The Relevance of Science for the Protection of the Unborn

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Samevatting

Daar is nie altyd ooreenstemming rakende die begrensing van 'n Christelike apologetiese benadering by die teenkanting van aborsie nie, nóg bied die wetenskap 'n universele oplossing in hierdie verband. Nietemin moet 'n Christelike standpunt teen aborsie die insette van beide die biologiese en mediese wetenskap insluit as 'n weg tot opbouende, diskursiewe deelname wat deur uiteenlopende verteenwoordiging verryk moet word. Gevolglik kwalifiseer hierdie artikel die relevansie van die wetenskap vir aanwending deur 'n Christelike anti-aborsieapologetiek, en beklemtoon dit die vermoë van die wetenskap om 'n platform te voorsien vir inklusiewe debat, wat sodoende die verwagtinge van rasionaliteit en onpartydigheid sal verbeter. Deur hierdie artikel word ook argumenteer dat bevrugting 'n noodsaaklike faset van die wetenskaplike debat ter bevordering van die beskerming van die ongeborene uitmaak. Dit is veral relevant vir Suid-Afrika, waar regsvakkundige gesprekke rakende aborsie nie sy volle juridiese potensiaal bereik het nie, iets waarvan veral die kerke kennis moet neem.

1. Introduction

According to Colson, when advancing the biblical perspective in public debate, the biblical truth ought to be interpreted in ways that appeal to the common good. Therefore, although we believe in Scripture as God's inerrant revelation, all arguments do not have to be derived from Scripture. Colson states the following example: When it is argued in state legislatures that criminals should be required to pay restitution to their victims, one does not say, "Do this because the Bible says so." Rather, the argument must be presented as sound public policy, arguing that it makes sense to give back what a person has taken, to restore what a person has destroyed

(Colson, 2007:134). This necessitates a consideration of 'grounds of commonality' or 'consensus'. Although the problem of discourse between persons of disparate views merges as the problems of presupposition and common ground, the answer is to find some common ground: "a principle neutral in the sense that all participants will accept it as a criterion of either the true, the good, or both" (Smolin, 1988:360). But this common ground or 'neutral principle' is not so easily attained. Take for example the right to life and what it is supposed to represent.

> To talk of the sanctity of life, for example, presupposes that one knows (1) what life is, and (2) what makes for its sanctity. More importantly, to talk of the rights of persons presupposes that one knows what counts as a person (Engelhardt, 2000:77).

Although jurisprudential and ethical scholars provide proposed answers on what 'life' and 'personhood' entail they fail to reach commonality regarding when human life or personhood begins (or whether 'personhood' should be included in the 'life' debate). What certainty there is in law regarding the legal status of the unborn[1], changes with the matter in question and ranges from conception, through the end of the first trimester of pregnancy, to the point of viability, the moment of birth and sometimes only after birth (Handler, 1994:308). According to Warren, it is no surprise that there is no single (or multiple) necessary and sufficient condition for the proper application of the ordinary concept of life due to subjective views, cultural relativism and lack of debate of a constructive, well-researched and informed nature (Warren, 1997:26).

Whether 'life' is the applicable concept to work with is also open to various views (both in religious and non-religious circles). According to Hauerwas, when people start talking about abortion, the first thing they discuss is "when *life*[2] begins". This is because people think that the abortion issue is determined primarily by the claims that *life* is sacred (Hauerwas, 1991:13). This implies that the reliance on life in order to oppose abortion could be that 'life' is perceived as a 'common measure'. The question as to what life is, is not that simple, whether it concerns debate in secular or Christian circles. In the words of Durand: "Any rational scientist who places a sample of fresh semen under a microscope will acknowledge that life begins before conception as sperm cells are clearly alive and active prior to fertilization" (Durand, 2006). Does the concept of life not also pertain to cells, animals,

1 The authors are of the opinion that the 'entity from the period of fertilization' is a human being, hence the reference to 'unborn'.

2 The authors' emphasis.

and biological organisms? In addition to, and inextricably linked to, debate on 'life' in both a jurisprudential and a moral context, is the view that 'science' is the mediating factor in solving the question as to what 'life' is, and consequently viewed as shedding light on the status of the unborn. However, just as in the case of the determination of what is meant by 'life', the dilemma is that the facts of science in the context of determining the status of the unborn are understood differently by Christians and non-Christians (and even between Christians themselves) so that they are not neutral (Pratt, 1979:59-60). In fact, a Christian anti-abortion apologetic which relies solely on life from a scientific point of view, exposes itself to a range of counter arguments which lead to circular reasoning and unexplainable axioms of departure. Also, by relying solely on science in the determination of foetal status, one becomes a prisoner to scientific naturalism which defines man in terms of physical and biological functions, "stripping man of his specifically human qualities as a person" (Taylor, 1966:272). Consequently, we find a reduction of man to the level of nature, regarding man as a mere object, as 'nothing' but a part of nature (Taylor, 1966:272).

Bearing in mind the complexities associated with 'consensus' pertaining to life (its relevance, origin as well as end) and science, this article is about the relevance of science in order to assist in the clarification not only of the 'life' issue, but also of the promotion of science as 'an important factor' (albeit not in an exclusive or absolute sense). Consequently it is proposed that the Christian can apply the 'scientific' debate in showing the pro-choice camp their arbitrary and unconvincing approach. This is not about proving the perfectness of 'science' as a measure towards determining the status of the unborn, but about indicating the more-irrational approach of those who believe that birth provides the keys to life and protection. In fact, many, even from the pro-choice camp, use science to determine the beginning of life or personhood, for example the popular 'viability test'.[3] It is not strange that a scientific approach includes numerous opinions regarding the point in time from when the zygote, embryo, and foetus should be protected, for example, the capacity of the foetus for feeling or effect (sentience), the ability of the unborn to carry on brain activity (psychophysiological unity), the ability of the unborn to live independently from the mother (viability), the fusion of the egg and sperm cell (fertilisation), the implantation of the fertilised cell in the uterus (conception),

3 Viability is the unborn's ability to survive without the 'assistance' of his or her mother, and the viability measure is a popular threshold beyond which society in general tends to add some value to the unborn.

and even birth. Be that as it may, these options should not negate the relevance of science, and this article includes the argument for the most rational of the said scientific options, namely fertilisation.

