ʿAbd al-Majīd al-Zindānī's *iʿjāz ʿilmī* Approach: Embryonic Development in Q. 23:12–14 as a Scientific Miracle

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Abstract

This article focuses on contemporary scientific exegesis of the Qur'an, analysing ʿAbd al-Majīd al-Zindānī's unique model of embryonic development derived from Q. 23:12–14. Since the majority of Muslim legal scholars consider the three main stages of embryonic development mentioned in Q. 23:12–14 to take place within 120 days, this view has been considered as the majority Muslim view in academic research. However, I claim that since the 1980s al-Zindānī has successfully disseminated the perception that the embryonic stages mentioned in the Qur'anic text take place over 40 days. An examination of al-Zindānī's work and publications by the Commission on the Scientific Miracles in the Qur'an and Sunna (CSMQS) demonstrates that al-Zindānī uses an *iʿjāz ʿilmī* approach (i.e. seeking to establish harmony between the Qur'an and modern natural science) to advocate a new interpretation of the Qur'anic stages of embryonic development in order to validate the connection between modern science and the Qur'an. I argue that his model rests on three hermeneutical strategies: first, the reformulation of Ibn al-Qayyim's (d. 751/1350) model of embryonic development; second, the modification of the last Qur'anic stage from *khalq* to *nashʾa*; and third, his preference for the variant of the so-called Ibn Masʿūd *ḥadīth* canonised in *Ṣaḥīḥ Muslim*. Accordingly, he does not follow the *fiqh* tradition and excludes the stage of the embryo's ensoulment from his model. It is this exclusion of the ensoulment and the reformulation of the developmental stages that enables al-Zindānī to align his model with both the Qur'anic text and modern scientific findings.

Keywords

embryology, *iʿǧāz ʿilmī*, scientific miracle, *ḥadīth*, ʿAbd al-Majīd al-Zindānī, Maurice Bucaille, Muslim World League

Introduction

Since the 1970s, there has been a trend for reassessing traditional interpretations of the Qur'anic passages mentioning embryonic development in light of modern medical knowledge.[1] Clearly, models of embryonic development are relevant with regard to bioethical issues such as in vitro fertilisation, prenatal diagnosis, embryo research, abortion, and the like. The invention and development of new medical technologies and procedures during the twentieth century requires consideration from the perspective of Islamic jurisprudence (*fiqh*). Moreover, nation states have to define legal frameworks for the application of certain technologies. Thus, questions relating to embryonic development have been the focus of high profile discussions by both religious

scholars and experts from different scientific fields in three decisive international boards for contemporary Muslim legal thought: the so-called *fiqh* academies.[2] The majority of Muslim scholars who have participated in these discussions consider the three main stages of embryonic development mentioned in Q. 23:12–14 to take place within 120 days of conception.[3] Accordingly, this view has been considered the majority Muslim view in academic research.[4] The discussions in the *fiqh* academies are, in fact, the prevailing focal point of academic research when it comes to the assessment of Muslim bioethics and Islamic legal rules regarding modern biotechnology. This is significant, since the academies' statements are influential in Islamic legal thought and are regularly referred to in *fatwās* or legal commentaries by Muslim scholars.[5]

While the 120 days of embryonic development may rightly be regarded as the majority view within the *fiqh* academies, scholars in the West have neglected an alternative discourse on embryonic development. Outside the specialised discussions of the academies, a second discourse exists that is based mainly on the so-called Ibn Masʿūd *ḥadīth*, canonised by Muslim, supporting the view that these three stages take place in 40 consecutive days. Hence, this article aims to create a more comprehensive picture of Muslim perceptions of embryonic development in the context of interpreting Q. 23:12–14. I assert that this view has been well-known and widespread since the 1980s, as can be seen from several publications both in the popular and the (semi-) academic sphere. A key figure in this alternative discourse is the Yemeni preacher and politician, ʿAbd al-Majīd al-Zindānī (b. *c*. 1942). His reference to natural science as an exegetical resource has enabled him to redefine the stages of embryonic development indicated in the Qur'anic text. Contrary to the participants of the *fiqh* academies, al-Zindānī does not pursue a legal or normative approach, but rather what can be called the *iʿjāz ʿilmī* approach. That is, his intention is to demonstrate and verify the presence of scientific knowledge in the Qur'an and the Sunna. By following this exegetical trend, al-Zindānī seeks to reveal the concurrence of Qur'anic passages with modern science and thus demonstrate the divine nature of the Qur'an. Although al-Zindānī's engagement in the discourse on embryonic development and his personal connections in this sphere have not gone unnoticed in current scholarship, they have not, thus far, been so closely analysed.[6]

I call his approach *iʿjāz ʿilmī* since he seeks to establish harmony between the Qur'an and the modern science of embryology.[7] Commonly, the term *iʿjāz* refers to the inimitability of the Qur'an and thus denotes its miraculous nature.[8] *Iʿjāz ʿilmī* can be translated as the 'scientific miracle' of the Qur'an, thus indicating a 'scientific inimitability'[9]. Exegetes engaging in *iʿjāz ʿilmī* thus 'identify a correspondence between some passages of the Qur'ān and (what they perceive or present as) "scientific data" or "facts" to argue that such correspondence is proof of the divine origin of the Qur'ān itself'.[10] Even though another term, *tafsīr ʿilmī*, is often used interchangeably, the two expressions must be distinguished: *tafsīr ʿilmī* is a kind of Qur'anic exegesis that refers to science in order to explain natural phenomena that are mentioned in the Qur'an, whereas *iʿjāz ʿilmī* seeks to illustrate scientific 'facts' that are described in the Qur'an but have only recently been recognised by science. In other words, science helps to interpret

the Qur'an in *tafsīr ʿilmī*, whereas in *iʿjāz ʿilmī*, the Qur'an is understood to outline scientific facts.

The most prominent advocate of the concept of *iʿjāz ʿilmī* was the French surgeon, Maurice Bucaille (1920–1998).[11] He gained a reputation in the Muslim world with his book, The Bible, the Qur'an and Science: The Holy Scriptures Examined in the Light of Modern Knowledge,[12] in which he strives to prove harmony between the Qur'an and contemporary science. More specifically, he stresses that several Qur'anic passages concur with science and states that this can only be explained by regarding the Qur'an as being of divine origin.[13] Since the publication of his book in 1978, many more books discussing the relationship between Islam and science have been published, particularly by Muslim authors who regularly refer to Bucaille.[14] As Stenberg points out, this genre can be roughly divided into two groups: on the one hand we find authors with a secular affiliation, while on the other hand we find authors with a religious agenda, many of them writing *iʿjāz ʿilmī* literature.[15] A common explanation in 'western' academia for the growing popularity of *iʿjāz ʿilmī* is that it reflects a perceived inferiority in the Muslim world when comparing itself to 'the West', especially in the realm of science. *Iʿjāz ʿilmī* is thus an attempt to show that the religious sources are compatible with the paradigms of ('western') science.[16] Yet, *iʿjāz ʿilmī* has often been trivialised with attributes such as 'unscientific' or 'apologetic' or as being a conspicuous instrument to convince both Muslims and non-Muslims of Islam's divine nature,[17] and few studies have thoroughly examined the content of *iʿjāz ʿilmī* literature.[18] Consequently, since *iʿjāz ʿilmī* has become very popular in the realm of Islam and science, this article will provide an analysis of both al-Zindānī's institutionalised *iʿjāz ʿilmī* network as well as its publications and activities.

