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THE WARNOCK REPORT AND PARTIAL ECTOGESTATION: RETRACING THE PAST TO STEP INTO THE FUTURE

ABSTRACT

Partial ectogestation continues to move towards human clinical trials. This article draws upon the Report of the Committee of Inquiry into Human Fertilisation and Embryology (Warnock Report) to provide guidance as to what may need to be considered for the future regulation of this technology. Whilst the Warnock Report dates back to 1984, its significance and legacy continue to influence the current regulation of reproductive practices in the United Kingdom. By drawing upon specific elements within the report, many of the decisions and recommendations within it could provide direction for the future regulation of partial ectogestation. The role of the public, the social and political context at the time of the Warnock report, the determination of the status of the embryo, and arguments pitted against in vitro fertilisation (IVF) at the time, are all examined. As a result, this article suggests that the inclusion of the general public in the development and implementation of partial ectogestation prior to another Warnock-style inquiry will increase the success of long-standing regulatory and legislative provisions.

KEYWORDS: Partial ectogestation, Public consultation, Regulation, Warnock, Inquiry

I.INTRODUCTION

The Warnock Committee was established in 1982 and published its recommendations in 1984 in the Report of the Committee of Inquiry into Human Fertilisation and Embryology (hereafter Warnock report).[1] Despite its age, its success continues to be reflected in the Human Fertilisation and

[1] Department of Health and Social Security, *Report of the Committee of Inquiry into Human Fertilisation and Embryology* (Cmnd 9314, 1984) hereafter the Warnock report.

Embryology Acts (hereafter HFE Act) of 1990 and 2008. Over the years reproductive technologies and procedures have continued to expand, with in vitro fertilisation (hereafter IVF), the practice which instigated the Committee's formation, leading to a three times higher birth rate in 2019 compared to 1991.[2] Now, technology seems to be going even further with the possibility of partial artificial gestation rapidly approaching.[3] The prospect of artificial womb technology has become significant following research carried out by a team in America[4] and another team of researchers from Australia and Japan.[5] Both teams have managed to artificially gestate premature lambs in extra-uterine environments, with the intention of seeking to improve the survival prospects of human foetuses born prematurely around the 22-24 week threshold. These extra-uterine environments open up the possibility of partial ectogestation- the partial gestation of a human foetus outside of the human body. Whilst it has been argued that partial ectogestation already exists within current neonatal intensive care with the use of incubators,[6] arguably the technology under development differs significantly to this type of care as the gestating entity will be fully submerged within artificial amniotic fluid in a sealed container.[7] As such, the entity will continue to obtain oxygen through liquid as it does within a human uterus and have significantly limited interaction with the social environment.[8] These differences raise questions as to whether the entity would continue to be considered a new-born or a

[2] HFEA, *Fertility treatment 2019: trends and figures* (May 2021), < https://www.hfea.gov.uk/about-us/publications/research-and-data/fertility-treatment-2019-trends-and-figures/> last accessed 27 July 2022.
[3] Discussions surrounding the possibility of artificial womb technology has been ongoing for years but we now have functioning technology that makes its implementation in humans a real possibility.
[4] Emily A Partridge and others, 'An extra-uterine system to physiologically support the extreme premature lamb' (2017) 8 Nature Communications 15112.
[5] Haruo Usuda and others, 'Successful maintenance of key physiological parameters in preterm lambs treated with ex vivo uterine environment therapy for a period of 1 week' (2017) 217.4 American Journal of Obstetrics and Gynecology 457.e1.
[6] Peter Singer and Deanne Wells, 'Ectogenesis' in Scott Gelfand and John R Shook (eds), *Ectogenesis: artificial womb technology and the future of human reproduction* (Rodopi 2006) 9-10.
[7] Partridge and others (n 4).
[8] Elizabeth Chloe Romanis, 'Artificial womb technology and the significance of birth: why gestatelings are not newborns (or fetuses)' (2019) 45.11 Journal of Medical Ethics 727, 728.

different entity altogether,[9] a point which is discussed later in this paper and is the rationale for referring to the subject of the technology as an "artificially gestated entity" throughout this paper. As it may not be considered a new-born, the regulation of how this entity will be cared for comes into question.

Whilst partial ectogestation is the intended practice to be translated to human use, the advance of this research has also led scholars to speculate about the possibility of full ectogestation, whereby an embryo is placed directly in an artificial uterus, subverting the requirement for any human gestation.[10] Although partial ectogestation remains the focus of this paper (and reference to an artificially gestated entity is limited to an entity that has already undergone partial human gestation),[11] it will later be shown how the future potential of full ectogestation remains relevant.

In the first part of this paper, I explain why the Warnock report remains a useful tool in considering the future of new technologies like ectogestation. Despite its age, the remit and nature of the issues under review by the Committee are equally applicable to partial ectogestation and therefore the approach taken by the Committee, including some of the questions they sought to answer, can provide guidance on how to approach the regulation of this new technology. In the second part, I look at the role of the general public as key stakeholders in the Committee's deliberations and consider the part that members of the public may play in the development and regulation of partial ectogestation. In doing so I also explore how the timing of the Warnock Committee's inquiry correlated with the

[9] Elizabeth Chloe Romanis, 'Artificial womb technology and the frontiers of human reproduction: conceptual differences and potential implications' (2018) 44.11 Journal of Medical Ethics 751.

[10] For example, see I Glenn Cohen, 'Artificial Wombs and Abortion Rights' (2017) 47.4 Hastings Center Report inside-back; Joona Räsänen, 'Ectogenesis, abortion and a right to the death of the fetus' (2017) 31.9 Bioethics 697 and Bruce P Blackshaw and Daniel Rodger 'Ectogenesis and the case against the right to the death of the foetus' (2019) 33.1 Bioethics 76.

[11] I acknowledge that should full ectogestation become possible there will exist an entity that has never been gestated within a human and this could alter some of the later claims made in this paper. However, discussion of this is beyond the remit of this work.

developmental timeframe of the activity it was seeking to examine. Being in a position whereby partial ectogestation has not yet been converted to human clinical use (unlike IVF at the time of the Warnock inquiry), I consider whether this presents a prime opportunity to be proactive towards inclusion of the general public or whether it may in fact hinder its benefits. In the third section of this paper, I explore how the Committee dealt with establishing the legal status of the embryo and whether the same circumstances exist for deciding on the legal status of the entity gestated in an artificial device. The Committee faced many criticisms for determining how the embryo should be treated as opposed to defining its actual moral or legal status, and this review explores whether such an approach would be sustainable with partial ectogestation. In the fourth and final section, I consider some of the arguments against IVF that the Warnock Committee grappled with and determine whether the same arguments could be applied to partial ectogestation. In doing so it is revealed how the future prospect of full ectogestation may still play a role in the response towards partial ectogestation. In conclusion, I argue that particular steps can be taken to include the general public in the development of partial ectogestation prior to a future Warnock-style inquiry. This technology will raise new moral and legal questions, as well as potentially reigniting the long-standing debate over the status of an *in utero* foetus. As such, it is imperative that the views of the general public are well-informed and taken into account.