Smit observes that the general pro-life stance can be characterised as a family centred approach based on the conviction that God is Creator of all life and that life is sacrosanct. As part of this view, Smit lists more specific characteristics of this pro-life stance, one of them being the view that "life begins at conception and deserves protection from the moment of conception. At conception the genetic code for an individual is finalised. What happens hereafter is a continuous process where nothing is added to increase the moral status of the human embryo" (Smit, 2000:89). This is reflective of Colson's postulation that when advancing the biblical perspective in public debate, the biblical truth ought to be interpreted in ways that appeal to the common good. It is in this context that the need for science in countering abortion needs to be understood. What is known in the science of the unborn can help us to be more precise about just what sort of being the unborn is during the course of its coming into being (Flower, 1992:451). Matthew-Roth (Harvard University Medical School) states that: "Our law, one function of which is to help preserve the lives of our people, should be based on accurate scientific data" (Alcorn, Internet). Science, for purposes of this article, is not understood as an absolute measure in understanding life, and one is well aware of the dangers regarding an absolute approach to science as a measure in the debate on the legal status of the unborn. In this regard, Carter states that in jurisprudential discussion such as the issue pertaining to the legal protection of the unborn, proponents are uneasy in stating the chain of reasoning that has led them to their moral conclusions. In other words, science, according to Carter, is being used to buttress a claim that proponents have actually reached on some other ground. Consequently science is tried, which perhaps seems more 'objective'. In the words of Carter: "But that is the other side of scientism's trap: it persuades us that our strongest moral convictions are useless in public debate unless we can repackage them as the conclusions of natural science. Scientism thus betrays a lack of faith in our ability to conduct dialogues on moral questions." According to Carter, this then is a way in which we abandon civility when we go to scientism: "we manifest a mistrust of public moral conversation, and we demonstrate a disbelief that our opponents might have anything useful to say. When democratic dialogue becomes infected with such mistrust and disbelief, the conversation simply stops" (Carter, 1998:206). One must pay heed to the warning by Carter, and the authors are fully aware of the risk in trying to conform to a language of 'the world'. On the other hand,

Smit states that formulating a Christian approach to the problem of abortion is no easy task, and that it would be pretentious to say that there is a common Christian view on the issue. Smit, however, adds that there are some perspectives that could serve as a more comprehensive paradigm for looking at the problem (Smit, 2000:93). In this regard, it is the contention of this article that the need for a Christian apologetic against abortion based on science forms *part* of this 'comprehensive paradigm for looking at the problem', which in no manner deviates from other insights in the said comprehensive paradigm. A central motive in a biblical apologetic against abortion would be to determine according to Scripture what God's view on the subject is. This necessitates, for example, an in-depth discussion on the unborn as the 'Image of God'. However, Frame states that "scientific propositions, *taken together with* the teaching of Scripture, may indeed cast light upon our questions". Scientific information is always valuable in assisting the believer to understand his or her situation and thereby to see the relevance of Scripture to that situation (Frame, 1988:102-103). Therefore, this article provides perspectives of assisting inclusive debate on the jurisprudential status of the unborn, with special emphasis on the application of 'science'.

There is much written in the context of abortion and science without the contributors clearly stating what is meant by science in the first place. For purposes of this article, science refers to that collection of biological and medical knowledge dealing with the form, nature and composition of that biological 'entity' which is formed at fertilisation, spanning the period between fertilisation and birth, as well as that biological and medical knowledge surrounding the said entity, be it before fertilisation or after birth, and whether in a direct investigative approach (for example, empiricist) or an indirect one (for example, philosophical) pertaining to the said entity. The contributions of science for the development of jurisprudential debate on the unborn are especially relevant to the South African context where discussions of the status of the unborn have not yet been heard by the Constitutional Court. In postulating science as a factor which will enhance inclusivity on the issue, this article prepares insights as to ways in which both the church and other role-players can sit around the table and come to an amicable solution.

2. Science and the right to life

Arguments based on science reflect a popular approach to the anti-abortion claim that a 'foetus' is a person entitled to legal rights, because these arguments provide what appears to be an objective basis for arguing that a

foetus is a *distinct human life* from the moment of fertilisation (Shaffer, 1994:74-75). Understanding the meaning of 'life', 'being alive' and 'human' is substantially enhanced by scientific knowledge. Science indicates that the unborn is more than merely a living 'organism' (De Freitas, 2005:140). Life cannot be defined or disproved scientifically, but it can serve as an important measure adding value to the legal protection of the unborn (Ibid., 135) – with a large section of the non-religious sphere in fact in agreement with this. According to Block and Whitehead, new medical technology will solve the abortion problem: but this will be only if pro-lifers work morally and philosophically to pave the way for this eventuality. From a pragmatic point of departure, the only way to resolve this vexing question in a way that will satisfy both sides – at least partially – is to rely on new medical technology (Block *et al.*, 2005:16). Bowes states that the beginning of life is conception and that "this straightforward biological fact should not be distorted to serve sociological, political, or economic goals" (Alcorn, Internet). Many pro-choice advocates have adapted and manipulated scientific facts by applying the viability approach to the legal status of the unborn, hereby implicating the beginning of life.

The concept of 'life' is commonly used in legal issues connected with abortion (Handler, 1994:485), and there are specific positive glimpses pointing to the enhancement of life by means of science when concerning contemporary jurisprudential findings regarding the legal status of the unborn. In the *Roe v. Wade*[4] decision, a 'background' sensitivity regarding the unborn is also to be witnessed, which was largely directed by scientific inclinations. This took the form of Justice Powell's eleventh-hour intervention, Justice Powell having urged that the Texas case not be decided on vague grounds, but on the central merits of the claims. More specifically,

4 410 US 113. *Roe* explicitly refused the use of science and biology in the determination of the legal status of the unborn, only to contradict themselves in the end by using the viability approach. The *locus classicus* of the judiciary's approach concerning the validity of abortion almost certainly is the 1973 United States Supreme Court case of *Roe v. Wade*, in which abortion was basically permitted on demand. In 1970 a single pregnant woman who assumed the name of Jane Roe, challenged the Texas statute, the latter requiring that an abortion was allowed only when the life of the mother was endangered. She argued that the statute unconstitutionally violated her right of privacy. In the US Supreme Court, Justice Blackmun delivered the majority opinion emphasising the fact that the right of privacy, whether it be founded in the 14th Amendment's concept of personal liberty and restrictions upon state action or in the 9th Amendment's reservation of rights to the people, was broad enough to encompass a woman's decision whether or not to terminate her pregnancy. Although the judge went on to state that this right was not absolute, it was made clear that such an application pertaining to the right of privacy was indeed fundamental (Frankowski, 1987:24).

