimes associated with particular interest groups. The subject of the qibla and orientations of religious architecture is extremely complicated, but we are beginning to understand it. It could take a mighty step backward with the appearance of this new book, because even the basics of how the qibla was determined and how it was applied to religious architecture over the centuries are not generally known, certainly not to most Muslims, and not to most Westerners involved with Islamic architecture either.

Mosque orientation is far more complicated than Gibson thinks. Why, for example, does the Great Mosque of Córdoba, built in the 780s, face the deserts of Algeria rather than the deserts of Arabia? Why does some medieval architecture in Cairo have different alignments for the insides and the outsides of the qibla-wall? In Samarqand, why do some religious edifices face due west and others due south? Historians of Islamic architecture are notoriously ill-informed on the subject of orientations. They even ignore what some historians of Islamic science, with access to medieval Arabic texts on the qibla in different regions, have contributed, and they ignore what some urban historians have written after measuring orientations in the light of our knowledge of which qiblas were accepted in those regions.

The way it was

Before the 9th century Muslims used exclusively tradition and folk astronomy – notably, astronomical risings and settings – to find the qibla. Early Islamic religious architecture, however, was often laid out in accordance with the foundations of pre-Islamic religious edifices. The general direction of Makka, as indicated by the road leaving a given location toward Arabia, would sometimes suffice.
We should not forget that the qibla is toward the Kaaba, and not toward Makka. The rectangular base of the Kaaba is itself astronomically aligned, with its main axis toward the rising of Canopus and its minor axis toward summer sunrise and winter sunset. In a society without serious geographical notions or mathematical science beyond commercial arithmetic, how does one locate a distant edifice to face it? The answer is astronomical alignments, of which the cardinal directions are the most obvious, less so sunrise and sunset at the winter and summer solstices, but also risings and settings of select qibla stars.

Muslim efforts to view the world about the astronomically-aligned Kaaba resulted in a colourful tradition of sacred folk geography, with sectors of the world around the Kaaba associated with segments of the perimeter of the Kaaba and their qiblas being defined in terms of astronomical horizon phenomena. The scholars who favoured such qibla methods by folk astronomy for over a millennium were invariably scholars of the sacred law in addition to being knowledgeable in folk astronomy.

By the beginning of the 9th century the Muslims had acquired the geographical knowledge (mainly from Greek sources) to realise what the qibla problem involved and the mathematical knowledge (mainly from Indian and Greek sources) to solve it – within medieval parameters. The solutions were trigonometrical or geometrical, either simple and approximate, or complicated and accurate, within the limits of the accuracy of medieval geographical coordinates. Thereafter mosques could be oriented in the mathematical qibla directions if a competent person were involved in the layout. The scientists took the problem to its natural (medieval) conclusion, with tables of qibla values for the whole Muslim world and cartographic grids centred on Makka with which one could simply read off the direction and distance to Makka for any locality.

Not only do we have access to what the astronomers and legal scholars wrote on the determination of qibla, we also have discussions of the palettes of qibla values that were used in such medieval centres as Córdoba, Cairo, and Samarqand. What has failed us is a survey of mosque orientations from one end of the Muslim world to the other, although some areas (al-Andalus, the Maghrib, Turkey) have already been well-served.
Cordoba: According to a 12th-century Andalusi treatise on the astrolabe, mosques in Cordova were oriented in these different directions: 113°, the qibla computed by the standard approximate formula (which works well for localities in the central regions of the Islamic world, but not for al-Andalus, where the error is more than 10°); 120°, winter sunrise; 135°, a compromise between due east and due south; 150°, the direction of the Great Mosque (which is ‘parallel’ to the major axis of the Kaaba); and 180°, due south (not specifically mentioned).

Cairo: The Egyptian historian al-Maqrizi (d. 1442) mentioned these qiblas as being used for mosque orientation in Cairo: 90°, due east (not specifically mentioned in this text); 117°, winter sunrise, the qibla of the Companions of the Prophet; 127°, the qibla of the astronomers, computed according to an exact procedure and first attested in the writings of the 10th-century Fatimid astronomer Ibn Yûnus; 141°, the qibla of the Mosque of Ibn Tûlûn, variously explained; and any direction in the range ca. 156° - ca. 204°, between the rising and setting of Canopus.

Samarkand: The legal scholar Abu ‘l-Yusr al-Bazdawi (d. 1089) reported these qiblas as being used for mosque orientation in Samarkand: 270°, due west, used by the Hanafite school of law and corresponding to the direction in which the road to Makka left the city; 240°, winter sunset, as used for the Great Mosque; 230°, a value underlying a table for the altitude of the sun in the azimuth of the qibla, presented by al-Bazdawi but lifted from some earlier source; 225°, south-west, a compromise between the Hanafite and Shafi’ite qiblas; and 180°, due south,
Historians of Islamic architecture, with a few notable exceptions, are clueless about orientations, not knowing what people in past centuries thought was the qibla in any given place, and most not being able to measure orientations properly anyway. For both of these shortcomings they can be (almost) forgiven. Yet some colleagues in architectural history still persist on ignoring orientations altogether, which is particularly annoying when the orientation has been deliberately changed from the orientation of neighbouring edifices (as in Cairo). Now with satellite imagery anybody can zero in on any mosque and actually visualise its orientation. And with the way open to just anybody, Dan Gibson has measured many of the significant mosques and – innocent of most research in the history of Islamic architecture and the history of Islamic science – has come up with some very challenging conclusions.

**Excursus: What do mosque orientations tell us?**

First, a general remark: We wish to investigate the way in which a given medieval mosque at location X was laid out, with the ultimate purpose of determining whether it was laid out facing location P or location M. Suppose the mosque faces 120° (30° S of E). Suppose the direction of P from X is 130° (40° S of E) and the direction of M from X is 140° (50° S of E). It would be tempting to think that the mosque was deliberately laid out to face location P. But the two directions we have given toward P and M are **modern directions, based on modern geographical coordinates and an accurate mathematical formula**. They are not at all relevant to the layout of a medieval mosque, except to
fill a vacuum in our minds. Therefore, we cannot claim that the
mosque at X was deliberately aimed at P (or M). It would be
silly to say the mosque is inaccurately oriented toward Makka
by 20° (or toward Petra by 10°) when we have no idea how the
people who built the mosque found the qibla. And suppose the
mosque was actually oriented toward M using winter sunrise, for
we know from medieval texts that this did happen. Then it is not
surprising that the mosque faces 120° (30° S of E), for that is
roughly winter sunrise (which depends on local latitude).
Centuries later a medieval astronomer equipped with
geographical data (different from modern data) and
mathematical knowledge might have calculated the direction of
M as 135° (45° S of E) so that someone could build another
mosque. This direction happens to be halfway between the
(modern) directions of P and M, but so what? That mosque will
face M at 135° (45° S of E). A modern mosque, if properly laid
out, would be aligned toward 140° (50° S of E).

