

# WOMEN IN ISLAMIC CIVILISATION: THEIR RIGHTS AND CONTRIBUTIONS

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**Abstract:** This paper provides a general survey of the contributions made by women to science, knowledge and welfare in Islamic civilisation. The paper determines that early Muslims approached Islam and science in a holistic fashion, after adopting an epistemology which maintained a unity between science, technology and spiritual knowledge. The paper also suggests that, in the early age of Islam, women were given positions of trust and high responsibility in the spheres of leadership, education, and science. But, this empowerment of women in early Islam bears little relation to the conditions of women in modern-day Muslim societies, where women often suffer the most in conflict-ridden regions, whether from insecurity, domestic abuse, low education levels or poor medical care. The paper accordingly establishes a direct link between the absence of good governance and issues like gender inequality, the violation of the rights of women, and the current weakness of Muslims in science and technology. Without good governance, the status of women is unlikely to improve. If women's rights to both a proper education and an occupation continue to be neglected, the equilibrium of Muslim society will be damaged, hindering its ability to produce innovative and passionate minds.

## Introduction

At present, the Muslim world is suffering from a range of social, political and economic ills, all of which have impeded Muslims, both men and women, from making significant contributions to scientific and other intellectual developments. The spirit of science in the contemporary Muslim world is as dry as a desert, argues Hillel Ofek from the University of Texas at Austin.<sup>1</sup> According to statistics provided by Pervez Amirali Hoodbhoy, a Pakistani nuclear physicist, mathematician and academic, contemporary Muslim countries have nine scientists, engineers, and technicians per thousand people, compared with a world average of forty-one.<sup>2</sup> There are around 1,800 universities in the Muslim world, but only 312 with scholars who have published journal articles. Nobel laureate physicist Steven Weinberg stated that, “for forty years I have not seen a single paper by a physicist or astronomer working in a Muslim country that was worth reading.”<sup>3</sup>

Some pundits and politicians, upon observing this miserable scientific and educational situation in the Muslim world, and while also being horrified by large-scale Muslim migration into Europe and the U.S.A. from various conflict-ridden zones, have begun calling Muslims ‘parasites’. In 2011, for example, Bryan Fischer, dubbed the ‘High Priest of Hate’ of the American Family Association, made this claim, adding that Muslims who came to the U.S.A. should either convert to Christianity or die.<sup>4</sup> In November 2014, Jack Whitley, chairman of the Big Stone County Republican Party, argued that America should ‘frag’ any and all ‘Muslim terrorists’ rather than waterboard them as, he said, “I am opposed to waterboarding Muslim terrorists because it is a waste of resources. They are Muslims, they are terrorist (sic), we know where they are from, we know where their buddies are, we know where their mosque’s (sic) are, we know millions of these parasites travel to Mecca every year and when...FRAG ‘EM!”<sup>5</sup>

Indeed, for some the labelling of Muslims as ‘parasites’ seems justifiable. Uncontrolled Muslim asylum seekers, for example, cost UK tax payers £550,000 each over the duration of their life-time. According to the *Briefing on British Muslims: Socio-Economic Data and Attitudes*, more than half of all UK Muslims are economically inactive (52 percent). Indeed, in the UK the unemployment rate for Muslims is more than three times that of the general population and is the highest of all faith groups. Moreover, 1 in 7 (14.6 percent) of economically active Muslims are unemployed, compared with 1 in 20 (5 percent) for the wider population. Half of all UK Muslim women have never worked.<sup>6</sup> As a result, Muslims (and especially women) are often labelled as ‘parasites’ who live on the wealth of others. Tax payers in developed countries, frustrated by such realities, often display radical Islamophobic attitudes as a result. One blogger, for instance, went so far as to claim that, in fourteen centuries of Islamic history, Muslims and “their toxic Islamic cultures, have produced virtually nothing of value.”<sup>7</sup>

This Islamophobic claim, however, is easily refuted by hundreds of examples of early Muslim scientists who made important, original contributions to their disciplines. Indeed, Islamic civilisation dominated the world of science and learning for nearly 600 years. Throughout the Abbasid Caliphate (750-1258 CE) and the period of Muslim rule in Spain (755-1492 CE), both of which are considered ‘Golden Ages’ in Islamic civilisation, Muslims led the world in scientific development. For example, in the early ninth century, the institution known as the *Bayt al-Hikmah* (House of Wisdom) was founded in the Abbasid capital, Baghdad. This gathered the world’s best minds under one roof, regardless of their religious beliefs. There they worked on translating Greek, Chinese, Sanskrit, Persian and Syriac works into Arabic, thereby initiating the translation movement in Islamic civilisation.<sup>8</sup> This movement continued for centuries,

acting as the main channel by which ancient learning could be forwarded to future generations and integrated with Islamic values and fresh scientific input.