Powell wrote privately to Blackmun (who gave the majority judgment in *Roe*) that drawing the line at viability would be "more defensible in logic and biology than perhaps any other single time". Powell directed Blackmun's attention to the opinion in *Abele v. Markle*[5], which suggested that the state's interest in foetal life would be weightier after the foetus became capable of living outside the uterus (Hunter, 2006:183-184). Judge Ress's dissent in the *Vo v. France*[6] judgment includes the following:

> Historically, lawyers have understood the notion of 'everyone' as including the human being before birth and, above all, the notion of 'life' as covering all human life commencing with conception, that is to say from the moment an *independent existence* develops until it ends with death, birth being but a stage in that development (Mowbray, 2005:176).

This implies the relevance of science, just as in the case of the approach by the German courts regarding the legal protection of the unborn. In the case of *BVerfGE*[7], the court, in its judgment of 28 May 1993, supported a verdict which emphasised that the state had a primary duty to protect 'human life', even before birth (Van Zyl Smit, 1994:311). However, the court made an attempt at reconciling the opposing position by stating that, in spite of the heavy burden which the constitution placed upon the state to protect the unborn, it was permissible, within the first trimester of pregnancy, for the state not to criminalise an abortion when it was conducted after the pregnant woman had been counselled (Ibid., 316). There are therefore substantial judicial indications/gestures which point to the inextricable relationship between 'life' and 'science' in a non-religious jurisprudential climate. In addition, South African legal theorists (not known for their staunch opposition to abortion) writing on the unborn draw the connection between science and the unborn, for example Meyerson refers to the unborn as 'not just being a bit of human tissue', but rather as a 'living organism'. According to Meyerson "the foetus becomes more developed, and particularly as it becomes capable of feeling pain and approaches the point of viability … the reasons for its destruction become intractably disputed" (Meyerson, 1999:56). Naudé opposes the fact that the state could freely allow the termination on demand of a form of biological life with a clear connection to born human life (and which looks very much

5 351 F. Supp. 224 (D. Conn, 1972).
6 5392/00, Eur. Ct. H.R., 8 July 2004.
7 D.1.1 JZ. at 16.

like born human life at some stage) (Naudé, 1999:556).[8] Science is therefore most important in abortion jurisprudence.

But here it is important to look at the credibility of referring to *life as a right*, as this may unfairly eliminate grounds beyond rights and life in countering abortion. Also, the fact that human rights jurisprudence dominates debate on 'life' as qualification of the status of the unborn, requires discussion on how science, alternative to assisting in determining 'life', can play an important role to qualify the unborn as a 'protectable entity'. It is interesting that several authors, both for and against abortion, agree with the fact that the use of human rights alone is irrational.[9] Resorting to the 'right to life' is not necessarily the proper route to following regarding the question of whether the unborn requires protection or not. There is no authoritative answer to the question of whether 'life' is the characteristic that marks off the class of individuals who have inherent value from those who do not (Regan, 1983:241). Why then should we sometimes have reverence for things that are not alive? For example, we would avoid shattering a precious crystal. A crystal is not alive but yet we want to preserve it: so is being alive the necessary condition to having inherent value? (Ibid.) There is no authority for this conclusion. In this regard, it can be argued that science therefore does not necessarily need to assist in the determination of life, and therefore, that it can assist in confirming the importance of allowing protection to an entity, in this case the unborn. This strengthens the relevance of science towards the protection of unborn even more, as the use of science to specifically assist in the clarification of 'life' (for jurisprudential reasons) can be more complex than science having to prove the importance of legal protection of an 'entity' *per se*.

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8 This reminds one of Benson's comment in opposition to the contemporary liberal approach to the status of the unborn by stating: "If the fetus is merely 'tissue', as some would have it, then why should we have any scruples about using … such 'tissue' for the good of society? What reasons can there be (apart from a sentimental feeling or a sense of 'taste') for restricting such research on the unborn? The Medical Research council, in its recently released guidelines, states that it is unwise and unjustified to ban embryo research but that such research should not be allowed on embryos older than seventeen days. One must ask: 'Why the hesitation after seventeen days?' Surely, if fetuses would otherwise be disposed of, they should be used 'for the good of society.' Yet, given that viability is somewhere between five and six months of gestation, or that we may be able to abort up until nine months, seventeen days seems rather frugal, not to say, arbitrary" (Benson, 1990:32). This observation implies that the liberal community does view not only the importance of science, but also the period shortly after fertilisation, as applicable to the protection of the unborn.

9 See for example, Catriona Mackenzie, "Abortion and Embodiment", *Australian Journal of Philosophy*, Vol. 70, (1992), 137.

In the same manner there can be argued for the relevance of science beyond that of determining life, by looking at alternative views to the 'rights view'. If we do not consider the 'rights view' as determining the position of the unborn, what other alternatives are there? Two alternatives to the Rights view are the 'Indirect Duty Views' and the 'Direct Duty Views'. Although the Indirect Duty and Direct Duty approaches do not necessarily determine the legal position of the unborn either, these alternative views are mentioned to show that the Rights View need not necessarily be followed and that in fact, science could more easily be applied to clarify the importance of an 'entity' than necessarily used for determining life, the latter requiring a higher threshold of scientific discourse and explanation. Indirect views mean that no duties are owed directly to animals, for example. Animals are a medium through which direct duties to human beings are discharged. These are duties involving animals and not duties to animals (Ibid., 150). Take for example the works of Picasso. We have no direct duty towards his works of art. The duty to preserve his paintings is an indirect duty to humanity. Similarly we have a duty to preserve animals, but not as a duty towards the animals but as an indirect duty we owe, for example, to humanity and a civilised approach. Direct duty views hold that we have duties directly to animals. Utilitarianism and duties based on considerations of cruelty and kindness are examples of direct duty views (Ibid., 150-151). In other words, let us assume that the position of the unborn is that of the indirect duty view and not the rights view. Then we need to treat the unborn to the best of our ability, and science can consequently play an important role in confirming an 'indirect duty' towards the unborn.