II.CAN THE WARNOCK REPORT REALLY AID FUTURE REGULATION?

Many of the recommendations in the Warnock report have led to long-standing and widely respected UK legislation, which governs the regulation of embryo research and particular reproductive practices. The HFE Act 1990, amended in 2008, establishes the set-up of the Human Fertilisation and Embryology Authority, which governs the licensing and monitoring of fertility clinics. IVF was a significant scientific breakthrough, making the existence of an embryo outside of the human body possible. Science is now

accelerating forward once again and creating the prospect of partially gestating a foetus outside of the human body. It therefore seems intuitive to review the context and recommendations of the Warnock Committee to examine how they worked their way through unchartered territory, in the hope that this may assist with the future regulation of partial ectogestation. Interestingly, the Warnock report makes explicit reference to ectogestation, albeit by the term 'ectogenesis'.[12] However, at the time of the report the Committee considered its development to be beyond the remit for their consideration and full ectogestation would be prevented by the 14-day limit on embryo research that they were to recommend.[13] Notably, their limited consideration of ectogestation and the anxiety it could cause was focused on how it could allow extensive research on embryonic and foetal development.[14] The prospect of the technology being used in a partial sense to increase the survival of premature babies was not envisioned at the time nor would it have been within the scope of the Committee's inquiry, which was limited to areas of conception. Nevertheless, it indicates how science has developed in ways previously unimagined.

Scepticism as to whether the Warnock report, in light of its age, can actually be useful or applicable to forthcoming technologies, such as partial ectogestation, is expected. However, many of the issues considered and decisions that needed to be made by the Committee are similar, if not identical, to the types of questions that are being speculated over regarding partial ectogestation. The foreword of the report describes the areas of which the Warnock Committee were concerned including '…questions

[12] Warnock report (n 1) para 12.7-12.8. See Elselijn Kingma and Suki Finn, 'Neonatal incubator or artificial womb? Distinguishing ectogestation and ectogenesis using the metaphysics of pregnancy' (2020) 34.4 Bioethics 354, 356 for why "ectogestation" is now considered the correct term for this process.
[13] Warnock report (n 1) para 12.8. Although they too recognised that public attitudes may alter as science develops (para 12.16). This recommendation was later adopted as statutory provision under section 3(4) of the Human Fertilisation and Embryology Act 1990 (as amended by the Human Fertilisation and Embryology Act 2008).
[14] Warnock report (n 1) para 12.7.

of birth and death, of the setting up of families and the valuing of human life…'.[15] As partial ectogestation is directly linked to premature birth and death, as well as contributing to the formation of families, it is apparent that the remit of the report would capture this technology now that it has become a possibility.

Whilst the age of the report suggests that our answers to particular questions may be different in light of social, legal and political changes, it nevertheless still remains a useful tool in directing us as to *what* questions may need to be answered and *how* we may want this future technology to be regulated. Natasha Hammond-Browning, in reviewing the evidence considered by the Committee, argued that the seminal influence of the Warnock report in shaping the regulation of embryo research means it is still a useful tool of reference.[16] Writing in 2015, Hammond-Browning outlined how issues relevant to the Warnock Committee were still the focus of debates then and this remains true in current times, particularly as calls for the extension to the 14-day limit on embryo research, a significant recommendation of the Committee which was translated to legislation, gains momentum.[17] Since the legislation resulting from the Committee's recommendations (and proceeding debates) has enjoyed such successful longevity, the approach of the Warnock Committee is a useful starting point in establishing the same success for the regulation of partial ectogestation. In the next section, I look at the key role the general public played in the Committee's approach and final recommendations and what this means for partial ectogestation.

[15] ibid Foreword para 5.
[16] Natasha Hammond-Browning, 'Ethics, embryos, and evidence: a look back at Warnock" (2015) Medical Law Review 23.4 588, 589.
[17] John B Appleby and Annelien L Bredenoord, 'Should the 14-day rule for embryo research become the 28-day rule?' (2018) 10.9 EMBO molecular medicine: e9437; Sophia McCully, 'The time has come to extend the 14-day limit' (2021) 47.12 e66-e66.

III.PUTTING THE PUBLIC AT THE CENTRE

Following the first successful IVF birth in 1978, the Warnock Committee was established in response to the increasing advancement of science in human fertilisation. They were charged with considering the "social, ethical and legal implications" of such developments.[18] The report included an explicit statement that the 'primary objective of regulation is protection of the public',[19] with public anxiety specifically referred to throughout the report.[20] Mary Warnock, the Chair of the Committee, commented after publication of the report, that whilst scientists should be free to pursue their goals, they should not be left to do so 'in *any* way or by *any* methods' (emphasis in original).[21] As a result, many of the Committee's recommendations were driven by a need to abate public concerns. For example, the Committee recommended that a statutory licensing authority (later to become the Human Fertilisation and Embryology Authority) should be set up to ensure embryo research was only carried out under licensed conditions. They proposed that the authority should include lay membership in order to increase public confidence.[22] It is well documented that the Warnock Committee drew a compromise between the ambitions of science and the views of the public,[23] and Hammond-Browning suggests that the Committee's recommendation to place a 14-day limit on embryo research may have also been driven by a need to obtain 'public backing'.[24] The political and social climate prior to the publishing of the Warnock report included a real impetus to move science and medicine away from internal regulation and to encourage external oversight.[25] Although this

[18] Warnock report (n 1) para 1.2.
[19] ibid para 13.3.
[20] ibid para 11.18, 11.19 and 12.1.
[21] Mary Warnock 'Scientific research must have a moral basis' (1984) 1430 New Scientist 36.
[22] Warnock report (n 1) para 13.4.
[23] e.g Hammond- Browning (n 16) 605-606, McCully (n 17) 1; Giulia Cavaliere, 'A 14-day limit for bioethics: the debate over human embryo research' (2017) 18.1 BMC Medical Ethics 1, 3.
[24] Hammond-Browning (n 16) 602.
[25] Duncan Wilson, 'Creating the 'ethics industry': Mary Warnock, in vitro fertilization and the history of bioethics in Britain' (2011) 6.2 BioSocieties 121, 128-129.

exposed a previously private profession to the opinions and views of others, such regulation was needed in order to allow science to progress forward with public support.[26] Despite the public clearly being at the foreground of the Warnock Committee's concerns, the Committee only received 695 letters and submissions from members of the public.[27] Arguably many members of the public may have been represented by the numerous organisations that submitted evidence to the Committee.[28] Nevertheless, centring the public in their recommendations was a key drive of the Warnock Committee.

