

# DIVISIBILITY AND THE MORAL STATUS OF EMBRYOS

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In debates on the moral status of embryos it has been popular to suggest that the possibility of monozygotic twinning in early fetal development disproves the claim that embryos have moral status from fertilisation. This idea has been used for justifying ethical views on abortion, contraception, embryo research, in vitro fertilisation and preimplantation genetic diagnosis. Moreover, it has influenced regulations of embryo research in the

West.<sup>1</sup> In this paper, I will argue that the moral premise underlying the argument from twinning is in fact highly implausible, and that this highlights several hidden inconsistencies in the moral basis of traditional opposition to the destruction of embryos and fetuses.

After having described two versions of the argument, each assuming a moral principle called *the requirement of indivisibility*, the concept of divisibility is briefly discussed in section 2. A first argument against the requirement of indivisibility, formulated in section 3, leads to a third version of the argument, formulated in section 4, which tries to meet the challenge of explaining why (in)divisibility is of moral importance. In section 5, this version of the argument is rejected as well. I close, in section 6, by describing a number of inconsistencies unfolded in the earlier discussion, suggesting very different basic views on moral status to be residing within the traditional basis of pro-life opinions.

## 1. THE ARGUMENT FROM TWINNING

Originally, the argument from twinning was formulated in the context of non-secular Christian ethics, more specifically, against a background where the moral status of the fetus is seen as dependent on its possession of a (human spiritual) soul which is, by conceptual necessity, an indivisible entity. This idea has repeatedly been used (most notably in official declarations of the

Catholic Church) as a basis for the claim that the fetus has moral status from fertilisation. However, in the early 1970's, the Catholic ethicist Joseph Donceel argued that this conception of the soul seems to make the claim that the embryo has such a soul from fertilisation incompatible with the fact that twinning may occur up to the point when what embryologists call the *primitive streak* has been formed (10-14 days after fertilisation).<sup>2</sup> Of these contraries, Donceel argued, we should choose to adhere to the facts, thus having to reject the idea of embryos having moral status from fertilisation.<sup>3</sup> One could easily complement this by observing that twinning may nowadays be induced in a laboratory and that, apart from twinning, there is the possibility of fusion of two distinct embryos into a single one.<sup>4</sup>

Since this argument is built on the somewhat mysterious concept of an immaterial soul created directly by God, it may be criticised for not taking all possibilities into account. For example, when twinning occurs, God might have foreseen this and placed *two* souls in the embryo from the beginning, or he may have added two new souls (taking away the old one), or just one 'extra' in the event of twinning.<sup>5</sup> In fact, such divine interventions may be what *cause* twinning or make it possible.<sup>6</sup> It might also be suggested that twins, triplets etc. actually *share* the *same* soul,<sup>7</sup> or the idea of souls as essentially indivisible may, on further inspection, be rejected altogether. In short, since a religious context is rather permissive regarding the more precise

nature of the soul and the possibility of divine interventions, *anything* seems to be imaginable regarding souls and twinning.<sup>8</sup>

However, since it is the alleged indivisibility of the soul that does the actual work in the argument from twinning, several writers have tried to restate the argument in a secularised usage.<sup>9</sup> Although the exact phrasing varies, the basic form of the argument can then be expressed like this:

1. Only indivisible entities can have moral status.
2. Twinning means that an embryo divides into several embryos, each one a separate entity.
3. *Therefore*, as long as twinning is possible, the embryo is not an indivisible entity.
4. Twinning is possible up to the point when the formation of the primitive streak has been completed.
5. *Therefore*, embryos are not indivisible until after the formation of the primitive streak has been completed.
6. *Therefore*, embryos cannot have moral status until after the formation of the primitive streak has been completed.

This restatement of the original argument from divisibility is not only a secularisation, it also makes more clear the essential content of its basic moral premise. Of course, the combination of the claims that only ensouled beings can have moral status, that souls cannot divide and that division of an ensouled being would

have to involve the division of its soul does not need to entail the claim that indivisibility is in itself the property which *makes* ensouled beings morally important. However, it does seem to entail the claim that such indivisibility is a *necessary* condition for moral status.

The first two objections above may be secularly rephrased as well. However, they would then amount to either claiming that one embryo is in fact several, or denying that twins are separate beings. I will comment on these possibilities below, but otherwise proceed on the assumption that the logic of the argument is valid. My attention will instead focus on the first premise: the claim that only indivisible beings can have moral status, or *the requirement of indivisibility*.

