PUBLIC POLICY RECOMMENDATIONS CONCERNING PRENATAL ADOPTION OF FROZEN EMBRYOS IN LIGHT OF FETAL MICROCHIMERISM

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No one is quite sure why women on average live longer than men.[1] Immunologists suggest that one answer may be found in small pockets or colonies of fetal stem cells that traffic into the body of pregnant women.[2] Normally, foreign cells that enter a person's body are detected, engulfed, and destroyed by T-cell lymphocytes.[3] However, due to the "'immunological paradox of pregnancy,'" a woman's body when pregnant generally does not attack but, rather, accommodates her own embryo (comprised of foreign cells).[4] On the other hand, in cases of preeclampsia, a woman's body rejects the embryo she conceived due to an "immunologic intolerance between maternal and fetal tissues."[5] This Article attempts to understand these puzzling biological processes, their ethical significance, and their import for law and public policy concerning the prenatal adoption of frozen embryos.

Part I notes that these fetal microchimeric cells bearing the genetic heritage of the father migrate across the placental barrier during pregnancy

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1. Keelin O'Donoghue et al., *Microchimeric Fetal Cells Cluster at Sites of Tissue Injury in Lung Decades After Pregnancy*, 16 REPROD. BIOMED. Online 382, 389 (2008).

2. *Id.* *See also* Kakali Sarkar & Frederick W. Miller, *Possible Roles and Determinants of Microchimerism in Autoimmune and Other Disorders*, 3 AUTOIMMUNITY REVS. 454, 460 (2004); J.L. Nelson, *Microchimerism and Human Autoimmune Diseases*, 11 LUPUS 651, 651 (2002).

3. Gustaaf Albert Dekker, *The Immunological Aspects of Preeclampsia: Links with Current Concepts on Etiology and Pathogenesis*, *in* HYPERTENSION IN PREGNANCY 37, 42–43, 47 (Michael A. Belfort et al. eds., 2002).

4. Aryn Martin, *Microchimerism in the Mother(land): Blurring the Borders of Body and Nation*, BODY & SOC'Y, Sept. 2010, at 23, 35 (citing J.L. Nelson, *The Chimeric Self-Cellular Traffic between Mother and Fetus Raises Questions about the Causes of Autoimmune Disease*, 110 NAT. HIST., no. 3, 2001 at 14.). *See also* Juan C. Galofré, *Microchimerism in Graves' Disease*, J. THYROID RES., Jan. 2012, at 1, 2.

5. Audrey F. Saftlas et al., *Abortion, Changed Paternity, and Risk of Preeclampsia in Nulliparous Women*, 157 Am. J. Epidemiology 1108, 1109 (2003) (citing A. El-Roeiy & N. Gleicher, *The Immunologic Concept of Preeclampsia*, *in* 10 HANDBOOK OF HYPERTENSION 257 (P.C. Rubin ed., 1998)).

and then differentiate into male tissue cells within the mother's body that persist within her for her whole life. The invasion and colonization of maternal tissue and organs with chimeric cells bearing the genetic heritage of non-spouse father in cases of heterologous prenatal embryo adoption[6] would seem to violate spousal one-flesh union.[7] Thus, Part II shows how recent immunological studies corroborate an interpretation of *Dignitas Personae* that views heterologous prenatal embryo adoption as morally illicit. It is wrong not merely because of possible negative medical, legal, or social circumstances that may attend it. Rather, it is wrong because it violates spousal one-flesh union, which is an intrinsic evil. Fetal microchimerism substantiates that heterologous prenatal adoption, even if done with a noble intention to save the child's life, is incapable of being oriented to God or human flourishing. In this respect it is not dissimilar from heterologous *in vitro* fertilization or surrogate motherhood. However, homologous embryo transfer accompanied by prior seminal priming through spousal acts of conjugal love, is morally licit because the essential role of the father in establishing the pregnancy of wife is not substituted, but merely assisted, by the acts of medical technicians. Therefore, Part III contends that law and public policy should not allow heterologous embryo adoption. However, because placental immune suppression and fetal microchimerism do not violate the one-flesh union of spouses who repent of homologous *in vitro* fertilization, public policy should favor homologous embryo transfer so long as *in vitro* fertilization remains legal.

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6. Heterologous embryo transfer occurs when medical technicians transfer an embryo conceived *in vitro* into a woman that is not the genetic mother of the child for purposes of gestation and delivery. Heterologous prenatal adoption occurs when the woman who undergoes heterologous embryo transfer has the intention to keep and raise the child after birth, rather than place the child up for adoption. Homologous embryo transfer results when a child conceived *in vitro* is transferred by medical technicians into his or her own genetic mother for gestation and delivery in order to be reunited to his or her family. The term homologous prenatal adoption is not used in this Article because it is argued that the pregnancy and birth of this child is not an adoption but a restored pregnancy and birth.

7. One-flesh union refers to the complementary nature of man and woman in their mutual self-gift in natural marriage, that is meant to be exclusive, life-long, and open to procreation: "Have you not read that he who made them from the beginning made them male and female, and said, 'For this reason a man shall leave his father and mother and be joined to his wife, and the two shall become one?'" *Matthew* 19:4–5 (Revised Standard, Catholic Edition). *See also Mark* 10:8 (Revised Standard, Catholic Edition); 1 *Corinthians* 6:16 (Revised Standard, Catholic Edition); *Ephesians* 5:31 (Revised Standard, Catholic Edition). For an extensive exegesis of these passages from the New Testament, see POPE JOHN PAUL II, MAN AND WOMAN HE CREATED THEM: A THEOLOGY OF THE BODY 214, 351, 480, 487, 659–60 **(**Michael Waldstein trans., 2006).

I. BIOLOGY, PREGNANCY, AND THE MATERNAL IMMUNE SYSTEM[8]

Why are some women prone to life-threatening preeclampsia?[9] According to immunologists, the answer involves the role of semen in sustaining a healthy pregnancy. The working hypothesis among many immunologists is that maternal T-cells, her so-called immunological border guards,[10] are first "primed" by repeated deposits of seminal fluid during sexual intercourse with the same man: "insemination is hypothesized to constitute a 'priming' event, acting to induce maternal immune tolerance to paternal transplantation antigens, many of which are present in semen and shared by the conceptus."[11] These genetically-specific male antigens located in semen reprogram the maternal T-cell lymphocytes[12] to accept cells with this particular antigen, which would normally be rejected by the mother's immune system as foreign invader cells. However, due to this seminal priming, maternal lymphocytes treat the embryo, which present the same antigen-identification as found in the semen, as native cells: "[S]emen may contribute to the induction of immunological tolerance towards paternal transplantation antigens, thereby favouring the survival of the semi-allogeneic conceptus."[13]

Consequently, in a successful pregnancy, the maternal T-cell lymphocytes actively assist the conceptus exhibiting the same antigen-presenting cells previously encountered in the semen, rather than arresting and attacking them as foreign invaders:

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8. This section of the Article was submitted on December 30, 2012 as a separate paper in response to the World Health Organization's call for papers. D. Brian Scarnecchia, Soc'y Cath. Soc. Sci. & Int'l Solidarity & Hum. Rts. Inst., *Recommendation: Preeclampsia Should be Included as an Indicator for Improving Maternal Health and Reducing Child Mortality, Millennium Development Goal 4 and Goal 5* (2012) (Response to a Call for Papers from World Health Organization Health in the Post-2015 Development Agenda Measurement of Progress Towards the Health Goals: What are the Best Indicators and Targets for Health?) (on file with author).

9. "Preeclampsia, characterized by sustained hypertension with proteinuria occurring after 20 weeks' gestation and spontaneous resolution after delivery, is one of the most common pregnancy disorders and a leading cause of maternal mortality. The consequences of preeclampsia also include preterm delivery and intrauterine growth retardation, resulting in high perinatal morality." De-Kun Li & Soora Wi, *Changing Paternity and the Risk of Preeclampsia/Eclampsia in the Subsequent Pregnancy*, 151 AM. J. EPIDEMIOLOGY 57, 57 (2000) (footnotes omitted).

10. Martin, *supra* note 4, at 36.

11. Sarah A. Robertson & David J. Sharkey, *The Role of Semen in Induction of Maternal Immune Tolerance to Pregnancy*, 13 SEMINARS IN IMMUNOLOGY 243, 243 (2001) (footnotes omitted).

12. Sarah A. Robertson et al., *Seminal 'Priming' for Protection from Pre-Eclampsia—A Unifying Hypothesis*, 59 J. REPROD. IMMUNOLOGY 253, 255 (2003).

13. Kelton P. Tremellen et al., *The Effect of Intercourse on Pregnancy Rates During Assisted Human Reproduction*, 15 HUM. REPROD. 2653, 2657 (2000) (citing S.A. Roberston et al., *Cytokine-Leukocyte Networks and the Establishment of Pregnancy*, 37 AM. J. REPROD. IMMUNOLOGY 438 (1997)).

> [E]xposure of the female reproductive tract to seminal TGFβ [transforming growth factor beta] initiates an influx of antigen-presenting cells that sample ejaculate antigens and subsequently activate lymphocyte populations in lymph nodes draining the uterus. . . . TGFβ is implicated as a potent immune deviating agent in the uterus. Thus, the processing of paternal transplantation antigens in a milieu containing high levels of TGFβ of seminal plasma origin may result in the generation of hypo-responsiveness in paternal antigen-specific T-lymphocytes. It is reasonable to postulate that, upon re-encounter with conceptus antigens, these regulator or effector T-cells might contribute to an immunological environment favouring successful implantation and optimal placental growth.[14]

This "tolerogenic" (suppressed) immune response produced by seminal antigens was first noted in mice.[15] Additional animal studies confirmed that it was semen—and not the physical act of copulation—that initiated the "inflammatory cascade" of immunologic tolerance that consequently improved litter size.[16] Providing further confirmation of the indispensable role of seminal fluid, women with high rates of miscarriage were also shown to experience significant improvement with embryo implantation after seminal plasma pessaries were applied.[17] Also, women exposed to the semen of their male partners through sexual intercourse showed significantly higher rates of viable embryos at six to eight weeks of gestation after embryo transfer following *in vitro* fertilization.[18]

However, this tolerogenic priming effect on a woman's immune system, allowing for improvement in embryo implantation rates, appears to be lost if she changes male partners. Because preeclampsia seems to be caused by an overly aggressive maternal immune response toward paternal antigens detected in the embryo,[19] researchers argue that the genesis of this pathology is linked to a woman's immunological memory of particularized antigens in male semen: "[T]he observations of partner specificity and cumulative benefit of semen exposure imply that immunological 'memory' to partner's antigens may be programmed at insemination."[20]

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14. Robertson et al., *supra* note 12, at 261–62.

