



AL KITAB
The Renaissance Project



Part 3

Life

Mohamed Al Qadi

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Introduction

Of all the things in this world, nothing poses a bigger enigma than the concept of life. What is it!? A series of chemical reactions? A set of interactions within the cell? Perhaps it is a soul; an element that cannot be touched, cannot be seen, but can be felt. Or is life simply a set of memories and emotions? Experiences that define who we are?

How can something so familiar, so intertwined with our existence, be so strange? How can we not understand what brought us to consciousness? How can we fail to explain what has always been a part of us? Such is the mystery of life... a mystery that seems destined to remain unsolved

In the third and final part of Al Kitab, we will investigate some of the wonderful living organisms that inhabit our world including plants, animals and human beings. We will then compare this third and final component of our world, "Life", to the teachings of the Quran and investigate the similarities and differences between them. How will the Quran fair in this final test?

Mohamed Al Qadi

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

{ سَنُرِيهِمْ آيَاتِنَا فِي الْآفَاقِ وَفِي أَنْفُسِهِمْ حَتَّىٰ يَتَبَيَّنَ لَهُمْ أَنَّهُ
الْحَقُّ ۗ أَوَلَمْ يَكْفِ بِرَبِّكَ أَنَّهُ عَلَىٰ كُلِّ شَيْءٍ شَهِيدٌ }

In the name of Allah, the Beneficent, the Especially Merciful

“We shall show them our signs in the far reaches of the Universe and **in their own selves**, until it becomes clear to them that it is the truth (*the Quran*). Does it not suffice your Lord that He is a witness of everything?”



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Chapter 12

Birth



Mohamed Al Qadi

Human Creation

I can hear it beating ever so faintly. I can feel its every thump, listen to its every thought, and eventually, after a few minutes of this, I can start seeing its future; what a bright future indeed for I will make sure of it.

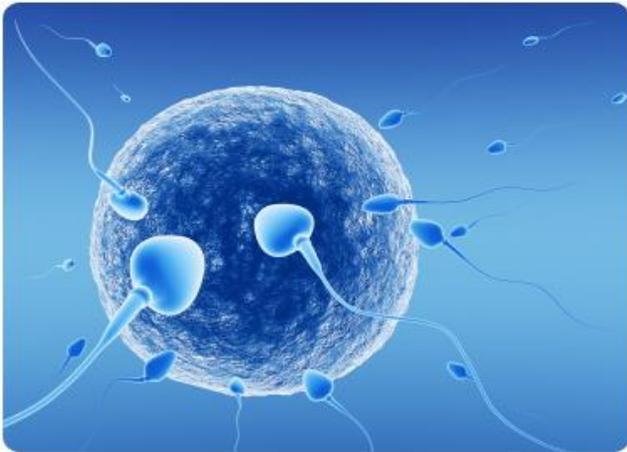
Of all the great miracles of this world, from the staff that splits the seas to the touch that heals the blind, nothing compares to the greatest miracle of all - the unborn child - something some of us are fortunate to experience in this lifetime.

As I place my hand on my sister's belly, I am left in awe. And how can I not be? A few months ago, this child did not exist. Then suddenly, a living being, a soul is living within the confines of her womb. In a few months, this child will fully form and come into this world. He will be given a name "Omar", and he will show so much promise at such a young age that I cannot help but feel optimistic about the future of my family.

One day, Omar will hopefully have children of his own. When that day comes, I will always marvel at the thought that this grown man was nothing more than an embryo at one point in time. At one point in time, he did not even exist.

How does this phenomena come to be? How does a fully grown man develop out of nothing? In the following chapter, we will review some of the major stages of fetal development and compare established scientific findings to a wide array of verses in the Quran that describe this process. The result of this comparison continue to shock many readers to this day and is one of the most cited evidence of alignment between religion and science.

Figure 12.1: Fertilization



The amazing story of human creation starts with the release of semen during reproduction and the subsequent fertilization of a female's egg.