It is statistically possible that some medieval mosque plans
suggest a focus of a point P rather than M. Given the shape of
the medieval Muslim world stretching from al-Andalus to China
with M somewhere in the middle, and most areas being north of
M, it is conceivable that there might be a suitable focal point P
to the north of M, but not too far. If many of those mosques are
facing astronomically-defined directions, including cardinal and
solstitial alignments, this will inevitably raise havoc with the
analysis and render the investigation futile.

When confronting a given medieval mosque one also needs to
measure its orientation properly within the surrounding city plan
with its physical features. One then needs to know which
directions were proposed by the legal scholars and by the
astronomers for that location. Then one can perhaps begin to
make comment meaningfully about how the mosque might have
been laid out. And one can hardly expect that practices in
different regions should be the same. Any large-scale
investigation should consider the orientations chronologically
within each region.

The orientations of medieval churches – toward Jerusalem, due
east, sunrise at solstices, sunrise on saints’ days – have been
investigated in recent years by colleagues in medieval Christian
history and archaeoastronomy. The wide spectrum of results
attest to the ingenuity of the human spirit, as is the case with
medieval mosques. But suppose we discover that many churches
face accurately toward Constantinople; does this mean they were
deliberately intended to face Constantinople. No, it does not. We return to Gibson’s mosques facing Petra.

The revisionists revise themselves

Gibson is not to blame for his basic premise that Islam did not begin in Makka. It goes back over 40 years ago essentially to three Arabists (Wansbrough and his students Crone & Cook) at the University of London (SOAS), who expressed the daft “revisionist” idea – though they were serious – that the origins of Islam were not in Makka, but somewhere else in N.W. Arabia. The latter two of these, in their unfortunate 1977 book Hagarism, “written by infidels for infidels”, claimed to have proven this by demonstrating that the earliest mosques in Egypt and Iraq indeed faced N.W. Arabia rather than Makka. I was happy to point out to Cook in person that the Egyptian mosque faced winter sunrise and the Iraqi mosques faced winter sunset, so one could hardly expect them actually (in modern terms) to face Makka.

For me as a non-specialist in most aspects of early Islamic history it is rather difficult to criticise any of the so-called “revisionist” historians of early Islam. I personally need a higher authority, and therefore I refer to Robert B. Serjeant’s brilliant and devastating review of Hagarism.[5] Bob wrote:

Hagarism … is not only bitterly anti-Islamic in tone but anti-Arabian. Its superficial fancies are so ridiculous that at first one wonders if it is just a ‘leg-pull’, pure ‘spoof’ … . Given the authors profess to be Islamic historians, they are sadly out of touch with contemporary research on Islam … . … tiresome travesty of history … pretentious humbug.”

By 1991 Crone and Cook had retracted their wretched book, Crone admitting that “we were young, and we did not know anything.” But their playful nonsense caused a lot of damage, and the “revisionists” continue to work with disregard for the early Muslim sources (but less for the contemporaneous Christian ones).

Enter the revisionist Dan Gibson

In his 2011 book Qur’ânic Geography Dan Gibson claims that Islam started in Petra, not Makka. I will not comment on this except to remind the reader that his starting point was the long-disproved premise of Crone & Cook. Gibson, like his predecessors, has no idea that the mosques faced astronomically-defined directions, so that they might not actually face Makka (those who built them certainly intended them to face the qibla toward the Kaaba in Makka). He played around with the orientations of various early mosques but was clearly out of his depth.

In his new book, based on articles that have appeared on his website (www.nabataea.net) over the past few years, Gibson sets out to prove that early mosques face Petra, not Makka. He presents satellite images of dozens of early mosques, and for each he gives the actual orientation, the direction to Petra, the direction to Makka, and, just in case, the direction to Jerusalem. Of course, these three directions are the modern values, unattainable to anyone before modern times, which is unfortunate because both the
information presented and his conclusions based thereon are all invalid, since modern directions based on modern coordinates are totally irrelevant to the study of early mosques.

Gibson’s “discovery” that most early mosques face accurately toward Petra is fortuitous because the first generations of Muslims had no means whatsoever for finding the direction of Petra accurately to within a degree or two, not least because they had no access to any geographical coordinates, let alone modern ones, and no mathematics whatsoever. He overlooked the fact that many of his mosques are aligned either cardinally or solstitially. That the early mosques do not face Makka as we moderns think they should is hardly surprising, because the early Muslims had no means to find the direction of Makka accurately either, though they did this as best they could with the means at their disposal. It is of little interest to compare medieval orientations with modern directions based on modern geographical knowledge and accurate trigonometric formulas. Modern values of directions from one place to a distant other one are irrelevant to investigating the orientations of historical edifices. I repeat this in the hope that even Gibson may understand.

The satellite images collected in this volume will surely be deemed useful by some. However, anyone who ventures to use the raw materials Gibson presents should do so with extreme caution.

Excursus: Astronomical alignments

The north celestial pole defines the cardinal directions on the local horizon, for the north-south line is defined by the meridian, and the east-west line is defined by the celestial colure perpendicular to the colure through the zenith. Unfortunately, perhaps, the celestial pole is not visible, and neither are the meridian or colure. That leaves us with the horizon. The sun rises in the east and sets in the west, more or less. In fact, the sun rises due east and sets due east only twice a year, at the equinoxes. Sunrise and sunset are about 30° north of east and west at midsummer, and about 30° south of east and west at midwinter (for latitude 36°, the middle of the ancient world). Many early mosques – those from before the scientific age – were oriented in the cardinal or solstitial directions. The intermediate directions between the cardinals were also used.