I will analyse how al-Zindānī seeks to harmonise the Qur'anic text and modern natural science through different *ḥadīth* variations.[19] Initially, I will consider al-Zindānī's institutional framework, which includes the Muslim World League and his scholarly network of renowned scientists, in order to examine how he has successfully disseminated the 40-day view as the correct interpretation of Q. 23:12–14.[20] Then, I will examine al-Zindānī's model of embryonic development derived from Q. 23:12–14 as well as the hermeneutical strategies he employs to legitimise his interpretation. Having done this, I will suggest that, rather than addressing legal issues, al-Zindānī's interpretive approach to Q. 23:12–14 is primarily concerned with commenting on the different *ḥadīth* variants. Accordingly, he does not follow the legal tradition of the *fiqh* academies, but reformulates the Qur'anic stages of embryonic development. In order to do so, he excludes the stage of the embryo's ensoulment from his model. It is the exclusion of the ensoulment and the reformulation of the developmental stages that results in al-Zindānī's model corresponding closely to both the Qur'anic text and modern science.

With regard to contemporary Muslim[21] perceptions of embryonic development, scholars refer to Q. 23:12–14[22] as the primary source:[23]

> *Certainly We created the human from an extract of clay. Then We made him a drop [nuṭfa] in a secure dwelling place, then We made a clot [ʿalaqa] (from) the drop, then We made a lump [muḍgha] (from) the clot, then We made bones (from) the lump, then We clothed the bones (with) flesh, (and) then We (re)produced him as another creature. So blessed (be) God, the best of creators!*

In the Qur'anic text three main stages of embryonic development are mentioned: *nuṭfa* ('drop'), *ʿalaqa* ('clot'), and *muḍgha* ('lump'). At the end of these stages 'another creature' develops. The majority of Muslim legal scholars interpret this formation of another creature as the ensoulment of the embryo, which makes him or her a human being.[24] However, the Qur'anic text itself does not indicate the exact point in time of the ensoulment. Hence, legal scholars have turned to the *ḥadīth* to specify and substantiate the Qur'anic dictum. This approach is complicated due to differing variants and several traditions that exist within the vast corpus of *ḥadīths*. As a result, two major interpretations have evolved: the ensoulment of the embryo takes place either on the one-hundred-and-twentieth day or on the fortieth (or forty-second)[25] day after conception. One of the most important *ḥadīths* regarding the ensoulment is the so-called Ibn Masʿūd *ḥadīth*, a tradition canonised in the collections of al-Bukhārī and Muslim. Yet, different variants of the tradition exist. Only those reported by al-Bukhārī support the view that the ensoulment of the embryo takes place on the one-hundred-and-twentieth day (henceforth referred to as the 120-day view):[26]

> The creation of one of you is assembled in his mother's belly in 40 days, then he also becomes an *ʿalaqa*, then also a *muḍgha*.[27] Then God sends an angel who infuses his soul and is ordered to determine four things: He writes down his [i.e. the new creature's] deeds, his livelihood, his date of death, and whether he will be blessed or wretched.

Muslim's collection includes a specific variant of the so-called Ibn Masʿūd *ḥadīth*, adding the words *fī dhālika* ('in this') to each respective stage. According to the interpretation of some scholars, this 'in this' addition implies that all three embryonic stages take place within 40 days rather than three sequential periods of 40 days:[28]

> The creation of one of you is assembled in his mother's belly in 40 days, then he also becomes in this an *ʿalaqa*, then also in this a *muḍgha*. Then God sends an angel who infuses his soul and is ordered to determine four things: He writes down his [i.e. the new creature's] deeds, his livelihood, his date of death, and whether he will be blessed or wretched.

Even though the latter interpretation remains a minority view among Muslim legal scholars, the 40-day view must not be neglected. In fact, it became a popular view outside the *fiqh*-based discussions of the academies, as I will show in the following discussion.

The Yemeni Preacher and the Muslim World League: al-Zindānī, the CSMQS, and the Popularisation of the 40-day View

In the following paragraphs we shall see that the Commission on the Scientific Miracles in the Qurʾan and Sunna (al-Hayʾa al-ʿĀlamiyya li'l-Iʿjāz al-ʿIlmī fī al-Qurʾān wa'l–Sunna, hereafter CSMQS[29]), as an institution, and al-Zindānī, as an individual, have both successfully authorised their statements by effectively drawing on the Canadian anatomist, Keith Moore, and his work. This move explains why al-Zindānī has succeeded in promoting the 40-day view. Before getting to this point, a few words on al-Zindānī's educational and institutional background are required to contextualise his activities.

ʿAbd al-Majīd al-Zindānī was born in 1942[30] in Yemen and gained international popularity as the founder of the Yemeni branch of the Muslim Brotherhood as well as the Yemeni Iṣlāḥ party. His profile was raised further after he was classified as a 'specially designated global terrorist' by the United States of America and the United Nations Security Council in 2004. He was accused of raising money and procuring weapons for al-Qaeda and was labelled the 'spiritual adviser' of Osama b. Laden during the 1980s.[31] Although he does not hold a university degree and has not undergone any official religious scholarly education or other professional training, al-Zindānī is described as an influential and powerful religious and political leader.[32] Despite his popular status in Yemen, it is difficult to find a reliable biography of al-Zindānī.[33] It is equally difficult to position him within any recognised system of religious scholarship. In fact, it is repeatedly stated in various biographies that his knowledge of Islamic law and jurisprudence is based on self-study. On the one hand, he cannot be defined as a religious scholar (*ʿālim*) or legal scholar (*fāqih*) in the sense of being an expert of *ḥadīth* or *fiqh* who has enjoyed an institutionalised religious education.[34] On the other hand, I am aware that it is difficult to define the group of *ʿulamāʾ*.[35] As in other Muslim countries, 'the traditional educational system in Yemen has changed fundamentally, as have the methods of transmission of religious knowledge.'[36] Al-Zindānī, like many others, lacks an *ijāza*, the license to transmit a certain text, or engage in *ijtihād*.[37] He is, however, often defined as being part of the *ʿulamāʾ* and he has even issued *fatwās*, one of an *ʿālim*'s core privileges.[38] Al-Zindānī can certainly be characterised as a prominent preacher whose books and cassettes have been widespread in Yemen's bookstores.[39] On one of these cassettes he summarises Bucaille's *The Bible, the Qur'an and Science* and comments approvingly on the statements concerning the relationship between the Qur'an and science.[40]

Al-Zindānī left Yemen for Saudi Arabia in 1979 after he was forced to step down as head of the Yemeni Muslim Brotherhood.[41] Since then, he has been affiliated to King ʿAbdulaziz University in Jeddah.[42] Apparently he has also had close ties with the Saudi Arabian-based and financed Muslim World League (Rābiṭat al-ʿĀlam al-Islāmī, hereafter MWL). The MWL is a Saudi Arabian organisation which has the objective of representing 'the Islamic nations' on an international level, both culturally and religiously. One of the MWL's main objectives is *daʿwa*, the preaching of Islam.[43] An international *daʿwa* conference, 'The Mosque Message

Conference', was held by the MWL in 1975. During this conference, the MWL agreed on the reorganisation of international *daʿwa* activities, and created the World Council of Mosques, making mosques the central focus of *daʿwa* activities.[44] In 1975, the founding year of the council, al-Zindānī became one of its original 26 members.[45] The importance of the World Council of Mosques within the MWL is underlined by the fact that ʿAbd al-ʿAzīz b. Bāz (1910–1999), who was President and Member of the Constituent Council of the MWL also concurrently held the Council's presidency.[46] Al-Zindānī strengthened his relationship with the MWL through the founding of the Commission on Scientific Miracles in the Qur'an and Sunna (CSMQS) in 1984, since the commission was established as part of the MWL.[47] Through this affiliation, the commission is thus strongly linked to the Saudi state.

The CSMQS was set up under the direction of al-Zindānī, when the three most prominent international *fiqh* academies had already been in existence since the 1970s. It appears that the MWL used the opportunity to answer questions pertaining to bioethics, such as in-vitro fertilisation, abortion, and cloning, from points of views other than the legal perspective.[48] In fact, the official goal of the commission has been to demonstrate and verify the scientific signs of the Qur'an and Sunna and publish its findings internationally.[49] The primary intention of the commission is *daʿwa* and the particular focus is on inner Islamic *daʿwa* rather than aiming at converting non-Muslims.[50] The commission's strategic decision to employ an *iʿjāz ʿilmī* approach has been conducive to *daʿwa* activities[51] and, furthermore, the CSMQS would not have been able to operate the way it has without the MWL's financial infrastructure.