The view of Finnis is another good example of a philosophy that rejects the use of rights for the determination of the legal position of the unborn, hereby providing science with relevance and application beyond the 'life' issue. Finnis criticises Thomson's playing-off of the 'right to life' and the 'right to decide what happens in and to one's body' in his article, *The Rights and Wrongs of Abortion: A Reply to Judith Thomson*[10]. Finnis states

10 John Finnis, "The Rights and Wrongs of Abortion: A Reply to Judith Thomson", *Philosophy and Public Affairs*, Vol. 2, No. 2, (1973), 117-145. The jist of Thomson's example reads succintly as follows: "You wake up in the morning and find yourself back to back in bed with an unconscious violinist – a famous unconscious violinist. He has been found to have a fatal kidney ailment, and the Society of Music Lovers has canvassed all the available medical records and found that you alone have the right blood type to help. They have therefore kidnapped you, and last night the violinist's circulatory system was plugged into yours, so that your kidneys can be used to extract poisons from his blood as well as your own. The director of the hospital now tells you, 'Look, we're sorry the Society of Music Lovers did this to you – we would never have permitted it if we had known. But still, they did it, and the violinist now is plugged into

that no argument, whether for or against abortion, has to be or needs to be expressed by way of rights. It unnecessarily complicates this issue. It is inappropriate and inconvenient to express something like the moral permissibility of a type of action such as abortion in terms of 'rights' (Finnis, 1973:130). Finnis believes that rights (for example the right to life) are not the fundamental rationale or reasoning behind the judgment that killing of another person is impermissible (Ibid.). This implies that 'the right to life' is not necessariliy relevant in the abortion issue, hereby confirming the fact that other measures could be proposed in order to provide protection. This consequently implies the assistance of science, hereby relieving science in the complex determination of 'life', yet making science most applicable. Therefore, although science can be applied to determine the 'value' of an 'object' which in turn can determine the 'degree of protectability' of such an object, this article expands on why the link between 'life' and 'science' is necessary to consider in the determination as to whether the unborn requires legal protection or not. This emphasis is important due to the contemporary popularity of linking the 'right to life' to the abortion debate.

3. The unborn as clarified by science

3.1 What science teaches

Fertilisation[11] is the time of the fusion of the egg cell and the sperm cell (Mathews-Roth, 1982:69). This takes place in the upper reaches of the Fallopian tube, which connects the ovary to the uterus (Morowitz *et al.*, 1992:45-46). The sperm swims 'up' the tube while the egg is swept toward the uterus (Flower, 1992:438). Fertilisation is a process and not a moment: it takes about twelve to twenty-four hours to complete. Fertilisation begins with the contact of a sperm with the outside of an *oocyte* (egg cell). Many

you. To unplug you would be to kill him. But never mind, it's only for nine months. By then he will have recovered from his ailment, and can safely be unplugged from you" (Thomson, 2000:241).

11 Alston states that it is often assumed that the unborn should be protected from the moment of 'conception' or 'fertilisation'. He adds that the concepts 'fertilisation' and 'conception' are not identical. 'Fertilisation' refers to the union of ovum and sperm which can take place shortly after intercourse. 'Conception' is defined as occurring only at the time of implantation in the uterine mucous, a process not completed until around the fourteenth day after fertilisation (Alston, 1990:173). It must be remembered that conception as being the time of implantation means that implantation and therefore conception will occur about six to ten days after fertilisation and the zygote is already well on its way in the process of development by the time this occurs (Mathews-Roth, 1982:69).

sperm attach themselves to a typical egg and, through chemical action, start to break down the egg's protective outer membrane. Eventually one sperm gets through (Morowitz *et al*., 1992:45-46). The sperm then penetrates the *oocyte*. The male and female *pronuclei* form, come next to each other but do not fuse. Fertilisation ends with the breakdown of the pronuclear membranes and the intermingling of maternal and paternal chromosomes resulting in a new cell namely, the zygote (Mathews-Roth, unpublished:2-3). Therefore, the first sperm to make contact moves into the egg itself, delivering twenty-three chromosomes that contain the genetic information that will contribute the male's characteristics to a new individual (Flower, 1992:438-439). Block and Whitehead comment that before fertilisation there is only a sperm and an egg. Neither, without the other, is capable of developing into anything else, let alone anything human. But the fertilised egg will most certainly become a human being, if kept in the womb for nine months (Block *et al*., 2005:17). Block and Whitehead believe that life begins at the beginning point of the mentioned continuum because if not interfered with, and without any further effort, the foetus is already on its way to human status. In this regard, bear in mind the fact that the foetus of thirty-five weeks and several days, although viable outside the womb in virtually all cases given present technology, has no rights at all. It can be killed with legal impunity. It will be a fully rights-bearing baby in a matter of hours, yet at this stage it can be 'disposed of'.

Compare two entities, assuming this to be technologically possible: one, the new-born babe, still attached to its umbilical chord, a few seconds old. The other, its sibling, is still in the womb but due out in a matter of minutes. No two entities could be more alike, biologically, spiritually, or in any other way. Yet, in 'pro-choice' philosophy, it would be murder to kill the one and a matter of judicial irrelevance to kill the other – "surely, this is a travesty not only of justice but also of common sense" (Ibid.). The fertilised egg may still develop and duplicate into twins. The two sets of chromosomes together are called a genome, constituting the unique genetic contribution of each parent to a cell that now has the capacity to begin development (Flower, 1992:439).[12] During the next four days the zygote

12 According to Jordaan, the embryo, at about four days after fertilisation, is a "spherical clump of cells, like a microscopic raspberry". He also states that there is a 50% chance that it will never implant in the uterine wall and subsequently pass right through the uterus and out of the woman's body. The chance of actually implanting, leading to a successful pregnancy, is between 10 and 20%, Donrich W. Jordaan, "The legal status of the human pre-embryo in the context of genetic revolution", 239. One of the cardinal

continues its journey down the Fallopian tube into the uterus, and it starts to divide. By the time it reaches the uterus the original zygote has grown to eight or sixteen cells. A few more divisions occur and the *blastocyst* develops. It eventually develops into the placenta and the embryo (Mathews-Roth, unpublished:3). It is not until about sixty hours after egg and sperm first made contact that any new genetic information is expressed; this means that for about two-and-a-half days following initial egg/sperm contact, the molecular characteristics of the pre-embryo are maternally determined (Flower, 1992:439).