Human semen is a mixture of compounds released by different glands and parts of the body (see figure 12.2). It includes elements such as amino acids, fructose, and sperm. The latter of these components is the most important as it carries the genetic information of the male counterpart; a total of 23 chromosomes.

Figure 12.2: Semen Content⁽¹⁾

Gland	Contribution %	Key Components
Testes	2-5%	Sperm
Seminal Vesicle	65-75%	Amino Acids, Fructose, Citrate, etc
Prostate	25-30%	Enzymes, Zinc, Citric Acid, etc
Bulbourethral Glands	> 1%	Galactose, Mucus

Did you know?

Human beings have a total of 46 chromosomes which carry our genetic information. We inherit 23 chromosomes from each of our parents. The 23rd chromosome of the father is responsible for determining the sex of the baby

Notes (1):Harvey, Clare (20 November 1948). "Relation between the Volume and Fructose Content of Human Semen", Canale D, Bartelloni M, Negroni A, Meschini P, Izzo P.L, Bianchi B, Menchini-Fabris G.F (December 1986). "Zinc in human semen", Other

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An average of 200-500 million sperm cells are released in a sample of human semen, and if reproduction is to be successful, only **one** of these millions of sperm cells will eventually make its way into the female's egg and fertilize it. Once it does so, no more sperm cells are allowed into the egg.

Did you know?

Twins arise due to fertilization of two eggs with two separate sperms that successfully implant in to the uterus or by the division of a zygote into two separate entities

The unification of sperm and egg leads to the creation of the zygote which contains all 46 chromosomes from both parents. A new human being holding genetic information from both parents is beginning to form.

Figure 12.3: Fertilization



One Sperm, One Egg – The Science

Penetration/contact between sperm and egg cell induces cortical and zona reactions (through the release of lysosomal enzymes from cortical granules) that alter the properties of the egg and as such prevents polyspermy (more than one sperm fertilizing the egg).

Figure 12.4: Early Stage of Development

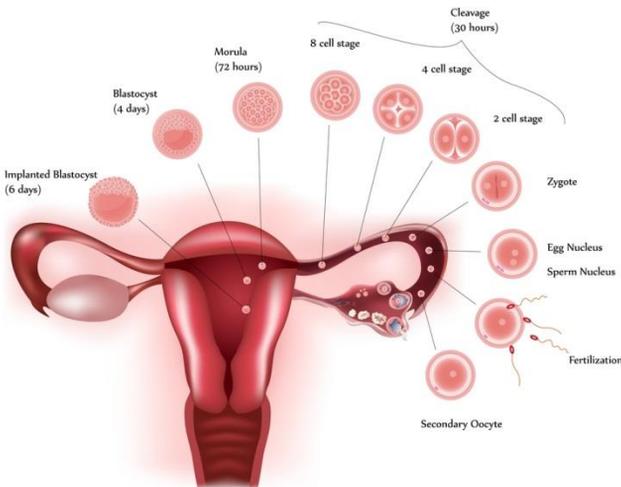
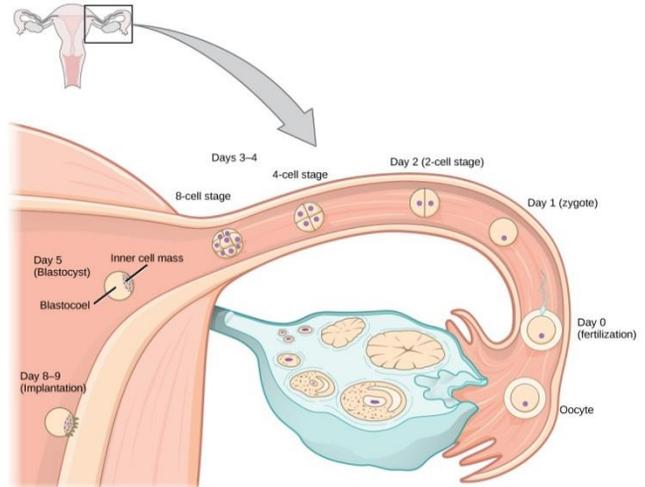


Figure 12.5: Implantation



Following unification of sperm and egg, the zygote, now called a blastocyst, starts to multiply and grow and moves towards the woman's uterus where it literally implants itself into the uterus's walls (see figures 12.4 and 12.5). The implanted embryo clings to the uterus deriving metabolic fuel and raw materials from the nutrient rich cell wall.