To find the cardinal directions on a given day, many moderns would be flummoxed unless they know what is contained in the previous paragraph or they have a phone at hand with astronomical software. By night, the Pole Star, a modest asterism near the celestial pole, is a close north marker in the northern hemisphere, and Canopus, the brightest star in the southern sky, is a south marker in the southern hemisphere;
however, Canopus rises and sets, so that south is actually midway between its rising and setting. In the recent past people used magnetic compasses to find directions, and, in historical investigations, it helped to know that magnetic north varies from true north with the exact variation depending on epoch and location.

When I worked at New York University in 1982, one early morning in late December, I was jogging around the rectangular Washington Square and I saw the sun come up directly at the end of the street forming the southern major axis of the Square. It was an impressive sight. But more significant for me was to realise that not only the Square but the entire orthogonal street plan of Manhattan was more or less solstitially aligned. Wow! I wondered how many denizens of NYC knew that. You would never know it from the maps of the City because the street-plan of Manhattan is always rectified to be aligned with the paper on which it is printed. Nowadays you can read about all this in the Wikipedia article “Manhattanhenge”.  

About the same time I was working with Gerald Hawkins on the astronomical orientation of the Kaaba. I had found information on this in a medieval Yemeni text on folk astronomy, and Gerald had access to satellite images which enabled him to find the orientations of the rectangular base of the edifice and ascertain the height of the surrounding hills and mountains on the local horizon. His data confirmed the information in my source. Or, to put it another way, some Muslim scholars in the medieval period knew already what we had just discovered. Basically, the major axis aligns with the rising of the brightest star in the southern sky, Canopus, and the setting of Ursa Minor, and the minor axis is aligned with summer sunrise and winter sunset. These directions happen to be perpendicular at the latitude of Makka. One cannot claim that the Kaaba was originally laid out in this way, but that’s the way it was centuries ago and it hasn’t changed, although one would never know this from looking at the Kaaba in its present setting.

Again, in the years preceding that time, I had identified some 30 medieval Arabic, Persian and Turkish manuscripts in which 20 different schemes of Islamic sacred geography are preserved. The Kaaba is at the centre of the world, which is divided in sectors about the centre, each sector associated with a segment of the perimeter of the edifice. The qibla in each sector is defined in terms of astronomical risings and settings. Such information for specific regions is attributed in some sources to
7th-century authorities such as Ibn ‘Abbâs and al-Hasan al-Basrî. Needless to say, these schemes are focused on the Kaaba in Makka, not Petra.

**Numbers galore, mainly misinterpreted by Gibson**

None of the mosques which Gibson thinks were built facing Petra has anything to do with Petra, nor do those he vainly finds facing “between Petra and Makka”.

I shall not demonstrate this for all of the mosques he investigated (pp. 11-114), but the following examples should suffice to show that not only are his interpretations erroneous, but also that the whole idea of assessing the “errors” of medieval orientations by comparing them with modern directions is flawed. In particular, even readers non-versed in numbers will recognise that Gibson has “discovered” that certain mosques have an orientation associated with Petra, but we know that they were laid out in accord with pre-Islamic religious edifices (Damascus, Jerusalem, Córdoba). Inevitably, problems arise when one investigates mosques that have been rebuilt in different directions.

Gibson’s section on how he derived the orientations is risible. Nevertheless, I shall risk using his orientations, assuming that they are more or less accurate, which is not always the case (see Tunis below). In his analysis, it suits his purpose to continuously ignore the cardinal and solstitial bearings and pre-Islamic fundaments. It now suits my purpose to use his modern directions to Makka and to Petra even though they are irrelevant to any historical investigation, but they are necessary to counter his interpretations of the mosque alignments.
In the following overview of Gibson’s findings, all orientations and bearings are given to the nearest degree clockwise from 0° at north, 90° at east, 180° at south, and 270° at west. The reader should keep in mind that I have not measured a single mosque myself.

**China**

We find that the Mosque in Guangzhou (China), which Gibson claims was built in 627 [1], although the present edifice is apparently no earlier than the 15th century, supposedly faces Petra to within 3°, Makka to within 7°. Gibson claims it was deliberately laid out to face Petra. One could contend that it was built by eager Muslims from Petra, who had no ships and who must have arrived in China on a flying carpet. But how did they know where they were? Where Petra was? Did they really know about great circles on the terrestrial globe? In fact, the early date for this mosque stems from a legend without credibility. To confirm the Petra victory, Gibson needs to fabricate some distortions of standard knowledge regarding the history of science, which he will do in a future chapter.

**Egypt**

For the Mosque of ‘Amr in Fustat (Egypt), first erected in 642, no information is given on orientations but our author claims it faces Petra. This contradicts medieval sources which say that the qiblat al-sahāba, “the qibla of the Companions of the Prophet”, was toward winter sunrise. Although Gibson does not mention them, the late-10th-century al-Azhar and al-Hâkim Mosques are laid out in the qibla-direction computed by the Caliph al-Hâkim’s astronomer Ibn Yûnus, namely, 127°. For the Mosque of Ibn Tûlûn, founded in 876, Gibson gives the orientation as 145°, with Petra at 84° and Makka at 136°. He states that this is a Makka-orientation, and so it is. But it is not the first qibla in Egypt, namely winter sunrise (117°), and it is not the later mathematically-computed qibla (127°).

Indeed, a legend claims that the inspiration for the orientation of Ibn Tûlûn’s Mosque involved the orientation of the Prophet’s Mosque in Medina and another maintains that the mihrâb was laid out by the Prophet Muhammad himself whilst Ibn Tûlûn was asleep.

In 1984 I published a paper showing how the axis of the Fatimid city of al-Qâhira, laid out alongside the Roman Red Sea Canal, which was fortuitously perpendicular to this first qibla (117°), and the later mathematically-derived qibla (127°) both influenced the development of the Fatimid city of Cairo founded in 969 and the later Mamluk city and funerary suburbs. In some edifices the outside is orientated perpendicular to the city axis, that is, toward the old qibla, and the inside is orientated in the new qibla, 127°; one can see the 10° difference at the windows. These results are, of course, quintessential to an understanding of urban development and religious edifices in medieval Cairo, but they have not yet been exploited by any historian of medieval Cairene architecture.