15. *Id.* at 258 (citing A. Lengerova & M. Vojtiskova, *Prolonged Survival of Syngenic Male Skin Grafts in Parous C57 B1 Mice*, 9 FOLIA BIOLOGICA 72 (1963)).

16. Kelton P. Tremellen & Sarah A. Robertson, *Seminal 'Priming' for Successful Mammalian Pregnancy*, *in* REPRODUCTIVE IMMUNOLOGY 88, 89 (Satish K. Gupta ed., 1999).

17. Tremellen et al., *supra* note 13, at 2656–57 (citing C.B. Coulam & J.J. Stern, *Effect of Seminal Plasma on Implantation Rates*, 1 EARLY PREGNANCY 33 (1995)).

18. *Id.* at 2655.

19. *Id.* at 2657.

20. Robertson et al., *supra* note 12, at 255.

Studies show that when a woman's immune system is not primed and has no immunological memory of particularized antigens in male semen due to withdrawal or barrier method contraceptives, those embryos that are conceived frequently fail to implant. One study demonstrated that "single women who used barrier contraception had a 2-fold higher risk of developing preeclampsia."[21] Researchers at Chapel Hill, North Carolina Memorial Hospital, conducted an unconditional logistic regression analysis that indicated "a 2.37-fold (95% confidence interval, 1.01 to 5.58) increased risk of preeclampsia for users of contraceptives that prevent exposure to [male ejaculate]."[22] In another study, a 2.4-fold increased risk of preeclampsia was concluded for users of contraceptive methods that inhibit interaction with male semen.[23] Yet another study found "a 2.52-fold (with 95% confidence interval, 1.17 to 5.44, $p < 0.05$), increased risk of preeclampsia for users of barrier contraceptives compared with women using nonbarrier contraceptives methods."[24]

Other researchers have demonstrated "that prevalence of preeclampsia in primigravida women is associated with weekly number of coitus before conception and the use of barrier contraceptive method."[25] Dr. Jon Einarsson, an obstetrician/gynecologist at Baylor College of Medicine in Houston, Texas, reporting to the American College of Obstetricians and Gynecologists (ACOG) on his recent study, noted the following:

> "Women who use barrier methods who had been having sex with their partners for less than 4 months prior to getting pregnant had a 6.5-fold increased risk of getting preeclampsia, compared with women who did not use barrier methods and had been in a sexual relationship for more than 12 months."[26]

Hence, the question arises: Why does a woman's body react as it does to seminal priming? Some researchers speculate that both the size of the human

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21. Jennifer A. Davis & Gordon G. Gallup, Jr., *Preeclampsia and Other Pregnancy Complications as an Adaptive Response to Unfamiliar Semen*, *in* FEMALE INFIDELITY AND PATERNAL UNCERTAINTY: EVOLUTIONARY PERSPECTIVES ON MALE ANTI-CUCKOLDRY TACTICS 191, 194 (Steven M. Platek & Todd K. Shackleford eds., 2006).

22. H.S. Klonoff-Cohen et al., *An Epidemiologic Study of Contraception and Preeclampsia*, 262 JAMA 3143, 3143 (1989) (abstract).

23. Dekker, *supra* note 3, at 41.

24. M. Hernández-Valencia et al., *Barrier Family Planning Methods as Risk Factor Which Predisposes to Preeclampsia*, 68 GINECOLOGIA Y OBSTETRICIA DE MEXICO, 2000, at 33 (abstract).

25. P. Bastami et al., *Preconception Period of Seminal Fluid Exposure and Prevalence of Preeclampsia in Primigravida Women*, 7 J. MED. SCI. 840, 840 (2007) (abstract).

26. Jacqueline Stenson, *Condom Use Linked to Risk of Preeclampsia*, PREVENTDISEASE.COM, http://preventdisease.com/news/articles/ condoms-preeclampsia.shtml (last visited Feb. 1, 2013).

brain (compared to other mammals) and the amount of nutrient that is devoted to its development in the second and third trimesters (up to sixty percent) require "a second wave of implantation."[27] It seems that "[t]he large size of the human fetal brain requires deep endovascular trophoblast invasion,"[28] which constitutes the second and more involved implantation not found in other mammals. Prior exposure to the same male antigens found in the embryo is critical to the success of this second phase of implantation: "[H]umans are the only species to undergo a second phase of implantation, there may be a critical period of prenatal development in which the presence of the father's semen facilitates the second phase of implantation."[29] In sum, "[e]xposure to paternal alloantigen occurs in two waves in the reproductive process—initially during transmission of seminal fluid at coitus, and secondly when placental trophoblast cells invade maternal tissues during embryo implantation."[30] In other words, paternal antigens are presented to the woman's immune system in two procreative waves: first, by the semen and second, by the embryo itself, should fertilization occur.

Although the complete etiology of preeclampsia still remains largely a mystery to the medical community, immunologists are certain that seminal fluid priming significantly improves the odds of avoiding this disease.[31] This working hypothesis is corroborated by evidence that a previous pregnancy fathered by the same man reduces the rate of preeclampsia.[32] In this way, a previous normal pregnancy provides protection against preeclampsia,[33] provided that the second pregnancy is fathered by the same man who fathered the first.[34] This holds true even when the first pregnancy is terminated by an elective abortion:

> Women with a history of abortion who conceived again with the same partner had nearly half the risk of preeclampsia . . . . In contrast, women with an abortion history who conceived with a new partner had the same risk of preeclampsia as women without a history of abortion . . . . Thus, the

27. Davis & Gallup, *supra* note 21, at 191.

28. Dekker, *supra* note 3, at 49–50.

29. Davis & Gallup, *supra* note 21, at 198.

30. Sarah A. Robertson et al., *Activating T Regulatory Cells for Tolerance in Early Pregnancy—The Contribution of Seminal Fluid*, 83 J. REPROD. IMMUNOLOGY 109, 112 (2009).

31. Li & Wi, *supra* note 9, at 57.

32. Carin A. Koelman et al., *Correlation Between Oral Sex and a Low Incidence of Preeclampsia: A Role for Soluble HLA in Seminal Fluid?*, 46 J. REPROD. IMMUNOLOGY 155, 156 (2000).

33. *Id.* (citing D. Campbell, *Pre-Eclampsia in Second Pregnancy*, 92 BJOG: INT'L J. OBSTETRICS & GYNAECOLOGY 131 (1985)).

34. Li & Wi, *supra* note 9, at 61.

> protective effect of a prior abortion operated only among women who conceived again with the same partner.[35]

A. *Preeclampsia Affects Maternal Health and Child Mortality in the Developing World*

Preeclampsia is one of the three leading causes of maternal morbidity and mortality in the world.[36] Two to eight percent of all pregnancies are complicated by preeclampsia.[37] Preeclampsia and eclampsia account for ten to fifteen percent of all direct maternal deaths.[38] Preeclampsia and eclampsia are distinguished according to the lethal symptoms they present:

> Preeclampsia and eclampsia are not distinct disorders but the manifestation of the spectrum of clinical symptoms of the same condition. The mildest disorder in this continuum is pregnancy-induced hypertension. In preeclampsia, hypertension and proteinuria are present, and when convulsions occur in addition to these signs, the condition is referred to as eclampsia.[39]

Not only is preeclampsia a leading cause of maternal mortality, but it has also become a leading cause of prenatal infant mortality.[40] As is only to be expected, the global impact of preeclampsia is felt most severely in the developing world where its prevalence ranges from 1.8 to 16.7 percent of all pregnancies[41] due to the inadequacy of primary health care:

> Preeclampsia has remained a significant public health threat in both developed and developing countries contributing to maternal and perinatal morbidity and mortality globally. However, the impact of the disease is felt more severely in developing countries, where, unlike other more prevalent causes of maternal mortality (such as haemorrhage and sepsis), medical interventions may be ineffective due to late presentation of cases. The

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35. Saftlas et al., *supra* note 5, at 1108 (abstract).

36. Labib Ghulmiyyan & Baha Sibai, *Maternal Mortality from Preeclampsia/Eclampsia*, 36 SEMINARS IN PERINATOLOGY 56, 56 (2012) (abstract).

37. Lelia Duley, *The Global Impact of Pre-Eclampsia and Eclampsia*, 33 SEMINARS IN PERINATOLOGY 130, 130 (2009) (abstract).

38. *Id.*

39. Kayode O. Osungbade & Olusimbo K. Ige, *Public Health Perspectives of Preeclampsia in Developing Countries: Implication for Health System Strengthening*, J. PREGNANCY, 2011 at 1.