As implantation comes to completion and as the third week of development commences, cells begin moving about in a process called *gastrulation.* Therefore, what was once a disc of cells now becomes increasingly complex. A three-dimensional embryo with a distinguishable anterior-posterior axis is identified. One can identify the future head- and tail-ends (Flower, 1992:440). 'Embryo' is used to describe the system after implantation; 'foetus', to describe it after sixty days (Morowitz *et al*., 1992:45-46). The mass of cells gradually takes on a complex and increasingly recognisable human shape, with identifiable internal organs and organ systems. A period of rapid growth as well as further developments of tissues and organs will occur starting in the ninth week, with a much slower rate of growth beginning at about twenty weeks of development (Flower, 1992:442). Up to the end of the second month the products of conception are called an embryo. The word embryo is derived from Greek, 'to swell or teem within', and refers to the initial stages of development after implantation in the uterus. The word 'foetus' is derived from the Latin meaning 'young one' or 'offspring' and refers to the stage that begins when the embryo has developed all of its internal organs and attained the exterior form of a human being (Hope, 2001:206). Examinations of embryos have shown that structural characteristics recognisably human are present at twelve to thirteen weeks of development. In other words, this is the end of the first trimester. This is the traditional time to change the term 'embryo' to 'foetus'. Responsive

questions asked to pro-lifers in this regard is: "If life begins at conception what about those embryos that abort spontaneously (such as where the embryos do not successfully attach to the wall of the uterus)? Do they have the same moral status?" To this Smit replies that all fertilised ova have the same moral status, and to take conception as the starting point for the moral status of the human embryo is the only non-arbitrary criterion for an ethically consistent view on the status of the human embryo (Smit, 2000:94-95). Smit explains on ibid., 93-94 why conception (understood as fertilisation- see Alston's explanation at fn. 11 supra) is to be viewed as the beginning of life (which is also discussed in this article).

movements are strong and spontaneous movement is beginning at this moment. The foetus is still very small but any observer is able to see that it is a human being (Ibid.). By the end of the first month, the length is about one third of an inch and the weight about twenty grams; the eyes and ears are distinguishable and limb buds are present. By the end of the third month the length is three quarters of an inch, the weight about 3 oz., the neck is developed and the oral and nasal cavities become separated by the palate. Sexual organs, fingers and toes have appeared and ossification has begun in most bones. The sex is not distinguishable until the fourth month. By the end of the fifth month the length is 9 inches and weight about 1 lb. and hair appears (Levitt, 1966:166).

The emergence of the nervous system is exceedingly complex and the region of the early three-week-old embryo that will alter to form the central nervous system can be identified (Ibid.). At approximately the sixth to seventh week electrical activity can be detected, as well as the appearance of a complex function that is known to be dependent on prior neural maturation (Ibid., 443). The late-stage embryo of six weeks can be seen to exhibit occasional and just discernible movement. About a week later, a startle response emerges. Over the next six to seven weeks, spontaneous motor activities appear. The foetal limbs and head move about, breathing movements occur, and swallowing and sucking are observed (Ibid.). By the end of the first trimester, the twelfth week, the foetus is more than three inches long and weighs about one ounce. The limbs are well shaped and the rib structure is visible through the skin. The digestive system is complete. Blood is beginning to be produced in the bone marrow. The brain has taken on the overall anatomical features that will characterise it for life (Shettles *et al*., 1983:55). During the second trimester, the fourth month, the foetus may more than quadruple its weight – going from one ounce to as many as seven ounces. The foetus now has the fingerprints he will have for the rest of his life, fine hair covers much of the body and the ears begin functioning. The lungs are largely complete but still collapsed. The heart pumps several quarts of blood through the foetus each day. The brain has many convolutions. At about the sixth month the foetus is much more active. The mother will definitely feel the unborn now. The mother may also now learn the sleeping patterns of her unborn child. She may even feel the foetus stretch upon awakening. When occasionally the foetus hiccups, the mother will know it is there. Hair follicles and sweat glands develop; cartilage gives way to real bone. At the end of the second trimester the foetus weighs two pounds and is about a foot in length. During the third trimester, the foetus will more than triple its weight. At nine months the baby measures about twenty inches. Final touches occur

during this month – for example, fingernails and toe nails grow rapidly (Ibid., 61-65). Deem asks the question whether science addresses the concept of when human life begins, and if so, what does science say? (Deem, Internet). When all the above information is considered it is clear that according to science there is enough data available to make a firm case for the protection of the human being from the zygote stage, and given what is presently known in embryology, we can do no less (Mathews-Roth, unpublished:13-14). Some of the world's most prominent scientists and physicians postulate that human life begins at conception (See Alcorn, Internet).

3.2 Scientific commentaries

There are those who argue that conception cannot be the beginning of life because the union of sperm and ovum "does not create a new unique individual", it only carries forward a process already begun and it is inconsistent "to assign the status of human individual to the human zygote or early pre-embryo when compelling biological evidence demonstrates that individuation is not yet established" (Smit, 2000:94). Smit replies that the fact that conception is a process does not change anything about the crucial finality of the DNA code. Smit also asks as to when individuation is established if not at the early pre-embryo stage? According to Smit, you do not need Christian scientists to tell you that conception means the beginning of a complete, identifiable, genetically coded individual and personal human life (Ibid.). Also, according to Smit, there is a separation between genes and personal characteristics, as well as between personhood and bodily existence. Although the development of the 'entity' is a process, the 'entity' itself is no process. At any specific moment an embryo is a human being – "The ultimate foundation for the moral value of a human being is its existence and not fleeting activities or needs. Becoming has its foundation in existence and this existence justifies among others the right to life" (Ibid., 97).

Deem is also of the opinion that the facts that science presents are enough to make a positive case for the legal protection of the unborn. According to Deem, "human beings are not constructed in the womb – they develop". All major organ systems are initiated within the first few weeks after conception. The process of embryonic development is a continuous process, with no obvious point at which the foetus magically becomes a 'person'. Further, science tells us that the heart of the human foetus begins to form eighteen days after conception. There is a measurable heartbeat twenty-one to twenty-four days after conception. This is only seven to ten days after a woman would expect to begin her menses. Since most women

have cycles that can vary by this amount, they do not discover they are pregnant until after this point. Therefore, *all* abortions stop a beating heart, even 'early' abortions. However, most abortions do not occur until four to six weeks after the foetus begins to form. The human brain begins to form on day 23 and is sufficiently formed to produce brain waves by 6 weeks, which means that most abortions destroy a functioning human brain (Deem, Internet). Deem also states that:

> Those who have taken embryology know full well the answer to this question. If you examine pro-choice arguments for abortion, you will find the proponents using such terms as "tissue" and "grams of material" (a weight). What they do not like to discuss is what that "tissue" consists of (Deem, Internet).