**Yemen**
The Great Mosque in Sanaa (Yemen) from 705 at 334° is pointing toward Petra at 334°, Jerusalem at 335°, Makka at 326°. But lo! its major axis is parallel to that of the Kaaba in Makka (and it even has a miniature Kaaba inside).

Great Mosque of Sanaa © Mary Evans / Grenville Collins Postcard Collection/YOONIQ Images

Jerusalem

The al-Aqsâ Mosque in Jerusalem, dated 709, faces 170°; with Petra at 173° and Makka at 157° Gibson would have this facing Petra, but it is clearly oriented along with al-Haram al-sharîf complex, which is off the cardinal directions by 10°. The qibla of Jerusalem according to medieval astronomers was about 135°, a far cry from due south, and need not concern us here (but architecture historians should take note).

Jordan, Syria, Lebanon

The Umayyad Mosque in Amman (Jordan), from 701, may face 183°, with Petra at 194° and Makka at 161°, but the mosque was clearly intended to face due south, certainly not to face Petra. The Khirbat al-Minyâ complex, built in 706, is at 183°, so Gibson favours and orientation toward Petra at 182° (Makka is at 161°). The complex was obviously intended to face due south. The Mosque at Khirbat al-Mafjar, built in 714, faces 180°, which Gibson sees as facing Petra at 181°, rather than Makka at 159°. Another example is the Mosque at Ba’albek (Lebanon), dating from 740. It faces 177°, with Petra at 190°, Makka at 165°, and the line from Petra to Makka at 178°. For Gibson it faces the last of these. All of these mosques are trying to tell us that they face south, and that those who built them took south as the qibla.
Gibson introduces the interesting idea that some mosques face “between Petra and Makka”. The Umayyad Mosque in Damascus (Syria) built in 709 (not from scratch) is at $177^\circ$, with Petra at $193^\circ$ and Makka at $165^\circ$; therefore, “this mosque points between Petra and Makka”. The Mosque was in fact built on the site of a Byzantine cathedral, itself replacing a Roman temple, which was cardinally aligned. The qibla-wall is off due south by $3^\circ$. Many Syrians throughout the Middle Ages and up to this day thought the qibla in Damascus was due south. Actually the qibla in Damascus according to medieval astronomers was about $150^\circ$. The Mosque in Ba’albek from 740 faces likewise $177^\circ$, more or less due south, and certainly not deliberately “between Petra and Makka”. See below on a curious group of edifices over a wide swathe of Syria, all facing about $195^\circ$.

Iraq

Gibson adds to the falsehoods that have been committed by Creswell onward, including Crone & Cook, about the Mosque at al-Wâsit (Iraq). This was originally built in 706 and then demolished and rebuilt in between 1009 and 1155 in a completely different direction, at about $50^\circ$ further south. (For this, the most controversial of mosque orientations, Gibson does not reproduce the splendid plan by F. Safar, who conducted the 1936-42 excavations, nor does he give any orientations – I reproduce the plan here. This shows the first two out of a total of four mosques built on the same site over the centuries.) The first Mosque faces about $245^\circ$ and the second Mosque faces about $195^\circ$. Creswell said the first Mosque first faced Jerusalem; Crone & Cook said it first faced an
unidentified site in N.W. Arabia; Gibson now says it was first built deliberately facing “between Petra and Makka”.

Whoever knows anything about the ways the earliest Muslims found the qibla one is not surprised to find the first mosque facing winter sunset: this was taken as the qibla by the first generations of Muslims in al-‘Irāq. The second mosque was oriented in a qibla for Wāsit that had been derived by someone familiar with (medieval) geographical coordinates and mathematics (we find 201° in a 15th-century Central Asian geographical table with medieval qiblas for over 250 localities; of course, we do not need the modern qibla for Wāsit). The orientation of the two mosques has never been previously explained in modern times. More careful measurements and calculations using geographical tables from the 9th, 10th and 11th centuries would surely confirm this explanation.

The Mosque of Basra (Iraq), dating from 721, is at 184°, with Petra at 203°, Makka at 164°. Gibson has it deliberately facing “between Petra and Makka” at 183°. In fact, the mosque was built facing due south and a 4° error is not bad for that time.

Central Asia, Indian subcontinent
For the Cheraman Juma in Kerala (India), supposedly built in 629 [1], we have the mosque at 305°, with Petra at 304°, and Jerusalem at 306°, whereas Makka is at 230° (with an incorrectly-marked pointer). Gibson favours a Petra orientation. I see no obvious explanation, but I smell a rat.

The Mosque at the site of Banbhore (Pakistan) dates from 727. It faces 266°, with Petra at 289°, Makka at 268° and Jerusalem at 292°. For Gibson this mosque faces toward Makka, indeed he thinks it is the earliest known mosque that faces Makka. It does indeed face Makka, but not in the way Gibson thinks. For it faces due west, which is the direction the builders took for the qibla toward Makka. The first mathematical determination of the qibla known to us comes from Baghdad ca. 825. The lists of qiblas for hundreds of locations from one end of the Muslim world to the other that were available in Greater Iran from the 15th century onwards do not include Banbhore, which was destroyed in the 13th century.

The Bibi Hânum Mosque in Samarqand (Uzbekistan), ca. 1400 and thus later than Gibson thinks, is at 262°, which he says is 2° off the direction to Petra (and 22° off the direction to Makka), but in fact the mosque is a careless 8° off due west, which the Hanafi school of religious law took as the qibla (the Shâfi‘i’s preferred due south). In 1983 I published a medieval text on the different qiblas used in Samarqand and measured some of the mosque orientations.[8]

Oman

Two early mosques in Oman of uncertain date face 293°/296°. Gibson shows a small error in orientation to Petra (2°) and a larger error (26°/29°) for Makka. For him, the mosques face Petra. In fact, they both face summer sunset (about 295°), and those who built them intended them to face the Kaaba at Makka.

