

Articoli/Articles

THE EMBRYO DEVELOPMENT IN QURANIC VERSES

NESMA ELSAKAAN, MICHELE LONGO

Dipartimento di Scienze Umanistiche

Università degli Studi di Palermo, I

SUMMARY

The aim of this paper is to answer two questions: is there a section in the Qur'an that describes the human embryo development? Second, if such a case existed, could it be compared to the Greek theories of generation? The answer to both questions is affirmative. In the first part of this paper, we discuss some Quranic verses talking about the embryo development. We also outline how the terminology (nutfah, 'alaqah, mudghah) used for expressing the embryo development in these verses involves complex translation challenges. In the second part, we compare the Quranic verses to two Greek theories of generation. Finally, we highlight a little-known aspect of the Quranic text worthy of study.

Introduction

Considered as a source of knowledge, the Qur'an (al-Qur'ān) is the holy book of Muslims. For them the Qur'an contains the word of God revealed to his Prophet Muḥammad¹. Like any other book thought sacred, the Qur'an tells the story and the customs of the Arab people at the time. Moreover, it provides account of some issues which have occupied human beings brain constantly, such as the bringing into existence of the universe and humankind origins².

In this paper, we focus on some Quranic verses that narrate the story of creation and the process of generation. We will examine three terms

Key words: Qur'an - Generation - *Nutfah* - *'Alaqah* - *Mudghah*

that describe the early stages of the embryo and illustrate their polysemy through the interpretation of the most famous medieval Muslim exegetes. We also will discuss how Avicenna uses the same terminology in his famous book *The Canon of Medicine* (al-Qanūn fi'l-Ṭibb). Finally, we will verify whether the generation process narrated in the Qur'an could be compared to the Greek theories of generation.

In *al-Mu'minūn* (The Believers), the 23rd surah of the Qur'an, God says:

”وَلَقَدْ خَلَقْنَا الْإِنْسَانَ مِنْ سُلَالَةٍ مِّنْ طِينٍ (١٢) ثُمَّ جَعَلْنَاهُ نُطْفَةً فِي قَرَارٍ مَّكِينٍ (١٣) ثُمَّ خَلَقْنَا النَّطْفَةَ عَلَقَةً فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً فَخَلَقْنَا الْمُضْغَةَ عِظَامًا فَكَسَوْنَا الْعِظَامَ لَحْمًا ثُمَّ أَنْشَأْنَاهُ خَلْقًا آخَرَ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ (١٤)

And indeed We created man out of an extract of clay (12). Thereafter We made him as nutfah in a safe lodging [womb of the woman] (13). Then We made the nutfah into 'alaqah, then We made the 'alaqah into mudghah, then We made out of that mudghah bones, then We clothed the bones with flesh, and then We brought it forth as another creation. So blessed is God, the best of creators (14)³

The verses tell about the creation of humans by describing the generation process. First, they identify an initial phase, where man was created out of an extract of clay. Most of exegesis refers this phase to the creation of Adam of water and mud mixed together. But this is not the phase we point to analyze. The process that we will focus on consists of three stages:

1. *Nutfah*
2. *'Alaqah*
3. *Mudghah*

In the verses, the generation is described as a linear process of three defined stages. Starting with *nutfah*, it turns into *'alaqah*, which becomes then a *mudghah*. Now let's go into the semantic analysis of each of the three terms.

Nutfah (نُطْفَة)

The word *nutfah* comes from the root *na-ṭa-fa*. In *Lisān al-‘Arab*⁴ the word has the following meanings:

1. Limpid water;
2. A little amount of water;
3. Man sexual discharge⁵.

Given that in Arabic language the root of the words is their verb form, the first meaning of *nutfah* (limpid water) is connected to the verb *naṭafa*, which means ‘to trickle’ (*yaṭuru*) or ‘to flow’ (*yasīlu*). According to the dictionary, the second meaning (a little amount of water) was common at the time when the Arabs were calling a small amount of water as *nutfah*. The word also means ‘male sexual fluid, i.e., sperm’ since the sperm is in little amount⁶ and liquid like water. The dictionary of *al-Munğid* gives almost the same meanings, adding another one:

4. Male and female sexual discharge or fluid⁷.

This is a very interesting interpretation since it introduces woman’s contribution and interprets *nutfah* as both male and female sexual fluids. Considered *nutfah* as a *sexual fluid*, like a possible meaning, the Arabic dictionaries give two fundamental definitions: on the one hand, *nutfah* is ‘the sperm’. On the other hand, it is ‘male and female sexual fluids’.