Implantation is a critical step for the continuation of the pregnancy. Failure to do so will result in miscarriage. Once the embryo is implanted, it develops further in a series of complex stages that are too detailed for our purpose until the process of gastrulation sets in (see Gastrulation – The Science Page 6) which accelerates cell development and differentiation in specialized tissue. During this, growth of the embryo will eventually give rise to an observable specimen that can be seen by the eye.

Human Creation

Initially, it looks like a small mass of flesh at the center; one that cannot be distinguished as a human being (see figures 12.6 -12.7). As it develops further as a consequence of gastrulation, clear changes occur:

Figure 12.6: Early Development Images

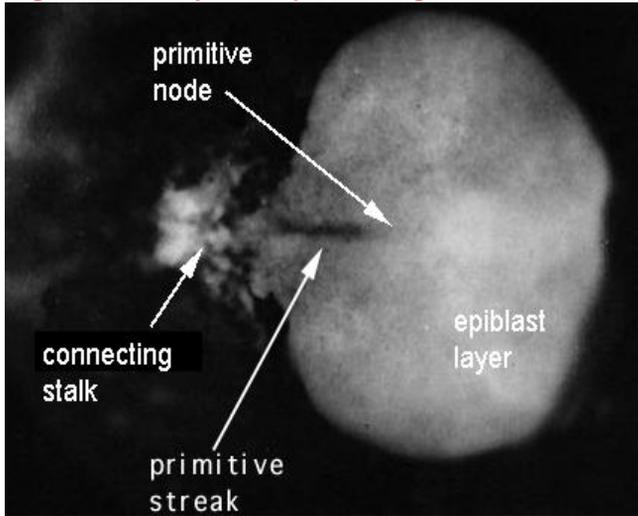


Figure 12.7: Early Development Images Continued



Human functions and features start to form in progressive stages which are well described today. Cartilage begins to form from the mesenchyma cells inside the initial mass which subsequently develops into bones which are wrapped and covered by muscle. The mesenchymal cells are also the source of lymphatic and cardiovascular tissues. Further specialized tissues namely the nervous and digestive tissues, as well as the eyes, ears, limbs, sex's organs and even the fingerprints all form within a few months of the pregnancy

Figure 12.8: Human Embryo 8th Week



Gastrulation – The Science

A process that establishes all three germ layers responsible for forming tissues and organs. The three germ layers are:

- (1) Ectoderm: Develops the nervous system, sensory epithelium of ears, nose, and eyes and several different glands
- (2) Mesoderm: Responsible for the formation of muscle tissue, bones and cartilage, dermis of skin, urogenital system (kidneys, etc) and cardiovascular system
- (3) Endoderm: forms the Gastrointestinal tract, epithelial lining of respiratory system, etc

By the 8th or 9th week, the embryo becomes increasingly distinguishable and some of its main features can be seen (see figure 12.8).

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It is interesting to note that during the early stages of a pregnancy, certain parts of the developing infant will look out of proportion. For example, the head is sometimes a lot bigger than the rest of the body. This however, doesn't remain so and eventually, the proportions resort to a normal configuration.