Al-Zindānī had already dealt with the question of embryology at King Abdulaziz University where he worked in the 'Embryology Committee' of the university. It was presumably in this context that he met the Canadian anatomist, Keith L. Moore, a renowned Professor of Anatomy born in 1925, for the first time. Moore is an important figure in the field of embryology and has authored numerous books, the most popular one among medical students and doctors being *The Developing Human: Clinically Oriented Embryology*. This was first published in 1973 and has since been published in several editions and languages.[52] In 1980, al-Zindānī invited Keith Moore to Saudi Arabia in order to consult him 'about the meaning of certain verses in the Qur'an and some sayings in the Hadiths which referred to human reproduction and embryonic development'[53]. Moore himself affirms his amazement at 'the scientific accuracy'[54] of the statements presented to him. The final step to convincing Moore of the accuracy of the Qur'anic description of embryonic development came when he was presented with a leech. Moore was astonished.[55] During the Seventh Saudi Medical Meeting in May 1982, Moore presented a paper in which he provides 'personal interpretations based on my knowledge of embryological history and of the modern science of embryology' of 'verses and sayings',[56] namely selected passages of the Qur'an and *ḥadīth*.[57] As Stenberg has noted,[58] Moore covers himself when pronouncing concurrence between science and the Qur'anic text by inserting phrases like 'it is reasonable to interpret' or 'the Koran could refer to'.[59] He also maintains this cautious wording in another paper he published.[60] However, this language is abandoned in later, joint publications, and instead, the introduction of *Human Development* states that 'the authors of

the papers in this book are in agreement concerning the distinctiveness and compatibility of the Islamic terminology with the actual events in human development.'[61]

Moore kept working with al-Zindānī and the CSMQS for some years. Shortly after his presentation in 1982, Moore published a 'special issue' of his popular *The Developing Human* together with al-Zindānī, entitled *The Developing Human: Clinically Oriented Embryology with Islamic Additions*.[62] As the title suggests, al-Zindānī's explanations of his Islamic viewpoint with corresponding Qur'anic verses and *ḥadīths* are added to the original content.[63] The CSMQS also organised several international conferences[64] and published books in English and Arabic when al-Zindānī was director in the years between 1984 and 1995.[65] The topics were geology, biology, astronomy, and medicine, among others. In his publications, al-Zindānī himself focussed on embryology. In the early 1980s he invited a group of American, Canadian, and European scientists from different fields and asked his guests for assistance in interpreting certain verses of the Qur'an.[66] This collaboration resulted in a joint publication called *Human Development as Described in the Qur'an and Sunna: Correlation with Modern Embryology*.[67] Al-Zindānī was one of the editors and provided, together with his assistant Musṭafā Aḥmad, what they call 'Islamic information' with each chapter.

Of particular interest to the editors of *Human Development* is the description of the embryo during the *ʿalaqa* stage (here the fifteenth to twenty-fifth day) as a leech, and as chewed gum during the *muḍgha* stage (here the twenty-sixth to forty-second day). They offer two illustrations that demonstrate the similarities between a leech and chewed gum, and they show how each one resembles an embryo in a particular stage of development. The illustrations may have had the function of further clarifying the embryological model for lay readers. The comparisons and their illustrations are not only referred to in all CSMQS publications, but are also frequently found in other publications. Based on my research, the illustrations of these two comparisons were published and popularised by the CSMQS for the first time.[68] Interestingly, the comparisons of a leech and a chewed substance were described in Moore's monograph, *The Developing Human*, in the third edition of the original—without Islamic additions—in 1982, and have since been an integral part of it until the latest, tenth edition of 2016. The introduction of the tenth edition contains a short historical overview, including 'the Middle Ages', which states that the Qur'an makes reference to 'the leech-like appearance of the early embryo'. Moore also writes that the embryo resembles a 'chewed substance'.[69] Shortly after Moore started his collaboration with al-Zindānī, even the assertion that the embryo becomes human on the fortieth or forty-second day was incorporated into the third edition of the original.[70]

The CSMQS group's expectation that international scientific institutions will adopt 'Islamic terminology due to its ease of use and accuracy'[71] has not been met, even though they have managed to promote their interpretation of the Qur'anic text in the light of modern science. One very vivid example of the popularity and impact of the CSMQS's work is the well-known *A Brief Illustrated Guide to Understanding Islam*.[72] This booklet, written by I.A. Ibrahim, appears to be essential material for *daʿwa*. It has been translated into several languages and is available

in mosques and Islamic information centres around the globe as well as being easily accessible online for free.[73] On the front cover the editors compose a colourful patchwork of Islamic and scientific imagery. The booklet itself also features many colour illustrations. Its purpose is not only to inform the reader about Islam in general, but also about supposed scientific miracles, including the different stages of embryonic development that are mentioned in the Qur'an.[74] On closer inspection, it becomes clear that the guide offers its readers the CSMQS's output in an easily accessible way. According to the guide, the Qur'anic description of embryonic development is consistent with the scientific findings of modern medicine. It essentially deals with the meaning of *ʿalaqa* and *muḍgha*, emphasising the resemblances to a leech and chewed gum, respectively. Although no time frame for embryonic development is explicitly mentioned, the descriptions below the figures indicate the age of the embryo and the respective Qur'anic stages. Therefore, one can easily recognise that the underlying calculation rests on the 40-day view.[75]

Interestingly, neither the *ḥadīths*, nor the issue of the ensoulment, are addressed in the embryology section of the guide.[76] Instead, two of the six pages include several illustrations highlighting the academic reputation of Moore and outline his conviction that the Qur'an and modern science correspond. Moreover, the guide claims that Moore advocates using the Qur'anic terms in science.[77] Several publications by both Moore and al-Zindānī are cited in the footnotes, albeit without al-Zindānī's name, which only appears in the guide's bibliography.[78] The purpose of consistently referring to Moore as a world-leading expert in the science of embryology is to transfer his scientific authority to the *iʿjāz ʿilmī* interpretation of the Qur'an. Even though al-Zindānī is referred to as a 'very eminent Muslim scholar'[79] in the CSMQS's publications, his perceived authority as a religious or legal scholar by his *ʿulamāʾ* peers is unclear. Furthermore, he has no education as a medical scientist. Accordingly, there must have been a perceived necessity to further authenticate his statements on embryology.[80] In other words, al-Zindānī takes strategic advantage of Moore's scientific expertise, and thus achieves authority.

The Embryological Model Introduced by al-Zindānī

We now turn to al-Zindānī's embryological model and his hermeneutical strategies in detail. Al-Zindānī's model of embryonic development is derived from Q. 23:12–14 and is laid out in several works that the CSMQS has published. I argue that his model rests on three hermeneutical strategies: the reformulation of Ibn al-Qayyim's (d. 751/1350) model of embryonic development, the modification of the last Qur'anic stage from *khalq* to *nashʾa* and his preference for the variant of the Ibn Masʿūd *ḥadīth* reported by Muslim. Before presenting these three strategies, I will summarise al-Zindānī's model of the three main stages of embryonic development (*nuṭfa, ʿalaqa,* and *muḍgha*).