But, if Muslim science was the most advanced in the world until at least the fourteenth century, why did it decline? Why are Muslims, who once taught the world, now pupils of their former students? Over the last few decades, several important works have been written in response to this question.<sup>9</sup> This article does not aim to evaluate all the reasons proposed by those texts for the decline of Islam's scientific tradition. Rather, it attempts to link this intellectual decay to a decline in the rights of women. In that regard, the article makes three main points: it underlines that Islam encourages scientific development, both for the improvement of human life and for achieving environmental sustainability; that there is a direct link between the status of women, good governance, and intellectual and scientific progress; and finally, that the existence of participatory opportunities for women in public and academic life serves as an indicator of an environment conducive to positive societal innovation.

Ultimately, I aim to underline that Islam has empowered women since the seventh century. From the earliest days of Islam, women took an active part in developing Islamic civilisation. Although numerous recent works have been composed glorifying the contributions of Muslim men to science,<sup>10</sup> the contributions of women are rarely discussed. This essay emphasises the role of women in scientific and intellectual developments during the rise of Islamic civilisation, providing a fresh insight into this issue.

## Islam and Science

The Qur'an considers it a sin not to use sense and reason when searching for truth. Those who make claims that are not founded on knowledge and reason, or who blindly imitate their ancestors, are criticised in the Qur'an: "Indeed, the worst of living creatures in the sight of Allah are the deaf and dumb who do not use reason" (*al-Anfāl* 8:22).

In early Islam, Muslims studied nature as a means of deciphering both the signs of Allah and the Divine code the cosmic order was built upon. According to the Islamic worldview, science therefore functioned within a religious and ethical framework. Such a holistic approach stimulated Muslims to excel in various fields of knowledge, without making any clear distinction between the religious and the worldly sciences. Early Muslims maintained an epistemology in which there was unity between science, technology and spirituality – what Osman Bakar calls a God-centric worldview dictated by the Qur'an.<sup>11</sup>

In Islam, knowledge is the criterion by which man's superiority over all other creatures (including the angels) is judged. In *al-Baqarah*, for example, there is a conversation between God and the angels about the former's appointment of

Adam as His vicegerent (*khalifah*) on earth. The angels, however, doubted the ability of man to perform this task, saying “Will You place upon it [the earth] one who causes corruption therein and sheds blood, while we declare Your praise and sanctify You?” God replied, “Indeed, I know that which you do not know” (*al-Baqarah* 2: 30). Then God taught Adam the “names of all things” – understood by many interpreters of the Qur’an to mean the nature of all things. As a consequence, the angels prostrated before Adam, in recognition of his superior knowledge.

In light of this episode, Islam has always considered knowledge to be the key to human salvation and happiness, both in this world and in the Hereafter. The Prophet Muhammad (pbuh) always encouraged Muslims to seek knowledge, to reflect and contemplate on natural phenomena with a view to deepening their understanding of Divine power and wisdom. This attitude helped Islamic civilisation dominate the world of science for nearly 600 years. Moreover, the significance Islam placed on knowledge allowed Muslims to pioneer such things as basic public education, regardless of gender or social class. Throughout the early Islamic period, for example, mosques commonly offered primary education to both boys and girls. Often mosques also had secondary schools (*kuttab*) built next to them. In various Islamic centres, higher learning institutions were also founded, together with facilities like hospitals and observatories, where students could practice the theoretical knowledge they gained from books. Together with higher educational institutions like al-Qarawiyyin in Fez, Zaytuna in Tunisia and al-Azhar in Cairo, many learning centres of this sort were founded in the cities of Andalusia, including in Cordova, Seville, Malaga and Granada. Together, these provided a model for the earliest European universities, both in terms of structure and curriculum.