40. Davis & Gallup, *supra* note 21, at 191.

41. Osungbade & Ige, *supra* note 39, at 1 (abstract).

> problem is confounded by the continuing mystery of the aetiology and the unpredictable nature of the disease.[42]

The World Health Organization (WHO) has taken note of the serious threat preeclampsia and eclampsia pose to both mothers and their infants: "Hypertensive disorders of pregnancy are an important cause of severe acute morbidity, long-term disability and death among mothers and babies."[43]

> In Africa and Asia, nearly one tenth of all maternal deaths are associated with hypertensive disorders of pregnancy, whereas one quarter of maternal deaths in Latin America have been associated with those complications. Among the hypertensive disorders that complicate pregnancy, pre-eclampsia and eclampsia stand out as major causes of maternal and perinatal mortality and morbidity.[44]

WHO makes the following recommendations to lower the incidences of preeclampsia in the Developing World: rest and reduce physical activity; reduce dietary salt intake; increase calcium intake if low; take low-dose aspirin; take antihypertensive drugs; take magnesium sulfate; induce labor if a mother is pregnant with a non-viable fetus or if the fetus is unlikely to achieve viability within one or two weeks (constituting an elective abortion); and engage in expectant therapy (wait and see) in cases where the fetus is viable, otherwise induce labor.[45] WHO puts great emphasis on the relatively inexpensive drug, magnesium sulfate, in the management of preeclampsia and eclampsia.[46]

Researchers suggest that in order to reach Millennium Development Goal (MDG) 5 (improving maternal health), "preeclampsia/eclampsia needs to be identified as a priority area in reducing maternal mortality in developing countries."[47] The Preeclampsia Foundation, working in consultation with the USAID, states that reaching MDG 4 (reducing child mortality) and MDG 5 (reducing maternal mortality) will depend

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42. *Id.* at 1 (footnotes omitted).

43. World Health Org., WHO Recommendations for Prevention and Treatment of Pre-Eclampsia and Eclampsia 4 (2011) (footnotes omitted).

44. *Id.* at 1.

45. *Id.* at 8–26.

46. *Id.* at 30.

47. Osungbade & Ige, *supra* note 39, at 3.

largely on comprehensive and innovative programs to address preeclampsia and eclampsia.[48]

Globally, approximately a half million women die in childbirth annually with ninety-nine percent of these deaths occurring in the developing world,[49] most of which are preventable.[50] Progress towards improving maternal health, MDG 5, is "further off-track than any of the other MDGs."[51] In order to get MDG 5 back on track, the United Nations needs to include preeclampsia as an indicator for assessing progress in reaching this goal as well as MDG 4.

In addition to its evidence-informed policy that magnesium sulfate should be used to treat preeclampsia, WHO should also recommend the avoidance of barrier method contraceptives as best practice to prevent the onset of preeclampsia, especially in cases of first pregnancy. For WHO to fail to warn women about the evidence linking barrier method contraceptives to a 200 to 650 percent increase in the incidences of preeclampsia would be to neglect the charge given to all U.N. agencies by the Human Rights Council to consider "all relevant actors in order to accelerate the realization of the rights of women and girls and the achievement of Millennium Development Goal 5 by 2015."[52]

B. *Fetal Stem Cell Migration and Differentiation into Maternal Tissue*

The term "microchimerism" was first coined by a French mouse researcher[53] to denote the coexistence, in the same organism, of two cellular populations derived from two different individuals.[54] Microchimerism occurs in blood transfusions, organ transplants, and pregnancy.[55] The immuno-suppressive effect of semen and embryo implantation described above prepares and facilitates the most common source of microchimerism—pregnancy. Once the female immune system is primed by male semen, it is

48. *Most Maternal Deaths from Preeclampsia Are Preventable*, PREECLAMPSIA FOUND., http://www.preeclampsia.ag/the-news/3-newsflash/243-preclampsia-toolkit-released-for-developing-countries (last updated Sept. 14, 2012).

49. Anthony D. Falconer, *Millennium Goal 5*, 20 OBSTETRICS, GYNAECOLOGY & REPROD. MED. 369, 369 (2010).

50. *Id.*

51. *Id.* at 371.

52. Human Rights Council Res. 21/6, Preventable Maternal Mortality and Morbidity and Human Rights, 21st Sess., Oct. 9, 2012, U.N. Doc. A/HRC/RES/21/6, ¶ 6 (Sept. 27, 2012).

53. Martin, *supra* note 4, at 30.

54. *Id.* at 46 n.1.

55. Ola Abdulaziez et al., *Y Chromosome Microchimerism in Patients with Systemic Lupus Erythematosus*, 34 EGYPTIAN RHEUMATOLOGIST 27, 28 (2012).

receptive to both the implantation of the embryo fathered by that man's semen and the migration of fetal cells bearing his genetic heritage into the mother's body:

> [P]lacental immune suppression helps establish fetal microchimerism. Immune tolerance to fetal implant allows pregnant woman [sic] to accept fetal circulating cells. . . . This immune suppression may remain some months after delivery, allowing fetal cells to establish themselves and to survive the postpartum period. Such dramatic changes throughout gestation make possible maternal tolerance of the fetus and permit fetal cells to move into maternal circulation and settle in maternal tissues. As a result, maternal tolerance allows the persistence of fetal mircochimerism.[56]

"Hence, the placental immune suppression which is needed to maintain the allogeneic pregnancy also helps establish fetal microchimerism. Thus, once fetal cells migrate into the maternal circulation and take up residence in maternal tissues, they may survive without being destroyed by the maternal immune system."[57] Microchimerism that occurs as a result of pregnancy is bi-directional, from embryo to mother and from mother to embryo:

> Bi-directional trafficking of cells and cell-free DNA during pregnancy is the most common source of mircochimerism. . . . The presence of low numbers of fetal cells or DNA in mother [sic] is known as fetal-maternal microchimerism. Similarly, the presence of low numbers of maternal cells or DNA in offspring is known as maternal-fetal microchimerism.[58]

"Maternal cells (and DNA) have been found in cord blood and in fetal circulation from elective terminations [abortions]."[59] Microchimerism occurs in twins.[60] Animal studies indicate that another source of pregnancy-related mircochimerism is nursing.[61] Researchers also speculate that

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56. Galofré, *supra* note 4, at 2 (footnotes omitted).

57. Takao Ando & Terry F. Davies, *Self-Recognition and the Role of Fetal Microchimerism*, 18 BEST PRAC. & RES. CLINICAL ENDOCRINOLOGY & METABOLISM 197, 204 (2004).

58. Sarkar & Miller, *supra* note 2, at 455.

59. Nelson, *supra* note 2, at 651 (footnotes omitted).

60. Sarkar & Miller, *supra* note 2, at 455 (citing P. Vabres et al., *Microchimerism from a Dizygotic Twin in Juvenile Ulcerative Lichen Planus*, 359 LANCET 1861 (2002)).

61. *Id.* (citing I.J. Wieler et al., *Demonstration that Milk Cells Invade the Suckling Neonatal Mouse*, 4 AM. J. REPROD. IMMUNOLOGY 95 (1983)). *See also* Thomas Klonisch & Régen Drouin, *Fetal-Maternal Exchange of Multipotent Stem/Progenitor Cells: Microchimerism in Diagnosis and Disease*, 15 TRENDS IN MOLECULAR MED. 510, 512 (2009) (citing F.H. Claas et al., *Induction of B-cell Unresponsiveness to Non-Inherited Maternal HLA Antigens During Fetal Life*, 241 SCIENCE 1815 (1988); L. Zhang & R.G. Miller, *The Correlation of Prolonged Survival of Maternal Skin Grafts with the Presence of Naturally Transferred Maternal T-cells*, 56 TRANSPLANTATION 918 (1993)).

microchimerism may result from acts of sexual intercourse because sperm contains lymphocytes.[62]

Fetal-maternal mircochimerism (embryo to mother cell transfer) more commonly referred to as simply "fetal mircochimerism" is established in virtually all full term pregnant women[63] and appears within the first month of pregnancy.[64] Fetal microchimerism persisted for more than twenty-seven years in one woman[65] and is believed to remain for the whole lifetime of postpartum women.[66] Some women show the presence of male cells even though they have no history of pregnancy, which causes researchers to speculate that these women may have had an undetected early miscarriage of a male child.[67]

Pregnancy also produces cell migration from mother to child. Maternal-fetal microchimerism[68] (mother to embryo cell transfer) is both frequent and long lasting. It has been demonstrated in up to half of normal adults.[69] Although maternal-fetal microchimerism results in lesser amounts of cell and DNA transfer than what occurs in fetal microchimerism,[70] the amount of maternal cells found in healthy fetuses is still significant.[71]

Researchers originally believed that fetal microchimerism caused various pathologies in women, especially immunological diseases: "By 2000, evidence of the presence of Y-bearing cells in women with diseases was mounting and the 'bad fetal cell' hypothesis was gaining momentum."[72] More recently, however, the general working hypothesis among researchers is that pregnancy-induced microchimerism may have a

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62. Sélim Aractingi et al., *Microchimerism in Human Diseases*, 21 TRENDS IMMUNOLOGY TODAY 116, 117 (2000). *See also* Galofré, *supra* note 4, at 1 (says it occurs but offers no citation); Nelson, *supra* note 2, at 651 (whether microchimerism occasionally occurs from sexual intercourse is unknown).

63. Klonisch & Drouin, *supra* note 61, at 510.

64. Galofré, *supra* note 4, at 5.

65. Ando & Davies, *supra* note 57, at 205 (citing Diana W. Bianchi et al., *Male Fetal Progenitor Cells Persist in Maternal Blood for as Long as 27 Years Postpartum*, 93 PROC. NAT'L ACAD. SCI. USA 705 (1996); O. Geifman-Holtzman et al., *Prenatal Genetic Diagnosis by Isolation and Analysis of Fetal Cells Circulating in Maternal Blood*, 18 SEMINARS IN PERINATOLOGY 366 (1994)).

66. J. Lee Nelson, *Microchimerism: Incidental Byproduct of Pregnancy or Active Participant in Human Health?*, 8 TRENDS IN MOLECULAR MED. 109, 112 (2002).