Along a similar vein, there have been ongoing calls to take a proactive approach towards consultation regarding ectogestation. In 2006 for example, Scott Gelfand suggested that research outputs and the fruits of academic debates need to be shared with policy makers and the general public prior to the technology first being used on humans.[29] This would prevent responses based on fear and confusion as was the case with the reaction to cloning.[30] Similar calls continue to be made for further engagement amongst ethicists and lawyers,[31] as well as healthcare professionals and the general public.[32] It has also been suggested that without societal acceptance the technology will not succeed.[33] Despite the technology being targeted towards a small population of people who may experience premature birth, since any one of the general public may be in a position whereby they would utilise the technology (and it is acknowledged that some will be more at risk than others), they must be

[26] ibid 132.
[27] Warnock report (n 1) Appendix.
[28] ibid.
[29] Scott Gelfand, 'Introduction' in Scott Gelfand and John R Shook (eds), Ectogenesis: Artificial Womb Technology and the Future of Reproduction (Rodopi, 2006) 1-2.
[30] ibid.
[31] Amel Alghrani, 'The legal and ethical ramifications of ectogenesis' (2007) 2 Asian Journal of WTO & International Health Law and Policy 189, 196.
[32] Author's own (2020).
[33] EJ Verweij and others, 'Ethical development of artificial amniotic sac and placenta technology: a roadmap' (2021) 9.793308 Frontiers in Pediatrics, 2.

considered key stakeholders in its development. Reproductive autonomy is also considered integral to the way one chooses to live.[34] The possibility of a technology that could secure the survival and/or prevent morbidities for one's future child and how one may go about accessing such technology is therefore central to the exercise of one's reproductive autonomy, even if one never ends up in need of such access. In addition, since human gestation is a pre-requisite of partial ectogestation, the gestating individual's bodily integrity is integrated into the how and when of the technology's use. Transfer of the foetus to the artificial device will likely require a caesarean section,[35] and it is suggested that, in light of the earlier stage of gestation, this will involve a higher risk of surgical complications.[36] Major surgical intervention of this kind will require informed consent from the gestating individual. Therefore, those who may find themselves in such a position will especially have a vested interest in rules which govern how and when the technology will be used. The technology further raises questions as to the value placed on human gestation, how far technologies should go to intervene in premature birth and who may come to use this technology.[37] These types of questions go beyond the realm of scientific research endeavours and speak to what is considered valuable in particular societies and cultures. Such questions trigger "obligations to consider those who may be affected in the development of ectogestation…",[38] and therefore they will need to be responded to with regulatory and legislative provisions. If regulation of the technology is to be effective, there must be some level of support from not only those who will be subject to this regulation (i.e., healthcare professionals),

[34] Nicolette Priaulx, 'Rethinking progenitive conflict: Why reproductive autonomy matters' (2008) 16.2 Medical Law Review 169, 176.
[35] This is what has been done in the animal studies thus far, however it has been suggested that such technologies should also be compatible with vaginal delivery- M Beatrijs van der Hout-van der Jag and others, 'Interprofessional Consensus Regarding Design Requirements for Liquid-Based Perinatal Life Support (PLS) Technology' (2022) 9.793531 Frontiers in Pediatrics doi: 10.3389/fped.2021.793531. Regardless, the gestating individual's body is still a significant part of the transition to artificial gestation.
[36] Seppe Segers and Elizabeth Chloe Romanis, 'Ethical, Translational, and Legal Issues Surrounding the Novel Adoption of Ectogestative Technologies' (2022) Risk Management and Healthcare Policy 2207, 2210.
[37] M Beatrijs van der Hout-van der Jag and others (n 35).
[38] Segers and Romanis (n 36) 2211.

but also those who seek to use the technology since the regulation may impact how and when they are able to use it.[39] Whether a Warnock-style inquiry would be the appropriate way to bridge the views of potential users of the technology and the regulation that comes to govern it requires looking back at the timing of the inquiry in comparison to the development of the technology under consideration, namely IVF.

A. Is a Warnock-style Committee the way forward?

At the time of the Warnock Committee's inquiry IVF was already underway and unregulated[40] prior to the setup of the Committee. The Committee acknowledged that whilst procedures were new, IVF was an 'established form of treatment'[41] in operation on human beings.[42] Conversely, whilst animal studies have proven successful,[43] partial ectogestation has not yet progressed to human application. Despite some media attention,[44] general public discourse surrounding the technology is currently quite limited. As such, there is not the same imperative (yet) to get the public "on side" of the technology. It is quite possible that should the technology begin to make movements towards clinical use, an outcry of public disdain could hinder the technologies ongoing use within clinical settings, but we are not at that stage yet. Therefore, we are in a somewhat more unique position in how to approach the public in regards to this technology.

[39] EJ Verweij and others (n 33).
[40] Hammond-Browning (n 16) 606.
[41] Warnock report (n 1) para 5.15.
[42] ibid para 5.5.
[43] Matthew Hornick and others, 'Technical feasibility of umbilical cannulation in midgestation lambs supported by the EXTra-uterine Environment for Neonatal Development (EXTEND)' (2019) Artificial Organs 1-8; Haruo Usuda and others, 'Successful use of an artificial placenta to support extremely preterm ovine fetuses at the border of viability' (2019) 221.1 American Journal of Obstetrics and Gynecology 69.e1.
[44] Examples include: Michelle Roberts, 'Premature lambs kept alive in 'plastic bag' womb' *BBC News Online* (London, 25 April 2017) <http://www.bbc.co.uk/news/health-39693851> last accessed 3 August 2022 and Hannah Devlin, 'Artificial womb for premature babies successful in animal trials' *The Guardian* (London, 25 April 2017) <https://www.theguardian.com/science/2017/apr/25/artificial-womb-for-premature-babies-successful-in-animal-trials-biobag> last accessed 3 August 2022.

So, what can we do with the unique position we find ourselves in, in that the general public could be given an opportunity to respond to this technology before it enters the clinical domain? It has been suggested that the time has come for another Warnock-style Committee,[45] an inquiry that allows the general public, organisations and representative groups to share their views towards this technology that currently remains under-development. I, myself, have for some time been of the view that another Warnock Committee may be upon us. The fact that the technology has not yet been translated to clinical use suggests there is scope to take a more pro-active approach to measuring public responses as opposed to trying to placate fearful reactions.

If however, claims of human clinical trials for partial ectogestation taking place 'within the next couple of years'[46] comes to fruition, the timeline of the Warnock's Committee's recommendations suggests that such an inquiry would be needed sooner rather than later. Although many of the recommendations did become enshrined in UK law, a period of six years passed before legislation was enacted. The Committee itself also took two years to consider the evidence and draft its report, and between the publishing of the Warnock report and the enactment of the HFE Act 1990, the debate surrounding IVF and embryo research advanced further amongst special interest groups, political parties and the general public.[47] The focus of the debate also changed, with particular influence by the media.[48] Therefore, rather than consider the Warnock report as a net that captured public opinion of the time, it may be better viewed as an instigator that generated further dialogue in the public domain.

[45] Hammond-Browning (n 16) 616.
[46] Jenny Kleeman, ''Parents can look at their foetus in real time': are artificial wombs the future?' *The Guardian* (London, 27 June 2020) < https://www.theguardian.com/lifeandstyle/2020/jun/27/parents-can-look-foetus-real-time-artificial-wombs-future> last accessed 3 August 2022.
[47] A useful outline of the debates that followed is reported in Michael Mulkay, *The embryo research debate: science and the politics of reproduction* (Cambridge University Press 1997).
[48] ibid 70-73.