More than anything else, it was the introduction of the experimental method that differentiated science under Islam from science under earlier peoples, such as the Greeks. Greek philosophers like Plato and Aristotle had believed in rationalism, arguing that human reason alone could understand and know everything. Muslim scholars, however, and although not underestimating the power of reason, acknowledged its limitations; they held that revelation, *sunan Allah* (natural laws in the universe), *fitrah* (inborn intuition) and, most importantly, observation of these natural laws were the main source of knowledge. As early as the eighth century, an experimental method evolved from this perception. As Muhammad Iqbal pointed out in his *The Reconstruction of Religious Thought in Islam*, the experimental method was not discovered by Europe: Roger Bacon, who is often celebrated as the European ‘father’ of the experimental method, received his scientific training from the universities of Muslim Spain.<sup>12</sup> Rather, it was Muslim scholars like Jabir ibn Hayyan (721-815), an alchemist recruited by

the Abbasid Caliph Harun al-Rashid (r. 786-809) to work in the *Bayt al-Hikmah*, and Abu Bakr ibn Zakariyyah al-Razi (854-925), the medieval Persian Muslim polymath known by the Latinised name Rhazes, who pioneered the experimental method. Moreover, and of more significance here, women were not excluded from this process.

## The Status of Women in Islam

Islam liberated women from ignorance and discrimination, both of which were widespread in pre-Islamic society. For the first time in human history, Islam empowered women with progressive social, legal, political and economic rights. William Montgomery Watt, for instance, suggested that Muhammad, the Prophet of Islam (pbuh), “can be seen as a figure who testified on behalf of women’s rights.”<sup>13</sup>

The Qur’an and Sunnah of the Prophet (pbuh) establish equity and parity between men and women, although while maintaining a differing function for the genders in marriage, family and society. The Qur’an emphasises that men and women were created of the same species, stating: “He created you from a single being; then of the same kind made its mate” (*al-Zumar* 39:6). In the chapter of *al-Nisā’*, Allah Almighty also said that: “O mankind! Fear Allah Who created you from a single person [Adam], and from him [Adam] Allah created his wife [Hawwa], and then from both of them, He created many men and women spread [all over the world]. And fear Allah through Whom you make claims [of your mutual rights]. And do not cut-off the relations with your blood relatives. Indeed, Allah is All-Watching over you” (*al-Nisā’* 4:1).

According to Islam, men and women complement each other and are a means of mutual fulfilment. Family life is not based on a formal hierarchy of rights and responsibilities, but on *sakīnah* (peace, restfulness and honour), *muwaddah* (affection), *rahmah* (forgiveness, grace, mercy, compassion) and *rufq* (gentleness). In his Last Sermon, Muhammad (pbuh) said:

O People, it is true that you have certain rights with regard to your women, but they also have rights over you. Remember that you have taken them as your wives only under Allah's trust and with His permission. If they abide by your right then to them belongs the right to be fed and clothed in kindness. Do treat your women well and be kind to them for they are your partners and committed helpers. And it is your right that they do not make friends with any one of whom you do not approve, as well never to be unchaste.<sup>14</sup>

Passages from the Noble Qur’an confirm that women are equal to men in the sight of God, both in terms of rights and responsibilities. It is clearly stated

that: “Every soul will be (held) in pledge for its deeds” (*al-Muddathir* 74:38). On another occasion, the Qur’an articulates that: “Whosoever does good, whether male or female, and is a believer, these will enter the Garden; they will be provided therein without measure” (*al-Mu’min* 40:40). Accordingly, men and women are spiritually akin to one another and are equal recipients of God’s favour and bounty, whether in this life or in the Hereafter.

Economically, Islam dictates that women have the right to independent ownership – a right many other societies denied them until the early twentieth century. Thus, a woman’s right to her money and other properties, whether she is married or single, is fully acknowledged by Islamic law. Even when married, women maintain their right to buy, sell, mortgage or lease their properties as they see fit, without their husband’s permission. Also, there is no ruling in Islam forbidding women from seeking employment – although her role as mother and wife is maintained as sacred and essential. Neither is there any restriction placed upon the fields in which women can gain their skills and knowledge.<sup>15</sup> Nor is there any ruling, whether in the Qur’an, the Sunnah or among the consensus of the scholars (*ijma*), depriving women of their public and political rights.<sup>16</sup> Certainly, during the time of the Prophet (pbuh) women were not excluded from public life; the restrictions that were subsequently imposed on them derived in part from specific conditions that have never commanded normative or undisputed validity under the Shari’ah.<sup>17</sup>

Supporting this, a long line of female scholars and activists attained high position and great renown both during the life-time of the Prophet (pbuh) and afterwards, when Islamic civilisation was flourishing.<sup>18</sup> For example, the Prophet (pbuh) assigned women to important administrative posts. He appointed a woman named Samra’ binti Nuhaik al-Asadiyyah to the position of *muhtasib* (market inspector), in which post she regulated commercial activity and guarded public interest. Not only did she keep this position during the rule of the first two caliphs,<sup>19</sup> but Caliph ‘Umar ibn al-Khattab appointed another woman, al-Shifa’ (Layla) binti ‘Abdullah, to the same position. She became well known and highly respected in the community for her knowledge, piety and morality.