As a matter of fact, the interpretation of a complex text such as the Qur’an must take account of *al-tafsīr*, one of the so-called Quranic sciences. The *tafsīr* is a huge exegetical Islamic tradition that has commented and interpreted the Qur’an over the centuries and besides, it has consolidated its orthodox interpretation in exegesis volumes. The most important exegetes or scholars (*mufasssīrūn*) in the Islamic tradition are al-Ṭabarī (838-923), al-Qurṭubī (1214-1273) and Ibn Kaṭīr (1301-1373).

According to al-Ṭabarī, *nutfah* is the male sexual fluid that is the sperm⁸. Similarly, al-Qurṭubī states that “it’s the sperm. Man’s sperm is called *nutfah* for being in little amount⁹”. While for Ibn Kaṭīr *nutfah* is “the water gushing forth that comes from the loins of man, i.e., his back, and the ribs of woman, i.e., the bones of her chest, between the clavicle and the breast¹⁰”. So both the first and the second commentators agree that *nutfah* is the male sexual discharge (the sperm). While for Ibn Kaṭīr’s the term refers to the ‘water’ (sexual fluid) of both sexes. He also explains that this liquid comes from man’s loins while for woman it comes from her chest¹¹.

None of the three quoted commentators talks about any kind of union between male and female sexual fluids. Nevertheless, a recent scholar, Ibn ‘Ashūr (1879-1973), makes exactly this consideration. First of all, for Ibn ‘Ashūr the word *extract* (sulālah), in “We created man from an extract of clay” (Qur’an 23:12), means both male and female sexual fluids that are *extracted* from their blood¹². And the word *clay* (ṭīn) alludes to the earth or the soil which is the main source of food for humankind¹³. So “extract of clay” means that man and woman sexual fluids come out from blood and represent the origin of the generating act. Furthermore, Ibn ‘Ashūr makes a very interesting consideration regarding the *nutfah*. On the one side, *nutfah* could be interpreted as man’s sexual fluid mixed and combined with female’s one within woman’s womb. He illustrates that this mixed sexual discharge is one of the early stages of the embryo¹⁴. On the other side, Ibn ‘Ashūr agrees that man’s penile fluid could be called *nutfah* because it becomes trickled (yaqṭuru) in woman’s womb¹⁵ during the sexual intercourse and this is one of the meanings of the verb (naṭafa) as we mentioned before.

To sum up, we can say that the term *nutfah* has several meanings. It is limpid water or small quantities of fluid. For many commentators, it is male sexual fluids. For others, *nutfah* is either the male and female sexual fluids¹⁶. We also found that according to one of the

scholars, it is man's sexual fluid mixed with female's one. This is a very interesting interpretation that has an echo in this Quranic verse:

إِنَّا خَلَقْنَا الْإِنْسَانَ مِنْ نُطْفَةٍ أَمْشَاجٍ نَبْتَلِيهِ فَجَعَلْنَاهُ سَمِيعًا بَصِيرًا (2)

Verily, We have created man from nutfah amshāğ¹⁷

*Amshāğ*¹⁸ derives from the root *ma-sha-ğa* and means 'to mix'. It may be singular and plural form¹⁹. In the verse, *nutfah amshāğ* could mean 'mixed semen' or 'sexual discharge of man and women'. Ibn 'Ashūr restates that if *amshāğ* in this verse is singular, so *nutfah amshāğ* means 'mixed semen'. But if it is plural, then it alludes to the numerous elements that exist into the *nutfah*²⁰.

There is a contribution regarding this debate in Avicenna's *Canon of Medicine*. In the chapter of the reproductive system, precisely in the 21st art, the author outlines the embryo genesis (tawallud al-ğanīn). After the conception, Avicenna illustrates that the embryo goes through this process:

إذا اشتملت الرحم على المنى فإن أول الأحوال أن تحدث زبدية المنى و هو من فعل القوة المصوّرة . والحقيقة من هذه الزبدية تحريك من القوة المصوّرة لما كان في المنى [...] إلى معدن كل واحد منها ليستقر فيه [...] وكما يستقر المنى ويزيد وينفذ الزبد إلى الغور نفخا للقلب [...] يتولد الغشاء من حركة منى الأنثى إلى منى الذكر و يكون متبرنا ثم لا يعلق إلا بالنقر لجذب الغذاء وإنما يتغذي الجنين بهذا الغشاء مادام رقيقاً²¹

When the sperm (al-maniyy) reaches woman womb, first, it becomes frothy (zabadiyyah) for the generative force. In fact, the froth originates when the formative transforms the components that the sperm contains into minerals, which remain within it [...]. Once the sperm gets stable and frothy, the foam goes deeper blowing up the heart [...]. After that, the sexual fluid of the woman reaches the sperm, thereby a membrane forms. This membrane remains free. Later, it will be attached to the uterine veins to get nutrients [...] and the embryo (al-ğanīn) gets nutrients through this membrane as long as it is slender²².