67. Galofré, *supra* note 4, at 5.

68. Sarkar & Miller, *supra* note 2, at 455.

69. Aractingi et al., *supra* note 62, at 117 (citing P.C. Evans et al., *Long-Term Fetal Microchimerism in Peripheral Blood Mononuclear Cell Subsets in Healthy Women and Women with Scleroderma*, 93 BLOOD 2033 (1999)).

70. Sarkar & Miller, *supra* note 2, at 455 (citing Y.M. Lo et al., *Quantitative Analysis of the Bidirectional Fetomaternal Transfer of Nucleated Cells and Plasma DNA*, 46 CLINICAL CHEM. 1301 (2000)).

71. Klonisch & Drouin, *supra* note 61, at 511.

72. Martin, *supra* note 4, at 31–32.

pathogenic, neutral, or beneficial effect depending on its etiology and various environmental factors:

> We have previously proposed a three-role division for fetal mircochimerism, which covers *pathogenic*, *beneficial*, and *neutral* microchimerism. The concept of *pathogenic microchimerism* . . . hypothesizes that fetal cells following gestation may lead to a graft versus host-like reaction in women. Accordingly, maternal immune response to these foreign cells may support an autoimmune reaction. It is also plausible the existence of a *beneficial microchimerism*, where persistent fetal cells may have a beneficial effect as a new source of progenitor cells potentially capable to contribute to maternal tissue repair processes. The third possibility could be *neutral microchimerism*, where fetal cells may act as innocent bystanders playing no role in biology at all.[73]

The kind of effect that microchimerism produces in its host may depend "upon other factors of which HLA [human leukocyte antigen] genes and the HLA relationship among cells are probably of key importance."[74] Microchemeric effects may also depend on "the type, number, state of activation or differentiation of trafficking chimeric cells and individual immunological responsiveness of the host can all determine whether microchimerism is 'good' or 'bad' for the host."[75] Environmental factors may also "contribute to the pathogenesis of autoimmune diseases, possibly by modulating the trafficking, proliferation or persistence of microchimeric cells. . . . It is likely that genetic, environmental and other as yet unidentified factors combine to determine the persistence, differentiation and ultimate fate of microchimeric cells."[76] The beneficial effects some microchimeric cells display in their hosts, demonstrating pluripotent regenerative capacity, may have major public policy ramifications. Microchimerism pioneer, Diana Bianchi, said: "'So our theory is that the cells go in as blood cells or stem cells and then they encounter the diseased tissue and in that setting they differentiate into the host organ, whatever that is.'"[77] Bianchi notes that microchimeric cells have drawn media attention because of the "tantalizing implications that fetal cells could be used therapeutically instead of the ethically loaded embryonic stem cells."[78]

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73. Galofré, *supra* note 4, at 2 (footnotes omitted).
74. Nelson, *supra* note 2, at 653.
75. Klonisch & Drouin, *supra* note 61, at 512.
76. Sarkar & Miller, *supra* note 2, at 459–60.
77. Martin, *supra* note 4, at 34.
78. *Id.*

In one study, Bianchi discovered fetal-maternal chimeric cells had differentiated into thyroid cells. She said in an interview: "'There's one woman . . . part of her thyroid is entirely male and part of her thyroid is entirely female. And she's healthy, . . . I mean those are definitely her son's cells in there. But that turned into a thyroid.'"[79] In another study, she found that a part of a woman's liver was made up of cells derived from her aborted son's cells bearing the genetic heritage of her former boyfriend:

> In one woman who had been diagnosed with hepatitis C, cells derived from a male fetus made up almost an entire lobe of her liver. The lab used genetic markers from the woman and her former boyfriend to prove that the cells originated from a pregnancy she had terminated years ago.[80]

Bianchi concludes that male cells that traffic into pregnant women must be "some kind of stem cell" because they differentiated into thyroid and liver cells "that were indistinguishable morphologically and functionally from their 'host' counterparts," which if replicated suggests "'fetal stem cells may be an alternate source of tissue repair in the [post-pregnant] woman.'"[81]

Researcher Keekin O'Donoghue found that chimeric cells from decades-old former pregnancies had differentiated into organ cells, which, she said, suggests "that fetuses transfer cells with multilineage potential to their mothers."[82] That stem cells bearing the genetic heritage of their father are passed from the embryo to the mother during pregnancy is generally accepted and that later contingencies may trigger their differentiation into various types of maternal tissue: "Despite their low number, the persistence in various body niches, their plasticity and the regenerative capacities of chimeric cells suggest that at least some chimeric cell populations are of stem cell/progenitor cell origin."[83] Further "[t]he working hypothesis driving many investigations is that the bi-directional transfer of stem cells occurs in many pregnancies but that perhaps only under certain circumstances do these cells become established, expand and/or migrate to interact with multiple

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79. *Id.* at 33 (second ellipsis added).

80. *Id.* (citing K.L. Johnson et al., *Significant Fetal Cell Microchimerism in a Nontransfused Woman with Hepatitis C: Evidence of Long-Term Survival and Expansion*, 36 HEPATOLOGY 1295 (2002)).

81. *Id.* (alteration in original) (citing K.L. Johnson et al., *supra* note 80, at 1296).

82. O'Donoghue et al., *supra* note 1, at 388.

83. Klonisch & Drouin, *supra* note 61, at 515 (citing K. Khosrotehrani et al., *Fetal Cells Participate over Time in the Response to Specific Types of Murine Maternal Hepatic Injury*, 22 HUM. REPROD. 654 (2007); K. Khosrotehrani et al., *Transfer of Fetal Cells with Multilineage Potential to Maternal Tissue*, 292 JAMA 75 (2004)).

tissues."[84] Post-partum women harboring fetal chimeric cells have been found to have lower incidences of cancer and breast cancer in particular:

> Parous women with fetal microchimerism are significantly less likely to develop cancer than parous women not harboring fetal cells. . . . A reduced breast cancer risk in the presence of fetal chimeric cells in women suggests that fetal microchimerism can have important immunosurveillance and/or tumor suppressor functions. The risk of more aggressive breast cancer, including pregnancy-associated breast cancer, was also less common in microchimeric-positive women.[85]

It may be that fetal microchimerism is nature's way of preserving the species by helping to protect the life of the mother and child: "[F]etal chimeric stem/progenitor cells are actively recruited to repair tissue damage. From an evolutionary point of view, this might be interpreted as the fetus assisting in protecting the mother's well being during and after pregnancy."[86]

II. MORAL IMPLICATIONS

A. *Heterologous Seminal Priming*

From the discussion of seminal fluid priming and immune suppression mentioned above it is apparent that sexual intercourse, conception, and embryo implantation are more closely linked biologically than previously understood. Conception and embryo implantation are causally initiated in the same act at the same time. The act of sexual intercourse is not only directly linked to conception through the union of male and female gametes, but it is also directly linked to the implantation of the embryo through seminal priming. Both conception and implantation are causally united even though conception[87] occurs chronologically before implantation:

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84. Sarkar & Miller, *supra* note 2, at 460.

85. Klonisch & Drouin, *supra* note 61, at 513 (footnotes omitted).

86. *Id.* at 511.

87. Conception as used in this Article refers to the first moment of fertilization, which this author argues occurs when the sperm cell penetrates the outer lining of the ova, prior to the fusion of the male and female pro-nuclei. *See* Magdalena Zernicka-Goetz, *Patterning of the Embryo: The First Spatial Decisions in the Life of a Mouse*, 129 DEV. 815 (2002); Maureen L. Condic, *When Does Human Life Begin?: A Scientific Perspective*, 1 WESTCHESTER INST. WHITE PAPER, 2–4 (2008), *available at* http://www.westchesterinstitute.net/images/wi_whitepaper_life_print.pdf; MAREIKE KLEKAMP, WOMEN AND ACTUAL CHALLENGES OF BIOETHICS: THE PERSPECTIVE OF CHRISTIAN SOCIAL DOCTRINE SHOWN AT THE EXAMPLE OF PRE-IMPLANTATION DIAGNOSIS (PID) 2 (citing Günter Rager, *Der Beginn des Individuellen Menschseins aus Embryologischer Sicht*, *in* Zeitschrift für Lebensrecht 13, J.G. §§ 66–74 (2004)), *available at* http://www.wwalf.net/public/editor/PDF%20ITA/Klekamp.pdf.

"Consequently, in its fundamental structure, the one-flesh union, and thus, the conjugal act, is not merely ordered to conception. In fact, it is biologically ordered toward *both* the conception and the gestation of a child."[88] To be morally licit, human conception (fertilization) must flow from an act of conjugal union: "'A medical intervention respects the dignity of persons when it seeks to assist the conjugal act either in order to facilitate its performance or in order to enable it to achieve its objective once it has been normally performed.'"[89] However, if conception and implantation are causally united and initiated in one and the same biological act then the same moral criterion should apply to both.[90]

Fr. Austriaco argues that the Church taught for millennia that it was wrong to separate the unitive and procreative aspects of conjugal love, although the biological connection of the two was only discovered in 1876 when the process of fertilization was finally understood. The moral prohibition against separating the unitive and procreative aspects of marital conjugal love corresponded, he states, with the biological fact "that conception involves the active contribution of both spouses working together as a one-flesh union."[91] Similarly, "we now know that gestation requires the active contribution of both spouses."[92] To argue that the moral object includes all the inherent biological processes it sets in motion, whether or not they are all foreseen or directly intended, is not to confuse the natural species

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It should be noted, however, that in 1965 the American College of Obstetricians and Gynecologists (ACOG) changed the definition of conception: "Conception is the implantation of a fertilized ovum." *See* TERMS USED IN REFERENCE TO THE FETUS, PRACTICE BULLETIN NO. 1 (ACOG, WASHINGTON, D.C.), 1965. They later amended this definition in 1972 to read "conception is the implantation of the blastocyst." *See* Am. Coll. of Obstetricians and Gynecologists, *Gametogenesis and Fertilization*, *in* OBSTETRIC-GYNECOLOGIC TERMINOLOGY 299–304 (Edward C. Hughes ed., 1972). The British Medical Association also states that pregnancy begins at implantation. *See* Veronica English & Rebecca Mussell, Brit. Med. Ass'n, *Abortion Time Limits: A Briefing Paper from the British Medical Association*, 1 (May, 2005), http://s3.amazonaws.com/zanran_storage/www.bma.eu/ContentPages/2469317029.pdf.