## 2. VARIOUS FORMS OF DIVISIBILITY

Divisibility is the property of an entity to be able to divide or be divided. Any attempt to seriously understand the requirement of indivisibility therefore needs to start with the question: What is involved in the division in an entity?

Above, I have mentioned only one case of division (twinning). When twinning occurs, the embryo is literally split in half, each half being an embryo. This holds for reported cases of induced twinning as well.<sup>10</sup> Compare this to the division of an amoeba undergoing procreation, or a worm being cut in two pieces (both of which become worms). Both of these cases seem analogous to

twinning in that the end-result of the division is several entities that are of the *same kind* as the original and divided entity.

This type of division should be kept apart from the one taking place when I divide an apple in two pieces, none of which is an apple. Another example of this second type of division is nuclear fission, where none of the resulting particles is a nucleus of the initial type of atom. In both these cases, and in contrast to the type of division involved in amoebian procreation, the end-products of the division are of a *different* kind than the divided entity.

This second type of division should, in turn, be distinguished from a type that may affect, for example, nations. If Germany is divided by a French-Polish 'corridor' through what is presently German soil, Germany's territory has then in a sense been 'split in two halves'. However, taken together, these two halves still form the nation of Germany. This in contrast to the two halves of a divided apple, which have lost the relational structure necessary for jointly forming an apple.

In the case of twinning, the division involved seems to be of neither of the second, nor the third type. Not only are the resulting twins of the same kind as 'the original', none of the resulting twins seem possible to single out as *being* 'the original', and the same seems to apply to amoebian procreation as well as the cutting up of worms. Even less does it seem plausible to suggest that – in analogy with nations – the twins *taken together*

constitute the original. Indeed, this seems to be one of the crucial difference not only between the type of division involved in twinning and the type of division a nation may undergo, but also between 'twinning-division' and *copying*. In the latter case, the original or 'blueprint' may remain, in the former the original necessarily ceases to exist.<sup>11</sup> However, copying, in turn, differs from the division of nations, since 'the original' continues without consisting of two spatially separated parts.

A complicating factor is that twinning need not mean that the embryo 'splits in half'. Sometimes, twins occur as a result of less than half of the cells splitting off from the embryo and starting a separate development. In the near future, this may become possible to induce in the laboratory and thereby create a host of new embryos without the original embryo being actually 'split in half'.<sup>12</sup> In the extreme case, only one cell would be extracted, and do we then have a case of division or copying? And what about the case when nuclear transfer is used in a procedure like the one involved in the famous 'cloning' of the sheep Dolly<sup>13</sup> – i.e. one of my somatic cells is made to develop into a new human being? Perhaps this would be a clear case of copying (since the original organism obviously remains). On the whole, though, all such branch-line cases seem to suggest that our concepts of division and copying of beings are rather hazy at best.<sup>14</sup>

What we may conclude, however, is that the divisibility assumed to have moral significance in the argument from twinning

(and, consequently, by the requirement of indivisibility) apparently involves the ability of an entity to split off parts (or have parts being split off) in such a way that (at least) *two new entities of the same kind thereby start to exist while the original, divided entity necessarily ceases to exist*. What I now will argue, therefore, is that the possession (or lack) of such an ability makes no difference to whether or not some being has moral status.

### 3. AGAINST THE REQUIREMENT OF INDIVISIBILITY

My basic argument against the requirement of indivisibility is straightforward: even if normal adult human beings would be divisible, they would nevertheless have moral status. This argument requires an imaginable scenario where adult human beings would in fact *be* divisible.

The scenario may be construed in different ways. One is an expansion of the idea of 'divided minds' (inspired by the surgical operation where the connecting fibres between the two upper hemispheres of the brain are cut) used by Derek Parfit in his discussion about personal identity. Assume that my brain is divided and that each half is transplanted into two (organically) alive bodies instead of the original (destroyed) brain-halves of these bodies, resulting in two new persons each *partly* resembling me in their respective personalities and eventually developing various new features.<sup>15</sup>

Another idea is this: imagine that in a few hundred years hu-



manity starts to colonise outer space and that, eventually, the colonisers on different planets gradually evolve biologically in quite different directions (due to different kinds of evolutionary pressure in differing environments). On one of these planets, natural selection leads to the result (after – say – 2.000.000 years) that humans on this particular planet actually procreate by division in a way similar to amoebas. However, in all relevant respects, they are still humans (they have our type of consciousness and physical features, and if their cells were to undergo meiosis,<sup>16</sup> they would be able to procreate with us).<sup>17</sup>

In any of these scenarios, would the people involved lack moral status? Are we, for example, allowed to torture, kill and eat the beings in the last scenario just because they procreate by cellular division rather than fusion? Clearly not. What we must conclude, therefore, is that the requirement of indivisibility is implausible.