In this quotation, Avicenna uses the word *maniyy*²³ to express the sperm. He explains that once the *maniyy* is within the womb of woman, it becomes frothy by the act of the generative force. The embryo

gets surrounded with a membrane through which it gets nutrients. A few paragraphs later, Avicenna points out the duration of this phase and reaffirms the way the formed or the generated (al-muṣawwarah) gets fed:

”أما مدة الرغوة فسنة أيام أو سبعة وفي هذه الأيام تتصرف المصنورة في النطفة من غير استمداد من الرحم وبعد ذلك تستمد²⁴

The foam takes from 6 to 7 days during which the generated (al-muṣawwarah) advances in the nutfah without taking anything from the uterus.

This quotation is very fundamental since the author uses the word *nutfah* where we would expect *maniyy* or at the least *zabadiyyah*. From his discourse we deduce that *nutfah* is not used here as sperm²⁵. Obviously, it has a broader meaning. However, it is not clear enough what it could be exactly. To verify this vagueness we quote here the Latin translation of Avicenna’s text by Gerard of Cremona (XII sec.):

*et spatium quidem spume est vj. dierum aut vij. & in his diebus format informativa in embryo non petendo aliquid ex matrice*²⁶.

In the Latin text, the term *nutfah* is rendered as *embryone* (embryo). This confirms the idea that we have just proposed: *nutfah* is not just the sperm, but mixed semen or (as Gerard says) embryo. Indeed, it is a kind of a developed entity created by the formative or generative force. According to Avicenna, after six or seven days this complex entity goes through an advanced stage. This is why we think that Avicenna’s consideration for *nutfah* coincides with our point of view. We should say that even the translators of the Quranic text give more than a possible interpretation for the *nutfah*. In the Italian translation of the Qur’an by Bausani the word is rendered as ‘a drop of sperm’: “ne facemmo una goccia di sperma in ricettacolo sicuro²⁷”. In the English interpretation of the Qur’an of al-Hilālī the Quranic verse is translated this way: “We made him as *nutfah* (mixed drops

of the male and female sexual discharge)”²⁸. Al-Hilālī considers the *nutfah* as mixed semen. Not only, but in another English translation the word results as ‘sperm-drop, i.e., zygote’²⁹.

At this point we should report the work of Aḥmad Shawqī Ibrāhīm, a famous Egyptian physician and scientist who wrote many works that aim to illustrate the correspondence between some passages of the Qur’an and the modern theories of generation. Shawqī claims that only in the 17th Century scientists got to know that reproduction requires a sperm which fertilizes an ovum instead of the menstrual blood’s hypothesis which was thought before. According to him, this truth has already existed in many Quranic verses and in the Hadith³⁰. It is not our aim to verify the idea carried out by Shawqī. What is important to us is his interpretation of *nutfah* as mixed semen, i.e., zygote³¹. This interpretation has not always worked out, despite that it is present in Avicenna.

To conclude the analysis of the first term, we claim that in this Quranic verse *nutfah* means a drop of water or fluid substance, precisely seminal fluid. Precisely, it is the mixed semen that comes out from the union between male and female sexual fluids.

‘Alaqah (عَلَقَة)

The second phase is the transformation of the *nutfah* into ‘*alaqah*: “We made the *nutfah* into ‘*alaqah*” (Qur’an 23:14)³². ‘*Alaqah* comes from the root ‘*a-la-qa* which means ‘to cling’, ‘to attach’ and ‘to suck’³³. The aforementioned dictionaries report the following meanings of ‘*alaqah* as a noun:

1. Bright blood;
2. Coagulated blood;
3. Leech.

It is ‘blood’, precisely ‘coagulated blood’. This interpretation is confirmed by the commentators of the Qur’an. For Ibn Katīr ‘*alaqah*

is “a red piece of blood, like an elongated clot³⁴”. Al-Ṭabarī also affirms that it is ‘a clot’³⁵. Moreover, both the scholars agreed that ‘*alaqah* is the second phase of the embryo.