88. Nicanor Pier Giorgio Austriaco, *On the Catholic Vision of Conjugal Love and the Morality of Embryo Transfer*, *in* HUMAN EMBRYO ADOPTION: BIOTECHNOLOGY, MARRIAGE, AND THE RIGHT TO LIFE 115, 124 (Thomas V. Berg & Edward J. Furton eds., 2006).

89. Congregation for the Doctrine of the Faith, *Donum Vitae* [*Instruction on Respect for Human Life in its Origin and on the Dignity of Procreation: Replies to Certain Questions of the Day*] pt. 2 at (B)(7) (1987) [hereinafter *Donum Vitae*].

90. Nicholas Tonti-Filippini, who graciously agreed to read a draft of this paper, suggested that my arguments suffered from the "naturalistic fallacy in trying to connect natural consequences with intrinsic evil." E-mail from Nicholas Tonti-Filippini (May, 3, 2013) (on file with author). In reply, I would like to adopt the rejoinder of Nicanor Austriaco, O.P. to William May who accused him of confusing the "natural species with its moral species." *See* Austriaco, *supra* note 88, at 127–31.

91. Austriaco, *supra* note 88, at 130.

92. *Id.*

with the moral species but, rather, "it does help us evaluate the object of the act freely chosen by the acting person."[93]

Heterologous prenatal embryo adoption, to the extent it takes advantage of heterologous seminal fluid priming to increase its success rate, must be considered akin to heterologous artificial insemination which replaces the conjugal act. Seminal priming with heat-treated sperm-free semen is currently used to improve the success rate of embryo transfer in pigs.[94] This best practice in animal husbandry may soon be considered best reproductive practice for human embryo transfer as well.[95]

Seminal fluid from a man other than her husband ought not to be used to prime a women's immune system to receive through heterologous embryo transfer that man's child conceived *in vitro*. Heterologous seminal fluid priming would violate the vow of marital sexual exclusivity and spousal one-flesh union as surely as heterologous artificial insemination.[96] It would be a morally illicit *semi-* or *quasi*-insemination.[97]

B. *Heterologous Embryo Transfer and Fetal Microchimerism*

Even in cases when heterologous embryo transfer occurs without seminal fluid priming, spousal one-flesh union is violated through fetal microchimerism. Within weeks of implantation,[98] chimeric cells from the embryo pass into the mother's blood bearing the genetic heritage of the father.[99] Spouses become one flesh not only functionally in the procreative act of sexual intercourse, or genetically in the flesh of their child should conception occur but, also, organically when the fetal chimeric stem cells bearing DNA of the father's linage differentiate into the tissues and organs of the mother. Some of the flesh of post-partum women is composed of her child's cells bearing DNA of its father's linage and these cells persist within

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93. *Id.* at 129.

94. Tremellen & Robertson, *supra* note 16, at 89 (citing Murray et al., *Increased Litter Size in Gilts by Intrauterine Infusion of Seminal and Sperm Antigens Before Mating*, 56 J. ANIMAL SCI. 895 (1983); J. Mah et al., *The Effect of Repeated Mating at Short Intervals on Reproductive Performance of Gilts*, 60 J. ANIMAL SCI. 1052 (1985)). *See also* note 6.

95. Tremellen & Robertson, *supra* note 16, at 89. *See also* Austriaco, *supra* note 88, at 125–26.

96. *See Donum Vitae*, *supra* note 89, at pt. 2(A)(2) (discussing heterologous artificial insemination).

97. Fr. Austriaco states the obvious, that if "sperm-free semen taken from the adopted embryo's father" were placed "into the womb of the woman in whom his embryo will be placed," such a procedure would be "repulsive" to all husbands he knows because it would offend "an intuition" that this procedure violates "intimacy of the marital covenant they share with their wives." Austriaco, *supra* note 88, at 125–26.

98. Sarkar & Miller, *supra* note 2, at 455.

99. Aractingi et al., *supra* note 62, at 116, 117.

her for her whole life.[100] The man whose embryo implants in a woman literally becomes one-flesh with her as fetal chimeric cells bearing his genetic heritage differentiates and colonizes her organs and tissues, for better or worse, till death do they part.[101]

However, a valid objection may be posed: If fetal microchimerism that results from heterologous embryo transfer violates spousal one-flesh union, would not the pluripotent chimeric cells from a non-spouse introduced into a married woman through a blood transfusion or organ transplant do so as well?[102]

On the contrary, the manner in which microchimerism occurs, not simply the resulting chimeric cells, is critical to the moral analysis. In cases of blood transfusion or organ donation, the resulting mircochimerism is not causually initiated in a sexual act or in a quasi-sexual act. In an act of sexual intercourse the introduction of sperm and seminal fluid into the reproductive tract of a woman's body immunizes and opens her body to the migration of his sperm, the conception of their child, embryo implantation, and fetal stem cell migration across the placental barrier. All of these biological processes begin causally in one act, the sexual act. The inherent biological effects of a completed sexual act, conception and implantation/gestation, retain their relationship to human sexuality by virtue of their causal origin and teleology. Incomplete though they are, the processes that unite human gametes in invitro fertilization ("IVF") and those that result in a successful human embryo transfer remain incomplete quasi-sexual acts. Therefore, embryo transfer, whether heterologous or homologous, is biologically equivalent to *in vivo* fertilization because both fertilization and implantation are set in motion simultaneously in the order of causality in a single fertile conjugal act.[103]

Fetal microchimerism that flows from a quasi-sexual act—as in the case of heterologous embryo transfer following IVF—violates the sexually exclusive one-flesh union reserved to spouses. Because it has its causal origin in the sexual act, the fetal chimeric stem cells containing male DNA of its father's linage that differentiates into the tissues and organs of the mother's body signifies an on-going sexual penetration of the woman's body by the paternal genetic heritage of the child.

On the other hand, microchimerism that results from blood transfusion or organ donation is not sexual or quasi-sexual in its causal origin but flows from a medical act, and signifies a therapeutic and noble gift of self. Pope

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100. Nelson, *supra* note 66, at 112.

101. *See generally* Bianchi et al., *supra* note 65. *See also* Nelson, *supra* note 2, at 653.

102. My research assistant, Ms. Angela Cosentino Williams, was the first to raise this objection to me.

103. It is interesting to note that the United Kingdom argued before the European Court of Human Rights that embryo transfer is equivalent to *in vivo* fertilization/conception. *See infra* p. 33 and note 174.

John Paul II commended the noble gift of self that organ donation signifies: "It is not just a matter of giving away something that belongs to us but of giving something of ourselves."[104] An organ donor intends to permanently donate a part of himself surgically. Spouses also intend to make a total gift of self in marital intercourse—an inherently procreative act open to the conception of a child. However, marital fidelity requires that the fetal microchimerism that results from the conception and gestation of a child respect the one-flesh union of spouses. Homologous fetal microchimerism[105] is natural to marital pregnancy. Heterologous fetal microchimerism from heterologous embryo adoption, however, is unnatural and incompatible with spousal one-flesh union. Heterologous fetal microchimerism that occurs when a woman becomes pregnant from an act of fornication or adultery cannot be said to be unnatural but it, too, is incompatible with spousal fidelity and one-flesh union.

Furthermore, the person who receives a kidney transplant simply chooses a body part to replace his own diseased organ. The organ donor's chimeric cells that also traffic into his body are a foreseen but an unintended consequence. On the other hand, the woman who chooses heterologous prenatal adoption knowingly chooses not a body part, but a personal relationship with a person, the child, whom she cannot not know is already in a fundamental relationship with his or her biological ancestry. In choosing heterologous prenatal adoption, the woman necessarily chooses, as her moral object, to place herself in a relationship "with child" and with those already in a relationship with the child. Whether she thinks about this or not, putting herself in relationship with the child and his or her kin is inescapably part of the moral object of her choice, not an unintended consequence or circumstance. Therefore, when the genetic ancestors—the father of the child, for instance—comes to visit and the child's paternal genetic heritage permanently takes up residence within her thyroid or liver,[106] she can hardly object, saying she did not invite them in. Rather, she opened the door for them to take up residence within her body through an (artificial) quasi-sexual procreative act. As in marriage, so in heterologous embryo transfer—you

104. Pope John Paul II, Address to the 18th International Congress of the Transplantation Society ¶ 3 (Aug. 29, 2000). *See also*, Pope John Paul II, *Evangelium Vitae* [*Encyclical Letter on the Value and Inviolability of Human Life*] ¶ 86 (1995) [hereinafter *Evangelium Vitae*]; U.S. CONF. OF CATHOLIC BISHOPS, ETHICAL AND RELIGIOUS DIRECTIVES FOR CATHOLIC HEALTH CARE SERVICES ¶ 30 (4th ed. 2001).

105. By homologous fetal microchimerism is meant the trafficking of the husband's cells into the body of his wife through pregnancy. Heterologous fetal microchimerism refers to the trafficking of fetal cells of a child bearing male cells with DNA traceable to a man not the husband of the woman who undergoes heterologous embryo transfer and becomes pregnant with his child.