Deem reveals that discussion of what this 'tissue' consists of will reveal sufficient data in science to provide legal protection for the unborn. The aborted foetus is not just 'a blob of tissue', and refers to the experiences of Brewer, the latter, upon encountering his first experience of abortion, describes the 'blob of tissue' as follows:

> I opened the sock up and I put it on the towel and there were parts in there of a person. I'd taken anatomy; I was a medical student. I knew what I was looking at. There was a little scapula [shoulder blade] and there was an arm, and I saw some ribs and a chest, and I saw a little tiny head, and I saw a piece of a leg, and I saw a tiny hand. ... I checked it out and there were two arms and two legs and one head, etc., and I turned and said, I guess you got it all ... It was pretty awful that first time ... it was like somebody put a hot poker into me (Ibid.).

Shettles and Rorvik agree that the unborn is not merely a 'blob of tissue' and confirm this by stating that those who employ this terminology are genuinely ignorant of the facts, while others are willing to overlook the biological facts, convinced that abortion is an acceptable means to a desired end (Shettles *et al*., 1983:56). They confirm that when the foetus is ten weeks or older, recognisable human body parts often emerge (Ibid., 58). Lugosi (2005:218) agrees that there is no biological basis to deny that the unborn, from the first moment of their creation at conception, are fully alive and are fully human. The person who would have developed from that embryo, if it had been allowed to live, will be destroyed also: a human life will be lost. Such consequences can be described by a situation such as that of Dr Bernard Nathanson, who owned and operated what was at the time the largest abortion clinic in the western hemisphere. He was directly involved in over sixty thousand abortions. After studying developments in the science of fetology, he was led to the conclusion that he had made a

mistake. He later wrote that he was deeply troubled by his "increasing certainty that I had in fact presided over 60 000 deaths" (Alcorn, Internet).

The concept of life varies when considered in the light of science. Several examples exist. These include: before the union of the sperm and ovum, at conception (fertilisation), upon the acquisition of a soul, at the change from embryo to foetus – after about the fourth month, upon the acquisition of human form, when the foetal brain has developed to a certain functional level, at or after quickening, at viability, at birth or during delivery or following birth (Kenyon, 1986:22-23). The pro-choice supporters make a strong case when they argue the embryonic stages of development. Pro-life supporters claim that life begins at conception, however the pro-choice argument leads that conception is a process over time and therefore the claim that life begins at conception becomes ambiguous. After fertilisation, there are possibilities of splitting of one embryo into two or more individuals or the merging of two embryos with different genotypes into one individual. This questions the notion of individuality at this early cellular level of development (Hope, 2001:207). The protagonists of this view hold that human life begins fourteen days after conception. The main reason for this is that the fertilised ovum shall have been implanted in the womb and the possibility of its division leading to the loss of its individuality is completely lost. Dworkin states that "scientists disagree about exactly when the biological life of an animal begins, but it seems undeniable that a human embryo is an identifiable living organism at least by the time it is implanted in a womb …" (Ibegbu, 2000:491). But what differentiates this 'living organism' at for example, twenty weeks (which is a popular cut-off time in abortion legislation where the mother during the preceding weeks, has much authority to decide whether to have an abortion or not) from the same 'living organism' at thirty weeks, bearing in mind the scientific fact that at twenty weeks the foetus is similar to a premature human infant. It has well-developed facial features, arms, legs, hands, feet, fingers, toes, fingernails and fingerprints. It breathes amniotic fluid and moves both spontaneously and in response to stimuli. It sucks, swallows and squints. The fetus is responsive to light and sound. It has well-developed external genitalia that make it easily identifiable as male or female (Hope, 2001:208).

Mathews-Roth concludes that (1) there is continuity in development from the zygote stage onwards: the developing human remains a member of the human species and is the same individual from the start as a zygote until natural death because of the presence of human genes; (2) monozygotic

twinning[13] is of genetic origin and thus two or more individuals would be present from the zygote state on; and (3) human zygotes only give rise to humans, not *hydatidiform* moles or members of other species (Mathews-Roth, unpublished:12). Brody agrees with the finding that human zygotes give rise to humans and not members of another species. Brody mentions the *principle of essentialism* – an object only has a property essentially if it cannot lose it without going out of existence. If it has the property accidentally, it can change and lose that property without extinction. Brody uses the following example: If *o* possesses a property *P*, and a change occurs, destroying *P* but *o* continues to exist, the change is an alteration and not a substantial change causing *o* no longer to exist (Brody, 1975:97). The essential properties of an object determine what a natural kind is. The set of objects having that property is a natural kind (Ibid., 98). If every member of that class has that property essentially, if no human being can stop being a human being and still exist, then the class of human beings will be a natural kind. So a human being goes out of existence when he stops being human: being human is therefore an essential property of every human being, and humanity is a natural kind (Ibid., 100).

According to Mathews-Roth (1982:69) it is incorrect to say that such biological data cannot be decisive. Experiments repeated and confirmed prove that particular biological findings are true. No experiment has disproved the finding that the human begins as a zygote and remains as the same species throughout his or her life. Therefore, it is scientifically correct to say that human life begins at fertilisation, when egg and sperm join to form the zygote. When one considers the facts of science it is clear that abortion is the destruction of growing human life. Life itself does not begin; it is continuous, being passed from generation to generation (Ibid.). Mathews-Roth (Ibid., 70) explains that this fact is established by science. The organisation *Doctors for life* brings together medical doctors to discuss, campaign and research issues such as abortion. They take a strong position against abortion and promote 'sound science in the medical profession'.[14] Therefore, they apply the science of the medical profession to abortion. They state that:

13 This is also known as identical twins. A type of twins derived from a single (mono) egg (zygote). Monozygotic twins form when a single fertilised egg splits into two embryos. Because the twins share the same DNA set, they tend to have similar features, "Monozygotic", *About.com: twins and multiples*, http://multiples.about.com/cs/glossary/g/monozygotic_def.htm (accessed 28/02/2008).