However, the unique position, in not yet having partial ectogestation clinically applied, may equally direct away from a Warnock-style inquiry at this stage. In attempting to clarify the meaning of the word 'potential' in their terms of reference,[49] the Warnock Committee outlined that they could only consider what they knew and what they could reasonably foresee.[50] This also meant that the Committee could only consider the views of society as they then were, stating 'the impact of scientific discoveries on the society of the future is…doubly hard to predict'.[51] In light of partial ectogestation being at a much earlier stage of development than IVF was at the time of the Warnock inquiry, it may be argued that there are risks attached to being *too* proactive with an inquiry, particularly if we cannot be certain when human clinical trials will begin and what the outcomes of those trials will be. For example, an early enquiry could draw upon the views of a society who may not see ectogestation implemented until several years later. The society in which the technology exists as part of clinical practice may not share the same views as to how it should be used and regulated. Secondly, until such time that partial ectogestation forms part of clinical practice, the public may struggle to construct a view on it. A concern that public opinion on surrogacy had not yet 'fully formed'[52] was a reason for two members of the Warnock Committee to dissent on that particular issue.

Therefore, justifications pull in both directions as to whether a Warnock-style inquiry would be appropriate in light of the stage of development of partial ectogestation. However, in this paper I seek to argue that perhaps there is a better way to approach public involvement with the technology *prior* to a Warnock-style inquiry, which in turn will hopefully improve the efficacy of such an inquiry.

[49] The full terms of reference state: 'To consider recent and potential developments in medicine and science related to human fertilisation and embryology; to consider what policies and safeguards should be applied, including consideration of the social, ethical and legal implications of these developments; and to make recommendations.'
[50] Warnock report (n 1) para 1.5.
[51] ibid.
[52] ibid, Expression of Dissent A. Surrogacy, para 9.

B. Members of the public as uncertified experts

In drawing upon what Harry M. Collins and Robert Evans refer to as uncertified expertise,[53] it is possible that certain members of the public with certain experiences may be in a position to offer a type of expertise to the *development* of partial ectogestation. Collins and Evans set out that whilst there may be a 'core-set' of scientists working on a specific development, their expertise does not correlate with 'extra formal qualifications' but comes from their experience and integration within a specialist group.[54] On this basis, it is not all scientists that can contribute to the technical decision-making of the technology and as such those outside of the core-set are considered as equivalent to the general public. Further to this, as members of the general public may have specific experiences, and if it is agreed that their field of experience is a legitimate source of expertise relevant to the technology,[55] then they may be considered to have contributory expertise[56] which feeds into the decision-making of the core-set. As such, the divide between the scientific community (even if a small core-set) and the general public at large, which was evident at the time of the Warnock Committee, becomes weakened as members of the public become part of or contribute to the decisions of the core-set. As to what field of experience and therefore which members of the public may be considered to have this contributory expertise would be up for debate and is beyond the scope of this paper. However, to flesh out the point here, it is arguable that perhaps those with previous experience of going through premature birth and having an infant cared for in neonatal intensive care[57] may have sufficient uncertified expertise based on their experiences. Such expertise would allow these members

[53] Harry M Collins and Robert Evans, 'The third wave of science studies: Studies of expertise and experience' (2002) 32.2 Social studies of science 235, 266.
[54] ibid 260.
[55] ibid 251-252.
[56] ibid 254.
[57] This is just an example and many other groups may have different experiences that are relevant to the technology, such as those for whom gestation carries several risks and therefore have never attempted to do so based on medical advice. I am grateful to Elizabeth Chloe Romanis for this point.

of the public to contribute towards the decision-making of the core-set group as to how the technology is developed. A similar approach has been argued for by EJ Verweij and others who encourage a 'value-sensitive design'[58] of artificial womb technologies by drawing upon stakeholder views '*throughout* technological development'[59] (emphasis in original). How this contribution would work in practice may be in the form of advisory boards such as that which currently exists for the Perinatal Life Support team who are working towards the development of 'a new environment for premature babies similar to that of the maternal womb'.[60] The teams Advocate Advisory Board runs parallel to their Scientific Advisory Board[61] and includes a consortium of designers, ethicists, healthcare professionals and patient representatives.[62]

Having members of the general public involved in the development of the technology in this way takes advantage of the position we are in with the technology that the Warnock Committee did not have with IVF. Rather than a committee spending time reducing tensions between the public and the scientific community, such friction may be reduced since certain members of the public will be part of the community of experts. There has also been recent criticism that the speculative academic discourse has gone beyond the realities of what the technology actually claims to do.[63] By involving members of the public during the development of partial ectogestation, speculation can be better managed since knowledge about the technology will be more accessible. When the time therefore

[58] EJ Verweij and others (n 33) 3.
[59] ibid 2.
[60] Perinatal Life Support, 'The PLS Project' <https://perinatallifesupport.eu/families/learn-more/> last accessed 4 January 2023.
[61] Perinatal Life Support, 'The Advocate and Scientific Advisory Board met to discuss progress on developing fetal mannikins' <https://perinatallifesupport.eu/the-advocate-and-scientific-advisory-board-met-to-discuss-progress-on-developing-fetal-mannikins/> last accessed 4 January 2023.
[62] M Beatrijs van der Hout-van der Jag and others (n 35).
[63] Claire Horn and Elizabeth Chloe Romanis, 'Establishing Boundaries for Speculation About Artificial Wombs, Ectogenesis, Gender, and the Gestating Body' in Chris Dietz, Mitchell Travis and Michael Thompson (eds), *A Jurisprudence of the Body* (Palgrave 2020), 227-254.

comes for regulation of the technology to be determined, perhaps by a Warnock-style Committee, the aim of such recommendations may be less burdened with placating a knee-jerk public reaction and could focus on the aims of the technology for those in need of it.

C. Education campaigns

A significant counter-point which may lower the suggested success of this approach is that the technology itself is only aimed at a small target population, and therefore those with the experiential expertise to contribute to its development is likely to be small. Subsequently, the wider public will generally be none the wiser to the ongoing developments. Contributory expertise from specific members of the public may not be enough. To compliment this therefore, there would also need to be widespread educational campaigns aimed towards the wider public in order to bring them within the knowledge sphere. The knowledge sphere here relates to the necessary information members of the public would need in order to engage meaningfully with a future inquiry. This could include information such as why the technology is being developed and how it may work. However, such campaigns should not have the aim of garnering public support. As Giulia Cavaliere warns, we can not only respect public opinion when it goes in favour of a particular procedure.[64] To do so would mean that scientists and researchers are merely using the public to further their own endeavours. Instead, we must remain mindful that public policy is shaped by 'institutions, organisations and individuals…'.[65] The educational campaigns should have the goal of providing clear and accurate information so that when the time comes for an inquiry, responses can be informed and concerns as to whether public opinion has fully formed, as was the feared case with surrogacy, can be rebutted. Those members of the public considered uncertified experts who contribute to the decisions of the core-set of scientists