al-Andalus

The mosque that “takes the cake” in its orientation is the Great Mosque at Córdoba (Spain), built in 784. For Gibson the Mosque is at 157° (actually it is at 152°), with Petra at 91° and Makka at 100°. Gibson finds that it is parallel to the line between Petra and Makka, which is at 155°, representing a modest error of 2°. (Remember, at that time these folk had very limited geographical and mathematical knowledge.) In fact, the Mosque was laid out in accordance with the late-1st-century Roman orthogonal street-plan, which has an identical orientation, and the curious qibla was never changed whenever the Mosque was later enlarged. Now the major axis of the Mosque is conveniently “parallel” to the major axis of the Kaaba, or, to put it another way, the qibla wall is “parallel” to the NW wall off the Kaaba. The major axis is solstitially aligned, as it the case of the Kaaba. So why change the qibla? Some schemes of sacred geography indicate that when one is in Makka, facing the NW Wall of the Kaaba, one is standing in the qibla of al-Andalus. Thus when one is back in al-Andalus one faces a direction “parallel” to the major axis of the Kaaba, and that direction was popular in al-Andalus and the Maghrib.
Gibson adds to a substantial amount of rubbish that has been written about the orientation of the Grand Mosque by investigators over the past century, many of whom thought that it faced due south. Already in 1978 I published a medieval Arabic text about the different qiblas that were used in medieval Córdoba;[9] later this year I shall be presenting all available data on the qibla in Córdoba and the alignment of the Mosque at a conference “Science in al-Andalus” held at the Casa Árabe in that city. For all orientations in the whole of al-Andalus the writings of Alfonso Jiménez, Mónica Rius and Julio Samsó are indispensable.

al-Maghrib

For the Maghrib Gibson could have spared himself considerable embarrassment by consulting the works of Monica Rius and Michael Bonine, which deal with orientations there, using respectively medieval Maghribi texts and geophysical analysis.

The Mosque of ‘Uqba ibn Nâfi’ in Qayrawan (also Tunisia), erected in 670 and rebuilt in 836, faces 151° [Bonine: 147°] with Petra at 97° and Makka at 111°. Gibson concludes that it is parallel to the line between Petra and Makka, at 155°, with an error of 4°. The Mosque called al-Zaytûna in Tunis, built in 732, faces 154° [Bonine: 145°], with Petra at 100° and Makka at 113°, and Gibson finds that it is within 1° of the line between Petra and Makka at 155°. The Ribât or Fortress at Sousse (Tunisia), dated 770, with a small mosque, faces 183°, and was clearly intended to face due south, The neighbouring Great Mosque, from 850, faces 162° [Bonine: 163°], with Petra at 98° and Makka at 112°. Gibson thinks it was deliberately laid out “parallel to a line drawn from Petra to Makka” at 155°.

Bonine found that the Great Mosques at Qayrawan, Tunis, Sfax, Monastir, Mahdia and Hammamet (but not Sousse) are all at 145°-147°, and observed “when the evidence of a Roman cadastral survey is found associated with this cities, it then appears that the qibla and the Islamic city structure has therefore been determined by the pre-existing Roman system”.[10] It is not always worthwhile to seek a Nabataean connection.

A new era begins

With the Great Mosque of Sâmarrâ (Iraq), built in 847, we are at the beginning of a new era. The Mosque is at 198°, Petra at 244° and Makka at 197°. The Mosque has been laid out in the qibla of the astronomers, and the man who computed it was probably Habash al-Hâsib, the most innovative astronomer of the 9th century, some of whose works containing tables for the latitude of Sâmarrâ have survived. Gibson accepts that the Mosque is oriented toward Makka. By this he means that the “true” qibla toward Petra has been abandoned and the Muslim have started to pray toward their “false” qibla toward Makka.
Orientations that are not so easily explained

I shall not deal with further examples of early mosques whose orientations can be explained in terms of folk astronomical techniques or the foundations of pre-Islamic edifices. There are not a few others whose orientations defy explanation.

Syria, Jordan, and Lebanon again

Gibson investigates the Great Mosque in Hama (Syria), dating from 637. It faces 194°, with Petra at 193° and Makka at 168°. For Gibson it faces Petra. Next the ’Anjar Palace Mosque (Lebanon), dating from 714. Its orientation is 191°, with Petra at 187°, Makka at 164°, and Jerusalem at 197°. Gibson decides this mosque “points almost directly at Petra”. So it does, but nobody could have planned that at the beginning of the 8th century, toward Petra or anywhere else. An 11° deviation west from true south is too much to assume that a southern orientation was intended. The Mosque at Qasr al-Hayr al-Gharbî (Syria), dating from 726, also faces 191°, with Petra at 205° and Makka at 171°. The Mosque at the eastern Qasr, dating from 728, is at 193°, with Petra at 214° and Makka at 177°. Gibson’s false interpretation is the same as that for ’Anjar. The same holds for the Mosque at Mushatta (Jordan), dating from 743. It is at 195°, with Petra at 199°, Makka at 161°. For Gibson the Mosque points to Petra; for me it remains to explain these 10°-15° deviations west of south. But we are not quite finished.

The Mosque at Raqqa (Syria) was built in 772. It faces 194°, and Gibson has Petra at 209° and Makka at 177°. He concludes that it faces “between” Petra and Makka, which would be at 193° with an error of just 1°. But there is no evidence that anyone ever tried to align an edifice “between” two distant goals, and that is certainly not what has happened here.

These orientations of 190°-195° are not so easily explained. What is clear is (a) that the direction was not calculated, and (b) that was not derived from risings and settings of the sun at the solstices, or of a bright star. (Notice that the orientation of the newly-discovered “platform” at Petra, which Gibson (p. 259) thinks is at the origin of his would-be Minâ, is also about 200°.)

Alas, we have no medieval discussion of mosque orientations in Syria. But certainly strange things happened there. For example, in the Mamlûk developments to Tripoli (Lebanon), mosques and their orientations were copied wholesale from mosques in Aleppo and Hama. Indeed, mosques in medieval Tripoli are in the range 165°-190°, even though the astronomers knew the mathematical qibla was 150°. Then, in the mid-14th century, we have al-Khalîlî of Damascus preparing a superb table of qibla values for the whole Muslim world and a smaller one for localities in Syria and Palestine.