14 "Doctors for life: Mission statement", *Doctors for life international*, http://www.doctorsforlife international.com/about/mission.cfm (1/02/2008).

> Scientific research clearly defines the beginning of life at conception. Each cell immediately after conception has sufficient information in its DNA structure to produce a complete human being. Destruction at any stage from one cell to several million cells after conception is murder of a human being.[15]

Roe explicitly refused the use of science and biology in the determination of the legal status of the unborn, only to contradict themselves in the end by using the viability approach. It is necessary to highlight this irrationality. In *Roe*, the unborn was never given any real protection. The only form of protection provided was to the unborn at viability in the trimester approach.[16] Viability is the foetus' ability to survive without the assistance of his or her mother. Any other physical development, organs, heart, brain, science or what the foetus is, was deemed unworthy of discussion. Justice Blackmun thus dehumanised the unborn, and maintained a semblance of humanitarianism (Smolin, 1988:404). The court also chose to silently pass over the briefs describing foetal development and photographs of the foetus. This was done by all of the judges including the dissenting judges (Ibid.) There was also no attempt to approach or consider medical expert evidence (De Freitas, 2006:184).[17] The court chose to ignore the scientific fact of human development, focusing instead on lengthy discussion of the medical-legal history of abortion.[18] The lack of consideration of science is not justified because courts are often asked to solve difficult

15 "Issues: Abortion", *Doctors for life*, http://www.doctorsforlifeinternational.com/issues/abortion.cfm (accessed 1/02/2008). In modern fetology the unborn is also considered as a human being (see Beckwith *et al*., 1991:27).

16 "With respect to a state's important and legitimate interest in potential human life, the point at which its interest becomes compelling is at viability, because the fetus is then presumably capable of meaningful life outside the mother's womb", *Roe v. Wade*, US Supreme Court Reports, 154 (147-200). "Prior to the end of the first trimester of pregnancy, the state may not interfere with or regulate an attending physician's decision, reached in consultation with his patient, that the patient's pregnancy should be terminated, from and after the end of the first trimester, and until the point in time when the foetus becomes viable, the state may regulate the abortion procedure only to the extent that such regulation relates to the preservation and protection of maternal health, from and after the point in time when the foetus becomes viable, the state may prohibit abortions altogether, except those necessary to preserve the life or health of the mother, and the state may proscribe the performance of all abortions except those performed by physicians currently licensed by the state," Ibid., 148.

17 A similar approach was taken in the case of *Tremblay v. Daigle* [1989] 2 S.C.R. 530, 62 D.L.R. (4th) 634, as well as in the South African case of *Christian Lawyers Association of SA and Others v. Minister of Health and Others* [1998 (4) SA, 1113].

18 *Roe v. Wade*, US Supreme Court Reports, 164-174, "Texas urges that, apart from the Fourteenth Amendment, life begins at conception and is present throughout pregnancy, and that, therefore, the State has a compelling interest in protecting that life from and after conception. We need not resolve the difficult question of when life beings. When

questions where there is no scientific consensus yet at the same time a need for a rational standard (Hope, 2001:223-224). To develop a rational standard one has to build as much as possible from the known facts and stick close to the data.[19] Yet, *Roe* steadfastly avoided discussing the facts of ontogeny to avoid having to discuss the appellee's contention that life begins at conception. What is even stranger from the *Roe* case is that at the end of the opinion the viability standard (which is scientific in nature) is invented without supporting analysis (of a scientific nature) or reasoned explanation (reasoned scientific explanation explaining why viability should be the compelling point).[20] Therefore, there is a conclusionary nature that viability is the compelling point (Hope, 2001:224). This was done without supporting analysis and reasoned deliberation. However, in *Gonzales v. Carhart* , the court stated that the *Partial-Birth Abortion Ban Act* of 2003 (prohibiting partial-birth abortions) does not impose an undue burden on the pregnant woman regarding pre-viability abortion. In other words, banning partial-birth abortions before the unborn has reached viability does not place an undue burden on the mother, and therefore partial-birth abortions, even before viability, are illegal. Therefore, the trimester approach was also altered and pre-viability abortions restricted in this case because pre-viability partial-birth abortions were banned – although only with regard to the one method of abortion and not other methods of abortion (Gee, 2007:984). Furthermore, in the case of *Planned Parenthood of Southeastern Pa. v. Casey*[22] the court reaffirmed *Roe*'s trimester approach, and reaffirmed that the State may not prohibit any

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those trained in the respective disciplines of medicine, philosophy, and theology are unable to arrive at any consensus, the judiciary, at this point in the development of man's knowledge, is not in a position to speculate as to the answer", Ibid., 159. Hope states that if there was consensus as to 'when life beings', the abortion issue would not have been in the Supreme Court (Hope, 2001:223).

19 This reminds one of the impartiality principle emphasised by the South African case of *SA Commercial Catering and Allied Workers Union v. Irvin and Johnson Ltd (Seafood Division Fish Processing, 2000 8 BCLR 886 (CC))* also states that impartiality requires "… open-minded readiness to persuasion …", par 13. The more evidence can be submitted, the more impartial the discussion becomes.

20 "With respect to the State's important and legitimate interest in potential life, the 'compelling' point is at viability. This is so because the fetus then presumably has the capability of meaningful life outside the mother's womb. State regulation protective of fetal life after viability thus has both logical and biological justifications. If the State is interested in protecting fetal life after viability, it may go so far as to proscribe abortion during that period, except when it is necessary to preserve the life or health of the mother", *Roe v. Wade,* US Supreme Court Reports, 183.

21 550 US (2007).

