

EXECUTIVE SUMMARY

*In God's name, All-Beneficent, Ever-Merciful,
With eternal blessings on the Best of Creation, his family and folk*

*'Verily shall We manifest to them Our signs on the horizons and
within themselves, that it might be clear to them that this is the Truth.
Is it not enough that your Lord is witness over all things?'*¹

THIS WORK IS PERHAPS THE MOST expansive investigation of the issue of prayer and fasting in high latitudes available in any language. It consists of detailed discussions of a number of pertinent questions, with extensive quotation or summarization from primary reference works in the respective fields, as well as the results of a year-long observational study of dawn. It has been written to answer the following questions:

- » What are the issues facing the Muslim community in high latitudes regarding prayer and fasting, especially during the summer months?
- » When does the fast commence?
 - » What is the precise definition of al-subh al-sadiq?
 - » What is its relationship – if any – with astronomical categorizations of twilight?
 - » How are the transmitted texts and legal positions on the onset of the fast to be understood?
 - » What factors influence the onset of dawn?
- » Is twilight time fixed or variable, and why?
 - » What are the scientific factors that bring about twilight?

¹ Fussilat 41:53 – as will be seen in chapter 4, the specific 'sign' of the arrival of dawn is something 'witnessed' by an interaction between what is 'on the horizons' and 'within themselves', in order that the observer might distinguish the false dawn from the 'truth.' Allah knows best.

- » Is there any relationship between dawn and angular depression of the Sun?
- » Is there any variance from latitude to latitude, and can this be explained?
- » What are the issues around performance of the isha prayer?
 - » What are the legal positions regarding the onset of isha?
 - » How and when do notions of facilitation and ease affect legal rulings?
 - » What should be done in cases of persistent twilight?
- » What does a literature survey of methods of determining prayer times reveal?
 - » Was there a different approach adopted by astronomers and jurists in classical times?
 - » What are the modern methods of determining prayer times, and how reliable are they?
- » When do dawn and night occur in high latitude countries under ideal conditions?
 - » What are the parameters of accurate observation of dawn and dusk in the UK?
 - » What method should be utilised to determine prayer and fasting times going forward?

Chapter 1 briefly introduces three preliminary discussions: the relationship between scripture and the natural world, the importance of qualified scholarship, and respecting difference of opinion. The majority of acts of Divine communion in our religion are tied to and dependent upon the natural world – the movements of the moon, the passing of the seasons, and the alternation of the day and night. In terms of determining when and how to perform those acts, it is a definitive obligation to seek out qualified scholarship. Indeed, it is built into the nature of scripture that it can be interpreted in both correct and incorrect ways – thereby necessitating recourse to those qualified to perform this task. Equally, though, one needs must recognise that different interpretations may be valid, and this difference ought to be respected.

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Chapter 2 frames the major issues under discussion, laying out the context and history, as well as the headline summary conclusions for some of them. It is primarily aimed at the casual reader, as the later chapters delve into academic details of the discussion that are more directed towards experts. It tackles four primary issues: the legal onset of fajr and the fast, the question of observing prayer times in the UK, historical attempts to do so, and the question of how precisely to determine prayer times. It concludes with a counsel to the lay Muslim that essentially urges them to abide by one of the positions verified by the ulama (despite their contradictory results), reassures them that this will fulfil their responsibility before God, and exhorts them to tolerance of differing opinions and disavowal of criticism or censure of others.

Chapter 3 tackles the issue of terminology, given that rulings are predicated upon precise definitions of concepts. It explicates the logical basis of legal judgements, the different types of definitions, and the notion that terms left partially defined by the Lawgiver are not extended or further specified on the basis of either reason or empirical findings. Thereafter, after providing referenced definitions for the most important scientifically and legally significant terms, attention is turned to disambiguating the concepts of astronomical twilight and al-subh al-sadiq, as the conflation of the two has become widespread in modern legal thought. It is clearly shown that both refer to separate phenomena, and both are arbitrary points on the spectrum of increasing light intensity at the horizon through dawn.