The Canon of Avicenna gives a description of this phase slightly different:

هذا والحال الأخرى ظهور النقطة الدموية في الصفاق وامتدادها في الصفاق امتدادا ما [...] وثالث الأحوال استحالة المني إلى علقة³⁶

The second circumstance concerns a drop of blood which appears in the peritoneum (al-ṣifāq) and somehow extends throughout [...]. The third circumstance is the transformation of the maniyy into ‘alaqah.

According to Avicenna, the change process goes through these stages:

1. *Al-maniyy* transforms into froth (which advances within the *nutfah* as seen before).
2. A drop of blood appears in the peritoneum (al-ṣifāq);
3. *Al-maniyy* changes into ‘*alaqah*³⁷.

Avicenna differentiates ‘*alaqah* from the drop of blood. As a result one might wonder what happens exactly to the embryo at this stage, from Avicenna’s point of view. We find the answer in the following passage:

أما مدة الرغوة فسنة أيام أو سبعة [...] وابتداء الخطوط و النقط بعد ثلاثة أيام أخرى فتكون تسعة أيام من الابتداء [...] ثم بعد ستة أيام أخرى يكون الخامس عشر من العلق تنفذ الدموية في الجميع³⁸

The foam takes from 6 to 7 days [...]. Three days after it will be the ninth day, some features and lines appear [...]. After another six days it will be the fifteenth since al-‘ulūq, the blood penetrates all (parts) forming ‘alaqah.

So in the third phase the blood penetrates all the parts of the *nutfah* which becomes ‘*alaqah*. But ‘*alaqah* is not just a drop of blood. To better understand what it means let’s consider the word ‘*ulūq* which is mentioned in the last quotation. In *The Canon* Avicenna uses the

word *'ulūq* when he talks about the conception. In fact, this word is another derived form of the root *'a-la-qa*. Consequently, one might think that both *'alaqah* and *'ulūq* allude to the conception act. Probably, this is what Gerard of Cremona had thought when he translated the last quotation. Reading the Latin translation we note that both of the words are translated into the same word:

*& recipiunt dispositiones conversionem spermatis ad conceptionem*³⁹;

This is the quotation, where *'alaqah* is translated in Latin as *conceptio*.

*deinde post vi. Dies alios. & sunt xv. a conceptione penetrat sanguineitas in toto, & fit [illud unde creatur]*⁴⁰

In the above excerpt, *'ulūq* is also rendered as *conceptio*. So we are in front of a misleading interpretation. This perhaps is due to the fact that both words have the same root. It is not possible to think that *'alaqah* is the 'conception', if one considers, as Avicenna does, that the *nutfah* contains already mixed semen; furthermore, the embryo has been already figured. It remains then to define what *'alaqah* represents for Avicenna. Given the brevity of the argued quotation, we can imagine that the drop of blood, which was formed at the ninth day, starts to spread throughout the *nutfah*, until the latter gets filled totally with blood then becomes coagulated blood. In order to summarize Avicenna's point of view we can say that the author distinguishes the following three phases:

1. The formation of the *nutfah* – seminal fluid (which takes almost six or seven day);
2. The appearance of a drop of blood accompanied with the first features and lines (at the ninth day);
3. Total transformation of the *nutfah* into *'alaqah* - coagulated blood (at the fifteenth day).

For this term al-Hilālī and Bausani give similar translation. The first renders ‘*alaqah*’ as ‘clot’ and/or a piece of a thick coagulated blood⁴¹. Also Bausani translates it as ‘grumo di sangue’ (blood clot). Anyway, this was the idea widely held at the time; in other words the embryo was thought like blood clot during its earliest stages.

However, another broader interpretation of this word can be possible. As seen before, leech is one of the meanings of ‘*alaqah*’ in Arabic. So we propose that the word ‘*alaqah*’ should not be understood literally but metaphorically. Thereby, the word could be interpreted as leech or as something similar⁴². In fact, in this phase the *nutfah* clings to mother’s uterine wall and begins to get nutrients from it. In this sense it is like a leech that attaches to (ta‘laqau) something and sucks substances from the bloodstream. And this is what the verb ‘*alaqa*’ means. It is not accident that Ibn Kaṭīr describes ‘*alaqah*’ as a clot of blood similar to a rectangular leech⁴³. So our point is to interpret ‘*alaqah*’ as ‘clingy clot-like leech’ since this second phase begins when the *nutfah* attaches to the uterine wall to suck nutrients from mother’s bloodstream.