The only straightforward reply to this argument that I have encountered is the idea that, although divisibility would certainly not deprive the people in my examples of moral status, it would still do so regarding embryos. The idea here seems to be that the requirement of indivisibility holds only when certain *other* conditions are met. In the case of embryos, we could, for example, point out that, unlike adults, they lack the capacity for conscious experience (since they have not yet developed rudimentary neurological structures).<sup>18</sup> However, why accord *any*

moral significance to the property of indivisibility in the case of embryos unless we can show that it has some such significance in other cases? In order to provide an *argument* (and avoid begging the question), some general or independent reason for such a refined version of the requirement of indivisibility is therefore needed.

#### 4. THE APPEAL TO POTENTIALITY

Such a reason has been developed on the basis of the supposed moral significance of the embryo's apparent potentiality to give rise to an individual with moral status (a person, a human individual, a sentient being, a holder of rights etc.). In this version of the argument, divisibility is not claimed to be morally significant *in itself* – rather, facts about divisibility are claimed to have strong bearing on the question of whether the (allegedly) morally relevant potentiality is present or not.

Having been vaguely hinted at by Marquis, and more explicitly by Eberl as well as Shannon and Wolter,<sup>19</sup> Ford is the one who has developed this argument in detail, as mentioned in terms of the embryo's 'ontological individuality'. This term is taken to mean "a single thing that exists in itself and not merely as a real part or principle of a greater whole",<sup>20</sup> a condition that, as Ford himself notes, does not seem to impede the embryo's ontological individuality.<sup>21</sup> However, in order to be a *human individual or person*, Ford argues, one must have either mental

capacities such as rationality, self-awareness etc., or be "a living ontological individual that has within itself the active capacity to maintain, or at least to begin, a human life-cycle *without loss of identity*".<sup>22</sup> This leads Ford to claim that "a human person begins as a living individual with the inherent active potential to develop towards human adulthood *without ceasing to be the same ontological individual*".<sup>23</sup>

In order to connect this idea to twinning, Ford uses the concept of division sketched above – in particular the condition that the original entity ceases to exist. For, on reflection, this seems to imply that an embryo that divides into twins cannot be the same individual as any of the twins. There remains the idea that the original embryo is the same individual as *both* of the twins, but since this would mean that the *twins* would have to be one and the same individual, this suggestion seems to be too absurd to consider seriously. This is the line along which Ford seems to be thinking when he claims that "[the] continuity of the same ontological individual ceases when the zygote forms twins. The zygote is not the same ontological individual as either of the eventual twins that result from its development".<sup>24</sup>

This shows that, in cases of actual division of embryos, there is a break in identity – i.e., the original embryo is extinguished. However, this implies nothing regarding the majority of cases where no division occurs, although the embryo is divisible.<sup>25</sup> Ford, however, tries to expand the conclusion to cover also these

cases by claiming that mere capacity for division breaks the chain of identity as well. Rhetorically, he asks: "whether the zygote itself would be one or two human individuals",<sup>26</sup> and eventually claims that, if we were to ascribe human individuality or personhood to the divisible (but undivided) embryo, "...we would have to claim that the zygote [...] at the same time, was both one person and more than one person".<sup>27</sup>

However, this move seems to me to rest on a simple lapse in logic. Even if the embryo, E, could (by its very divisibility) in the future give rise to two new embryos, it does not follow that E *is* any of these two any more than it follows from the fact that I may in the future reach the age of 63 that I am already now 63 years old (or even a person who will become 63). For if we did say this, we would have to conclude that when E does not divide, it *may* still be the same individual as some *non-existent* individual – i.e. the twin(s) it could have given (but did in fact not give) rise to. But, since E exists, it *cannot* be the same individual as someone who does not exist.