These few examples perfectly demonstrate how women were actively engaged in public, political, economic and educational spheres during the early Islamic period. At that point in time, appointment to influential posts was based on suitable qualifications and skills, not gender. This also applied to the fields of science and welfare. The rest of this paper will discuss the contributions Muslim women made to these spheres.

## The Architects of Islamic Civilisation

During the early stages of Islam, women played a central role in education, helping to produce some of Islam's best scholars. For example, 'Aisha bint Abi Bakr, the beloved wife of the Prophet (pbuh), played a key role in the growth, development, and understanding of Islam. She transmitted a great deal of knowledge about Muhammad (pbuh) and is still considered Islam's central authority on matters relating to the role of women. In addition, she also introduced herself into the world of politics: in the Battle of the Camel in 656 CE, for instance, 'Aisha led the army from the back of her camel.<sup>20</sup>

'Amrah bint 'Abd al-Rahman, the pupil and secretary of 'Aisha, is another example of female scholarly excellence, this time from the generation of the *tabi'in* ('followers'). With her extensive knowledge, 'Amrah became an authoritative voice on *hadith*, frequently overriding the opinions of male scholars and later becoming an important judge. Even the renowned Umayyad Caliph, 'Umar ibn 'Abd al-'Aziz (r.717-720 CE), and who was a great scholar in his own right, said that he knew of no one alive who was more learned in the *hadith* of 'Aisha than 'Amrah. From the same period, 'Aisha bint Sa'd was another woman learned in the Islamic sciences, to the point that a number of famous jurists and scholars of *hadith*, including Imam Malik, Hakim ibn 'Utaybah and Ayyub al-Sakhtiyani, became her pupils.

Undoubtedly, therefore, women made several notable contributions to the preservation of *hadith*. Many of the earliest and most important compilers of *hadith* had female teachers, whom they list as immediate authorities. Imam Shafi'i, for example, studied '*ilm al-hadith*' in Egypt under Sayyida Nafisa bint al-Hasan ibn 'Ali ibn Abi Talib, a leading scholar of the time. Likewise, Ibn Hajar studied under fifty-three women, while al-Sakhawi had *ijazas* (licences to teach) from sixty-eight women and al-Suyuti from thirty-three.<sup>21</sup>

In addition to their contributions to *hadith*, women also pioneered the first educational institutions. The grand college mosque complex of al-Qarawiyyin in Fez, for example, and which is perhaps the oldest university in the world, was originally established in 841 by Fatima al-Fihri. A devout, pious and well-educated young woman from Kiroan (Tunisia), Fatima inherited a large sum of money from her father and decided to use it in order to give Fez a great centre of learning. She vowed to spend her entire inheritance to realise this dream and, from these humble beginnings, al-Qarawiyyin developed into a great centre of religious instruction and political discussion, gradually extending its curriculum to cover all subjects, particularly the natural sciences (and so hence earning its name as one of the first universities). At its height, al-Qarawiyyin was well-equipped with astronomical instruments, while its 'timers room' had astrolabes, sand clocks and



other instruments for calculating time.<sup>22</sup> Its variety of subjects and high-quality teaching drew scholars and students from far and wide, contributing greatly to the flourishing of Islamic civilisation.

In the early thirteenth century, Gevher Nesibe Sultan (d. 1206), the daughter of Kilij Arslan II of the Rum Sultanate, endowed a magnificent complex comprising a hospital, an adjoining madrasah devoted to medical studies, and a mosque. Located in Kayseri, Turkey, this complex is considered a pre-eminent example of Seljuk architecture and is still named after the princess – the Gevher Nesibe *kulliyesi* (complex).