Al-Zindānī defines six stages of embryonic development, which he derives from Q. 23:12–14: *nuṭfa, ʿalaqa, muḍgha, ʿiẓām, laḥm,* and *al-nashāʾa al-ukhrā*.[81] In Q. 23:13, the first of the three

main stages is mentioned, i.e. the *nuṭfa*, which is placed in a *qarār makīn*: *Then We placed him as (a drop of) sperm in a place of rest, firmly fixed*. Al-Zindānī follows the usual interpretation by Muslim scholars of *qarār makīn*, i.e. that this is the uterus.[82] One of the sub-stages of the *nuṭfa* is the stage of the *nuṭfa amshāj*, mentioned in Q. 76:2, *Surely We created the human from a drop, a mixture [nuṭfa amshāj]—We test him—and We made him hearing (and) seeing.* The *nuṭfa amshāj* is commonly interpreted to be the fertilised ovum, meaning the combined male and female gametes in the form of a drop. The next step in al-Zindānī's model is *al-khalq*, or creation. It is important to note that in other Muslim models of human embryology, both premodern and modern, when mentioning *al-khalq* in the context of Q. 23:14 it is attributed to *khalq ākhar* in the same verse and is thus held to refer to the ensoulment of the embryo that follows the *muḍgha* stage. In contrast, in al-Zindānī's model *al-khalq* determines the 'real beginning of the human being'[83] since fertilisation has taken place. Interestingly, al-Zindānī does not define *al-khalq* as the beginning of human life as such, but only as the beginning of the process. Accordingly, *al-khalq* here is part of the *nuṭfa* stage and not linked to Q. 23:14.

After the *nuṭfa*, he describes the *ʿalaqa* and *muḍgha* stages.[84] Al-Zindānī sets the date for the start of the *ʿalaqa* stage between the fifteenth and twenty-fifth day after conception. He makes two striking comparisons. The first is the comparison between the embryo in this stage and a leech. Usually, three meanings of the Arabic word *ʿalaqa* are given: 'leech', 'suspended thing/something that clings', and 'blood clot'. It is the perceived similarity to a leech that is particularly emphasised.[85] The second comparison is of the embryo in the *muḍgha* stage to a piece of chewed gum. In the *muḍgha* stage (in this case between the twenty-sixth and fortieth/forty-second day), the embryo does not have the shape of a human being because it has not yet been formed. The human formation does not occur before the fortieth day. Instead, the Arabic term *muḍgha* is translated as 'chewed substance', comparing the somites at the back of the embryo with teeth marks in chewed gum. According to Q. 22:5,[86] the *muḍgha* stage is divided into two sub-stages before the fortieth day: *mukhallaqa* and *ghayr mukhallaqa*, when the embryo has only partly started to differentiate in terms of shape.

The heart of the human embryo starts beating around the twenty-second day after conception. However, al-Zindānī states that this stage of development is not classified as human life, but should rather be categorised as vegetal life that is perceived to be involuntary. The idea of dividing the embryo's life into an involuntary and a voluntary stage goes back to the legal scholar Ibn Qayyim al-Jawziyya (d. 751/1350).[87] Ibn al-Qayyim made this distinction to harmonise the 120-day *ḥadīth* with a *ḥadīth* of Ḥudhayfa b. Asīd which presents an important embryonic development on the forty-second day:[88]

> When 42 nights have passed for the sperm-drop (*nutfa*), God sends an angel to it who forms it and creates its hearing, its sight, its skin, its flesh and its bones. Then he says 'O Lord, is it a male or female?' And your Lord decrees what He wills and the angel writes [it] down. Then he says, 'O Lord, what is its [i.e. the new creature's] date of death?' And your Lord says what He wills and the angel writes [it] down.

> Then the angel says, 'O Lord, what is its livelihood?' Your Lord decrees what He wills and the angel writes [it] down. Then the angel comes out with the document in his hand, without having either added anything to what he was commanded [to write down] or omitted anything.

Ibn al-Qayyim claims that the Ḥudhayfa *ḥadīth* describes the embryo's predestination and only the Ibn Masʿūd *ḥadīth* in the120-day variant describes the ensoulment of the embryo. However, Ibn al-Qayyim's assumption of the ensoulment of the embryo on the one-hundred-and-twentieth day is not compatible with the fact that the embryo moves into its mother's womb before the one-hundred-and-twentieth day.[89] In order to solve this conflict, Ibn al-Qayyim compares the embryo's movements before ensoulment with a growing, involuntarily moving plant. In contrast, the ensouled embryo moves voluntarily, which is what makes it a human being. Essentially, Ibn al-Qayyim draws a line between 40 and 120 days. From the fortieth to the one-hundred-and-twentieth day the embryo moves involuntarily. The ensoulment then takes place on the one-hundred-and-twentieth day and the embryo becomes a human being who moves voluntarily. Al-Zindānī, however, splits the 40 days without taking the time frame of 120 days into consideration.[90] Since, according to al-Zindānī, the three stages, *nuṭfa*, *ʿalaqa*, and *muḍgha*, take place in the first 40 days, he assigns Ibn al-Qayyim's distinction between voluntary and involuntary movement to this time frame. Even though al-Zindānī adopts Ibn al-Qayyim's idea, he changes the basis of the initial calculation and transfers it to the narrowed timeline of 40 days. For al-Zindānī the mere fact that the heart starts to beat during the *ʿalaqa* stage, on the twenty-second day, does not classify the embryo as human, but rather as vegetal life.

The *ʿiẓām* ('bones') and *laḥṃ* ('flesh') stages are excluded from the time frame of 40 days in al-Zindānī's model. On the one hand, his explanations and calculations regarding the developmental stages are compatible with the findings of modern science and biology. Other models of embryonic development are faced with the problem that they are either in conflict with science when all six or seven stages are included[91] in the 40 days, or they are in conflict with the calculation of the 120-day version of Ibn Masʿūd when including all stages instead of only the three main stages in the 120 days.[92] On the other hand, this exclusion complicates the process of determining the moment of ensoulment. Traditionally, the moment of ensoulment has been associated with the last stage, the *khalq ākhar* ('formation of another creature'), and takes place either around the fortieth or on the one-hundred-and-twentieth day. Al-Zindānī solves this problem by excluding the issue of the soul from his calculations. In fact, he does not equate the *khalq ākhar* with ensoulment. Instead, he redefines the last stage: the Qur'anic text reads *thumma anshāʾnahu khalqan ākhar (then We (re)produced him as another creature).* Al-Zindānī derives the name of the sixth stage, the '*nashʾa* stage', from the verb *anshaʾa*, which is a novel interpretation of the Qur'anic text. In his model the *nashʾa* stage starts after the *laḥṃ* stage, that is from the fifty-seventh day until the two-hundred-and-sixty-sixth day after conception, or the end of pregnancy. *Nashʾa* is, hence, simply defined as 'growth' of the foetus during which it 'becomes recognizable as human'.[93] Moreover, he refrains from making any

explicit statement on the ensoulment. Throughout the CSMQS's publications, different opinions on the ensoulment are outlined.[94] According to al-Zindānī, the Qur'an and the Sunna imply that the ensoulment of the embryo takes place during the *nashʾa* stage.[95] Since no scientific evidence exists, al-Zindānī points out that, ultimately, only God knows the truth about ensoulment.

Another issue al-Zindānī has to address in his argument is the al-Bukhārī variant of the Ibn Masʿūd *ḥadīth* in favour of the 120-day view that has enjoyed preferred status both in the past and in contemporary legal discussions.[96] Nevertheless, al-Zindānī advocates the Ibn Masʿūd *ḥadīth* reported by Muslim rather than the variant reported by al-Bukhārī. In shorter publications, he usually does not explain this preference in further detail.[97] Yet, in *Human Development*,[98] as well as in a joint article with Dr ʿAbd al-Jawād al-Ṣāwī,[99] a Saudi physician and a scientific adviser of the CSMQS, he gives a more elaborate clarification of his preference for the variations reported by Muslim.