What can be concluded, however, is that if E will in fact divide, E will not be the same individual as any one of the resulting twins, and that if E will in fact *not* divide, the chain of identity never breaks and E may very well be the same individual as the later fetus, child, adult etc. Despite the obvious *practical* difficulties of actually *predicting* what will happen, there is a fact of the matter here, since we can be certain that *either* E will

divide *or* it will not.

The only way for Ford to get around this, I suggest, is to claim that moral status in virtue of one's potentiality requires it to be a potential for giving rise to *one and only one* being of the relevant kind which is not 'mixed' with a parallel potential for giving rise to any other number of such beings.<sup>28</sup> Perhaps Ford and his followers should be understood as implicitly accepting such a view. However, this raises the question of the soundness of such a moral principle.

## 5. TWO NOTIONS OF THE MORAL RELEVANCE OF POTENTIALITY

Ford and his followers never anchor their discussions of embryonic individuality in a clearly spelt out *moral* basis. Hence, it is not evident that the criteria for individuality they suggest bear any moral relevance at all. However, in spite of this, all the papers and books written on this topic apparently suggest that the discussion is thought to have important moral implications. Proceeding on the assumption that the moral principle formulated in the end of the preceding section expresses the best available for an argument to this effect, I will now assess this principle from a general discussion of the grounds on which the potentiality of developing clearly morally relevant properties may be ascribed moral relevance in itself. This will lead up to the formulation of two very different ideas of the moral relevance of

potentiality, of which only one can be used as a basis for arguments like Ford's. This idea, however, is morally unsound, or, at least, goes against the basic underlying motivation for ascribing moral status in virtue of potentialities, and for ascribing such potentialities to embryos and fetuses.

Why care about the fact that some being has the potential for developing into a being with a certain property,  $p$ , which confers moral status to its possessor? The most straightforward answer is that beings with  $p$  (call these  $p$ -beings) are of value and that, therefore, the impediment of a being to actualise its potentiality to develop into a  $p$ -being would constitute a morally significant value-loss. This seems to be the most common argument for according moral relevance to potentiality.<sup>29</sup> In particular, it seems to be the view alluded to by Ford when he disapproves of Singer's and Kuhse's view of new-borns as having less of a moral status than adults (because they are not  $p$ -beings)<sup>30</sup> for the reason that they do not take into account the moral significance of the fact that a new-born may develop into a  $p$ -being.<sup>31</sup> Although not willing to say that the destruction of merely potential persons would be *homicide*, he still claims that, in virtue of the potentiality to become the kind of being who could be a victim of homicide (i.e. a  $p$ -being), "...the deliberate destruction of a potential person would, by reason of its biological human life, be *immoral*".<sup>32</sup> Ford's view on this point seems to accord well with Marquis' slogan of "having a future like ours" – i.e. the ascription

of moral status to beings on account of their developmental capacity to become beings which are like us in respects we take to confer moral status (i.e. *p*-beings).<sup>33</sup>

This rationale also explains why the supporters of autonomy-, interest- or rights-based moral outlooks (such as Singer and Kuhse, Glover, Steinbock, Tooley, Thomson, and Warren) are not impressed by appeals to potentiality.<sup>34</sup> For, although they claim that *p*-beings should be respected, this respect is not owed due to their being *valuable*. Rather, the basis for respect are those strivings which are results of their actual use of the property *p* (e.g., capacity for autonomous action), and what we owe them is not to get in the way of these strivings. This provides no basis for ascribing moral status in virtue of a *mere* potential for becoming a *p*-being with certain strivings, since there is no actual striving of this being which commands respect in the above described way.

Let us now restate the moral principle formulated at the end of the preceding section in terms of *p*-beings:

*Potentiality Principle 1*

A being that lacks *p* can have moral status in virtue of its potentiality for giving rise to a *p*-being only if (i) this is a potentiality to give rise to *one and only one* *p*-being, and (ii) this potentiality is not "mixed" with a parallel potentiality to give rise to another number of *p*-beings.

This principle may be contrasted with the following moral

principle:

*Potentiality Principle 2*

A being that lacks  $p$  can have moral status in virtue of its potentiality for giving rise to a  $p$ -being only if this is a potentiality to give rise to *one or more*  $p$ -beings.

How do these principles compare in light of the reason for ascribing moral status to merely potential  $p$ -beings - i.e., the idea that  $p$ -beings are of value? In my view, it is obvious that *Potentiality Principle 2* best captures the spirit of this reason. If the reason why we should not impede the further development of a mere potential  $p$ -beings is that we thereby impede the realisation of something valuable, surely we have even *more* reason for not impeding the actualisation of even *more* things of value.