106. Martin, *supra* note 4, at 33.

end up in a relationship not just with "Your Intended" but also his or her family, for better or worse.[107]

C. *Maternal-Fetal Microchimerism and Wet-Nursing*

Maternal-fetal microchimerism occurs in two ways: During pregnancy when maternal stem cells cross the placental barrier, migrating into the embryo/fetus,[108] and during breastfeeding.[109] Maternal cells—some of them pluripotent—passing into the fetus during pregnancy is normal, and may contribute to that special bond affectionately referred to as a "mother's love." But, as one biologist notes, in cases of heterologous embryo transfer, the child born of a woman who is not his genetic mother literally has two "mommies," one genetic and the other a surrogate:

> Maternal cells also pass through the placenta to the baby. Cells moving across the placenta, in either direction, call for 'cross talk' between mother and fetus. Embryo adoption would partially violate the norm of a human nature passed on to the child from its mother identical to her own. That is, the child has two mothers anyway you look at it and this then would constitute a special form of surrogacy.[110]

But if maternal-fetal microchimerism also occurs through nursing, then, does a child who suckles milk from a wet nurse have two mommies, too? Those in favor of heterologous prenatal adoption constantly raise this objection—that prenatal embryo adoption is no different than wet-nursing an infant. However, there are many distinctions to be drawn, of course, between heterologous prenatal adoption and wet-nursing.[111] Moreover, the presumption that wet-nursing is good or even morally neutral is questionable because of the affective bonding that occurs between a child who suckles and

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107. Aractingi et al., *supra* note 62, at 117 (citing P.C. Evans, et al., *Long-Term Fetal Microchimerism in Peripheral Blood Mononuclear Cell Subsets in Healthy Women and Women with Scleroderma*, 93 BLOOD 2033 (1999)); Galofré, *supra* note 4, at 5; Nelson, *supra* note 66, at 112; Sarkar & Miller, *supra* note 2, at 455.

108. Aractingi et al., *supra* note 62, at 117. *See also* Ando & Davies, *supra* note 57, at 205; Galofré, *supra* note 4, at 1; Klonisch & Drouin, *supra* note 61, at 510; Nelson, *supra* note 2, at 651 (whether microchimerism occasionally occurs from sexual intercourse is unknown).

109. Sarkar & Miller, *supra* note 2, at 455.

110. Interview with Edwin Bessler, Prof. Emeritus of Biology, Franciscan Univ. of Steubenville (Aug. 1, 2012).

111. *See* Christopher Oleson, *The Nuptial Womb: On the Moral Significance of Being 'with Child'*, *in* HUMAN EMBRYO ADOPTION: BIOTECHNOLOGY, MARRIAGE, AND THE RIGHT TO LIFE 165, 188–92 (Thomas V. Berg & Edward J. Furton eds., 2006) (comparing and contrasting ten differences between nursing and adoption).

the woman from whom he suckles, normally his own genetic mother. The wet nurse, however, interferes with the natural mother-child relationship, and "it can only be justified if it is absolutely necessary for his survival."[112]

The moral difference between fetal microchimerism and mircochimerism that results from blood transfusion or organ transplantation, noted above, applies equally to wet-nursing. Although a sexual act may have prepared a wet nurse's body to lactate, her provision of milk is not a reproductive act. The ingestion of some maternal cells in mother's milk is not an ongoing quasi-sexual act, as we have argued, occurs in seminal priming and/or fetal microchimerism following heterologous embryo transfer. Allowing a needy child to suckle at her breast, a wet nurse performs a selfless act similar to those who give blood or donate a paired organ. However, only proportionately serious circumstances justify any of these three acts of self-donation.[113]

D. *Homologous Embryo Transfer and Fetal Microchimerism*

Neither *Donum Vitae*[114] nor *Dignitas Personae*[115] specifically addresses whether it is morally licit for the genetic mother who repents of her sin of IVF to undergo embryo transfer of her own frozen embryos. The language in *Donum Vitae* describing the "absurd fate" of frozen embryos "not transferred into the body of the mother" left "with no possibility of their being offered safe means of survival which can be licitly pursued"[116] seems to leave open the question of whether their own genetic mother is included among those who cannot offer them a safe and licit means of survival. Some argue that since *Donum Vitae* stipulated that every conception must flow from a conjugal act between husband and wife,[117] therefore, the same principle should apply to every pregnancy. Nicholas Tonti-Filippini writes:

> In my view there would be a problem with asserting that she [the wife who together with her husband's seed had artificially procreated embryos] must receive those embryos. Such a course would have the clinician

112. Austriaco, *supra* note 88, at 127 n.28.

113. Also, there may be a qualitative difference between fetal-maternal chimeric cells and the chimeric cells in breast milk, blood transfusion and organ transplant. In the latter examples the chimeric cells may have passed a critical period and no longer "imprint" their host as well as embryonic fetal chimeric cells. This hypothesis was given by Edwin Bessler, Prof. Emeritus of Embryology, Franciscan Univ. of Stuebenville (Sept. 23, 2012).

114. *See Donum Vitae*, *supra* note 89.

115. Congregation for the Doctrine of the Faith, *Dignitas Personae* [*Instruction on Certain Bioethical Questions*] (2008) [hereinafter *Dignitas Personae*].

116. *Donum Vitae*, *supra* note 89, at pt. 1(B)(5).

117. *Id.* at pt. 2(B)(4).

> impregnating her and, though it would be with the couple's own embryos, it would still be from outside the marriage in the sense that pregnancy would not result from the conjugal act, but from a medical procedure.[118]

Father Tadeusz Pacholczyk goes so far as to say that a couple who attempts to rescue their own frozen embryos commits a "second evil"—"namely, the act of becoming a surrogate mother to the couple's own embryos generated earlier at the clinic. Overall, it appears that there is a discernible double violation of the meaning of motherhood whenever one engages in IVF."[119]

Father Nicannor Austriaco disagrees with those who believe it is the clinician—and not the father of the child—who makes his wife pregnant in cases of homologous embryo transfer.[120] Having considered the significance of seminal fluid in priming the immunological system of a woman to enhance implantation, he argues that homologous embryo transfer is morally licit provided that one, the genetic mother of the child repents of her sin of IVF and two, she engages in conjugal acts with her husband, the genetic father of the child, prior to embryo transfer.[121] Under these circumstances the father of the child prepares his wife for the implantation of their child no differently than if the child had been conceived *in vivo*:

> Here, the father of the embryo properly plays his role in establishing the pregnancy in his wife, even though conception, in the case of the IVF, occurred outside her body. In other words, he still prepares his wife to receive and implant their child, something he does every time he engages in marital intercourse with her. In this way, despite the evil of IVF, homologous embryo transfer respects the integrity of the marital covenant.[122]

It is a mistake to think that the pregnancy that results from homologous embryo transfer is begun by the clinicians alone and thereafter maintained by the mother alone and that the father of the child is a complete bystander and contributes nothing to initiate implantation or maintain a successful

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118. Nicholas Tonti-Filippini, *The Embryo Rescue Debate: Impregnating Women, Ectogenesis, and Restoration from Suspended Animation*, 3 NAT'L CATH. BIOETHICS Q. 111, 126 n.37 (2003).

119. Tadeusz Pacholczyk, *Some Moral Contraindications to Embryo Adoption*, *in* HUMAN EMBRYO ADOPTION: BIOTECHNOLOGY, MARRIAGE, AND THE RIGHT TO LIFE 37, 52 (Thomas V. Berg & Edward J. Furton eds., 2006).

120. Austriaco, *supra* note 88, at 131. *See also* Tonti-Filippini, *supra* note 118, at 126 n.37.

121. Austriaco, *supra* note 88, at 131; *cf.* Mary Geach, *The Female Act of Allowing an Intromission of Impregnating Kind*, *in* HUMAN EMBRYO ADOPTION: BIOTECHNOLOGY, MARRIAGE, AND THE RIGHT TO LIFE 251, 269–70 (Thomas V. Berg & Edward J. Furton eds., 2006) (arguing "intromission of a woman's own IVF embryo is not of impregnating kind" and it is "an act disintegrative of marriage").

122. Austriaco, *supra* note 88, at 131; *cf.* Geach, *supra* note 121, at 269–70.

pregnancy. On the contrary, as in every successful and morally licit pregnancy, the specified male antigens in his seminal fluid have prepared his wife's body to receive and not reject the implantation and development of their child in her womb.

Heterologous embryo transfer is intrinsically evil because it violates the right of the husband to establish the pregnancy of his wife.[123] In cases of heterologous embryo transfer, the husband's role is *replaced* completely by technicians and, as best practice would require, by the father of the adopted embryo whose sperm-free semen is placed into her womb to enhance the likelihood of embryo implantation and gestation. Whereas in cases of homologous embryo transfer the husband's role is *assisted* by technicians who help him to establish the pregnancy of his wife after he has fulfilled his inalienable role of providing his own ejaculate within his wife during acts of conjugal love to prepare his wife for the implantation and successful gestation of their embryo.[124] Thus homologous embryo transfer respects the principle that spouses have an "exclusive right to become father and mother solely through each other."[125]

Tonti-Filippini's objection—that the pregnancy of a married woman in cases of homologous embryo transfer is brought about solely by third parties—is addressed: The husband's acts of conjugal intercourse contributes to the aptness of her body to carry their child to term, no differently than had the conception occurred *in vivo*. Moreover, there is no second evil as Fr. Pacholczyk suggests when the genetic mother, repenting of the sin of IVF, pursues homologous embryo transfer. The implantation of their child, properly understood, is in fact a result of previous acts of marital intercourse and, so, she is not acting as a surrogate to her own child. The marital act still contributes to the conception/implantation causally united event in cases of homologous embryo transfer. Because there is but one evil that has occurred, in the conception phase of pregnancy through IVF, it would seem that husband and wife, i.e., genetic procreators, would be morally obligated to do what they reasonably could do to prepare for and complete the implantation phase of pregnancy through acts of intercourse that prime her immune system for successful homologous embryo transfer.

Moreover, the objections mentioned previously with regard to the mircochimerism resulting from heterologous prenatal adoption would not apply in cases of homologous embryo transfer. First, the priming event with her husband's semen would not be analogous to heterologous artificial

123. Austriaco, *supra* note 88, at 125.

124. *Id.* at 131.