At the outset of this article, al-Zindānī and al-Ṣāwī state that the opinion that the three developmental stages, *nuṭfa, ʿalaqa,* and *muḍgha*, take place within 120 days is very popular among both medieval and contemporary Muslim scholars[100] and that a majority of scholars support the 120-day view. Furthermore, al-Ṣāwī points to the *fatwās* of several scholars which permit abortion (*ijhāḍ* or is*qāṭ*) of the unborn during the first four months of pregnancy on the grounds that the soul has not yet been infused and the unborn life is still valued as vegetal life. He even notes that this notion became a *ḥaqīqa sharʿīa musallama*, an axiom or an established legal fact. However, modern science has shown that the three stages take place within 40 days as indicated by the variant of the Ibn Masʿūd *ḥadīth* reported by Muslim. Al-Ṣāwī. Adds that those Muslims who are not familiar with science remain suspicious of the scientific truth and keep repeating the 'wrong' version of the *ḥadīth*.

According to al-Zindānī and al-Ṣāwī, there are several reasons for preferring Muslim's Ibn Masʿūd *ḥadīth* over the variants reported by al-Bukhārī. First, and most importantly, Muslim's variant is characterised by the additional expression 'in this' (*fī dhālika*). Al-Ṣāwī comments that this additional expression clarifies the understanding of the *ḥadīth* material. In a more general comparison of Muslim's and al-Bukhārī's collections, al-Ṣāwī insists that *fī dhālika* has to be assessed as a legitimate addition. The variant reported by Muslim is seen as having the most authentic *matn* and is, therefore, as a general feature of Muslim, the most complete tradition as declared by al-Ṣāwī.[101] Furthermore, *fī dhālika* must refer to the time frame of 40 days, that is, *nuṭfa, ʿalaqa,* and *muḍgha* take place within 40 days. This understanding contrasts with other interpretations of the term *fī dhālika* that refer to the womb. The second reason for al-Ṣāwī and al-Zindānī preferring the Muslim variant is its harmonisation with the Ḥudhayfa *ḥadīth*. According to the developmental stages described in the Qur'an, the bones are formed after the *muḍgha* stage. The Ḥudhayfa *ḥadīth* indicates that the formation of the bones starts after the forty-second night. Therefore, al-Ṣāwī and al-Zindānī point out that the description of the formation of the bones after 120 days must be rejected because the latter explanation

contradicts the Ḥudhayfa *ḥadīth* and, according to al-Ṣāwī, *ḥadīth*s never contradict each another. Additionally, modern embryology supports the meaning of the Ḥudhayfa *ḥadīth*, since the bones have been proven to start developing directly after the sixth week after conception, not the seventeenth week.[102] Third, according to al-Ṣāwī and al-Zindānī, the account of *nuṭfa, ʿalaqa,* and *muḍgha* taking place in 120 days is not in accordance with the Qur'anic description of the three stages. Al-Ṣāwī argues that an embryo on the twentieth, thirtieth, or thirty-ninth day does not look like a drop of water. The same can be said for the embryo on the sixtieth or seventieth day after conception, which cannot be described as having the form of a leech or a congealed blood clot. The embryo has developed to a further stage and limbs have become visible. Generally, the 40-day view is supported by scientific research findings as all publications repeatedly argue. Fourth, al-Zindānī and al-Ṣāwī elaborate on the argument concerning another expression in the Ibn Masʿūd *ḥadīth*, which is found in both variants, namely *mithla dhālika*: 'The creation of one of you is assembled in his mother's belly in 40 days, then he also [*mithla dhālika*] becomes (add. *fī dhālika*) an *ʿalaqa*, then also [*mithla dhālika*] (add. *fī dhālika*) a *muḍgha* ...'. According to al-Zindānī and al-Ṣāwī, the variant of al-Bukhārī must be understood in light of the Muslim variant. Since al-Zindānī and al-Ṣāwī already relate the adverbial expression *fī dhālika* of the Muslim variant to the 40-day time frame, *mithla dhālika* cannot relate to this time frame but to that where 'the creation of one of you is assembled' (the so called *jamaʿa al-khalq*). Moreover, this explanation leads to further harmony with the Ḥudhayfa *ḥadīth* which also indicates a time frame of 42 days.[103] Interestingly, al-Ṣāwī emphasises another aspect: the word *nuṭfa* in the collection of al-Bukhārī is an incorrect addition which has led to further misinterpretations of embryonic developments. While he does not clarify this argument, he presumably refers to the fact that at some point in the exegetical process the term *nuṭfa* was added to the *matn* of the *ḥadīth*.[104]

Strikingly, issues such as abortion or embryo research are not elaborated on but only mentioned in passing: al-Zindānī states that the ensoulment takes place after the *muḍgha* stage. Even though it is not clear when the ensoulment occurs, it may happen from the fortieth day onwards because this is the end of the *muḍgha* stage. One of the two major Muslim positions regarding the beginning of human life is the moment of ensoulment. Thus, abortion should be prohibited after 40 days, according to al-Zindānī.[105] Since al-Zindānī does not want to determine the moment of ensoulment and may not want to engage in abortion discussions, he closes his short description by affirming that God knows best. Similarly, he does not give a clear interpretation of the beginning of human life.

In short, al-Zindānī manages to construct a compatibility of his model of embryonic development with both the Qur'anic text of Q. 23:12–14 and the contemporary knowledge of modern science. The explanation for this compatibility is threefold: in order to argue that the three main stages *nuṭfa, ʿalaqa,* and *muḍgha* take place within 40 days, he reformulates Ibn al-Qayyim's embryological model, gives priority to the variant of the Ibn Masʿūd *ḥadīth* reported by Muslim and modifies the last Qur'anic stage from *khalq* to *nashʾa*.

Conclusion

Based on these observations, it can be concluded that the 120-day view cannot be perceived as *the* majority Muslim view. Evidently, the 40-day view has become widely available, especially outside the legal discussions of the *fiqh* academies.

Since the 1970s, bioethical issues related to embryonic development have been widely discussed among Muslim legal scholars and scientists. The majority of the legal scholars in the international *fiqh* academies hold the opinion that the three main stages of embryonic development (*nuṭfa, ʿalaqa,* and *muḍgha*) mentioned in Q. 23:12–14 take place within 120 days after conception. I have shown, however, that at least a second Muslim discourse on embryonic development co-exists independently of the academies. Contrary to the *fiqh* academies, ʿAbd al-Majīd al-Zindānī and the CSMQS do not pursue a legal or normative approach regarding embryology. Instead, al-Zindānī follows an *iʿjāz ʿilmī* approach and critically comments on the *ḥadīths* in order to justify his view that the three stages occur within 40 days after conception. He has therefore developed a unique model of embryonic development that is characterised by three elements. First, al-Zindānī reformulates Ibn al-Qayyim's model of embryonic development. He uses Ibn al-Qayyim's distinction between involuntary (vegetal) life and voluntary (human) life. However, al-Zindānī does not refer to Ibn al-Qayyim's initial time frame of involuntary life starting on the fortieth day and voluntary life starting on the one-hundred-and-twentieth day. Instead, he draws the distinction between involuntary and voluntary life within the same 40 days. Second, al-Zindānī redefines the sixth Qur'anic stage from *khalq* to *nashʾa* in order to avoid the association of the formation of the *khalq ākhar* with the ensoulment of the embryo. He interprets *nashʾa* as growth of the foetus during pregnancy and excludes not only the *ʿiẓām* and *laḥm* stages from the period of 40 days but also the intricate questions pertaining to the ensoulment. Al-Zindānī uses these measures to make his model congruent with contemporary knowledge in the science of embryology. Third, al-Zindānī justifies his preference for the 40-day view by criticising the Ibn Masʿūd *ḥadīth* reported by al-Bukhārī. Instead, he prefers the variant of the Ibn Masʿūd *ḥadīth* reported by Muslim. Ultimately, al-Zindānī's model, and especially his promotion of the 40-day view, together with his comparisons of the embryo with a leech and with chewed gum, have become widespread. Al-Zindānī's and the CSMQS's intensive cooperation with the anatomist Keith Moore for many years may have been the main reason behind his reaching a wide audience.