Of course, the potential of a being to give rise to a  $p$ -being may be more or less strong and it may plausibly be claimed that this variation should be linked to a variation in degrees of the moral *significance* of a potential  $p$ -being's moral status (i.e., how much of a reason this status provides against the being's destruction). This blocks the possibility of the destruction of gametes becoming seriously wrong<sup>35</sup> and, furthermore, backs up the claim that the significance of the early embryo's potential is not very great, due to the many spontaneous abortions in early stages of pregnancy.<sup>36</sup>



However, *Potentiality Principle 2* gives no support whatsoever to the requirement of indivisibility. On the contrary, in view of this principle, the divisibility of early embryos carry with it a promise of *more* valuable beings coming into this world, and may therefore be claimed to even *increase* the significance of the moral status of these embryos.<sup>37</sup> In other words, in view of *Potentiality Principle 2*, the divisibility of early embryos shows only that the kind of potentiality mentioned in this principle is divisible too, but may nevertheless confer moral status.

What can also see that *Potentiality Principle 1* not only accords badly with the general reason for ascribing moral status to merely potential *p*-beings, it also lacks the capacity of ascribing moral status to the embryo even *after* it has become *indivisible* (as long as it has not become an actual *p*-being). For, just as the potential of the divisible embryo to become one particular *p*-being is mixed with a potential for becoming several *p*-beings, the potential of the indivisible embryo (and fetus) is always mixed with a potential for becoming no *p*-being at all! As living organisms, we all carry within us not only the inherent capacity of developing further in suitable conditions, but also to be destroyed in less suitable conditions.

In the end, therefore, the attempt to base a restricted version of the requirement of indivisibility on the (alleged) moral relevance of the potentiality to become a being with moral status seems even less capable of doing its moral job than the original unre-

stricted version of this requirement. What we end up with is the idea that, in order for a being to have moral status, it has to actually be a *p*-being (since the potentialities of other beings always entail the potentiality for *not* becoming a *p*-being), and then facts about this being's (in)divisibility carry no moral significance whatsoever. In order to escape this, we have to opt for Potentiality Principle 2 and, then, facts about (in)divisibility again lack all relevance for the ascription of moral status.

## 6. INCONSISTENCIES IN THE MORAL BASIS OF PRO-LIFE POSITIONS

If the reasoning above is sound, a significant part of the embryo debate has been proceeding from untenable premises. This, of course, does not settle the issue of the moral status of embryos. However, we can conclude that whether or not some being possesses moral status is at least not dependent on facts regarding its (in)divisibility. Moreover, if the potentiality of embryos and fetuses to develop into sentient, self-aware, autonomous or rational beings is to confer any moral status at all, facts about (in)divisibility cannot be allowed to influence whether or not such a being has moral status.

This makes salient a hidden inconsistency in the general argumentative strategy of pro-life advocates. On the one hand, they use the idea of the sanctity of the life of human individuals, on the other, they argue in favour of the applicability of this

sanctity to embryos and fetuses by pointing to their potential for becoming 'fully human' individuals. However, as we have just seen, if the implied requirement of individuality is to be interpreted sufficiently strong to support some version of the requirement of indivisibility, what we get is either an obviously absurd moral principle or an idea of the sanctity of human life totally inapplicable to merely potential 'fully human' individuals. One may wonder, therefore, whatever could lead anyone to pursue such a peculiar idea as the requirement of indivisibility.

One explanation could be the legacy of a religious context where the concept of the soul has entailed the Platonic-Cartesian idea of a pure metaphysical substance or 'ego',<sup>38</sup> and where the idea that our soul is what makes us morally special has been taken for granted. However, if my argument against the requirement of indivisibility is correct and if souls indeed are indivisible, it follows that the possession of a soul is actually *not* a requirement for having moral status. In order to escape this, the soul-theorist would have to modify the theory of the soul in accordance with *Potentiality Principle 2*, so that the soul indeed is divisible.