Gideon Avni has investigated the orientations of a dozen simple mosque layouts in the Negev Highlands, which date back to the earliest Arab expansion into S. Palestine. He found that 10 fall in the range 162°-172° (with two others at 158° and 182°). Again I have no explanation.
For all of these early mosques mentioned above, from China to al-Andalus, one thing is clear, namely, that **Gibson’s claim that early mosques facing Petra is nothing more than wishful thinking**. For all of these early mosques and for many hundreds of other, later mosques the investigation of their orientations would also be worthwhile. All mosques are oriented in the *qibla*, and the challenge for us moderns is to measure the orientations properly and identify the diverse ways that were used for finding the *qibla* in each location. For example, Alfonso Jiménez has measured the orientations of all mosques in the Iberian Peninsula and Mònica Rius has made a major contribution by investigating astronomical and legal texts on the *qibla* in al-Andalus and the Maghrib.[12]

**Early Muslims seeking the “pibla” with advanced technical skills**

Gibson now proceeds (pp. 135-171) to claim that his early Gibsonian Muslims were equipped to derive the “*pibla*” (my word) to Petra accurately. In a desperate hopelessly-muddled and utterly-puerile chapter he describes a palette of procedures that he claims his early Muslims could have used to find the “*pibla*”.

He promises to correct my suggestion that before they encountered mathematics of one sort or another, the Muslims used the techniques of folk astronomy, that is, astronomical alignments. He writes (p. 131):

> So instead of King’s proposed two categories (poor early techniques followed by more accurate mathematical techniques) I would like to suggest a slightly different scenario. From my reading of Islamic writings, I have come to the conclusion that the art of determining the *qibla* direction came out of early navigation, not mathematics. In the ancient past the Arabs sought for methods to help them guide their camel caravans across the trackless deserts of Arabia. They needed to know where cities lay over the horizon in order to guarantee that their caravans arrived at the correct city, and not one of an enemy."

The categorisation is Gibson’s, not mine, because the Muslims used folk astronomy, inherited from the pre-Islamic Arabs, alongside mathematical astronomy for over a thousand years. Gibson imagines that *qibla* determinations “came out of early navigation”, neglecting to say precisely what documents he means, where he found these documents, or precisely what he found in them. Nonetheless he makes his imaginings into a personal truth, but it surely doesn’t rise to the level of scholarship. All rather Trumpish. I know of no such documents.

Three examples of Gibson’s “evidence” must suffice. Gibson claims they used the astrolabe. But he does not know what an astrolabe is, and he mistakenly thinks one can use an astrolabe to find the “*pibla*”. He ignores the well-documented encounter of the Muslims with the astrolabe in N. Syria in the 8th century. We actually have two astrolabes from the 8th century, and all astrolabes from before 1100 have been published. He also introduces the Arab windrose, but this was used only in Arab navigation, certainly not for finding the *qibla* to Makka or the “*pibla*” to Petra. Of these two devices he writes (p. 159):

> Early astrolabes were based on the Arab compass that used the rising and setting of different stars [†]. The astrolabe below has both a front side and rear side, so that calculations can be made [??]. The astrolabe was also known as a windrose [†]."
But even with such instruments, the Arabs needed mathematical knowledge, and Gibson claims they had all they needed (p. 170):

> The Arabs of Muhammad's time had access to the basic concepts of spherical trigonometry which deals with the relationships between trigonometric functions of the sides and angles of the spherical polygons (especially spherical triangles) defined by a number of intersecting great circles on the sphere. Spherical trigonometry is of great importance for calculations in astronomy, geodesy and navigation. The outside circle of numbers on the Arab compass demonstrate that the Arabs had access to spherical trigonometry and used it regularly.

This is utter folly, given that spherical trigonometry was developed by Muslim mathematicians only in the 10th century. Gibson has no idea what spherical trigonometry is but does not mention plane trigonometry at all, which was indeed important for the first mathematical determinations of the qibla in the 9th century.

Gibson’s is truly a revolutionary reappraisal of Arab capabilities in the 7th and 8th centuries. His “spherical polygons” boggle the mind. He clearly has no idea what trigonometry is. His theories turn the history of science upside down. They force a rewriting of the early history of Islam. And they are, of course, complete nonsense.

Gibson mixes up astrolabes, spherical astronomy, simple nautical devices, Babylonian geometry and √2, the so-called “Theorem of Pythagoras”, poetic meters, pigeons, and more, and although he shows considerable ingenuity at producing all of these out of the bag, his entire chapter (pp. 135-171) is a pathetic attempt to justify his Petra theory.

He even makes a bold but fanciful claim that mosques in Syria, Iraq and Iran could have laid out accurately toward Petra using homing pigeons (p. 169):

> So it is possible that qiblas were set without any science or math, just by transporting a number of homing pigeons from Petra, and releasing them at the construction site a few at a time until an accurate direction could be established...

Part of his conclusion (pp. 170-171) reads:

> … during the time of the founding of Islam, the Arabs … taking celestial bearings and using mathematical solutions … had an understanding of basic formulas for spherical trigonometry. With this knowledge, it comes as no surprise that the qiblas of early mosques [toward Petra] all over the ancient world are accurate to within several degrees.

**Mosque orientations in the post-Gibson era**

For Gibson, Muslim scientific skills in later centuries regressed, whereas, in fact, for several centuries further they advanced (p. 170):

> The Arabs of the ninth to fifteenth centuries would become the world leaders in algebra which simplified trigonometry. However, as time passed, the earlier methods of establishing the qibla direction were lost, leaving us to wonder, exactly how the early Muslims could have calculated their qiblas [to Petra] so accurately...

There were no “earlier methods” other than folk astronomical procedures and adapting pre-Islamic edifices. Nothing was “lost”. Gibson thinks that the Muslims in later
centuries who wanted to align mosques toward Makka were less successful than the Gibsonian Arabs with their mosques facing Petra (p. 131):

“This data seems to indicate that not only were the early Arabs accurate in determining their qibla direction [toward Petra], there seems to be a breakdown in technique as the accuracy of [the orientation toward Makka of] later mosques lag behind those of earlier mosques [oriented toward Petra].”

He gives no evidence of ever having worked on any mosque after about 850. He ignores all the research over the past 100 years that shows how the mathematics of qibla determinations developed over the centuries.