[64] Cavaliere (n 23) 9.
[65] Amel Alghrani, *Regulating Assisted Reproductive Technologies: New Horizons* (Cambridge University Press, 2018) 47.

could also form part of these campaigns to provide real-life accounts as to why the technology is needed. Their experiential expertise would then serve to assist in both the development of the technology as well as the dissemination to the wider public. This could lessen any scepticism people may feel from having to "take the scientists word for it", thereby increasing public trust.[66]

A. The role of empirical research

Despite the inclusive approach attempted by the Warnock Committee, the report noted the difficulties they faced in engaging marginalised and special interest groups with their inquiry.[67] In a very small way, if a future Committee relating to partial ectogestation were to consider empirical research studies as a form of evidence, the connection with marginalised groups may be more successful. Our understanding of diversity itself has expanded since the Warnock report, particularly in areas of family formations, sexual identity and gender roles. Empirical studies can be aimed at specific target populations, including those that are under-represented, in the hope that this diversity is better represented in research outputs. Inclusion of these studies as a form of evidence in an inquiry will perhaps improve the likelihood that recommended regulations have considered the impact on marginalised groups within society.

Although academic commentary regarding ectogestation is now quite vast,[68] there are currently no known empirical studies in the UK examining the views and attitudes of the general public towards the technology. Survey studies have however been carried out in other jurisdictions in relation to partial ectogestation. In Israel, for example, studies indicate a positive attitude towards the

[66] Segers and Romanis (n 35) 2213.
[67] Warnock report (n 1) para 1.7.
[68] For example, see Romanis (n 9), Kingma and Finn (n 12), Horn and Romanis (n 63), Anna Nelson, 'Should Delivery by Partial Ectogenesis Be Available on Request of the Pregnant Person?' (2022) 15.1 International Journal of Feminist Approaches to Bioethics 1.

technology when its use is focused on the benefits for a foetus as opposed to gestating individuals[69] and the technology is best considered as a last resort treatment for infertile individuals.[70] Whilst these studies do not necessarily provide insight to the position of UK citizens, they nevertheless demonstrate that the society of any jurisdiction will hold particular views as to how this technology should be used and by whom. Empirical research may therefore take a more in-depth account of societal values and beliefs that shape perceptions of the technology.

In order for a future Committee to take empirical studies into consideration in making recommendations for the regulation of partial ectogestation, they of course need empirical studies to have actually been undertaken. There is therefore an imperative for researchers to undertake this type of research to build up a pool of evidence that will be available for a future inquiry. However, perhaps in a more effective way, empirical research is also needed in order to test the theoretical debates that currently dominate academic discourse in this field. For example, a research project examining the value, if any, that individuals place on human gestation could inform the theoretical debates as to whether and to what extent partial ectogestation may pose a risk to human pregnancy eventually becoming a "social anomaly".[71] If the theoretical debates are empirically tested and lead to further robust and informed debate within the academic commentary, a further rich resource will be available should a committee become charged with considering the 'social, ethical and legal

[69] Frida Simonstein and Michal Mashiach-Eizenberg, 'A Survey of People's Attitudes Towards the Artificial Womb and Ectogenesis in Isreal' in Frida Simonstein, *Reprogen-ethics and the future of gender* (Springer Science & Business Media 2009), 217.

[70] Ruth Landau, 'Artificial womb versus natural birth: an exploratory study of women's views' (2007) 25.1 Journal of Reproductive and Infant Psychology 4, 13.

[71] Maureen Sander-Staudt, 'Of machine born? A feminist assessment of ectogenesis and artificial wombs' in Scott Gelfand and John R Shook (eds), *Ectogenesis: Artificial Womb Technology and the Future of Reproduction* (Rodopi 2006) 114.

implications' of partial ectogestation in the same way that the Warnock Committee were with regard to IVF.

In this section, it has been argued that prior to a Warnock-style inquiry other steps could be taken to improve the general public's participation in the development of partial ectogestation, through the use of uncertified experts, education campaigns and a drive towards empirical research. Taking these steps may reduce the tension between the scientific community and the wider public, encourage more informed responses to any future inquiry and provide a rich resource of evidence for a future Warnock-style Committee to take into account. In the following section, I review how the Warnock Committee dealt with the question of the legal status of the embryo and how the three suggested approaches above may assist in determining the status of an (partially) artificially gestated entity.

IV.ESTABLISHING LEGAL STATUS

When having to consider the moral and legal status of an embryo, the legal position during the time of the Warnock deliberations were somewhat similar to that with partial ectogestation, in that there was no legislation specifically governing IVF,[72] just as there is no current legislation that contemplates ectogestation (either fully or partially). In fact, the legislation that was in place at the time of the Warnock report, such as the Offences Against the Persons Act 1861, is still current law. Since the Warnock report, the HFE Acts of 1990 and 2008 have been enshrined, however, aside from the 14-day limit on embryo research which may prevent prospects of full ectogestation, the Acts themselves do not provide guidance for the regulation of the technology.[73] In addition, the treatment services which the legislation covers are currently defined in the HFE Act 1990 as 'medical, surgical or obstetric

[72] Warnock report (n 1) para 1.9.
[73] Amel Aghrani noted that the updating of the HFE Act in 2008 was perhaps a missed opportunity to regulate ectogestation- Amel Alghrani, 'The Human Fertilisation and Embryology Act 2008: a missed opportunity?' (2009) 35.12 Journal of Medical Ethics 718.

services provided…for the purpose of assisting women to carry children.'[74] Since partial ectogestation would in fact relieve an individual of carrying a child, it is questionable whether the HFE Acts would apply to this technology. Therefore, the applicable legislative framework that exists now is almost identical to that which was at the hands of the Warnock Committee between 1982 and 1984.

Although the Warnock Committee accorded an embryo a special status that requires protection in law, in reaching this prominent recommendation, the Committee explicitly avoided answering the question of when life or personhood begins and instead focused on how an embryo should be treated.[75] Whether one question can be answered without the other is dubious and the Committee faced much criticism for their approach, such as John Harris labelling it as an 'evasion' and arguing that the Committee failed to deliver an explanation of what is valuable about the embryo that warrants its protection.[76] Despite such accusations, Hammond-Browning highlights that if the Committee had taken a firm position on this, there would have been implications for abortion legislation, specifically the Abortion Act 1967.[77] She outlines that if the embryo was granted full moral status and this was to be recognised in law, then defences to abortion would have to be repealed.[78] Alternatively, if the embryo only gained moral and legal rights upon birth then gestational restrictions on abortions could no longer be justified.[79]

Mary Warnock, prior to any recommendations being published, defended going straight to the question of how a thing should be treated by claiming that to call something a person simply acts as

[74] HFE Act 1990, s 2.
[75] Warnock report (n 1) para 11.9.
[76] John Harris, *The Value of Life: An introduction to medical ethics* (Routledge 1985), 133-134.
[77] Hammond-Browning (n 16) 607-608.
[78] Abortion Act 1967, s1(1).
[79] Hammond-Browning (n 16) 607-608.

an indicator of how that thing should be treated.[80] Therefore, she claimed it made more sense to decide how the thing should be treated based on moral principles rather than status.[81] However, the embryo starts from a position of being an isolated entity, whereas a partially gestated entity has already been part of another individual and had the legal protections associated with being so. As such the embryo benefited from a much more neutral foundation when its moral and legal status came under consideration. In having the status of an *in utero* foetus prior to its transfer to artificial gestation it is questionable whether an artificially gestated entity could also enjoy such neutrality. Therefore, it is questionable where the 'evasive' approach of the Warnock Committee can similarly be adopted when deciding on the status of an artificially gestated entity.