Turning to the contributions Muslim women have made to public welfare, Zubayda bint Ja'far ibn Mansur (d. 831), wife of the Abbasid Caliph Harun al-Rashid, was a noblewoman of great generosity and munificence. She contributed to many welfare projects in many cities ruled by her husband, helping to improve roads, bridges, wells and caravan-*sarays* (roadside inns). Zubayda is also known for building waystations with wells along the *hajj* (pilgrimage) route from Baghdad to Mecca. Moreover, because Mecca used to experience water shortages, especially during the *hajj* season, Zubayda ordered the construction of a 60km-long aqueduct on the outskirts of Mecca, at a place called Numan Valley. In total, she spent over 2 million dinars improving Mecca's water supply. The famous Zubayda spring located on the outskirts of Mecca still bears her name. She was also a patron of the arts and poetry.<sup>23</sup>

In the sixteenth century, repairs to the waterways of Zubayda were carried out by another Muslim princess, Sultana Mihrimah, the daughter of Suleyman the Magnificent (r. 1520-1566). Moreover, the favourite wife of Sultan Suleyman, Hurrem Sultan (originally named Roxelana), founded a number of welfare institutions, including a mosque complex in Istanbul called the Haseki Kulliyesi (consisting of a mosque, madrasah, school and *imaret* or public kitchen), a *çifte hamam* (or double bathhouse, with sections for both men and women), two schools and a women's hospital in Istanbul, four schools in Mecca, and a mosque in Jerusalem.<sup>24</sup>

Finally, Dhayfa Hatun, the Ayyubid Queen of Aleppo (r. 1236-1242), founded many charities aimed at supporting scientists and their work. She also sponsored the establishment of two schools, al-Firdaus and the Khankah,<sup>25</sup> both of which taught Islamic studies alongside other more secular fields of learning. These few examples reveal how Muslim women contributed to the welfare, education and prosperity of early Muslim society. They possessed both the financial capacity and political power to carry out significant projects capable of substantially impacting upon society. As a result, scholarly and scientific developments flourished.



## Women in the Medical Field

In one capacity or another, women have been regularly involved in medical practice throughout Islamic history. Starting from the time of the Prophet (pbuh), many examples emerge of Muslim women making significant contributions to public healthcare.

For example, nineteen women are cited in Islamic biographical collections (*sirah* books) as having participated in battles during the time of the Prophet (pbuh), mostly as water bearers and as nurses treating the sick and wounded.<sup>26</sup> In the latter context, Rufaidah bint Sa'ad of the Bani Aslam tribe of the Khazraj tribal confederation in Madinah is particularly worthy of mention. Living during the time of Muhammad (pbuh), she was amongst the first people in Madinah to accept Islam. Rufaidah received her medical training and knowledge from her father, Sa'd al-Aslami, who was a physician. Very soon, she became a professional nurse, capable of treating the sick and wounded on her own. In peace time, Rufaidah would treat the ill in a tent set up outside the Prophet's mosque. During war time, however, she would lead groups of volunteer nurses onto the battle-fields, where they would treat casualties.<sup>27</sup> Together with her team, she participated in the battles of Badr, Uhud, Khandaq and Khaibar. Indeed, the Prophet (pbuh) used to direct his men to carry any casualties to Rufaidah's tent. At the battle of the Trench (Khandaq), for instance, he instructed that Sa'ad bin Ma'adh, who had been injured in battle, be moved to her tent. There Rufaidah nursed him, carefully removing the arrow from his forearm and achieving haemostasis. As cited in the *sirah*, the Prophet visited Sa'ad in the tent several times a day.<sup>28</sup> It is also narrated that when the Prophet's army was getting ready to go to the battle of Khaibar, Rufaidah and her volunteer nurses went to the Prophet (pbuh) and asked for permission to go: "Oh messenger of Allah, we want to go out with you to the battle and treat the injured and help Muslims as much as we can." The Prophet gave them permission and they proved so valuable that he subsequently assigned a share of the booty to Rufaidah in recognition of her medical work. Her share was equivalent to that of a soldier who had actually fought in the battle.<sup>29</sup>

But, Rufaidah did not confine her nursing to just clinical situations and the battlefield. She also went out into the community, where she tried to solve the social problems which led to disease. In that context, she could be considered both a public health nurse and a social worker. Biographical sources describe Rufaidah as a woman possessing many of the ideal qualities of a nurse: compassion, empathy, good leadership and the ability to pass her clinical knowledge on to others.<sup>30</sup>

Another female Companion, al-Shifa bint Abdullah, is also worthy of mention. Originally named Layla, her nickname ‘al-Shifa’ (the healing) was given to her in recognition of her abilities as a nurse. A member of the ‘Adi tribe of Quraysh,<sup>31</sup> she was a well-educated and extremely intelligent women. In particular, she became well known for developing a preventative treatment against ant bites. As is narrated, after the migration to Madinah, al-Shifa approached the Prophet (pbuh) and said, “O Messenger of Allah, I used to do preventative medicine for ant bites during Jahiliyya (period of ignorance), and I want to demonstrate it for you.” He said, “Demonstrate it.” Al-Shifa said, “So I demonstrated it for him, and he said [continue to] do this, and teach it to Hafsa [a wife of the Prophet].”<sup>32</sup> In addition to her medical role, and as briefly mentioned above, al-Shifa was also appointed by the caliph ‘Umar ibn al-Khattab to the position of *muhtasib* in Madinah.<sup>33</sup>