After the analysis we propose that ‘*alaqah*’ in the Quranic verse is related to the blood, which means that it is fluid. Precisely, it is semifluid for being in condensed state. Compared to the first phase, the substance has undergone change. It is not water any more, but blood. It also has had a change of state. The substance is not fluid, but something denser. In other words, it becomes coagulated.

Mudghah (مَضْغَةٌ)

After the ‘*alaqah*’ the embryo continues to develop and turns into *mudghah* through the third stage: “We made the ‘*alaqah mudghah*’” (Qur’an 23:14). *Mudghah* is noun and derives from the root *ma-ḍa-gh-a* which means ‘to chew’ and ‘to masticate’. The aforementioned dictionaries give this meaning for the word:

1. The amount of something that mouth can hold⁴⁴.

This term does not give rise to a great debate. The scholars are of a similar opinion. Ibn Kaṭīr presumes that *mudḡhah* is like a piece of flesh that has no shape or features⁴⁵. Al-Qurṭubī says that “it’s a mouthful of flesh⁴⁶”. On the other side, *mudḡhah* for Avicenna is similar to a piece of flesh, where some shapes and features start to appear and three organs (the heart, the liver and the brain) are almost complete⁴⁷. This phase is different because its substance has defined limits and with the first organs almost formed. It looks like a piece of flesh, not liquid anymore neither solid. The *mudḡhah* seems like a tender mass⁴⁸ or a group of aggregate elements⁴⁹.

It is interesting to quote Shawqī’s point of view concerning this phase. He argues that medieval commentators have considered *mudḡhah* as a chewed lump of flesh; but “this could be correct in form and not in substance”⁵⁰. Shawqī reiterates that the commentators could be right when they described *mudḡha* as a piece of flesh, if they only considered its external shape. But it would be completely inaccurate, if they pointed its consistency, since the muscle cells (the flesh) appear after the bones have grown⁵¹.

Before going further in our analysis, it is appropriate to focus on some details of the Quranic verse under discussion. In the text, there are two coordinating conjunctions: *thumma* and *fa*. Both mean ‘and’ or ‘then’ and are used for expressing two events which are one after another but in different way. *Thumma* coordinates two actions that are separated by a certain distance of time. Meanwhile, it expresses consequence and result⁵². *Fa* coordinates two things or events that are connected and follow one after the other; moreover, they have common characteristics⁵³. In “Then (*thumma*) We made the *nutfah* into ‘*alaqah*” (Qur’an 23:13) the use of *thumma* is suitable since there is a distance of time, space and different function between *nutfah* and ‘*alaqah*. *Nutfah* takes time before turning into ‘*alaqah*. They are also located in different places. Actually, the *nutfah* originates in the uterine tube and only some days later it reaches the

womb and clings to the uterine wall then becomes ‘*alaqah*. While *fa* is used to coordinate ‘*alaqah* and *mudghah* in “Then (fa) We made the ‘*alaqah mudghah*” (Qur’an 23:13) since they represent two consecutive phases. Both the two entities are part of a linear sequence and share common characteristics: they are semisolid substance, able to get nutrients.

Going back to the analysis of the third term, we propose that in these Quranic verses *mudghah* means “soft mass”. Accordingly, the state has changed again. Now it is an aggregated matter that is not solid but compact. It is no more blood but perfect mass with clear borders. Nevertheless, it is not solid. But it will be followed by a solid state. In other words, bones grow then muscular tissue (flesh) begins to grow around. The following table summarizes the entire process of embryogenesis, which we read in the verse:

Qur’an	1) <i>Nutfah</i>	2) ‘ <i>Alaqah</i>	3) <i>Mudghah</i>	4) Bones-flesh
Substance	Water (seminal fluid)	Blood (coagulated)	Soft mass	Bones–flesh
State	Fluid	Semifluid	Aggregated	Solid

The Greek theories of the embryo before the revelation of Qur’an

It is strangely enough to find such a sophisticated theory in the Qur’an. Moreover, it is surprising to see how Avicenna, as we demonstrated before, had to make little modifications to reconcile what we read in the Qur’an to the Greek theories of embryogenesis process. At this point one might wonder if it is possible to compare the Quranic theory of generation to the ones we read in the Greek texts. This is what we will do in this paragraph. Regarding the ancient Greek medicine, we will take into consideration two theories:

- a. The single-seed theory (the vase theory)
- b. The double seed-theory (the bisexual seed theory)