Perhaps the requirement of indivisibility instead connects to the idea of human individuals as necessarily *unique*? For example, Steinbock has interpreted the argument from twinning as claiming that "the chance of twinning [...] makes it impossible to say that at fertilization there exists a unique human being".<sup>39</sup>

However, this assumes that unique beings cannot divide and why accept that? The embryo may be a unique human being which, when twinning occurs, divides into two other unique human beings, and the undivided (divisible) embryo may be a unique human being that could be (but is in fact not) extinguished through division. Furthermore, a 'requirement of uniqueness' would fare no better than the requirement of indivisibility. Suppose that it turns out that normal adult human beings are not necessarily unique (for example, because we may be copied). Surely, that would not make it morally unproblematic to torture or kill us.

When the requirement of indivisibility is connected to the idea of the moral relevance of potentiality, a better explanation of its attraction for people like Singer and Kuhse, Steinbock and Warren would perhaps be that, here, the requirement defeats any ambition to ascribe a morally relevant potentiality to embryos and fetuses. This seems to accord well with their view that the kind of potentiality actually possessed by embryos and fetuses does not confer any moral status.

The unwillingness of these people to ascribe moral status to the embryo may not be that surprising, so let us instead look again at those who are more willing to do this. Perhaps the requirement of indivisibility has been inspired, not by ideas about the value of *unique individuals*, but, instead, by the thought that each individual human being (unique or not) have a *unique value*

and that *division* of such individuals therefore always involves a loss of value (since 'the original' individual ceases to exist when it is divided) impossible to compensate for.<sup>40</sup> The step from this thought to the requirement of indivisibility has then been taken by way of the confusion between actual division and mere divisibility described above.

However, even disregarding the last mentioned flaw, this idea in fact seems to be *at odds* with the requirement of indivisibility. Assume that I divide like an amoeba, thereby ceasing to exist, and give rise to two other beings existing in my place. If this end of my existence is to involve a value-loss, obviously I must have moral status. However, since I divided, I was divisible and the requirement of indivisibility must therefore be false. Again, then, we seem to encounter a hidden inconsistency in the moral basis of pro-life positions. If the requirement of indivisibility is to hold, individual human beings cannot be ascribed a unique value which can motivate a strong moral ban on murder. Even less will we be able to apply such a ban to embryos and fetuses in virtue of their potentialities.

It is, of course, open for discussion whether or not individuals really *have* this sort of unique value. If twinning is indeed explained by God's placing of two new souls in an embryo, few Christians would conclude that God wilfully destroys uniquely valuable entities on a regular basis. In a similar vein, McMahan has questioned whether we should view cases of twinning as

tragedies – as we would have to where they to involve losses of unique values.<sup>41</sup> Parfit's suggestion that the mere loss of numerical identity with 'the original individual' does not involve a morally important loss points in the same direction.<sup>42</sup> Analogously, the confusions of the twinning-debate, can be taken to suggest that it does not matter *which* human beings exist, as long as there exist *some*. That is, particular human beings do in fact not possess a unique value impossible to trade off against the value of other human beings.

However, to press this further point is not my business here. My central claim is that there are good reasons to reject the requirement of indivisibility in either of the versions I have presented. *If* the existence of individual people should turn out to have unique values there are even better reasons to accept this claim, and the same goes if we want to use the concept of potentiality for ascribing any moral status to embryos and fetuses.<sup>43</sup>

## NOTES

<sup>1</sup> See MacKellar, *Reproductive Medicine and Embryological Research: A European Handbook of Bioethics Legislation*, Edinburgh: European Bioethical Research, 1997. A very influential document in this context was the so-called Warnock Report, see Mary Warnock (ed.), *Report of the Committee of Inquiry into Human Fertilisation and Embryology*, London: H.M.S.O., 1984.

<sup>2</sup> See, for example, W J Larsen, *Human Embryology*, New York, Edinburgh, London, Melbourne & Tokyo: Churchill Livingstone, 1993.

<sup>3</sup> Joseph Donceel, 'Immediate Animation and Delayed Hominization', *Theological Studies* 31, 1970, pp. 76-105; and 'A Liberal Catholic's View', in Feinberg (ed.), *The Problem of Abortion*, Belmont, Ca.: Wadsworth, 1984.

<sup>4</sup> As described by Thomas A Shannon & Allan B Wolter, 'Reflections on the Moral Status of the Pre-embryo', *Theological Studies* 51: 4, 1990, pp. 603-629, this concerns the possibility that the twins resulting from a division of an initial single embryo fuse into a single embryo. Peter Singer & Helga Kuhse, 'Individuals, Humans and Persons', in Singer et.al. (eds.), *Embryo Experimentation*, Cambridge: Cambridge University Press, 1990, instead point to the possibility that two initial and genetically different embryos fuse into a so-called *chimera*.