Preservation of public healthcare is highly recommended in Islam and considered a key responsibility of government. Although individuals are responsible for maintaining their spiritual, mental and bodily well-being,<sup>34</sup> governments are responsible for providing public well-being, including the preservation of health. As such, from as early as the eighth century, Muslims rulers began building mobile and permanent hospitals, called Bimaristan, in various parts of the Muslim world. These provided healthcare for the public, especially for the poor and needy. By the twelfth and thirteenth centuries, these hospitals, especially in Greater Syria and Egypt, had reached such high levels of performance that travellers and historians deemed them to be one of the main achievements of Islamic civilisation. Such public healthcare institutions also provided a space for women to become actively engaged in professional healthcare. For example, Muslim hospitals have historically had separate wards for male and female patients; Islamic modesty norms demanded that these wards be staffed by people of the same gender as the patients. This immediately opened up opportunities for female medical practitioners. According to Surty, the first official female nurses (all from the Sudan) were hired by al-Qayrawan (Kairouan) hospital, built in 830 by the Aghlabid ruler, Prince Ziyadat Allah I of Ifriqiya (r.817–838).<sup>35</sup>

Indeed, medieval medical treatises provide numerous indications of women providing important health services. Certainly, sources occasionally speak of female physicians (*tabibah*), with a few women from the families of famous doctors apparently receiving an elite medical education.<sup>36</sup> Al-Zahrawi, for example, and while explaining how to excise bladder stones, noted that the procedure was difficult for male doctors to perform on female patients because

of the need to touch the genitalia. He therefore suggested that a male practitioner find a female doctor capable of performing the procedure, or else use a eunuch physician or a midwife capable of taking instruction from a male surgeon.<sup>37</sup>

On a more day-to-day level, women probably provided much of their family's medical care, even if elite male physicians took a dim view of their activities.<sup>38</sup> For instance, the Christian physician Sa'id ibn al-Hasan (d.1072) referred to the role of women as healers accordingly:

How amazing is this [that patients are cured at all], considering that they hand over their lives to senile old women! For most people, at the onset of illness, use as their physicians either their wives, mothers or aunts, or some [other] member of their family or one of their neighbours. He [the patient] acquiesces to whatever extravagant measure she might order, consumes whatever she prepares for him, and listens to what she says and obeys her commands more than he obeys the physician.<sup>39</sup>

Serefeddin Sabuncuoglu (1385-1470), the Ottoman-period author of the first illustrated surgical encyclopaedia, *Cerrahiyyetu'l-Haniyye* (Imperial Surgery), itself a translation of al-Zahrawi's multi-volume *Kitab al-Tasfir*, included several miniatures depicting female surgeons (*tabibe*) in fifteenth-century Anatolia. These *tabibes* were shown practicing the management of dead foetuses with foetal hydrocephalus and microcephalus, thereby providing the first evidence that Turkish women performed rudimentary neurosurgery.<sup>40</sup>

In sum, both the *sirah* and various classical Islamic texts provide instances of women actively engaging in healthcare, whether as nurses or doctors. During later periods, however, this evidence becomes more limited.

## Known Female Muslim Scientists

Ibn al-Nadim (d.998), the famous Muslim biographer and scholar, speaks of a woman named al-'Ijiliya in his work *al-Fihrist*, claiming that she was amongst the pupils of Bitolus, a well-known tenth-century astrolabe maker who lived in Baghdad.<sup>41</sup> Her full name was Maryam al-Astrulabi (d.967) and she was the daughter of a famous astrolabe maker, al-'Ijili al-Astrulabi, who lived in Aleppo and had likewise been a pupil of Bitolus. Maryam al-'Ijiliya's hand-crafted astrolabe designs were so intricate and innovative that, from 944 to 967, she was employed at the court of Sayf al-Dawlah, a powerful Hamdanid ruler based in northern Syria.<sup>42</sup>