Chapter 4 aims to answer the question: if astronomical twilight and al-subh al-sadiq are not the same thing, but have been historically observed to be co-synchronous, why can they not be used interchangeably? The inductive assumption that repeated observation entails necessary correlation is invalidated through a precise explication of the causal factors of twilight, with a focus on how these factors vary at high latitudes from mid-latitude locations. It is explained that the phenomenon of twilight comes about as the result of interaction between light, the atmosphere, Sun-earth relative positions, and the optical system. It is further shown that

geographical location and atmospheric density and height at high latitudes are the two most important determining factors of when twilight is first observed. That is, the closer to the poles an observer is, the later twilight is likely to appear. This is especially so for areas of high water vapour content.

The chapter also contains an observational description of twilight, as well as a ‘real-time’ scientific explanation of those observations. Additionally, the scientific basis of the three characteristic features of high latitude regions: wide variation in twilight duration, very lengthy summer twilights, and persistent twilight are laid out, along with an analysis of how this affects legal rulings.

Chapter 5 details the most important scriptural and juristic aspects of the discussion, centering on the Hanafi school, as it is the madhab of the majority of UK Muslims. Attention is first given to the question of al-subh al-sadiq and the onset of the fast, with the central Quranic verse explored in light of its major legal commentaries: those of Qurtubi and Jassas. Thereafter, the central ahadith are explored along with related narrations, in order to explicate something of the practice of the earliest Muslims with regards to commencing the fast, which was basically one of leniency. The (apparently little-known) Hanafi difference of opinion regarding the granular definition of al-subh al-sadiq is thereafter presented via extensive and chronological quotation from the major figures and works of the madhab over a thousand years. The conclusion reached is that both the first definitive light of dawn (awwal tulu al-fajr al-sadiq), as well as its wide-spreading (intishar), are valid and followable positions for delineating the time of al-subh al-sadiq.

Focus then turns to the time of isha prayer, with the position of the jamhur and the difference of opinion in the Hanafi school established and analysed with reference to the major works of the field. The question of whether isha is to be performed if twilight persists through the night is tackled via a summary of Shurunbulali’s and Ibn Abidin’s discussions of the Fatwa li Ahl al-Bulghar, concluding that – given the frequency, length and extent of persistent twilight in our time – the fatwa must be that isha remains obligatory.

The classical discussions about how to determine a time for isha (taqdir) are approached, citing the seemingly solitary Hanafi

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discussion of the topic by Tahtawi, before discussing the positions of the other schools – primarily the Shafis – as well as modern solutions to the issue. Coverage is given to the modern question of joining maghrib and isha due to a general difficulty (a minority position in the Shafii and Maliki schools) along with its validating conditions; and then to clarifying a modern misconception that isha can be performed any time after the *waqt al-ikhtiyar* of maghrib, which is shown to be invalid by consensus.

The question of the length and onset of the fast during long summer months is then explored, with an analysis of the modern position entailing artificially restricting the length of the fast in high latitude countries to the maximum length of the fast in Makka. This view is analysed and critiqued according to the principles of ‘the fiqh of reasonable fear’ that determine when (and what) dispensations may be utilised.

The chapter concludes with a detailed overview of the twin legal principles of facilitation and lifting harm. The classical discussions of ibn Nujaym and Suyuti from their respective *al-Ashbah wa al-Naza’ir* works are summarized, along with the proper manner of their operationalization as per ibn Abidin’s *Sharh ‘Uqud Rasm al-Mufti* and Uthmani’s *Usul al-Ifta*. It is demonstrated that, while removing hardship and bringing ease are primary aims of – and indeed central mechanisms to implement – the Divine law, they are neither independent sources of law nor unrestricted in their application. Particularly in cases where dispensations are scripturally stipulated, they need to be limited to the extent of the need and not carelessly over-extended.

Chapter 6 consists of a literature survey of classical and modern attempts to construct prayer timetables. The works of major Muslim astronomers are examined, along with their findings for the start and end of morning and evening twilights. The oft-ignored historical distinction between the observational astronomy favoured by jurists and the mathematical astronomy of the high classical period is also presented, along with a historical overview of the development and practice of the science of astronomy in Muslim civilisation. Also addressed is the question of the differing methods of solar angle

determination in classical and modern times, and whether it is appropriate to directly conflate the two.