NOTES

1 The research for this article was carried out as part of the project 'Contemporary Bioethics and the History of the Unborn in Islam' (COBHUNI) at the University of Hamburg which has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement no. 647490). An earlier draft of this article was presented at the academic colloquium 'Reading is Believing? Sacred Texts in a Scientific Age', The Faraday Institute for Science and Religion, University of Cambridge, 26–28 March 2018. I wish to thank the organisers of the colloquium, Hilary Marlow and Caroline Tee, for giving me the opportunity to present my work, as well as the reviewers for their valuable feedback.

2 These are the Islamic Organization for Medical Sciences in Kuwait (IOMS), the International Islamic Fiqh Academy affiliated to the Organization for Islamic Cooperation in Jeddah (IIFA) and the Islamic Fiqh Academy affiliated to the Muslim World League in Mecca (IFA).

3 While some of the scholars expressed their criticism of (ʿUmar Sulaymān al-Ashqar) or doubts about (for example, Muḥammad Mukhtār al-Salāmī) this particular variant due to inconsistency in the chain of transmission, the majority of the participants of the academies' discussions have defended and preferred the 120-day variant as a part of canonical knowledge. See, for example, the IOMS symposium of 15–17 January 1985 in Kuwait as mentioned by Ghaly, 'The Beginning of Human Life'. For a detailed analysis of the role of al-Bukhārī and Muslim in the Sunnī *ḥadīth* canon, see Brown, *The Canonization*.

4 Ghaly, 'The Beginning of Human Life', p. 193; Atighetchi, *Islamic Bioethics*, pp. 93–94; Kellner, *Islamische Rechtsmeinungen*, pp. 212–216; Eich, 'Decision-Making', pp. 64–67. The 120-day view is also considered the majority view among premodern Muslim jurists. See Musallam, 'The Human Embryo', p. 39.

5 See, for example, Fischer, 'National Bioethics Committees', p. 58; Ghaly, 'Human Cloning', pp. 30ff; Shabana, 'Negation of Paternity', p. 199.

6 Accounts of al-Zindānī's relations and activities concerning *iʿjāz ʿilmī* can be found in, for example, Stenberg, *The Islamization of Science*, pp. 231–234; Iqbal, *Science and Islam*, pp. 163–164.

7 Throughout this article the term 'science' refers to the modern natural sciences, including medicine.

8 Martin, 'Inimitability'.

9 Bigliardi, 'What We Talk About', p. 38.

10 Bigliardi, 'What We Talk About', p. 38.

11 Therefore, the term 'Bucailleism' is frequently used interchangeably with *iʿjāz ʿilmī*; Bigliardi, 'The Strange Case'. Ṭanṭāwī Jawhārī is often considered to be one of the first scholars to produce *iʿjāz ʿilmī* literature, see Bigliardi, 'The "Scientific Miracle"', p. 151; Jansen, *The Interpretation*, pp. 44–45; Rippin, Muslims, pp. 227–228; Campanini, *The Qurʾan*, p. 37.

12 Original title: *La Bible, le Coran et la science: Les écritures saintes examinées à la lumière des connaissances modernes*. The book is available in various languages and is also easily accessible online.

13 On the contrary, Bucaille found 'monumental errors' in the Bible (Bucaille, *The Bible, the Qur'an and Science*, pp. 120–122).

14 For a more detailed description of Bucaille's influence see Stenberg, *The Islamization of Science*, pp. 221–243.

15 Stenberg, *The Islamization of Science*, pp. 222–231.

16 Pink, 'Striving for a New Exegesis', p. 766.

17 For critics and criticism of *iʿjāz ʿilmī* see Wielandt, 'Exegesis'.

18 A noticeable exception is the work of Stefano Bigliardi.

19 I am very thankful to the reviewers for making me aware that some clarification might be necessary: I neither wish to state that al-Zindānī's positions are correct, nor do I defend his positions in any way. Rather, I want to show that he managed to construct a compatibility between the Qur'an and embryology in a way that is uncannily and strikingly consistent.

20 By using the terms 'disseminated', 'promoted', or 'popularised' I refer to the fact that al-Zindānī's ideas and positions on embryology are widely available and easily accessible through various channels. However, I do not intend to make any statement about the acceptance of his positions among possible recipients.

21 Throughout this article, the adjective 'Muslim' is used to refer to the religion, law/jurisprudence (*fiqh*) or the civilisation of Islam.

22 It must be noted, however, that in premodern works on *tafsīr* the commentators focused on Q. 22:5 which also provides information on human embryology (see Eich, 'Patterns').

23 I have used the translation by Droge for all translations of the Qur'anic text in this article.

24 See Ghaly, 'The Beginning of Human Life', for an account of the major Muslim positions regarding the beginning of human life among participants of the IOMS symposium held on 15–17 January 1985.

25 For greater clarity, the latter view is subsequently called 'the 40-day view'. The indication of 42 days is based on a tradition on the authority of Ḥudhayfa b. Asad reported by Muslim that reads as follows: 'When 42 nights have passed for the sperm-drop (*nutfa*), God sends an angel to it who forms it ...'

26 *Saḥīḥ al–Bukhārī*, 'Kitāb al-Tawḥīd', no. 7016 in al-Maktaba al-Shāmila. Translations of the *ḥadīths* are the author's.

27 i.e. three discrete periods of 40 days each.

28 *Saḥīḥ Muslim*, 'Kitāb al-Qadar', no. 2643 in al-Maktaba al-Shāmila. This understanding contrasts with other interpretations of the phrase *fī dhālika* that refer to the womb.

29 Other (online) references often use the English name Commission on Scientific Signs in the Qur'an and Sunnah. However, I think that the translation as Commission on Scientific Miracles in the Qur'an and Sunnah is more accurate. For a discussion on the term *iʿjāz* see Bigliardi, 'What We Talk About', pp. 38–45.

30 Other online biographies indicate 1938.

31 McGregor, 'Stand-Off in Yemen'; Johnson, 'Yemen's Al-Iman University'.

32 McGregor, 'Stand-Off in Yemen'; Bonnefoy, *Salafism in Yemen*, p. 24. He is further defined in different online bibliographies as *sīyāsī* ('politician') or *dāʿī* ('one who invites/calls to Islam').

33 For this problem see Dresch & Haykel, 'Stereotypes and Political Styles', p. 428 n. 31. 34 Zaman, Religion and Politics, p. 3.

35 For the discussion on what constitutes *ʿulamāʾ* in the modern period see, for example, Zaman, *The Ulama*, and Hatina, *Guardians of Faith*.

36 Heibach, 'Contesting the Monopoly', p. 567.

37 There is no evidence that he holds an *ijāza*. It is also never stated in biographies on al-Zindānī that he does. See also Heibach, 'Contesting the Monopoly', p. 567.

38 Dresch and Haykel, 'Stereotypes', p. 411f; Heibach, 'Contesting the Monopoly', p. 579 n.34. It was his *fatwā* on temporary marriage that upset legal scholars in the Arab world. His opinion was declared to be void and he was criticised for not being qualified for practising *ijtihad* (independent legal reasoning). For the notion of a layman's interpretation of the sources and the *ʿulamāʾ*, as interpreters see Brown, 'Is Islam Easy to Understand or Not?'.

39 For an account of the important role of cassettes for Salafī networks in Yemen see Bonnefoy, *Salafism in Yemen*, pp. 138–141.

40 Stenberg, *The Islamization of Science*, p. 234.

41 Schwedler, 'The Islah Party in Yemen', p. 212.

42 Seemingly, al-Zindānī taught *ʿilm al-sharʿī* at King ʿAbdulaziz University and Saudi schools, but none of the bibliographies written by different organisations provides detailed information on al-Zindānī's professional activities. See, for example: http://olamaa-yemen. net/Article/index/315 [accessed 16 July 2018], http://www.ikhwanwiki.com/index.php?title=%D8%B9%D8%A8%

D8%AF_%D8%A7%D9%84%D9%85%D8%AC%D9%8A%D8%AF_%D8%A7%D9%84%D8%B2%D9%86%D8%AF%D8%A7%D9%86%D9%8A [accessed 15 September 2016].