125. *Donum Vitae*, *supra* note 89, at pt. 2(A)(2).

insemination but it would be in fact an act of marital intercourse. Second, the mircochimerism of fetal stem cells eventually passing into the mother's body would be those of her husband's linage and this would contribute to their one-flesh union as in every normal pregnancy. Third, the maternal cells that pass into her child's body as a result of maternal-fetal mircochimerism would be of her own linage as occurs in every normal pregnancy, not those of a "second mommy."

E. *Controversy Following Dignitas Personae*[126]

To provide further direction concerning new developments in the field of biotechnology following *Donum Vitae*, the Congregation for the Doctrine of the Faith issued *Dignitas Personae*.[127] In it, they cautioned against pre-natal embryo adoption.[128] The encyclical's treatment of prenatal adoption is terse—a scant five paragraphs—and leaves unsettled whether heterologous embryo transfer is, or is not, an intrinsic evil.[129]

Dignitas Personae, Section 19, third paragraph, compares unfavorably heterologous embryo transfer for the purpose of treating infertility to heterologous IVF and surrogate motherhood.[130] This paragraph notes that

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126. *See also* D. Brian Scarnecchia, *Frozen Embryo Adoption: Has Rome Spoken?*, LAY WITNESS, Jan. 1, 2012, https://www.cuf.org/2012/01/frozen-embryo-adoption-has-rome-spoken/# (discussing much of the following section).

127. For a review of some articles that came out prior to *Dignitas Personae* on prenatal adoption, *see* Mauro Cozzoli, *The Human Embryo: Ethical and Normative Aspects*, *in* IDENTITY AND STATUTE OF HUMAN EMBRYO: PROCEEDINGS OF THIRD ASSEMBLY OF THE PONTIFICAL ACADEMY FOR LIFE 260 (Juan de Dios Vial Correa & Elio Sgreccia eds., 1998); Mary Geach & Helen Watt, *Are There Any Circumstances in Which it Would be Morally Admirable for a Woman to Seek to Have an Orphan Embryo Implanted in her Womb?*, *in* ISSUES FOR A CATHOLIC BIOETHIC: PROCEEDINGS OF THE INTERNATIONAL CONFERENCE TO CELEBRATE THE TWENTIETH ANNIVERSARY OF THE FOUNDATION OF THE LINACRE CENTRE 341 (Luke Gormally ed., 1999); Germain Grisez, *Should a Woman try to Bear her Dead Sister's Frozen Embryo?*, *in* 3 THE WAY OF THE LORD JESUS: DIFFICULT MORAL QUESTIONS 239 (1997); WILLIAM E. MAY, CATHOLIC BIOETHICS AND THE GIFT OF HUMAN LIFE 94–107 (2000); Maurizio Faggioni, *The Question of Frozen Embryos*, L'OSSERVATORE ROMANO, Aug. 21, 1996, at 4–5; Tonti-Filippini, *supra* note 118; Wm. B. Smith, *Questions Answered*, HOMILETIC & PASTORAL REV., Oct. 1995, at 72; Wm. B. Smith, *Response* [*to Geoffrey Surtees*], HOMILETIC & PASTORAL REV., Aug.–Sept. 1996, at 16; Geoffrey Surtees, *Adoption of a Frozen Embryo*, HOMILETIC & PASTORAL REV., Aug.–Sept. 1996, at 7.

128. *Dignitas Personae*, *supra* note 115, § 19.

129. *Id.*

130. "Surrogate mother" means:

> a) [T]he woman who carries in pregnancy an embryo implanted in her uterus and who is genetically a stranger to the embryo because it has been obtained through the union of the gametes of "donors." She carries the pregnancy with a pledge to surrender the baby once it is born to the party who commissioned or made the agreement for the pregnancy.
>
> b) [T]he woman who carries in pregnancy an embryo to whose procreation she has contributed the donation of her own ovum, fertilized through insemination with the sperm of a man other

heterologous embryo transfer to treat infertility will lead to further health care and societal problems:

> The proposal that these embryos could be put at the disposal of infertile couples as a *treatment for infertility* is not ethically acceptable for the same reasons which make artificial heterologous procreation illicit as well as any form of surrogate motherhood; this practice would also lead to other problems of a medical, psychological and legal nature.[131]

The fourth paragraph in Section 19 addresses the "prenatal adoption" of those who engage in heterologous embryo transfer, not as a treatment for infertility, but solely to save the life of a frozen embryo.[132] Although they are to be commended for their noble life-saving intention, their action still suffers from problems similar to those couples that resort to heterologous embryo transfer simply to treat their infertility:

> It has also been proposed, solely in order to allow human beings to be born who are otherwise condemned to destruction, that there could be a form of "*prenatal adoption*". This proposal, praiseworthy with regard to the intention of respecting and defending human life, presents however various problems not dissimilar to those mentioned above.[133]

F. *Rome Has Spoken*

Does the language of *Dignitas Personae* Section 19 condemn the practice of prenatal adoption of frozen embryos? Some ethicists hold that even if the third paragraph is read as a condemnation of fertility-treating heterologous embryo transfer, the fourth paragraph is more lenient and only discourages life-saving prenatal adoption because of the bad consequences that may attend it.[134] They read the "various problems not dissimilar to those mentioned above" in the fourth paragraph as limited to the "other problems of a medical, psychological and legal nature" mentioned in the third paragraph.[135] If one were to deal adequately with those health care and legal

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> than her husband. She carries the pregnancy with a pledge to surrender the child once it is born to the party who commissioned or made the agreement for the pregnancy.

Donum Vitae, *supra* note 89, at pt. 2(A)(3).

131. *Dignitas Personae*, *supra* note 115, § 19 (footnotes omitted).

132. *Id.*

133. *Id.*

134. *See generally* Edward J. Furton, *Embryo Adoption Reconsidered*, 10 NAT'L CATH. BIOETHICS Q. 329 (2010).

135. *Dignitas Personae*, *supra* note 115, § 19.

problems, then one would be permitted to engage in life-saving heterologous prenatal adoption. They deny that the intrinsically evil problems of IVF and surrogacy apply to life-saving heterologous prenatal adoption but, rather, the physical event of heterologous embryo transfer is a "neutral event" that is further morally specified, good or bad, according to motive and circumstance.[136]

In support of their argument, they reference the United States Conference of Catholic Bishops' press release stating that the Congregation for the Doctrine of the Faith had not spoken definitively on the issue of prenatal embryo adoption.[137] Therefore, since *Dignitas Personae* is not a definitive statement in this respect, they are free to advance the same arguments in favor of life-saving heterologous prenatal adoption as before.[138]

On the contrary, in 2011, the Pontifical Council for the Family dropped its recommendation of governmental aid for heterologous prenatal adoption following the release of *Dignitas Personae*.[139] Previously, in 2000, the Pontifical Council for the Family recommended that the State "provide special measures" for the family when it is "not in a position to protect the interests of the unborn child to a sufficient degree."[140] In particular, the State should provide "assistance to the mother before and after delivery, the *cura ventris*, prenatal adoption and guardianship."[141] However, in 2011, Ennio Cardinal Antonelli, Prefect for the Pontifical Council for the Family, qualified this previous recommendation:

> As an aside, it is fitting to point out here that, with the publication of the Instruction *Dignitas Personae*, the Congregation for the Doctrine of the Faith, whose competence it is to promote and safeguard the doctrine on faith and morals, declared that the practice of *prenatal adoption* (even if carried out with the praiseworthy intention of respecting and defending

136. *See* Furton, *supra* note 134, at 334. *See also* John S. Grabowski & Christopher Cross, Dignitas Personae *and the Adoption of Frozen Embryos: A New Chill Factor?*, 10 NAT'L CATH. BIOETHICS Q. 307 (2010).

137. Grabowski & Cross, *supra* note 136, at 308–09. *See also* E. Christian Brugger, *Rescuing Frozen Embryos: Is Adoption a Valid Moral Option?*, ZENIT, Mar. 17, 2010, http://www.zenit.org/article-28669?1=english; *U.S. Bishops: Questions and Answers on* "Dignitas Personae," CATHOLIC ONLINE (Dec. 14, 2008), http://www.catholic.org/national/national_story.php?id=31057.

138. *See* Brugger, *supra* note 137.

139. H.E. Ennio Card. Antonelli, President of the Pontifical Council for the Family, Messagio alla Conferenza "il fondamento dei diritti umani: contributi cattolici," [Message to the Conference "The Foundation of Human Rights: Catholic Contributions"] at Ave Maria School of Law (Mar. 3–4, 2011) n.9, *available at* http://www.vatican.va/roman_curia/pontifical_councils/family/documents/rc_pc_family_doc_20110211_mess-dir-umani_it.html.

140. Pontifical Council for the Family, *The Family and Human Rights* ¶ 48 (2000), *available at* http://www.vatican.va/roman_curia/pontifical_councils/family/documents/rc_pc_family_doc_20001115_family-human-rights_en.html.