A. Why is the legal status of an artificially gestated entity up for debate?

Before considering how to go about defining the artificially gestated, we must first consider why any definition or declaration of its status is needed. As mentioned in the introduction to this paper, there is an argument that partial ectogestation is simply an extension of current neonatal intensive care and as such the artificially gestated entity is no different to any other premature new-born receiving treatment.[82] However, within the academic community there are contentious debates as to how the technology and therefore the entity subject to its use is conceptualised. Elizabeth Chloe Romanis, for example, argues that the entity undergoing artificial gestation, which she terms as a 'gestateling', is different to a new-born on the basis that a new-born can interact with the environment to which it is exposed.[83] Elselijn Kingma and Suki Finn have further built upon this claim by outlining the physiological differences between a new-born and the artificially gestated entity, arguing that whilst

[80] Mary Warnock, 'In vitro fertilization: the ethical issues (II)' (1950) 33.132 The Philosophical Quarterly 238, 241.
[81] ibid.
[82] Singer and Wells (n 6) 9-10.
[83] Romanis, *Artificial womb technology and the frontiers of human reproduction* (n 9) 754.

a 'gestateling' has undergone a change of location in the same way as a new-born, it still maintains physiological features of a foetus, such as breathing through an umbilical cord.[84] They argue that, unlike neonatal intensive care, artificial gestation treats the foetus as if it had not been "born-by-physiological-change".[85] Nick Colgrove, on the other hand, has argued that the artificially gestated entity should be treated like another type of new-born on the basis that live birth has taken place.[86] In accordance with the WHO definition of birth, Colgrove suggests that the entity exhibits signs of life through its beating heart and therefore should be considered "live born" like a new-born.[87]

When considering the status of an embryo, aside from some consideration of the legal treatment of *in vivo* embryos,[88] there were very limited parallels on which the Warnock Committee could draw. Nevertheless, the Committee were able to clearly define the embryonic stage from fertilisation to six weeks post fertilisation.[89] The way the entity is conceptualised will have an impact on how it is treated legally. If it is considered a new-born as Colgrove argues then there will be minimal, if any, legal changes necessary for how the entity is to be treated and it would be considered to have legal personhood. However, if the artificially gestated entity is not to be considered a new-born and not to be considered a foetus, then there is a severe lack of current legal guidance that explains whether it would be considered to have legal personhood.[90] This would then impact whether it has rights and what other people may or may not do with it.

[84] Kingma and Finn (n 12) 359. A similar claim was also made in an earlier paper by Romanis- Elizabeth Chloe Romanis, 'Challenging the 'born alive' threshold: Fetal surgery, artificial wombs, and the English approach to legal personhood' (2020) 28.1 Medical Law Review 28.1 93, 94.
[85] Kingma and Finn (n 12) 360.
[86] Nick Colgrove, 'Subjects of ectogenesis: are 'gestatelings' fetuses, newborns or neither?' (2019) 45.11 (2019) Journal of Medical Ethics 723.
[87] Nick Colgrove, 'Artificial wombs, birth and 'birth': a response to Romanis' (2020) 46.8 Journal of Medical Ethics 554.
[88] Warnock report (n 1) para 11.16-11.7.
[89] ibid para 1.4.
[90] Romanis, 'Challenging the 'born alive' threshold' (n 84) 95.

B. Where does the public come into this?

As alluded to earlier, prior to becoming the subject of partial artificial gestation, the entity in question will be a foetus inside the body of an individual and as such the gestating individual's bodily integrity, as well as their reproductive autonomy, becomes deeply intertwined with how the artificially gestated entity comes to be defined. The legal status of a foetus is somewhat haphazard in UK law. Despite it not being considered a person,[91] it is nevertheless afforded protection through restrictions on procuring an abortion.[92] An individual's reproductive autonomy is curtailed by their needs to justify the termination of their pregnancy, suggesting that the foetus is considered as more than nothing.[93] Since it is an *in utero* foetus before becoming an artificially gestated entity, it would seem logical to assume that the minimum starting point as to how the entity should be treated is the same as an *in utero* foetus. However, the treatment of an *in utero* foetus has been largely framed around the fact that it exists within the body of a legally recognised person and so translating that to an entity that is being gestated mechanically would not be simple. To rely on the basis that a change of location would not signify any difference between an *in utero* foetus and an artificially gestated entity, would run the risk of any protections that are later given to the artificially gestated entity being translated back to the *in utero* foetus.[94] This could have a severe detrimental impact on the bodily autonomy of gestating individuals. There have already been suggestions that partial ectogestation could 'end the abortion debate',[95] which relies on an erroneous assumption that individuals seeking an abortion simply wish

[91] *Paton v British Pregnancy Advisory Service Trustees and Another* [1979] QB 276, 279.
[92] Offences against the Person Act 1861, s58. The Abortion Act 1967 provides defences to this provision but still means that abortions can only be legally obtained under specific conditions.
[93] *St. George's Healthcare N.H.S. Trust v S; R v Collins and Others* [1999] Fam 26, 45. Hammond-Browning highlights that the position of a foetus is not much different to that of an embryo, in that it has some protections with having a definitive status- (n 16) 616.
[94] See Romanis, 'Challenging the 'born alive' threshold' (n 84) 102-105 for the impact of this in relation to foetal surgery.
[95] Singer and Wells (n 6) 11-13.

to end their physical pregnancies.[96] Additionally, to deny any significance of the change of location from within to outside the gestator's body would run counter to the legal position that personhood is assigned at birth, which includes expulsion from the gestator's body.[97]

The academic debates illustrate that, just as there was with an embryo, there are likely to be divergent views as to the moral and legal status of an artificially gestated entity. Conceptual arguments as to their differences may not be apparent to lay people, and it has been claimed that reactions to an artificially gestated entity are likely to be influenced by its visual likeness (or not) to a new-born.[98] The evidence submitted to the Warnock Committee,[99] plus the Committee having its own dissenting members, indicates how difficult it was to reach consensus on such contentious issues in 1982 and these issues remain contentious, if not more so, today. A utilitarian approach is argued to be the final position that the Warnock Committee decided to take,[100] whereby the benefits of embryo research were considered to deliver the greatest good for the greatest numbers. In light of the recent overturning of rights to abortion access in the US,[101] as well as the UK governments removal of abortion rights from their international human rights statement,[102] any attempt at such a balancing

[96] See Leslie Cannold, *The abortion myth: Feminism, morality, and the hard choices women make* (Wesleyan University Press 2000) which shows this is not the case. Not also that in order for partial ectogestation to replace abortion, individuals will be forced to stay pregnant which can cause them significant harms (see Elizabeth Chloe Romanis , 'Abortion & 'artificial wombs': would 'artificial womb' technology legally empower non-gestating genetic progenitors to participate in decisions about how to terminate pregnancy in England and Wales?' (2021) Journal of Law and the Biosciences 8.1 doi:10.1093/jlb/lsab011, 11-14).