43 Literally, *daʿwa* means 'call' or 'invitation' (to Islam).

44 Masud et al., 'Daʿwah'.

45 Schulze, *Islamischer Internationalismus*, p. 285.

46 Schulze, *Islamischer Internationalismus*, p. 288. Ibn Bāz was a famous Saudi Arabian scholar and Grand Mufti of the country from 1993–1999.

47 Moreover, according to al-Zindānī, the CSMQS was established as part of the World Council of Mosques (al–Zindānī, *Taʾṣīl al-iʿjāz al-ʿilmī*, p. 8).

48 The MWL has its own *fiqh*-academy, al-Majmaʿ al-Fiqhī al-Islāmī, founded in 1977/1978, where questions on the beginning of life and related issues were discussed on several occasions (for example, in 1982, 1984, 1985, and 1990).

49 al-Zindānī, *Taʾṣīl al-iʿjāz al-ʿilmī*, p. 8.

50 Masud et al., 'Daʿwah'.

51 al-Zindānī makes such claims in al-Zindānī, *Taʾṣīl al-iʿjāz al-ʿilmī*, pp. 32–33. For the use of *iʿjāz ʿilmī* in *daʿwa* activities see also Bigliardi, 'The "Scientific Miracle"', pp. 156–157.

52 Moore, *The Developing Human*, first edition 1973, current tenth edition, 2016.

53 Moore, 'Highlights of Human Embryology'.

54 Moore, 'Highlights of Human Embryology'.

55 Golden, 'Western Scholars'. However, when the *Wall Street Journal* journalist Daniel Golden asked Moore for an interview, the latter refused by saying 'it's been 10 or 11 years since I was involved in the Quran.'

56 Moore, 'Highlights of Human Embryology'.

57 Since Moore states in this paper that his consultation was requested almost a year ago at the time of writing, it can be assumed that al-Zindānī selected both the Qur'anic verses as well as the *ḥadīth* material under consideration prior to the working sessions with Moore (Moore, 'Highlights of Human Embryology').

58 Stenberg, *The Islamization of Science*, p. 232. Stenberg compares Moore's and al-Zindānī's publications with that of Bucaille and the impact of Bucaille's *The Bible, the Qur'an and Science*.

59 Moore, 'Highlights of Human Embryology'.

60 Moore, 'A Scientist's Interpretation', pp. 15f.

61 al-Zindānī et al., *Human Development*, p. 1.

62 Stenberg informs us that he found some additional unpublished papers by Moore and al-Zindānī in the library of the International Institute of Islamic Thought in Herndon which were presented at different conferences. These papers, however, mostly reproduce the content of *The Developing Human ... with Islamic Additions* (Stenberg, *The Islamization of Science*, pp. 233–234 n. 71).

63 Moore & al-Zindānī, *The Developing Human ... with Islamic Additions*; see also Stenberg, *The Islamization of Science*, pp. 233–234.

64 The first CSMQS conference was held in Islamabad, Pakistan, in September 1987. According to al-Zindānī, 228 scientists from 52 different countries as well as 160 other individuals participated in the conference at which 79 papers from various fields were presented.

65 Since 1995 the CSMQS has also published a journal called *Majjalat al-Hayʾa al-ʿālamiyya liʾl-iʿjāz al-ʿilmī fī al-Qurʾān waʾl-sunna*.

66 It remains unclear exactly how scientific collaboration between the CSMQS and the other scientists was established. According to the journalistic research of Golden, it was Muṣṭafā Aḥmad who personally approached the scientists in the USA, remunerated them and also offered them amenities including first class flights, five-star hotels, and gifts like luxury watches (Golden, 'Western Scholars'). Among other invited scientists most referred to by the CSMQS are the embryologist Gerald Goeringer and the obstetrician and gynaecologist Joe Leigh Simpson. Since Moore has the closest relationship to al-Zindānī and has worked the longest with him and the CSMQS by far, I focus on his contributions. Moreover, both Goeringer and Simpson later distanced themselves from their statements and claimed that they were quoted out of context.

67 Seemingly, the book *ʿIlm al-ajinna* is a previous Arabic version. Due to its lesser content, *Human Development* is discussed in this article. The book is available for download as a PDF on the MWL's website which is an indication of the publication's authorised status. PDF available at: http://en.themwl.org/content/human-development-describes-quran-and-Sunna-0 [accessed 20 July 2018].

68 In the *Lisān al-ʿArab, ʿalaqa* is, interalia, defined as a 'a blood sucking leech living in water' (*dūda fī al-māʾ tamtasṣ u al-damm*). However, no link is established between *ʿalaqa* and the appearance of an embryo (Ibn Manẓūr, *Lisān al-ʿArab*, vol. 9, p. 267). In 'Atṿ ār al-janīn', al-Zindānī and al-Ṣāwī refer to Ibn Kathīr (d. 774/1373) who is supposed to have also defined *ʿalaqa* as a 'blood sucking leech living in water'. Yet, al-Zindānī neither specifies his exact source, nor is the definition to be found in Ibn Kathīr's *tafsīr*.
The translation of *ʿalaqa* as 'something that clings' was advocated by Bucaille since this translation corresponds to modern science. Additionally, he speaks of *muḍgha* as 'chewed flesh'. However, Bucaille establishes no link to a leech or a chewed substance, such as chewing gum (Bucaille, *The Bible, the Qur'an and Science*, pp. 205f).

69 Moore, *The Developing Human*, p. 8/5.

70 Moore, *The Developing Human*, 3rd edn, p. 9.

71 al-Zindānī et al., *Human Development*, p. 1.

72 Ibrahim, *A Brief Illustrated Guide*. Whereas the guide is the most prominent and noticeable example of the CSMQS's impact, many more cases can be found where Moore and al-Zindānī in particular are, sometimes imprudently, cited. See for example Emerick, 'A Complete Idiot's Guide', p. 52; Abd-El-Maeboud, 'Human Life Cycle', pp. 366–370; Saadat, 'Human Embryology', pp. 105–109. Whereas the first example is certainly popular literature, the two other examples attempt to appear as scholarly literature. Bigliardi also mentions some examples of *'iʿjāz* articles' that made their way into peer-reviewed journals (Bigliardi, 'The "Scientific Miracle"', p. 152). Moreover, it is striking that Bucaille as well as Moore and al-Zindānī are cited as secondary literature in the *Encyclopaedia of the Qurʾan*'s article 'Biology as the Creation and Stages of Life' by Abul Fadl Mohsin Ebrahim.

73 The guide is to be found on many different websites, for example as a PDF at: https://www.islamreligion.com/ebooks/islam-guide.pdf [accessed 19 July 2018]. The official MWL website also provides a PDF: http://en.themwl.org/a-brief-illustrated-guide-to-understanding-islam [accessed 20 July 2018].

74 The guide also seeks to promote intellectual engagement: 'If we would like to know if a religion is true or false, we should not depend on our emotions, feelings, or traditions. Rather, we should depend on our reason and intellect' (Ibrahim, *A Brief Illustrated Guide*, p. 4). Moreover, it apparently helps Muslims advertise Islam as well as gain converts.

75 Ibrahim, *A Brief Illustrated Guide*, pp. 10ff.

76 Only the first sentence of both the Ibn Masʿūd *ḥadīth* and the Ḥudhayfa *ḥadīth* are cited in a section called 'Scientists' Comments on the Scientific Miracles in the Holy Qur'an'. Hence, only the number 40 is highlighted, without showing the difference between the variants. No further explanation on the *aḥādīth* is given (Ibrahim, *A Brief Illustrated Guide*, p. 28).