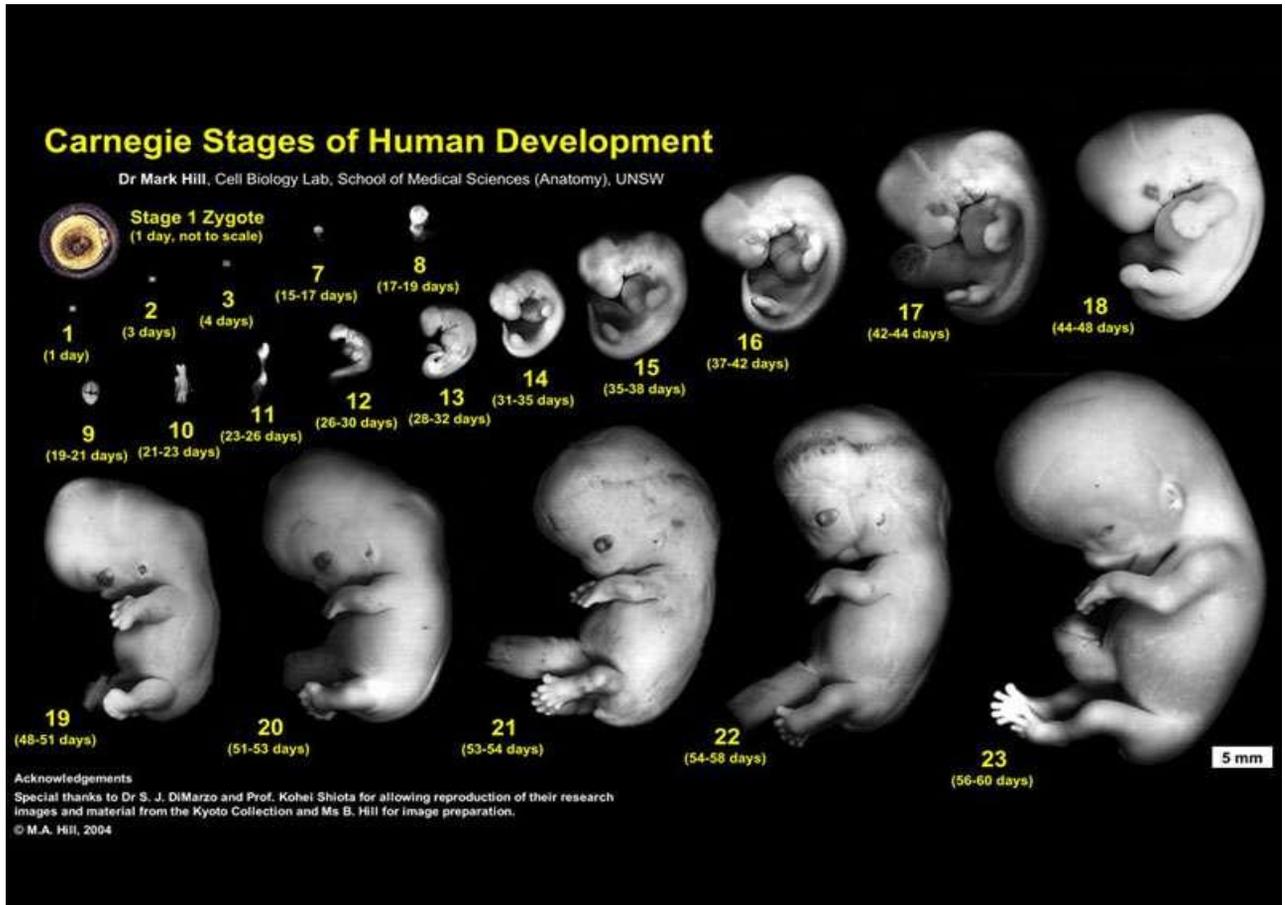
After 3 months of pregnancy, the embryo becomes a human fetus (by definition), continues to grow in size, and is finally delivered, usually by the 9th month.

With that, the miraculous process that I have overly simplified comes to an end (a proper description would need an entire book!) and a new born comes to be, who only 9 months before was just a fusion of sperm and egg. Now, let us investigate the Quran's description of this complex process and determine whether the selected verses are in line with scientific findings.