In 14th-century Damascus, the mathematical problem of finding the qibla for the whole Muslim world was solved for all time with the splendid table of al-Khalîlî, giving accurate values to degrees and minutes for each degree of latitude and each degree of longitude difference from the meridian of Makka. I have described al-Khalîlî’s table as “the most sophisticated trigonometric table known to me from the entire medieval period”. In 15th-century Samarqand a table was compiled with entries for each of 275 localities from al-Andalus to China, giving longitudes and latitudes, as well as accurately-computed qibla-directions and distances to Makka. From 17th-century Isfahan we have three world maps centred on Makka, so devised that one can read off the qibla accurately for any locality in the Muslim world (the underlying cartographical theory was developed several centuries earlier). These are all highly impressive by medieval standards. What people did with this information is another matter.[13]

It would still be useful to have a survey of the orientations of all significant medieval Islamic religious architecture chronologically by region. Probably the most rewarding regions will be Iran and C. Asia. And with the imagery now available, there is less need now for volunteers to work in situ. Someone with Gibson’s talent at finding the images should be involved. But the orientations should be interpreted in the light of present historical knowledge of the qibla in different regions over the centuries. (Modern qibla values might be included, but are relevant only for modern mosques.) Gibson’s book can serve as an example of how not to conduct such a survey.

Bibliographical mishmash

Gibson’s bibliographical citations throughout the book leave a lot to be desired: many are inconsistent and incomplete. However, the bibliography tells its own story. Jamil Ali’s 1967 translation of al-Bîrûnî’s Tahdîd nihâyât al-amâkin, “On the determination of the limits of localities”, the most significant Muslim work on geodesy and mathematical geography and the determination of the qibla, quoted from me and surely not consulted – E.S. Kennedy’s 1973 commentary is inevitably overlooked. al-Bîrûnî, the greatest scientist the medieval Muslim world produced, would have been very surprised about early mosques facing Petra.
The article by Gerald Hawkins and myself on the astronomical alignments of the Kaaba is missing, deliberately suppressed (because Gibson’s “Kaaba” was at Petra, and a pre-Islamic astronomically-aligned Kaaba at Makka is an embarrassment to his theories).

On the qibla Gibson lists several articles and one book by myself but nothing by any of my colleagues, and my articles dealing with orientations of Islamic religious architecture are not cited. On Islamic architecture there is only K.A.C. Creswell’s early overview and a few serious studies of individual edifices.

On the history of Islamic astronomy there is not a single item. On the history of Islamic mathematics there is not a single item. On Islamic navigation at least the excellent study by G. Tibbetts is cited. On Islamic astronomical instruments there is one amateur history of the astrolabe from the Internet.

Not a single study of Islamic folk astronomy is included. A. Heinen’s excellent study of Islamic folk cosmology is quoted in a footnote but does not appear in the bibliography because the quotation is taken from my work. The enormous volumes edited by C. Ruggles on ethnoastronomy and archaeoastronomy are overlooked altogether. Even the writings of J.-A. Belmonte on the archaeoastronomy of Petra are overlooked.

In fact, most works relevant to the topic at hand have not been consulted, and most of the works cited in the bibliography are irrelevant and even many in the footnotes.

At first I was surprised that most of the work I have done on the qibla and the orientation of Islamic religious architecture is deliberately ignored. In this second book Gibson does mention my articles “Kibla” and “Makka as centre of the world” in the Encyclopaedia of Islam and my 1999 book on the spectacular newly-discovered Makka-centred world-maps, which embody a tradition that goes back to the 10th century. That book does include an overview of what we know about the qibla. These studies are quoted and misquoted and liberally copied by the page, along with illustrations and footnotes. In an undergraduate paper this would be considered plagiarism. Nevertheless Gibson has not looked seriously at any of them. And on second thoughts, none of my other publications on the qibla would have been relevant to Gibson, hell-bent as he was on advancing and justifying his Petra theory.

Exit Dan Gibson

I refrain from comment on Gibson’s reconstruction of early Islamic history – how and why Islam started in Petra, not Makka. Gibson’s theories have already caused a lot of mischief, as one can see from googling “qibla Petra”. Bob Serjeant’s review of Hagarism inspired me to write about Gibson’s book:

“Early Islamic Qiblas is not only bitterly anti-Islamic and anti-Arabian in purpose. Its superficial fancies are so ridiculous that at first anybody with a vague idea about the qibla might think that this is just a ‘leg-pull’, pure ‘spoof’. The author is sadly out of touch with contemporary research on Islam, on the history of mathematics, astronomy, instrumentation, archaeoastronomy, ethnoastronomy, and more. This is a tiresome travesty of history and nothing more than pretentious humbug.”
To the unwary, Gibson’s book at first sight looks like a monument to what can be achieved by an eager and innovative amateur in Islamic history, even without serious knowledge of classical Arabic and without critical training in Islamic Studies. It is in fact a giant complex of scaffolding around an imaginary Kaaba in Petra, the scaffolding more than ready to collapse. Its publication, however, is a monumental disaster for historical studies (and more so for the entire Muslim community) mainly because there are so few people around who have the necessary background to judge it for what it is worth, namely, some nice pictures. There are other parts of the book that others more qualified than I must address, and I hope that they will not fall for the author's conclusions about early mosque orientations.

Gibson, having in his opinion established that Muslims have been praying in the wrong direction for well over a millennium, expresses his hope that Muslims will now see the light (p. 272). But, in reality, they have less to worry about than he thinks. All of Gibson’s investigations of early medieval orientations using modern data and modern mathematical methods are of no historical value. His efforts to show that the Muslims from China to al-Andalus must have had all the necessary technical equipment to find the direction of Petra accurately to within a degree or two are ridiculous. Fortunately, his mission has self-destroyed.

Bibliographical notes

Most of the studies are based on medieval Arabic sources.

In these notes no complete references are given. These can be easily retrieved from the accompanying bibliographies or from the internet. Sometimes the articles themselves will be downloadable.