77 Ibrahim, *A Brief Illustrated Guide*, pp. 13f.

78 Ibrahim, *A Brief Illustrated Guide*, pp. 9–15. Ibrahim also refers to al-Zindānī's 'This is the Truth'(*Innahu al-ḥaqq*). The title refers both to a videotape of al-Zindānī including sequences of the interviews al-Zindānī conducted with the scientists and to a book compiled by Abdullah al-Rehaili on the basis of the videotape. In the Arabic version of the book, al-Zindānī is named as the author.

79 Moore et al., *The Qur'an and Modern Science* in the Publisher's note; al-Zindānī et al., *Human Development*, p. 7.

80 Moore is also referred to by other Muslim scholars or physicians. For example, the Saudi Arabia-based physician Muḥammad ʿAlī al-Bār in his popular book *Khalq al-insān* (English title: *Human Development as Revealed in the Holy Quran and Hadith*) regularly substantiates his view on embryonic development with Moore's *The Developing Human*. For an account of (western) biomedicine's authority and superiority, see Klassen, 'Medicine', pp. 411–414.

81 It must be noted that the Qur'anic stages have been divided into seven since the bioethical discussions during the 1980s and 1990s: quintessence of clay, *nuṭfa, ʿalaqa, muḍgha*, bones, clothing the bones with flesh, creation of another creature. Usually, the first step, 'clay', is considered to be the creation of Adam and thus does not refer to every embryo's development. See Eich, 'Decision-Making Processes', pp. 66. Al-Zindānī, however, points to 'another meaning' (*maʿnā ākhar*) of the word 'clay'. More concretely, he names it 'big fish'. According to al-Zindānī, this meaning does not only point to the resemblance between fish and spermatozoa but also to the fact that clay is the only substance that is 'living matter'. For the so-called 'crystals-as-genes hypothesis' stating that clay is 'living matter' see Cairns-Smith, 'The Origin of Life'; and Bullard et al., 'Test of Cairns-Smith's'.

82 For example, in Johnson et al., 'Description of Human Development', pp. 48–50.

83 Johnson et al., 'Description of Human Development', p. 41.

84 In *Human Development*, where al-Zindānī expounds his model in most detail, the *ʿalaqa, muḍgha, ʿiẓām*, and *laḥṃ* stages are sub-stages of the so-called *takhlīq* ('differention') stage. At the same time, he speaks of *nuṭfa, ʿalaqa,* and *muḍgha* as the main stages of embryonic development as well as of *nuṭfa, ʿalaqa, muḍgha, ʿiẓām, laḥṃ*, and *al-nashāʾa* as the major stages.

85 In *The Developing Human ... with Islamic Additions*, al-Zindānī does not refer to other meanings of the term, but explains further that the term leech 'presumably describes the external appearance of the embryo as well as its relationship with the uterus. In this case the embryo resembles a primitive multicellular organism attached to a host and feeding on its blood' (Moore & al-Zindānī, *The Developing Human ... with Islamic Additions*, p. 446c).

86 *People! If you are in doubt about the raising up—surely We created you from dust, then from a drop, then from a clot, (and) then from a lump, formed [mukhallaqa] and unformed [ghayr mukhallaqa], so that We may make (it) clear to you. We establish in the wombs what We please for an appointed time, then We bring you forth as a child, (and) then (We provide for you) so that you may reach your maturity. Among you (there is) one who is taken, and among you (there is) one who is reduced to the worst (stage) of life, so that he knows nothing after (having had) knowledge. And you see the earth withered, but when We send down water on it, it stirs and swells, and grows (plants) of every beautiful kind.*

87 For a detailed account of Ibn al-Qayyim's embryology, see Weisser, 'Ibn Qaiyim al-Gauzīya'.

88 *Ṣaḥīḥ Muslim*, 'Kitāb al-Qadar', no. 2654 in al-Maktaba al-Shāmila.

89 The embryo starts moving around in the sixth week after fertilisation. The movement can be felt by some pregnant woman as early as the twelfth week after fertilisation, i.e. around the eighty-fourth day of pregnancy.

90 On the reformulation and reproduction of primary authors in the framework of modern medicine see Ragab, 'Prophetic Traditions and Modern Medicine'.

91 These are: (quintessence of clay), *nuṭfa, ʿalaqa, muḍgha*, bones, clothing the bones with flesh, creation of another creature.

92 The problem of compatibility is also addressed by Eich, who has shown how Muḥammad ʿAlī al-Bār, a Saudi-Arabian-based physician, has changed the traditional concept of Islamic embryology to fit his embryological model. See Eich, 'Decision-Making Processes', pp. 64–67.

93 Moore & al-Zindānī, *The Developing Human ... with Islamic Additions*, p. 446a. See also Persaud et al., 'Description of Human Development', pp. 94–95; Johnson et al., 'The Scientific Significance', p. 175.

94 al-Zindānī indicates that a possible sign for the ensoulment might be the two alternating conditions of falling asleep and the awakening of the foetus. He relates this hypothesis to Q. 39:42, *God takes the self at the time of its death, and that which has not died in its sleep, and He retains the one for whom He has decreed death, but sends back the other until an appointed time. Surely in that are signs indeed for a people who reflect.* Other attempts to scientifically justify the moment of ensoulment include the voluntary movement of the foetus (al-Bār, *Contemporary Topics*, pp. 133–134), and the development of synapses of the cerebral cortex with lower centres of the brain (al-Bār & Chamsi-Pasha, *Contemporary Bioethics*, pp. 165–166).

95 Johnson et al., 'Description of Human Development', p. 41.

96 For example, in a recent article on the beginning of human life, Hamza Yusuf, the President of the Zaituna College in Berkeley, states that *Ṣaḥīḥ Muslim* is 'the second most important book of hadith' (Yusuf, 'When Does a Human Fetus Become Human', n. 54).

97 Likewise, in *The Developing Human ... with Islamic Additions*, al-Zindānī's reasoning is almost entirely based on the Qur'anic text. The Ibn Masʿūd *ḥadīth* is mentioned only once. In this context, al-Zindānī explains that the Ibn Masʿūd *ḥadīth* can be found in both Muslim's and al-Bukhārī's collection, although the al-Bukhārī variant lacks the *fī dhālika*. Instead, the developmental time frame is imparted by the scientific accounts of Moore's book.

98 al-Zindānī et al., 'Embryogenesis'.

99 'Aṭwār al-janīn'.

100 Likewise, al-Zindānī states that the Ibn Masʿūd *ḥadīth* 'had been interpreted to mean that each of these stages took 40 days in sequence' (Moore & al-Zindānī, *The Developing Human ... with Islamic Additions*, p. 84a).

101 It is also interesting to note that al-Zindānī and al-Ṣāwī are not focusing on the *isnād* of the *aḥādīth* as is usually done to evaluate a *ḥadīth*, but on the *matn*.

102 al-Zindānī & al-Ṣāwī, 'Aṭwār al-janīn', and al-Zindānī et al., 'Embryogenesis', pp. 121–126.

103 al-Zindānī regularly refers to the scholar, al-Zamlakānī (d. 651/1253), who has applied this argument based on Arabic grammar and thus came to the same conclusion, namely that *nuṭfa, ʿalaqa,* and *muḍgha* take place within the first 40 days after conception. For the reference to al-Zamlakānī, see Moore & al-Zindānī, *The Developing Human ... with Islamic Additions*, pp. 84–85; al-Zindānī et al., 'Embryogenesis', p. 123.

104 al-Zindānī & al-Ṣāwī, 'Aṭwār al-janīn'; al-Zindānī et al., 'Embryogenesis', pp. 121–126. See Eich, 'Patterns' on the exegetical process of specifying and adding the term *nuṭfa* in the Ibn Masʿūd *ḥadīth*.

105 al-Zindānī & al-Ṣāwī, 'Atẉār al-janīn'. Accordingly, if the moment of the ensoulment is set for the one-hundred-and-twentieth day, abortion should be prohibited after this day. The second major position asserts that human life begins at the moment of conception. For premodern Muslim opinions on abortion, see Musallam, 'The Human Embryo', p. 39.

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