Figure 12.9: 7.5 Week Embryo



Figure 12.10: Stages of Human Development



Human Creation

As we have seen, human creation is a complex process. It follows a number of distinct stages throughout its cycle, starting with the fertilization of the egg by a sperm cell, the subsequent implantation of the newly formed embryo into the uterus's wall, the embryo's rapid growth, and the eventual development of bones, muscles, organs, limbs, and even finger prints after the onset of gastrulation. Let us now investigate the claim that this process was detailed in some of the Quran's various verses.

1 Difference between Creation of Adam and Human Reproduction – A Note

Before investigating this claim, it is necessary to note that the Quran mentions two forms of human creation; the creation of Adam and the subsequent creation that results from sexual reproduction. It is important to distinguish the two when investigating scientific facts regarding the latter.

For example, you will find many verses that state that human creation started from earth, soil, mud, or clay, depending on the translation. These instances refer to the creation of Adam and are not the subject of this Chapter. What concerns us here is the human reproduction element which starts with the release of semen during reproduction.

2 Semen and Sperm – A Distinction

As mentioned previously, semen is a mixture of various compounds and liquids such as amino acids, fructose and sperm cells. It is the sperm cell that fertilizes the egg and carries the male's genetic information. It is worthy to note that the Quran makes this distinction:

Creation of Adam - Soil, Clay and Mud

The Quran makes countless references to the role of earth, soil, clay, or mud in the creation of Adam. However, interpretation of such verses differs:

Traditional authors for example have proposed that Adam was created directly from such material. Others have cited that references to earth, mud or soil supports evolution theories. Yet there is a third group who do not accept a literal translation; it is said that the reference to earth, soil, mud or clay reflects the fact that human beings were created from the same elements that make up these materials i.e. human beings and soil have very similar chemical compositions.

Whichever interpretation is correct, the verses in the Quran can easily coincide with modern scientific knowledge.

ماء مهين (Ma Mahin) – A Definition

“Ma” is generally used to describe water (used here to describe liquids). “Mahin” means “despised or disgraceful”. Semen is called Ma Mahin and is thus described as a disgraceful liquid. This is not because of its nature, but because it is emitted from the urinary tract, using channels that are used to pass urine.

”ثُمَّ جَعَلَ نَسْلَهُ مِنْ سُلَالَةٍ مِّنْ مَّاءٍ مَّهِينٍ“^(32,8)

(Allah) made his (man's) progeny from the extract of semen (Ma Mahin)

Here, the author of the Quran states that a man's offspring is made from the extract / the best part of human semen; a clear indication of the author's knowledge that semen is made of different components and that only one of its components (sperm cells⁽²⁾ - an extract or the best part of semen) is responsible for fertilization.

Notes (2): To describe “Sperm”, the Quran often uses the word “Nutfah” – This is because there is no term that is strictly appropriate. Nutfah is used to describe what remains at the bottom of a bucket that has been emptied out; a very small quantity of liquid

Human Creation

3 Stages of Embryonic Development

But the Quran doesn't stop here; it also states that an embryo develops in various stages. More importantly, it goes on to detail some of them. This is nothing short of incredible. To the best of my knowledge, the realization that the human embryo develops in stages was not discussed and illustrated until the 15th century⁽³⁾. Furthermore, the staging of human embryos was not described until the 20th century by *Streeter* (1941), which was later replaced by a more accurate system proposed by *O'Rahilly* (1972).