In the field of mathematics, several female scholars excelled in calculations and arithmetic. Sutayta al-Mahamali (d.987), for example, came from a highly-educated Baghdadi family (her father, Abu 'Abdullah al-Hussein, was a judge

and the author of several books on Islamic jurisprudence).<sup>43</sup> Sutayta, however, excelled in mathematics; proving good at *hisab* (arithmetic) and *fara'idh* (successoral calculations), she invented solutions to equations which had long been cited by other mathematicians. Although these equations were few in number, her ability to solve them demonstrates that her skills in mathematics went beyond a simple aptitude for performing calculations.<sup>44</sup>

Labana of Cordoba (d.984) was another famous Muslim woman who contributed to the field of mathematics. Originally a slave-girl of Spanish origin, she rose to become an important figure in the Umayyad Palace of Cordoba. Thoroughly versed in the exact sciences, she was fully capable of solving the most complex geometrical and algebraic problems.<sup>45</sup>

## Conclusion and Recommendations

If women were so active in educational and scholarly activities during the early Islamic period, why did they become so passive and marginalised later on?

In short, the exclusion of women from the public sphere occurred gradually and should be understood within a broader context of political-religious fragmentation. In the early years of Islam, young and old, rich and poor, men and women, immigrants and locals, all had equal access to the leaders of society. Very soon, however, the management of Islam's vast empire required the creation of a new position, the vizier. Coordination between the vizier and the sovereign then necessitated yet more new officials, so leading to the creation of an extensive bureaucracy. With this innovation, the separation of ruler and ruled became institutionalised. Likewise, the sovereign's privilege of administering religious justice and issuing legal opinions (*fatwa*) was also delegated, this time to hired *qadis* (judges). This further entrenched the above separation and was finally completed by the Turks who, when they rose to power in the tenth century, supplanted the institution of the caliphate with that of the sultanate. As a result, they entirely surrendered their religious responsibilities to professional *qadis*.

This separation of political and military authority from religious responsibility, and as Nazeer Ahmed suggests, led to the rise of despotism and the closing of all doors to good governance.<sup>46</sup> As a consequence, the universal brotherhood and sisterhood created by the Prophet (pbuh) shattered. In its place, class distinctions, whether between the ruled and the rulers or between the different sexes, emerged. As the masses became separated from political power and the educational privileges that it entailed, so women found themselves secluded and cut off<sup>47</sup> – and when women became gradually deprived of their access to proper education, Islamic civilisation lost its spirit to develop, flourish and

excel. In light of this and the above evaluation of the female contribution to the development of science, education and public welfare in Islam, the paper suggests the following conclusions.

Firstly, there is no contradiction between Islam and science. Rather, Islamic teachings encourage all forms of scientific development and innovation, especially as a means of improving humanity's quality of life. As the paper highlights, in Islam science functions within a religious and ethical framework. Throughout history, this holistic approach stimulated Muslims to excel in various scientific fields without making any distinction between the religious and the worldly sciences. In light of this, the Islamic world's current deficiencies in the field of science cannot be explained by an alleged dichotomy between the two. Rather, the contemporary Muslim failure to innovate is directly related to the neglect Muslim governments have shown to the educational rights of their citizens.

Secondly, Islam has historically empowered women. As the various examples cited above reveal, during the early Islamic period women served as full, vibrant members of their societies, whether as skilful educators, leading scholars, innovative scientists, successful entrepreneurs or shining examples of generosity and altruism. Along with men, they contributed substantially to the prominence of Islamic civilisation; when considered equal to men, women enjoyed full access to all their basic rights as citizens of an Islamic polity. Respect towards all human beings, regardless of their gender or social status, was a primary rule in Islam.

Thirdly, female excellence in scholarly, public and political affairs only became exceptional during later periods of Islamic history. This was because those periods saw the vast majority of common women lose all of their civil rights. The universal brotherhood and sisterhood created by the Prophet (pbuh) was shattered and, in its place, sex distinctions between men and women emerged. After the thirteenth century in particular, women became secluded from intellectual and political life, resulting in a sharp decline in scholarly development. Today, most modern Muslim women remain marginalised and suffer severely from the political and social ills prevalent in their societies. As a vulnerable segment of society, women are more likely to be oppressed and discriminated against, especially in corrupt and war-ridden societies.

In sum, this paper underlines the direct relationship between good governance, the rights of women and scientific development. The absence of good governance commonly results in gender inequalities and the violation of women's rights. Gender inequalities in turn undermine sustainable development and public welfare. They are also often linked to corruption and scholarly passiveness. Women encounter even more oppression, distress and social exclusion in corrupt

and war-torn societies. As a result, women residing in many contemporary Muslim societies often find themselves completely deprived of even the most basic education, let alone the opportunity to participate in scientific development. Unless Muslim states establish good governance, there is unlikely to be any improvement in this situation.