The first theory held that the procreative force exists in male's semen which is active and warm. Thereby, the role of the woman is similar to the moist vase which receives passively the seed and gives it nutrients during the early stages. Aristotle was the first to advocate and amplify the success of this theory which dates back to pre-Socratic physiologists⁵⁴. According to the second theory, the procreative force exists in both male and female seeds (the double-semen theory). The embryo comes out from two mixed-seeds. Each one has physical characteristics that can be transmitted to descendants. Besides, each of them carries within male and female characteristics (the bisexual-seed theory). This theory is present in one of the texts of the *Hippocratic Corpus*, known as *De natura pueri*, also in the *De Semine* of Galen. Here we can distinguish two camps: the first is represented by Aristotle (philosopher), the second one is represented by Galen and physicians. In fact, during the Islamic Golden Age the Greek medical texts were well known to the Arabs⁵⁵. They also translated the *De natura pueri* into Arabic⁵⁶. Not only that, but the Arabic version had a wide circulation⁵⁷. In this text we read a particular description of the embryo development that coincides largely with the Quranic one. According to the Hippocratic author, the embryo development goes through these phases⁵⁸: first, two seeds (both fertile) mingle in the woman womb; second, the fluid coagulates; third, a membrane forms (delimitation of the mass) and the embryo clings to the uterus and gets nutrients through a protrusion; fourth, the fluid turns into blood. Finally, the latter becomes flesh. In the following table we summarize this process and compare it to the one which is described in the abovementioned Quranic verses:

<i>De natura pueri</i>				
Substance	1)Mingled semen	2) Condensed semen	3) A (thick and defined) membrane comes out	4) Blood -flesh -bones
State	1) Fluid	2) Semifluid	3) Semifluid (with external borders)	4) Solid

Qur'an	1) <i>Nuṭfah</i>	2) <i>'Alaqah</i>	3) <i>Mudḡhah</i>	4) Bones -flesh
Substance	1) Water (seme)	2) Blood	3) Soft mass	4) Bones –flesh
State	1) Fluid	2) Semifluid	3) Aggregated	4) Solid

As we notice the Greek text and the Quranic verses have things in common. In both texts the first phase is characterized by a fluid state in which two seeds are mingled forming the embryo. In the second phase, the fluid is condensed. In the third phase, a defined boundary surrounds the condensed fluid, which means that the substance is distinguished from the rest. Finally, the substance is perfectly consolidated and ready for becoming flesh.

On the other hand, there are some differences. First, the Greek text refers to the blood only in the fourth phase, while in the Quranic verses the blood appears in the second one. Second, according to the Greek text, flesh grows out before bones. In spite of these differences, the fact remains that the Greek text and the Quranic verses we highlighted above fall into the same general framework. These small differences do not alter the main discourse.

Conclusions

Now let's record the questions which we tried to answer in this paper. The first one was whether the Qur'an talks about the development of the embryo. The answer is affirmative. There are different verses that tell about the embryogenesis in short but meaningful words. The verses that we examined distinguish four phases through which we can follow a gradual change of substance and state. Regarding the substance, the mixed semen that comes out from the mingle of male and female seeds (*nuṭfah*) transforms first into blood (*'alaqah*), then into an aggregated mass (*mudḡha*), then into bones and flesh. As regards the state of the substance, it changes from fluid into dense fluid, then into aggregated substance and finally, it assumes a solid state.

The second question that we answered was whether it was possible to make a comparison between these Quranic verses and the ancient Greek medical texts that talk about the theory of generation. We also gave a positive answer to this question. Particular attention was paid to the *De natura pueri*, a text from the *Hippocratic Corpus*. We demonstrated that (except for few differences) the text gives similar description of the embryo early phases. Moreover, one of the fundamental common ideas between the Quranic verses and the *De natura* is that they tell about mixed semen (seminal fluid) which comes out from the union between male and female seeds.

No doubt that the Greek medical texts belong to a so far era which is more ancient than the one in which the Qur'an was revealed. Almost a millennium separates the first Greek medical texts and the Quranic one. It is tempting to say that there is a relationship of dependency of the second text on the first one. This is a simple hypothesis that opens the field to further detailed study; however, it remains difficult to go along. But the fact that we wanted to highlight is that the Qur'an contains between its pages deep and surprising glimpses which are waiting to be discovered.