[97] Birth is defined under section 4(2)(a) of the Congenital Disabilities (Civil Liability) Act 1976 as the moment in which a child "first has a life separate from his mother" and section 1(1) of the Infant Life Preservation Act 1929 makes reference to "existence independent of its mother".

[98] Joyce M Raskin and Nadav A Mazor, 'The Artificial Womb and Human Subject Research' in Scott Gelfand and John R. Shook (eds), *Ectogenesis: Artificial Womb Technology and the Future of Reproduction* (Rodopi 2006) 167-168.

[99] As detailed by Hammond-Browning (n 16).

[100] Hammond-Browning (n 16) 606.

[101] Dobbs v Jackson Women's Health Organization 597 U.S. . ____ 2022.

[102] Lizzie Davies, "UK in diplomatic standoff over deletion of abortion rights from gender statement" *The Guardian* (London, 28 July 2022) < https://www.theguardian.com/global-development/2022/jul/28/uk-in-diplomatic-standoff-over-deletion-of-abortion-rights-from-gender-statement> last accessed 2 August 2022.

exercise with the regulation of partial ectogestation need also account for the potential broader implications for society.[103] Whilst the technology may provide a lot of hope for families and individuals harmed by premature birth and potentially even provide insights that could eliminate other pregnancy losses, the legal complexity that will need to be unravelled poses a risk of reducing reproductive rights for a large portion of the society. Paying attention to these wider implications by educating the public and having certain members involved in the technology's development and implementation could help to ensure that any future regulation will be robust and avoids any unintended consequences.

Education campaigns suggested above should provide as detailed as possible explanations as to what the technology will look like and how visually accessible the artificially gestated entity will be. The use of images, closely replicating the reality of the technology would be most helpful in this regard.[104] Allowing the general public the opportunity to see how the technology may look in a reconstruction may have a less shocking impact than seeing images of the technology in clinical use for the first time. Again, this opportunity and preparation may prevent knee-jerk reactive responses to the technology. As Segers and Romanis have claimed, terminology is key when it comes to communication[105] and using realistic reconstructions may give members of the general public an opportunity to consider how they would define the artificially gestated entity. This is an important area where legislation needs to draw upon the consensus of those who will be closely interacting with the technology, including parents and healthcare professionals. Studies indicate that clinicians often concede to whatever moral status parents give to their foetus when providing treatment on the basis that this is a value judgment as

[103] Cavaliere (n 23) 7.
[104] An example of a visual depiction of this kind of technology can be found on the website for the Perinatal Life Support project- Perinatal Life Support explained, 'The PLS Project' <https://perinatallifesupport.eu/> last accessed 6 January 2023.
[105] Segers and Romanis (n 36) 2213

opposed to a clinical judgment,[106] and the same reasoning may be applied to artificially gestated entities. However, the legal status of the entity will dictate how healthcare professionals are to treat it. If the parents disagree with the boundaries of treatment that can be provided to the entity, then disputes will occur as is evident from recent litigation involving the treatment of very sick children.[107] How parents feel the artificially gestated entity should be treated will very much be driven by how they conceptualise the entity and therefore finding out what those conceptualisations could be, and comparing them with the views of healthcare professionals, is likely to help guide legislators towards the most mutually agreed definitions. Empirical studies would be a useful tool by which to capture the differing views of the artificially gestated entity amongst different stakeholders. In addition, uncertified experts, again using the example of those who have experience of an infant being treated in neonatal intensive care, could assist in the development of the technology by guiding scientists as to the terminology they preferred, or found most reassuring, in their previous experiences.

In this section, I have detailed how the Warnock Committee approached the legal definition of the human embryo. In establishing that the artificially gestated entity sits on far less neutral ground, I evidenced the need to explore it's moral and legal status, emphasising the need to include key stakeholders in such deliberations. In the next section, I examine some of the arguments presented against IVF discussed in the Warnock report, to determine whether such claims could be (or are already) linked with partial ectogestation.

[106] Lisa Campo-Engelstein, Lisa and Elise Andaya, 'Clinicians' criteria for fetal moral status: viability and relationality, not sentience' (2022) Journal of Medical Ethics Epub 0:1–6. doi:10.1136/medethics-2022-108392, 4.

[107] For example, see Re Pippa Knight [2021] EWCA Civ 362 and Fixsler v Manchester University NHS Foundation Trust [2021] EWCA Civ 1018.

V.FACING OPPOSITION

As has been alluded to, the Warnock Committee had an unenviable task in trying to work its way through the different opinions expressed in submissions to their inquiry. Hammond-Browning, in her examination of submissions from organisations to the Committee, found there was a spectrum of divisive opinions at the time relating to embryo research.[108]

Such submissions to the Committee included the claim that IVF, as well as treatment for infertility more generally, interferes with nature. The Committee responded to this argument by stating that IVF and other techniques are acceptable substitutes for natural fertilisation due to the ambiguity of the terms 'natural' and 'unnatural'.[109] A claim of interfering with nature is already a prominent argument aimed at partial (and full) ectogestation, as there is a concern that there is so much we do not understand about the human uterus that it would be dangerous to the resulting child to attempt to replicate it artificially.[110] The terms 'natural' and 'unnatural' remain just as ambiguous today as they did at the time of the Warnock report, and perhaps even more so as medicine has developed.[111] The Warnock Committee at the time stated '…actions taken with the intention of overcoming infertility can…be regarded as acceptable substitutes for natural fertilisation.'[112] Infertility is most commonly understood as the inability to conceive.[113] Whilst the current intention of partial ectogestation is to improve the survival outcomes of premature babies, that premature birth may have been caused by an individual's inability to maintain late term gestation. Therefore, partial ectogestation may be framed as a tool to overcome particular diseases that prevent individuals from maintaining

[108] Hammond- Browning (n 16) 593.
[109] Warnock report (n 1) para 2.4.
[110] Christine Rosen, 'Why not artificial wombs?' (2003) 3 The New Atlantis 67, 76.
[111] Nuffield Council on Bioethics, *Ideas about naturalness in public and political debates about science, technology and medicine- Analysis Paper*, (November 2015), 26-27.
[112] Warnock report (n 1) para 2.4
[113] "Infertility" (World Health Organisation, 14 September 2020) <https://www.who.int/news-room/fact-sheets/detail/infertility> last accessed 2 August 2022.

pregnancies. The use of the word 'substitute' by the Warnock Committee however does draw out differences between replacing the mode of conception and replacing the mode of gestation. Gestation is a much more visible part of the procreation process and it is possible that, because human gestation can be physically seen (which conception cannot), 'substituting' it with an artificial device may ignite more emotive and potentially negative responses.[114] There have already been concerns raised within the academic community that the potential of partial ectogestation to develop into full ectogestation may result in pregnancy becoming a 'social anomaly'.[115] This has been exacerbated by academic discourse treating full ectogestation as 'imminent and inevitable'.[116] Whilst research is currently focused on partial ectogestation, fears as to where that could lead in the future may impact the stance that members of the public take on the current technology. Regulation will therefore be key in determining whether, when and how the technology would ever be allowed to develop in such a way.