It is further demonstrated that the classical positions about fajr and isha times were based either on angular solar depression (for astronomers) or pure observation (for most jurists). The seminal Urdu-language fatwa of the astronomer-jurist Rida Khan – *Dar' al-Qubh fi Waqt al-Subh* – is then summarized. It brings together the two approaches, clarifying that prayer and fasting times are delineated by scripture (*tawqifi*) as being observationally based, but that calculation serves as an indispensable tool for generalising observational data across the remaining days.

Thereafter, a number of the major modern attempts to determine prayer times in the UK are presented and critiqued for methodological rigour, legal precision and accuracy of extension. Particular attention is given to Hizb al-Ulama's observations and subsequent extrapolations, as well as Shams al-Huda's assertions that *al-subh al-sadiq* necessarily enters at 18° of solar depression in all places and times, thus obviating the need for observation entirely. The widespread practice of fixed twilight durations is also critiqued as being counter-factual, though mitigation is offered on the basis of the difficulty of accurately determining times based on angular depression at that juncture of UK Muslim history. A number of modern studies in mid-latitude countries are presented and critiqued, with suggestions proffered for how to proceed with the issue in high latitude countries.

Chapter 7 thereafter analyses a number of studies, including the author's own year-long, scientifically rigorous, observational study in 2012-3. The aims, considerations, methods, limitations and findings of the study are presented in detail, before analysis of the data set and recommendations for methodological rigour in future observations.

The primary finding was that, though durations and times of twilight varied from location to location and through the year, the angular depression of the Sun at each of the phenomena was remarkably constant. Further results include the earliest possible observation of dawn (*awwal tulu' al-fajr*) being at 16.5° of solar depression, the certainty of dawn's entry (*tabayyun*) being at 14.5°

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modally, and the wide-spread dawn-light (*intishar al-fajr*) being at 12.5°. Less well-attested findings (due to fewer valid observations) include the disappearance of red twilight (*ghuyub al-shafaq al-ahmar*) at 12-13° and the white twilight (*al-abyad*) at between 15-16°.

Chapter 8 concludes the work with a summary of the major issues relating to prayer times and fasting at high latitudes and a discussion of recommendations borne out of this study. The major recommendation is for a return to the observational basis of prayer times, by means of rigorously established methodological principles. This is founded on the scientific evidence proffered, indicating that high latitude regions require a new observational data set, due to their unique set of geographical circumstances. The practice of fixing durations of twilight – possibly a necessity of the times brought on by lack of astronomical expertise – should be abandoned and replaced by the historical default of angular extrapolation.

It is thereafter advised – on the basis of the rigorous observations conducted – that for most of the year, the time of *fajr* be calculated at 14.5°, with *isha* being set at 16° for precaution. During the months of daylight savings, the legal entry time of *isha* should switch to the majority position of *ghuyub al-shafaq al-ahmar*, calculated at 12.5°, in order to remove hardship from people. In this period, *suhur* for the Ramadan fast can also be set at 12.5°, on the basis of the valid Hanafi position of *intishar al-fajr*.

A number of questions that require further discussion are detailed, including how to approach the lateness of *isha* in high summer (post 11pm). The interim recommendation is to adopt the position of *ghuyub al-shafaq al-abyad* and then, considering its non-entry, make *taqdir* upon a fractional division of the night. The question of estimating (*taqdir*) an entry of *fajr* for fasts, versus adopting the Makkan duration, versus simply delaying performance of the fast to later in the year, is also identified as requiring significant further discussion.

It is hoped that this executive summary will enable interested readers to get a flavour of the ‘headlines’ of this rather extensive body of research and assist them navigating both the issues and the work itself. All recommendations are submitted with humility, bearing

SHEDDING LIGHT ON THE DAWN

in mind the necessity of an immediate solution to people's needs, but also cognisant that they are in need of rigorous peer-review and critique by experts in their respective fields.

May God Most High grant right guidance and ease in this world and the next, bless my teachers and parents, and forgive us all. May He provision our minds with clear understanding, our bodies with willing and joyful submission, and our hearts with a unity that comes from love and mutual respect, despite our differences of opinion.

O God! Let us see the truth as true, and follow it; and falsehood as false, and avoid it. O God! Bear us through the long night of separation, through the dawn of realisation, to the sunlit day of Your sanctified presence, and the fellowship of the Perfect Moon, peace and blessings upon him, and his stars.

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