The first modern scholar to turn his attention to qibla determinations was Karl Schoy (1877-1925), on whom see the obituary by J. Ruska in Isis 9 (1927): 83-95:

- KS, “Die Mekka- oder Qiblakarte (Gegenazimutale mitttabstandstreue Projektion mit Mekka als Kartenmitte)” (1917);
- – , “Abhandlung des ... Ibn al-Haitam (Alhazen) über die Bestimmung der Richtung der Qibla” (1921);
- – , “Abhandlung von al-Fadl b. Hatim al-Nairizî: Über die Richtung der Qibla” (1922);

The next was Edward S. Kennedy (1912-2009), on whom see the obituary and bibliography in Suhayl 9 (2009-2010): 185-214:

On the subject of the qibla, I have published the following books and articles:

- “al-Khalîlî’s (universal) qibla table (for the whole world)” (1975);
- “Some medieval values of the qibla at Cordova” (1978);
- “Astronomical alignments in medieval Islamic religious architecture” (1982);
- “The astronomical orientation of the Kaaba” (with Gerald S. Hawkins, 1982); and “Faces of the Kaaba” (1982);
- “Al-Bazdawî on the qibla in early Islamic Transoxania” (1983);
- “Architecture and astronomy: The ventilators of medieval Cairo and their secrets (regarding orientations in Cairo)” (1984);
- “The sacred direction in Islam: A study of the interaction of religion and science in the Middle Ages” (1985)
- “Kibla (mathematical aspects)” in Encyclopedia of Islam (1986);
- “The earliest Islamic mathematical methods and tables for finding the direction of Makkâ” (1986);
- “L’Islam et la science : le problème de la qibla” (1987, based on DAK)
- “Makka as centre of the world” in Encyclopedia of Islam (1991);
- “Qibla charts, qibla maps, and related instruments” (with Richard P. Lorch, 1992);
- “Folk astronomy in the service of religion: The case of Islam” (1994);
- “The orientation of medieval Islamic religious architecture and cities” (1995);
- “Samt (direction)” in Encyclopedia of Islam (1995);
- “Islamic astronomy” (1996);
- “Two Iranian world maps for finding the direction and distance to Mecca” (1997);
- World-Maps for finding the direction and distance to Mecca – Innovation and tradition in Islamic science (1999);
- Finding Qibla in Islam, partial Persian translation by Hossein Nahid of World-Maps book, (2016);
- In Synchrony with the Heavens: Studies in astronomical timekeeping and instrumentation in medieval Islamic civilisation (2004-05);
- “The sacred geography of Islam” (2005);

For many other writings on mathematical methods for finding the qibla by colleagues – especially Richard P. Lorch, Julio Samsó, Jan P. Hogendijk, J. Lennart Berggren and Ahmad Dallal – see:

www.staff.science.uu.nl/~gent0113/islam/qibla.htm

For other writings on finding the qibla by folk astronomical methods see:

- Mònica Rius, La Alquibla en al-Andalus y al-Magrib al-Aqsà (2000);

For writings on Islamic sacred geography see also Petra Schmidl, Jean-Charles Ducène and Mónica Herrera Casais.

For writings on aspects of Islamic folk astronomy see also Paul Kunitzsch, Julio Samsó and the Barcelona school, Petra G. Schmidl and Daniel M. Varisco.

On mosque orientations in specific regions see also M. Philibert (the Maghrib), Michael Bonine (Morocco and Tunisia), Alfonso Jiménez (Spain), Mustafa Yılmaz (Turkey), and others. (Nothing of consequence has been published on this subject by historians of Islamic architecture, which is perhaps just as well.)

For medieval Arabic texts on mosque orientations see King (Córdoba, Cairo, Samarqand) and Mònica Rius (al-Andalus and the Maghrib); for legal controversies over mosque orientations see Ahmad Dallal (the Maghrib).


**The author:**

David A. King is a British orientalist who has devoted some 50 years researching the original sources – manuscripts and instruments – for the history of science in the medieval Islamic world. He has a doctorate from Yale University (1972), where he studied under Profs. Franz Rosenthal, Bernard R. Goldstein and Edward S. Kennedy (AUB, Beirut). He directed a Smithsonian Institution project in medieval Islamic astronomy at the American Research Center in Egypt (1972-79), then was Professor of Near Eastern Languages & Literatures at New York University (1979-85). Thereafter he was Professor of the History of Science at the Johann Wolfgang Goethe University in Frankfurt, directing the Institute for the History of Science made famous by his predecessor Prof. Willy Hartner and his colleague Prof. Fuat Sezgin. In 2013 he was awarded the Alexandre Koyré Prize of the Académie internationale d’histoire des sciences for his life’s work.

Prof. King has expanded our knowledge of this subject by using previously-unknown manuscript sources to document the ways in which Muslims over the centuries applied scientific methods to regulating the lunar calendar, organising the times of prayer, and determining the sacred direction. His *magnum opus* entitled *In Synchrony with the*
Heavens includes analyses of all available tables from over a millennium displaying the times of prayer for each day of the year for different localities in the pre-modern Muslim world. King has also published extensively on Islamic folk astronomy and mathematical astronomy and instrumentation, as well as on aspects of medieval and renaissance European religion, science and art. His publications are listed at www.davidaking.org.

Acknowledgements:

The author is grateful to Shefayet Chowdhury for bringing Gibson’s work to his attention and thereby changing the orientation of his retirement, and for accessing literature unavailable to this retiree in a distant land. He is also indebted to Peter Kaiser for realigning and fine-tuning this response.

References:

[1] This mistake has been circulated recently in publications by various established Western historians of Islamic architecture.


[3] It was Jan Hogendijk who was able to verify my hypothesis that the mathematical theory underlying the cartographic grids on the three 17th-century Makka-centred world-maps from Isfahan, too sophisticated for that milieu and certainly not of European inspiration, went back several centuries. He found the underlying theory in 10th- and 11th-century works on conic sections from Baghdad and Isfahan. See his “Het mysterie van de Mekkawijzers van Isfahan”, Nieuwe Wiskrant 22:2 (2002: 4-11, available at www.fisme.science.uu.nl/wiskrant/artikelen/222/222december_hogendijk.pdf.


[13]  Some 30 years ago I met by chance the representative of British Food in Frankfurt. Since he was an affable fellow, I asked him the obvious question. He assured me there was nothing wrong with British food. What the Brits did with it was, he said, another matter, and not his concern.