BIBLIOGRAPHY AND NOTES

1. The introduction is written by ELSAKAAN & LONGO. Pp. 923-932 are written by ELSAKAAN. Pp. 932-935. According to the Islamic traditions, the revelation of the Qur'an began in 610 when Prophet Muḥammad was 40 years old.
2. Religious scholars ('ulamā'), whose role was to study the Qur'an and the Islamic texts, used to compare the Quranic verses with science in order to approve the correspondence between Islam and scientific facts besides the inimitableness of the Qur'an. In this paper we don't follow these approaches.
3. The verses in English are cited from AL-HILALI, Taqi-ud-Din, Mohammad, *Translation of the Meaning of the Noble Qur'an*. K.S.A., King Fahd Complex, Madinah, [No date], pp. 455-456 (23:12-14).

4. IBN MANZŪR M., *Lisān al-‘arab*. Beirut, Dār Beirut, 2003. It is the most authoritative dictionary of classic Arabic language.
5. Ivi, vol. III, *Naṭafa*.
6. Ibid.
7. MA‘RŪF L., *al-Munğid fī‘l-adab wa‘l-‘ulūm*. Beirut, al-Maṭba‘ah al-kāṭūlikiyyah, 1960, *Nuṭfah*.
8. AL-ṬABARĪ M. I. J., *Gāmi‘ al-Bayān ‘an ta‘wīl ayāt al-Qur‘ān*. Al-Turkī Muḥammad, (eds.), Dar Hağr, 2001, vol. XVII, p. 20.
9. AL-QURTUBĪ A.B., *al-Gāmi‘ li-aḥkām al-Qur‘ān*. ‘Abdullāh al-Turkī (eds.). Beirut, al-Risālah, 2006, vol. XIV, p.313.
10. IBN KAṬĪR, AL-DIMASHQĪ, *Tafsīr al-Qur‘ān al-‘aẓīm*. Sāmi bin Muḥammad, al-Salāmah (eds.), Riyad, Dār Ṭibah, 1999, vol. V, p. 466.
11. Actually, the comment of Ibn Kaṭīr is the reflection of a very important Quranic verse that says: “So let man see from what he is created (5) He is created from water gushing forth (6) Proceeding from between the backbone and the ribs (7)” Qur‘an (86: 5-7).
12. IBN ‘ASHŪR, al-Ṭāhir, M., *Tafsīr al-tahrīr wa‘l-tanwīr*. Tunisi, al-Dār al-tūnisiyya li‘l-nashr, 1984, vol. XVIII, p. 22.
13. Ibid.
14. Ibid.
15. IBN ‘ASHŪR, *Tafsīr*, ref. note 12, p. 23.
16. Actually, the prevailing interpretation is the first one, supported by a Hadith (though its reference is weak) in which the Prophet Muḥammad gives his men this advice: “Choose the best for your *nuṭfah* and marry compatible women”. AL-QAZWĪNĪ, Ibn Māğah, *Sunnah Ibn Māğah*. Ch. of Marriage, vol. III, book 9, hadith no. 1986. Hadith narrated by ‘Ā‘isha and its reference is weak. The hadith is available on <http://sunnah.com/urn/1320450> (Last access 20/10/2015 at 15.30).
17. The verses in English are cited from AL-HILALI, *Translation*, ref. note 3, p. 803 (76: 2).
18. In the specialized terminology of modern biology *amshāğ* indicates the spermatozoa and the ovum.
19. There is a linguistic debate about this word. For more information see IBN MANZŪR, *Lisān*, ref. note 4, vol. III, *Mashağa*.
20. IBN ‘ASHŪR, *Tafsīr*, ref. note 12, vol. XIX, pp. 373-374. As we said *amshāğ* in the specialized Arabic lexicon of contemporary biology indicates the spermatozoa and the ovum. And this is favorable for the last interpretation of *nuṭfah*, cfr. IBRĀHĪM, Shawqī Aḥmad, *Aṭwār al-khalq wa ḥawās al-insāna*, Cairo, Dār al-fikr al-‘arabī. 2001, p. 48.