On how babies develop in different stages, The Quran mentions:

“يَخْلُقُكُمْ فِي بُطُونِ أُمَّهَاتِكُمْ خَلْقًا مِّنْ بَعْدِ خَلْقٍ” (39,6)

“He creates you in the wombs of your mothers, one creation after another”
 “He makes you in the wombs of your mothers in stages, one after another”

On the different stages of embryonic development:

ثُمَّ خَلَقْنَا النُّطْفَةَ عَلَقَةً فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً فَخَلَقْنَا الْمُضْغَةَ عِظْمًا فَكَسَوْنَا الْعِظْمَ لَحْمًا ثُمَّ أَنشَأْنَاهُ خَلْقًا آخَرَ فَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ (23,14)

Then We fashioned the small quantity of sperm (nutfa) into something which clings (alaqa), and We fashioned something that clings into a chewed lump of flesh (mudga), and We fashioned the chewed flesh into bones and we clothed the bones with intact flesh; thereafter We developed it into another creature. So, glorious is Allah, the Best of the creators!

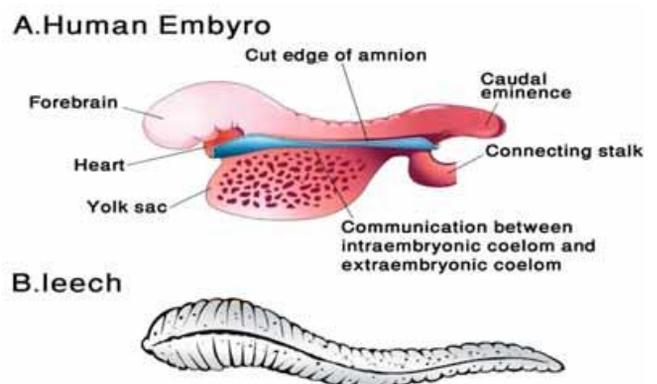
The first verse states that embryonic development is the subject of many consecutive stages. The second describes these stages with incredible accuracy:

The author starts with sperm (nutfah) as the first step in human creation. Next, this sperm cell is used to create a “thing that clings” (alaqa)⁽⁴⁾. As we have seen, after the sperm fuses with the egg to form a zygote, the zygote grows and then literally implants itself into the uterus wall, clinging to it as described by the Quran. This implantation is repeated in various different verses⁽⁵⁾.

There are some who point out that the word (Alaqa) can also be used to describe a leech. Even if such an interpretation was to be used, it is still an accurate one, for the implanted embryo, as we have seen, clings to the uterus walls like a leech, absorbing the nutrition from the mother's blood for survival and growth (see figure 12.11).

Next, the implanted embryo is “fashioned” into “chewed flesh” (mudga). It is a crude description, yet one can clearly see from figures 12.12 and 12.13 how the embryo looks like chewed flesh before the full impact of the process of gastrulation sets in.

Figure 12.11: Embryo and Leech Illustration



Notes (3): Aristotle had suggested that chick embryos developed in various stages but his accounts were inaccurate

(4): The origin of the word alaqa comes from alaq which means “something which clings”. Translations of “blood clot” should be disregarded

(5): The first 2 verses communicated to the prophet Mohamed were: “Read! In the Name of your Lord, Who has created, Who created man from something which clings”

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Figure 12.12: Human Embryo Illustration



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Figure 12.13: Human Embryo Image



Next, bones are formed from this “chewed flesh” and are covered by intact flesh (lahm). Intact flesh could signify muscle tissue here which covers the bones and eventually, a new human being is fully created and enters this world.

To the reader, I now ask a question: how could one know all this in 640AD? Can this really be the result of chance? Someone’s biased interpretation? Can one really stop doubting the divinity of the Quran after reading this verse? The author, it seems, provides us with an answer:

يَا أَيُّهَا النَّاسُ إِن كُنْتُمْ فِي رَيْبٍ مِّنَ الْبَيْعِ فَإِنَّا خَلَقْنَاكُمْ مِّن تُرَابٍ ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِن عَلَقَةٍ ثُمَّ مِن مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ لِّنُبَيِّنَ لَكُمْ
وَنُقَرِّرُ فِي الْأَرْحَامِ مَا نَشَاءُ إِلَىٰ أَجَلٍ مُّسَمًّى ثُمَّ نُخْرِجُكُمْ طِفْلًا ثُمَّ لِنَبْلُغُوا أَشُدَّكُمْ وَمِنكُمْ مَّن يُّتَوَفَّىٰ وَمِنكُمْ مَّن يُرَدُّ إِلَىٰ أَرْذَلِ الْعُمُرِ
لِكَيْلَا يَعْلَمَ مِن بَعْدِ عِلْمٍ شَيْئًا (22,5)

O mankind! if you are in doubt about the Resurrection, (consider) that We created you from soil / dust (Adam), then out of sperm then out of a leech-like structure (thing that clings), then out of chewed flesh, partly in proportion and partly out of proportion, in order to show you. And We cause what We will to remain in the wombs for an appointed time, and afterward We bring you forth as infants, then (give you growth) that you attain your full strength. And among you there is he who die (young), and among you there is he who is brought back to the most abject time of life, so that, after much knowledge, he knows nothing.

Reading the verse, it seems that the author has anticipated some of the skepticism that may be faced in our age and seeks to address these doubts by reassuring the reader that only a divine source could have held such knowledge at such an ancient time. In the verse, Allah states that if you are in doubt of judgment day or the divinity of the Quran then know that we have created you from soil (Adam) then from sperm, then from an implanted embryo (a thing that clings), then fashioned you into flesh, both in proportion and out of proportion then made you a human being. This represents yet another accurate description of embryonic development with one slight difference: it is mentioned that chewed flesh is created partly in proportion and partly out of proportion.

As previously discussed in the chapter, we know how certain parts of the embryo appear to be out of proportion during embryonic development with what is latter to become the individual, while others remain in proportion.

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One important note to make here is that the verse could also be translated as piece of chewed flesh, partly formed and partly unformed (rather than reading: chewed flesh is created partly in proportion and partly out of proportion). This is still in line with scientific discoveries as Dr. Keith Moore explains:

“This part of Sura 22:5 seems to indicate that the embryo is composed of both differentiated and undifferentiated tissues. For example, when the cartilage bones are differentiated, the embryonic connective tissue or mesenchyme around them is undifferentiated. It later differentiates into the muscles and ligaments attached to the bones.”

In other words, whatever translation one adopts, the description is in line with scientific facts that have only recently been established.

4 Formation of Sex Organs

In addition to all of the above, other verses in the Quran also refer to other facts about human creation such as the formation of sex organs during embryonic development as seen below:

On the formation of sex organs:

أَلَمْ يَكُ نُطْفَةً مِنْ مَنِيٍّ يُمْتَأَىٰ (٣٧) ثُمَّ كَانَ عَلَقَةً فَخَلَقَ فَسَوَّىٰ (٣٨) فَجَعَلَ مِنْهُ الذَّكَرَ وَالْأُنثَىٰ (٣٩) أَلَيْسَ ذَٰلِكَ بِقَدِيرٍ عَلَىٰ
أَنْ يُحْيِيَ الْمَوْتَىٰ (٤٠)
(75, 37-40)

Was he (man) not a Sperm (nutfah) from semen emitted (poured forth)? (37) Then he became an 'Alaqa (a thing that clings / leech); then (Allâh) shaped and fashioned (man) in due proportion. (38) And made him in two sexes, male and female. (39) Is not He (Allâh Who does that), Able to give life to the dead? (Yes! He is Able to do all things). (40)

5 Conclusion

Embryonic development is one of the most referenced natural and scientific phenomena in the Quran. Looking at these scattered verses, the observations and predictions made on the matter have been extraordinary. They provide the best support to the claim that science and Islam are not at odds but instead, compliment one another to a great degree.

As I write the final words for this chapter, I cannot help but marvel at the knowledge expressed in this document and wonder what other possible explanation can there be? A question that is destined to yield an unsatisfactory answer.

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Photo and Figure Sources

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Editors

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