<sup>5</sup> I owe the latter suggestion to Torbjörn Tännsjö.

<sup>6</sup> Christian Munthe, *Livets slut i livets början. En studie i abortetik*, Edsbruk: Thales, 1992, pp. 86-87, and Alfred Cioffi, *The Fetus as Medical Patient. Moral Dilemmas in Prenatal Diagnosis from a Catholic Perspective*, Lanham, new York & London: University Press of America, 1995, p. 188.

<sup>7</sup> I owe this idea to Lars Ährlund-Richter.

<sup>8</sup> Cf Shannon & Wolter, 'Reflections on the Moral Status of the Pre-embryo'. See John Connery, *Abortion: The Development of the Roman Catholic Perspective*, Chicago: Loyola University Press, 1977, for an

exposé of various theological theories of the human soul and its relation to the human organism.

<sup>9</sup> See, for example, Jason T Eberl, 'The Beginning of Personhood: A Thomistic Biological Analysis', *Bioethics* 14: 2, 2000, pp. 134-157, Norman M Ford, *When did I Begin? Conception of the Human Individual in History, Philosophy and Science*, Cambridge: Cambridge University Press, 1988, John Mahoney, *Bioethics and belief*, London: Sheed & Ward, 1984, pp. 62-64, Richard A McCormick, 'Who or What is a Preembryo?', *Kennedy Institute of Ethics Journal* 1: 1, 1991, 1-15, Paul Ramsey, 'Reference Points for Deciding About Abortion', in Noonan Jr. (ed.), *The Morality of Abortion: Legal and Historical Perspectives*, Cambridge, Mass., 1970, Shannon & Wolter, 'Reflections on the Moral Status of the Pre-embryo', Singer & Kuhse, 'Individuals, Humans and Persons', Bonnie Steinbock, *Life Before Birth. The Moral and Legal Status of Embryos and Fetuses*, Oxford & New York: Oxford University Press, 1992 and Mary Warnock, 'Do Human Cells Have Rights?', *Bioethics*, 1: 1, 1987, pp. 11-12.

<sup>10</sup> Rebecca Kolberg, 'Human Embryo Cloning Reported', *Science* 262: 5134, 1993, pp. 652-653.

<sup>11</sup> Cf, Parfit, *Reasons and Persons*, Part 3, and Jeff McMahan, 'Cloning, Killing, and Identity', *Journal of Medical Ethics* 25: 2, 1999, pp. 77-86.

<sup>12</sup> Alan H Handyside, 'Preimplantation Genetic Diagnosis Today', *Human Reproduction*, 11: supplement 1, 1996, pp. 139-151.

<sup>13</sup> Ian Wilmut et.al., 'Viable Offspring Derived from Fetal and Adult Mammalian Cells', *Nature* 385: 6619, 1997, pp. 810-813.

<sup>14</sup> Cf, McMahan, 'Cloning, Killing, and Identity'.



<sup>15</sup> Parfit, *Reasons and Persons*, Chapter 12.

<sup>16</sup> Meiosis is the peculiar process of cellular division giving rise to our gametes.

<sup>17</sup> Cf, Christian Munthe, *Pure Selection. The Ethics of Preimplantation Genetic Diagnosis and Choosing Children without Abortion*, Gothenburg: Acta Universitatis Gothoburgensia, 1999, p. 113.

<sup>18</sup> I owe this suggestion to Anders Tolland. See Michael J Flower, 'Neuromaturation of the Human Fetus', *Journal of Medicine and Philosophy* 10: 3, 1985, pp. 237-251, for an accessible introduction to neural fetal development (which starts in week 5-8). See Burgess & Taiwa, 'When did You First Begin to Feel It? – Locating the Beginning of Human Consciousness', *Bioethics* 10: 1, 1996, pp. 1-26, for an interesting discussion of when the embryo/fetus may be said to become sentient.

<sup>19</sup> Eberl, 'The Beginning of Personhood', Don Marquis, 'Why Abortion is Immoral', *Journal of Philosophy* 86: 4, 1989, pp. 183-202, and Shannon & Wolter, 'Reflections on the Moral Status of the Pre-embryo'.