21. IBN SĪNĀ, Abū ‘Aliyy al-Ḥusayn Ibn ‘Aliyy, *al-Qanūn fī l-Ṭibb*. Muḥammad Amīn (eds.), Beirut, Dār al-kutub al-‘ilmiyyah, 1999, vol. II, p. 756.
22. Avicenna’s quotations are translated from Arabic into English by Nesma Elsakaan.
23. Avicenna uses the same word when he talks about woman sexual fluids. However, in *Lisān al-‘Arab maniyy* means only the sperm.
24. IBN SĪNĀ, *al-Qanūn*, ref. note 21, p. 756.
25. In the excerpt which is cited in note 21, Avicenna uses the word *maniyy* to express the sperm.
26. AVICENNA, *The Canon of Avicenna*. GHERARDUS C. (trans. of), 1595, *Liber III, Fen XXI*, cap. II, p. 921, lines 53-57.
27. BAUSANI A., *Il Corano*. Milano, Rizzoli, 2010, p. 247 (23:13).
28. AL-HILALI, *Translation*, ref. note 3, pp. 455-456 (23:13).
29. *The Qur’an English meanings*. Jeddah, Ṣaḥeeḥ International, al-Muntadā al-Islāmī, 2004, p. 327 (23:12).
30. SHAWQĪ, *Aṭwār*. ref. note 20, pp. 46-47.
31. Ivi, pp. 48-49.
32. There is more than one Quranic verse that talks about this stage. Besides, in the verse that we cited ‘*alaqah* is singular, while in the following one it is plural: “Read! In the name of your Lord Who has created (all that exists), He has created man from ‘*alaqah*” Qur’an (96:1). According to the Islamic tradition, this is the first verse revealed to Prophet Muḥammad. The verse is the first of the 96th sura of *al-‘Alaq* (The Clot).
33. IBN MANZŪR, *Lisān*... ref. note 4, vol. II, ‘*alaqa*.
34. IBN KAṬĪR, *Tafsīr*... ref. note 10, p. 466.
35. AL-ṬABARĪ, *Ḡāmi’*... ref. note 8, p. 21.
36. IBN SĪNĀ, *al-Qanūn*... ref. note 21, p. 757.
37. Ibid.
38. Ibid.
39. AVICENNA, *The Canon*... ref. note 26, p. 921, lines 29-30.
40. Ivi p. 921, lines 61-63.
41. AL-ṬABARĪ, *Ḡāmi’*... ref. note 8, p. 21.
42. Unlike Avicenna, Shawqī thinks that ‘*alaqah* is the embryo’s second phase. “The cells of the *nutfah* begin to divide [...]. After that it attaches and penetrates the uterine wall. Thus it becomes ‘*alaqah* which takes nutrients from mother’s bloodstream” (The quotation is translated by Nesma Elsakaan). See SHAWQĪ, *Aṭwār*... ref. note 20, p. 56. Furthermore, he states that ‘*alaqah* may allude to the spermatozoa, which is similar to the leech in both form and

movement. So the word 'alaqah could be allegorical. But we don't agree with him as the spermatozoa already transformed and got mixed with female semen to form the *nutfah*.

43. IBN KAṬĪR, *Tafsīr*... ref. note 10, p. 466.
44. IBN MANZŪR, *Lisān*... ref. note 4, vol. III, *maḍagha*.
45. Ibid.
46. AL-QURṬUBĪ, *al-Ġāmi'*... ref. note 9, p. 313.
47. IBN SĪNĀ, *al-Qanūn*, ref. note 21, p. 757.
48. BAUSANI A., *Il Corano*... ref. note 27, p. 247.
49. GERARD of Cremona translates *mudgha* into Latin as *sodalitas*, perhaps in reference to its nature no more fluid and liquid as the one of 'alaqa. Cfr. AVICENNA, *The Canon*... ref. note 26, p. 921, lines 29-31.
50. SHAWQĪ, *Aṭwār*... ref. note 20, p. 56.
51. Ibid.
52. IBN MANZŪR, *Lisān*... ref. note 4, vol. I, *tumma*.
53. Ivi, vol. II, *fa*.
54. GIORGIANNI F. (ed.), *Ippocrate. La natura del bambino dal seme alla nascita*. Palermo, Sellerio, 2012, p. 40.
55. CAMPBELL D., *Arabian Medicine and its Influence on the Middle Ages*. London, Routledge, 2013 [1926].
56. GIORGIANNI F., *La traduzione araba del De Natura Pueri ippocratico*. In: GAROFALO I., FORTUNA S., LAMI A., ROSELLI A., *Sulla tradizione indiretta dei testi medici greci: le traduzioni*. Atti del III Seminario internazionale di Siena - Certosa di Pontignano 18-19 Settembre 2009, Pisa - Roma, Fabrizio Serra Editore, 2010, pp. 69-90.
57. GIORGIANNI F., *La traduzione*... ref. note 56, p. 73.
58. GIORGIANNI F. (ed.), *Ippocrate*... ref. note 54, pp. 51-56.

Correspondance should be addressed to:

ELSAKAAN Nesma, Dipartimento di Scienze Umanistiche, Università di Palermo, Viale delle Scienze, edificio 12, Palermo - Italia
nesma.elsakaan@unipa.it