22 505 US 833 (1992).

woman from making a decision to terminate her pregnancy.[23] *Roe* is therefore an important case concerning the lack of consideration of science, this having been decided while the court itself had allegiances with science in order to make sense of the viability principle postulated by itself. In this regard, Naudé comments that abortion legislation is based on medical knowledge regarding the development of the foetus, and that the *Roe* decision very prominently took into account the medical view that pregnancy can be divided into trimesters (Naudé, 1999:554). Furthermore, viability as the 'compelling' point marking the constitutional protection of foetal life is logically and biologically flawed and unworkable (Hope, 2001:211). In practice this is not true. Viability becomes a vague marker when one considers different circumstances (Ibid.). For example, the concept of viability becomes vague and relative if we ask whether we mean viability in an advanced neonatal intensive care unit or viability in a remote rural county with limited medical resources. Viability lacks one of the key characteristics of a rational standard, namely that it identifies a conceptually distinct division point. Pediatric medicine has improved and the frontier of viability has moved backwards several weeks and may retreat further. Using a standard such as viability is relative, arbitrary and deeply flawed (Ibid.). Viability can be at twenty-four weeks, maybe twenty-six weeks. However the treatment of premature infants has progressed to such a point that the distinction in *Roe* is no longer valid. Physicians are now able to intervene successfully at earlier and earlier stages in the pregnancy. However, no improvement in the survival of babies below twenty-five weeks was observed. They talk of "hitting the wall" (Morowitz, 131-132).

Viability does not measure the universal human characteristics shared by the foetus and the larger community and species, rather it focuses on the potential ability of the foetus to breathe air (Hope, 2001:211). Therefore clearly, the viability standard makes little sense from the human development perspective (Ibid.). The reproductive process has become more determinate at each stage of the pregnancy. The singling out of a specific stage as the stage where development is determinate enough for legal protection to start, must rest on convincing, objective ground,

23 Before viability, a state "may not prohibit any woman from making the ultimate decision to terminate her pregnancy", *Planned Parenthood of Southeastern Pa. v. Casey:* 879. The court also stated that it may not impose upon this right an undue burden, which exists if a regulation's "purpose or effect is to place a substantial obstacle in the path of a woman seeking an abortion before the fetus attains viability", … Ibid., 878.

otherwise it will be arbitrary and unacceptable (Jordaan, 2005:244). Noonan is of the opinion that conception is the only start for human life that is not arbitrary (Pojman, 2000:233). Warren believes that viability is relative, among other things, to the medical care available to the pregnant woman and her infant (Warren, 1989:50). When a court establishes an extreme position such as the validity of abortion, such as in the case of *Roe*, a very compelling rationale needs to be given in order to justify and validate the position. This was not the case in *Roe*. Viability and the trimester approach are not sufficient to circumvent the scientific facts of the presence of a human being during the whole of pregnancy. It is therefore irrational to say that the unborn is worthy of protection due to the fact that it can survive outside of the womb because the court, in making this decision, had no investigative analysis into facts to support and justify such a conclusion. If such reasoning is acceptable, it can also be said that the presence of a developed heart is sufficient to bestow the unborn with legal protection without giving any justification. Whether the heart is developed or not, how can we say that the fact that there is a certain organ present makes the unborn more important? What if the spinal cord is enough for life to exist? Who determines that? If the spinal cord were enough, life would begin at ten weeks or even earlier. If the arms were enough, life would begin very close to conception. And this is accepted without justification. In the light of all this, choosing viability still as the point of protecting the unborn remains an arbitrary decision. There is no rational reason why the fact that the unborn is able to survive outside the mother's womb, should be the determining factor for protection of the unborn. What is more, viability in itself refers to science, therefore to state that science has no role or relevance in or to the law is a contradiction in secular and positivistic pro-abortion jurisprudence.

4. Conclusion

Science presents the biological and medical facts of the unborn, its development, and of abortion itself. When the biological structure and development, as well as the medical nature, of the unborn are known, these facts support consideration and sensitivity towards the unborn. The importance of these facts is that they cannot be manipulated and no argument can be made to make them fit into specific social and political patterns. This is not to say, however, that science is truly objective and neutral, because all science also rests on ideological foundations. However, science should receive more attention, as it is a measure (not *the* measure) or an aid that can shed more light on complex jurisprudential and ethical issues such as the legal protection of the unborn. Disparity exists

in science, but science presents an opportunity to be more rational (and more impartial) about a clearer determination of the legal status of the unborn. Even once the relevance of science is accepted, there is the further step of finding the most convincing argument in support of a specific scientific finding, in this instance, fertilisation above that of, for example, viability or birth. Science is not necessarily objective, but this does not render its use always irrelevant or irrational. It is the absolute exclusion of science from the debate (especially pertaining to the science applied by the pro-life movement) that will result in irrationality since it is contrary to the inclusive nature of rationality, and also attests of an approach that is not impartial (or rather less impartial than many other options). An absolute exclusion of science regarding the legal protection of the unborn will be even more irrational in light of the fact that several other areas of law are sensitive to the use of science. For example, there is support of the proposed inextricable relationship between science and sexuality within jurisprudential discourse,[24] and in some areas of the law beyond human rights jurisprudence, there is sensitivity based on scientific observation regarding the unborn. An example is in criminal law where the crime of feticide (the killing of the unborn against the wishes of the mother) could only take place after 'quickening' (the moment when movement in the womb is detected). This gave rise to the 'rule of quickening' where it was assumed that the 'foetus' was not alive prior to quickening because medical knowledge was not advanced enough to determine if a woman was, in fact, pregnant prior to foetal movement (Lugosi, 2005:63).

Carter refers to the feminist author Naomi Wolf, who warned her fellow feminists to be more measured in their objections to the tactics of pro-life activists. For example, by protesting the display of graphic photographs of aborted foetuses, noted Wolf, abortion rights supporters may be trying to evade an unpleasant truth that intellectually honest arguments would accept: abortion does kill 'something' (Carter, 1998:218-219). Herein lies an important truth and message regarding science as an instrument for collective and representative discourse. The tendency by contemporary abortion jurisprudence to apply science as an important measure, the relevance of science *per se* in the abortion debate, as well as the Christian

24 See Van Aardt, W.J. and Robinson J.A., "The biology of homosexuality and its implications for human rights in South Africa", *Tydskrif vir Hedendaagse Romeins-Hollandse Reg*, Vol., 71(2), (2008), 179-197. This article discusses several of the different biological and psychological theories regarding homosexuality, and which includes theories regarding the possible causes of homosexuality. Based on this the authors enter into a discussion concerning "homosexuality in the context of equality".

qualification for the accommodation of science in moral discourse, necessitates a re-consideration and emphasis of the science-aspect in the attainment of clarity regarding the legal status of the unborn. The abortion jurisprudential issue in South Africa needs yet to exceed the confines of the High Court, and when this happens the science-aspect will be most relevant, both for church and the rest of society.

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