<sup>20</sup> Ford, *When did I Begin?*, p. 72.

<sup>21</sup> Ford, *When did I Begin?*, p. 119. This, however, is overlooked by Shannon and Wolter, who claim that an argument like Ford's supports the idea that the embryo is not a *single* entity.

<sup>22</sup> Ford, *When did I Begin?*, pp. 84-85, my emphasis.

<sup>23</sup> Ford, *When did I Begin?*, p. 85, my emphasis.

<sup>24</sup> Ford, *When did I Begin?*, p. 119.

<sup>25</sup> Ford, *When did I Begin?*, p. 133, cites evidence suggesting the incidence of twinning to be approximately 3-4 per 1000 births.

<sup>26</sup> Ford, *When did I Begin?*, p. 120.

<sup>27</sup> Ford, *When did I Begin?*, p. 135.

<sup>28</sup> Eberl, 'The Beginning of personhood', pp. 142-143, as well as Singer & Kuhse, 'Individuals, humans and Persons', p. 68, come very close to this idea, but formulate it (in the former case) as a condition for being 'one individual human organism', and (in the latter case) as a condition for 'when a particular individual's life begins' – not as a condition for having moral status.

<sup>29</sup> See, for example, Donagan, *The Theory of Morality*, Chicago: Chicago University Press, 1977, p. 171, Marquis 'Why Abortion is Immoral', John T Noonan Jr., 'An Almost Absolute Value in History', in Noonan Jr. (ed.), *The Morality of Abortion*, and Vatican Congregation of the Doctrine of the Faith, *Instruction on Respect for Human Life in its Origin and on the Dignity of Procreation*, Vatican City: Vatican Press 1987.

<sup>30</sup> Peter Singer & Helga Kuhse, *Should the Baby Live? The Problem of Handicapped Infants*, Oxford: Oxford University Press, 1985.

<sup>31</sup> Ford, *When did I Begin?*, pp. 76-79, 96-99.

<sup>32</sup> Ford, *When did I Begin?*, p. 99, my emphasis.

<sup>33</sup> Marquis, 'Why Abortion is Immoral'.

<sup>34</sup> Jonathan Glover, *Causing Death and Saving Lives*, Harmondsworth: Penguin, 1977, pp. 76-77, Judith Jarvis Thomson, 'A Defence of Abortion', *Philosophy and Public Affairs*, 1: 1, 1971, 47-66, Steinbock, *Life Before Birth*, pp. 40-41, Michael Tooley, *Abortion and Infanticide*, Oxford: Oxford University Press, 1983, chapt. 6, Mary Anne Warren, 'On the Moral and legal Status of Abortion', in Hunt & Arras (eds.), *Ethical Issues in Modern*

*Medicine*, Palo Alto: Mayfield, 1977, and 'Do Potential People have Moral Rights?', in Sikora & Barry (eds.), *Obligations to Future Generations*, Philadelphia: Temple University press, 1978. In the case of Glover, this regards only his view of the moral importance of respecting personal autonomy.

<sup>35</sup> Cf, Noonan, 'An Almost Absolute value in History'.

<sup>36</sup> Cf, Munthe, *Pure Selection*, pp. 107-108 & 114.

<sup>37</sup> It should be noted, though, that multiple pregnancies in general increase the risk for spontaneous abortion. In other words, the promise of more valuable beings may in practice very well be balanced out by such risks.

<sup>38</sup> Ford, *When did I Begin?*, chapter 2, explicitly rejects such an idea in favour of an Aristotelian account of the soul as the 'form' of the human organism. However, as we have seen, he still retains an important rest of the Platonic-Cartesian account in his requirement that the form that is the soul has to be the form of *one and only one* being of a certain kind. Eberl, 'The Beginning of Personhood', p. 138, provides an explanation for this by his claim that the form, according to a Aristotelian/Thomistic account, not only determines of what kind a piece of matter is, but also *individuates* this piece of matter.

<sup>39</sup> Steinbock, *Life Before Birth*, p. 50. A similar suggestion is put forward in Eberl, 'The Beginning of Personhood', pp. 144 & 149.

<sup>40</sup> I owe this suggestion to Torbjörn Tännsjö.

<sup>41</sup> McMahan, 'Cloning, Killing, and Identity'.

<sup>42</sup> Parfit, *Reasons and Persons*, chapter 12, especially pp. 261-266.

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