As a final word, the paper proposes the following policy recommendations:

- More early Islamic manuscripts should be studied in order to obtain a clearer and more comprehensive picture of the past role of women in Islamic civilisation. Existing research centres and academic institutions across the Muslim world should appoint skilled experts capable of conducting a systematic investigation designed to yield more information about how and when female Muslim scholars contributed to science.
- Muslim governments should acknowledge the importance of scientific innovation and intellectual development for the well-being and prosperity of their societies. They should provide all the necessary assistance to help develop science and promote the role of women therein.
- Public welfare and social stability are essential preconditions for innovation and scholarly development. The evils of gender and ethnic-based discrimination, in addition to corruption, nepotism, intolerance, and political and economic injustice, should be prevented by the authorities; they are extremely harmful for the well-being, security and stability of society. All governments must guarantee the rights of all their citizens, regardless of gender, age, religious, social or ethnic background.
- The rights of women should not be neglected or interfered with. Governments must ensure a platform for women, to allow them to actively participate in scholarly, educational and policy-making processes. The Muslim world should recognise the potential women have to positively affect society. In this context, the Prophetic (pbuh) model of female empowerment should be considered an example of best practice.
- Muslim religious leaders, including judges, '*ulama*', and *muftis*, must concentrate on achieving a better understanding of the role of women in Islamic society, both as individuals and citizens. In order to heal the wounds caused by the ill treatment of women over a prolonged period, these religious figures must publicly condemn all types of gender-based discrimination, domestic violence and any other form of abuse that violates the rights of women.
- Muslim governments should harness both the media and their countries' education systems to actively promote the significance of women in Islam.

The Islamic perspective on this issue should be included in university curricula and in textbooks prepared for Muslim youth. These steps will hopefully encourage Muslims to adopt a more appropriate attitude towards the treatment of women in future.

## Notes

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- Animals); Abbas ibn Firnas (810-887), a man from Muslim Spain who dreamt of flying like a bird, before managing to realise it; Abu al-Qasim al-Zahrawi (936-1013), who invented more than 200 types of surgical instruments; Ismail al-Jazari (1136-1206), a palace engineer from Anatolia who invented the earliest automaton for the entertainment of his masters; and Abu Bakr ibn Zakariyyah al-Razi (854-925) and Ibn Sina (980-1037), whose books were Europe's main medical reference texts from the twelfth until the seventeenth centuries.
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  21. Zainab Aliyah, "Great Women in Islamic History: A Forgotten Legacy," *Young Muslim Digest*, <http://www.youngmuslimdigest.com/study/02/2015/great-women-islamic-history-forgotten-legacy>, (accessed on 1 October 2016).
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  23. See, Sa'd ibn 'Abd al-'Aziz Rashid, *Darb Zubaydah: The Pilgrim Road from Kufa to Mecca* (Riyad, Saudi Arabia: Riyadh University Libraries, 1980).
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27. Omar Kasule, "Historical Roots of the Nursing Profession in Islam," <http://webcache.googleusercontent.com/search?q=cache:http://omarkasule-01.tripod.com/id333.html> (accessed on 15 July 2016). The women who worked with Rufaidah were: Umm Ummara, Aminah, Umm Ayman, Safiyat, Umm Sulaim, and Hind. Other Muslim women who became famous nurses were Ku'ayibat, Aminiyyat bint Abi Qays al Ghifariyyat, Umm 'Atiyyah al Ansariyyat, and Nusaibah bint Ka'ab al Maziniyyat.
28. *Ibid.*
29. *Ibid.*
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31. Muhammad Saeed Siddiqi, *The Blessed Women of Islam* (Lahore: Kazi Publications, 1982), 157.
32. <http://www.mkjournal.org/science/alshifaa-bint-abdullah-al.shtml>, (accessed on 15 July 2016).
33. See, Khan, *Unveiling the Ideal*, 192.
34. The issue of healthcare comes under the Islamic responsibility of caring for the body, which is considered an *amanah* (trusteeship) of God. In an authentic *hadith*, the Prophet (pbuh) is quoted as saying: "Your body has a right over you" (Sahih Bukhari, vol.7, no. 127). This right requires every human being to feed the body when it is hungry, rest it when it is tired, clean it when it gets dirty, protect it against all harm, take precautions against subjecting it to illness, provide it with the necessary treatment when it suffers from disease, and not to overburden it in any way.
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