A concern of over-population was also addressed by the Warnock Committee, with the response in the report stating that the number of children born as a result of infertility treatment is insignificant compared with those born naturally, and that many other treatments exist that are aimed at malfunctions and infertility can be considered as such.[117] Over-population concerns are less likely to be aimed at partial ectogestation in the same way as IVF, since in most cases you will be dealing with continuing the development of a foetus already in existence, as opposed to creating a foetus that would otherwise not exist.[118] The continued development of a life rather than the creating of a life is likely to be more favourable. Nevertheless, concerns do exist about the financial strain on society of potential surplus babies, particularly if intended parents change their mind during artificial

[114] Raskin and Mazor (n 98) 167-168.
[115] Sander-Staudt (n 71).
[116] Horn and Romanis (n 63) 231.
[117] Warnock report (n 1) para 2.4.
[118] Such a claim could be dismissed if you consider no "person" to exist until birth, but consideration of such arguments is beyond the scope of this paper.

gestation.[119] This would mean that questions as to responsibility need to be considered and whether ownership of the technology translates to ownership of the gestated entity.[120] As the same situation may arise with infants cared for in neonatal departments, procedures and policies may be replicated. However, this again will be dependent on the broader question discussed above as to the status given to the artificially gestated entity.

A final argument presented against IVF was that the desire for children is outweighed by other needs.[121] Such an argument is evident in most debates surrounding technologies that aid or assist human reproduction and as with all claims upon clinical resources, there is always the subjective call that money could be better spent elsewhere. The Warnock Committee defended infertility as a malfunction within the human body that merits treatment[122] and such a position appears widely accepted with funding options available from the NHS.[123] However, distinguishing IVF and partial ectogestation as the creation of life and the continued development of an existing life could perhaps suggest that resource claims may be less targeted at partial ectogestation. This would particularly be the case if partial ectogestation is considered as purely an extension of current neonatal intensive care. There are no doubts however that the technology is likely to be of huge expense. The Warnock Committee at the time claimed that costs arguments relate to the extent of provision of the treatment as opposed to whether the treatment should be provided at all.[124] Therefore, the expense of partial

[119] Alghrani, 'The legal and ethical ramifications of ectogenesis' (n 31) 198.
[120] Natasha Hammond-Browning, 'A new dawn: ectogenesis, future children and reproductive choice' (2018) 14.4 Contemporary Issues in Law 349.
[121] Warnock report (n 1) para 2.3.
[122] ibid para 2.4.
[123] Although it is acknowledged that many problems still exist with such funding. See for example, Siân Smith and Olivia Marshall (British Pregnancy Advisory Service), BPAS investigation into the IVF postcode lottery: an examination of CCG policy for the provision of fertility services (2020) <https://www.bpas.org/media/3369/bpas-fertility-ivf-postcode-lottery-report.pdf> last accessed 2 August 2022.
[124] Warnock report (n 1) para 5.8.

ectogestation should not cloud debates as to whether the treatment should be developed, however, particularly in light of strains on NHS resources, regulatory decisions will likely involve parameters as to when and how the technology should be used. This will therefore include discussions as to who will have access to the treatment. Whilst these initial parameters may be very narrow as the efficiency and safety of the technology is confirmed, discussions as to how these parameters might expand need to be had. The uncertified expertise of members of the public, such as those who have experienced premature birth, alongside the experiences of healthcare professionals working within the relevant units could provide insights as to the circumstances where partial ectogestation may be most fruitful.

Whilst some of the arguments raised against IVF explored in this section may be more targeted at full ectogestation, they nevertheless provide food for thought as to some of the issues and areas of debate where further public engagement and education will be needed. Again, academic commentary on some of these issues have been discussed, but it is now timely to test those theoretical assumptions with empirical research to add to the pool of available knowledge should a future inquiry take place.

VI.CONCLUSION

In 2015 Hammond-Browning put a case forward for a new Warnock-style committee[125] and this was echoed by Alghrani in 2018.[126] As advances in reproductive technology have continued to grow, the prospect of partial ectogestation indicates that we are about to embark upon a realm of possibilities that were not considered possible at the time of the Warnock Committee. Just as IVF represented the first creation of an embryo outside of the human body, partial ectogestation opens up the possibility of gestation with only the partial need of a human gestator.

[125] Hammond-Browning (n 16) 616-617.
[126] Alghrani, *Regulating Assisted Reproductive Technologies: New Horizons* (n 65) 267-269.

In this paper, I have sought to demonstrate how the Warnock report, despite being published in 1984, can assist in the move forward with the future regulation of partial ectogestation. By examining how the Warnock Committee placed the public at the centre of their recommendations and the timing of the inquiry compared to the developmental stage of IVF, different approaches to involving the general public in the development of partial ectogestation prior to another Warnock-style inquiry is suggested. This includes utilising certain members of the public as uncertified experts, running educational campaigns outlining pertinent information as to the purpose and design of the technology and encouraging empirical research to build up a rich pool of knowledge for future regulation. In exploring how the Warnock Committee dealt with determining the status of the embryo by focusing on how it should be treated, I have shown that the existing status of an *in utero* foetus may hamper taking a similar approach with partial ectogestation. The varying ways in which an artificially gestated entity could be treated or labelled and its implications on reproductive autonomy indicate why public involvement in this particular area of regulation would be necessary. Reviewing some of the arguments that the Warnock Committee had to contend with in relation to IVF, also points to some of the issues that could be raised in regard to partial ectogestation. The link of these possible claims to full ectogestation, which is arguably beyond the scope of any current scientific endeavours, serve as a reminder that the potential of the technology may still influence the regulation of its current intentions.

Science has developed to a point where the effectiveness of some of the Warnock Committee's recommendations, such as the 14-day limit on embryo research, is up for renewed debate. Whilst many of the Warnock recommendations have had long-standing success, it is now time to ensure that some of those recommendations are either re-established (such as the continuing requirement for a licensing authority) or revised (such as the 14-day limit on embryo research). Although many moral

and legal questions surrounding partial ectogestation remain, it is important to begin to involve the general public in the development and potential future implementation of this technology. Whilst it may be too soon for a Warnock-style inquiry, steps can certainly be taken to ensure that such an inquiry can be as effective as possible in making regulatory and legislative recommendations that will take account of public values. These provisions can therefore stand more chance of heralding the long-standing success of the recommendations of the Warnock Committee.