141. *Id.*

> human life) presents various problems not dissimilar to those listed by the Congregation in connection to the practice of artificial heterologous procreation, for example. For this reason, any consideration of *The Family and Human Rights*, paragraph 48, must today be read in the light of the Congregation's 2009 clarification.[142]

It should be noted that Cardinal Antonelli did not confine his negative assessment of life-saving heterologous prenatal adoption to problems "of a medical, psychological or legal nature." He tied his change of public policy recommendations to an interpretation of *Dignitas Personae* that regards the problems associated with life-saving heterologous prenatal adoption as analogous to "heterologous artificial procreation," i.e., IVF and surrogacy.[143]

As we have seen, one pontifical council has already changed its public policy recommendations[144] regarding the expenditure of funds to assist heterologous prenatal adoption based upon its interpretation of *Dignitas Personae* as having cast the *moral deed* of heterologous prenatal adoption in the same light as IVF and surrogacy regardless of the *motive* of the mother—to compensate for her infertility or to simply save a child's life. There are some deeds one may never do, even to save someone's life:

> Some pro-life advocates take the view that saving life is the greatest possible priority, taking what can only be considered to be an entirely consequentialist view. This argument will not mean much to them, based as it is on the intrinsic nature of the act involved and accepting that there are some things that we may not do, even to save life. Some acts are in their nature incapable of being ordered towards God, blaspheming for instance.[145]

III. PUBLIC POLICY CONTROVERSIES OVER PRENATAL EMBRYO ADOPTION

Couples who procreate through IVF and then separate, leaving their embryos abandoned at IVF clinics, present a wrenching moral, social, and legal nightmare.[146] In 1992, the Supreme Court of Tennessee heard the appeal of a married couple who sought the help of an IVF clinic to procreate seven frozen embryos with their own gametes, but shortly afterwards

142. Antonelli, *supra* note 139 (emphasis added) (author's translation).

143. *Id.*

144. *Id.*

145. Tonti-Filippini, *supra* note 118, at 114 n.9.

146. Much of this portion of the Article appears in D. BRIAN SCARNECCHIA, BIOETHICS, LAW, AND HUMAN LIFE ISSUES: A CATHOLIC PERSPECTIVE ON MARRIAGE, FAMILY, CONTRACEPTION, ABORTION, REPRODUCTIVE TECHNOLOGY, AND DEATH AND DYING 141–219 (2010).

divorced, and disagreed on the disposition of their frozen embryos.[147] Initially, over the objection of her former husband, Mrs. Davis wanted to become pregnant with her own frozen embryos.[148] Then, she remarried and no longer wanted to become pregnant with her former husband's frozen embryos but, rather, wished to place them up for heterologous prenatal adoption.[149]

The trial court in *Davis v. Davis* concluded that the eight-cell entities at issue were not merely genetic material or "preembryos" but were "'children in vitro'" and so invoking the doctrine of *parens patriae* "held that it was 'in the best interest of the children' to be born rather than destroyed."[150] Finding that their mother was willing to provide such an opportunity, but their father was not, the trial judge awarded her custody of her "'children in vitro.'"[151] On appeal, the decision of the trial court was reversed on the grounds that frozen embryos were not persons[152] but perhaps they were property: "without explicitly holding that the preembryos in this case were 'property,' nevertheless awarded 'joint custody' of them" to Mr. and Mrs. Davis.[153]

The Supreme Court of Tennessee disagreed with both the trial court and the appellate court and ruled that frozen embryos were neither persons nor property.[154] They held it was beyond the competence of the trial court to regard pre-natal human embryos as persons under the United States Constitution given the holding of *Roe v. Wade*: "'the unborn have never been recognized in the law as persons in the whole sense.'"[155] On the other hand, if the frozen embryos were property, as the Court of Appeals seemed to imply, then the cryopreservation agreement would have created a bailment between Mr. and Mrs. Davis and the IVF clinic.[156] If so, the clinic (bailee) ought to return the property to Mr. and Mrs. Davis, the joint bailees, once they were no longer in agreement as to how to proceed with their joint

147. Davis v. Davis, 842 S.W.2d 588, 589 (Tenn. 1992).

148. *Id.*

149. *Id.* at 590.

150. *Id.* at 594.

151. *Id.*

152. *Id.*

153. *Id.* at 595–96 (citations omitted) (citing Davis v. Davis, No. 180, 1990 WL 130807, at *3 (Tenn. Ct. App. Sept. 13, 1990) ("[T]he parties share an interest in the seven fertilized ova.")).

154. *Id.* at 597.

155. *Id.* at 595 (citing Roe v. Wade, 410 U.S. 113, 162 (1973)). *See also Roe*, 410 U.S. at 156–57 ("If this suggestion of personhood is established, the appellant's case, of course, collapses, for the fetus' right to life would then be guaranteed specifically by the [Fourteenth] Amendment.").

156. *Davis*, 842 S.W.2d at 596 (citing York v. Jones, 717 F.Supp. 421, 424–25 (E.D. Va. 1989)).

property, the frozen embryos.[157] The Supreme Court of Tennessee took an intermediate position:

> [T]he preembryo deserves respect greater than that accorded to human tissue but not the respect accorded to actual persons . . . because it has not yet developed the features of personhood, is not yet established as developmentally individual, and may never realize its biologic potential.[158]

The court then created a legislative scheme for the disposition of frozen embryos that decided the matter according to the following criteria: (1) the agreed preferences of the progenitors, (2) any prior agreement between them, finally (3) weighing the relative interests in using or not using their embryos so that (a) the party wishing to implant the embryos should be given preference, unless (b) the party wishing to implant the embryos "intends merely to donate them to another couple, [then] the objecting party obviously has the greater interest and should prevail."[159]

The European Court of Human Rights considered a similar case in *Evans v. United Kingdom*. Ms. Evans and her unmarried partner, both of them knowing she had ovarian cancer and would have to have her ovaries removed, had a number of her eggs fertilized prior to the surgical removal of both her ovaries.[160] She and her male partner both signed an IVF agreement stating that prior to implantation, either of them could withdraw their consent, and the embryos would be destroyed.[161] "Six embryos were created."[162] Later, Ms. Evans and her male partner broke up, and he withdrew his consent for her to implant any of their six frozen embryos.[163]

The IVF clinic, under an obligation to destroy those six frozen embryos, was enjoined from doing so when Ms. Evans sought an injunction in the High Court in the United Kingdom requiring her male partner to restore his consent.[164] Her claim was dismissed,[165] and the decision was upheld on appeal.[166] Ms. Evans appealed to the European Court of Human Rights, arguing that the provisions of the 1990 Act—to the extent that it permitted

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157. *Id.*

158. *Id.* (citation omitted).

159. *Id.* at 604.

160. Evans v. United Kingdom, Eur. Ct. H.R., App. No. 6339/05, ¶¶ 7–11 (2006), *available at* http://hudoc.echr.eoc.int/webservices/content/pdf/001-80046?TID=mnyczhecf.

161. *Id.* ¶¶ 9–10.

162. *Id.* ¶ 11.

163. *Id.* ¶¶ 12–13.

164. *Id.* ¶ 13.

165. *Id.* ¶ 14.

166. *Id.* ¶ 18.

her former male partner to withdraw his consent after her eggs had been fertilized with his sperm—violated the European Convention for the Protection of Human Rights and Fundamental Freedoms, Article 8.[167] The European Court of Human Rights held that the U.K.'s 1990 Act did not, in fact, violate the European Convention because both parties had, with informed consent, signed an agreement that allowed either party to withdraw consent for any reason prior to implantation.[168] The European Court of Human Rights held that this "bright line" test (rather than a case by case test reviewing of the relative interests of the parties) fell within the "margin of appreciation" or discretion afforded member states under the European Convention.[169]

In reaching its decision, the European Court of Human Rights reviewed the legal status of frozen embryos in the member states of the Council of Europe, the United States, the State of Israel, and in other relevant international texts.[170] It concluded "there is no international consensus" regarding the regulation of IVF treatment of abandoned or contested frozen embryos.[171] It did note, however, that there were three basic approaches: (1) Progenitors may not withdraw their consent to bring frozen embryos to term after fertilization occurred; (2) Progenitors may not withdraw their consent to bring frozen embryos to term after implantation (no abortion); and (3) Progenitors may withdraw their consent on a case by case basis *as per* contract or as the court so determines after weighing of the relative interests of two parties.[172]

Ms. Evans complained that women who conceive *in vivo* are not subject to abortion at the whim of their male partner.[173] Why, then, should a woman

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167. *Id.* ¶ 43.

168. *Id.* ¶¶ 68–69.

169. *Id.*

170. *Id.* ¶¶ 31–42.

171. *Id.* ¶ 61.

172. *Id.*

> [W]hile certain States have adopted specific legislation in this area, others have either not legislated, or have only partially legislated, relying instead on general legal principles and professional ethical guidelines. Again, there is no consensus as to the point at which consent to the use of genetic material provided as part of IVF treatment may be withdrawn by one of the parties; [1] in certain States, it appears that consent may be withdrawn only up to the point of fertilisation, [2] whereas in other States such withdrawal may occur at any time prior to the implantation of the embryo in the woman; [3] in still other States the point at which consent may be withdrawn is left to the courts to determine on the basis of contract or according to the balance of interests of the two parties.

Id.

173. *Id.* ¶¶ 70–71.

who conceives *in vitro* be subject to her partner's veto of her desire to have their frozen embryos implanted in her womb? The U.K. Government argued there was no discrimination under the 1990 Act "because the transfer to the woman of the embryo created *in vitro* was the equivalent of the fertilisation of the egg inside a woman following sexual intercourse."[174]

The European Court of Human Rights did not address the grave risk to a woman's health and her future fertility that egg extraction poses to her versus the relative ease, lack of health risks, and venereal pleasure masturbation affords men in order to produce their respective gametes for the IVF process: "The Court is not persuaded by the applicant's argument that the situation of the male and female parties to IVF treatment cannot be equated and that a fair balance could in general be preserved only by holding the male donor to his consent."[175]

The Court admitted, however, the balance of interest could have reasonably been assessed differently and that "making the consent of the male donor irrevocable or by drawing the 'bright line' at the point of creation of the embryo" might "arguably have struck a fairer balance."[176] However, the Court noted, that the U.K. is not alone in drawing the "bright line" at implantation, not conception, and therefore its discretion must be respected under the European Convention.[177]

The Dissenting Opinion of two justices of the European Court of Human Rights said that the majority gave too much weight to public policy considerations and the discretion of the states' members of the European Union to the detriment of the individual's rights:

> Denying the implantation of the embryos amounts in this case not to a mere restriction, but to a total destruction of her right to have her own child. In such a case the Convention case-law is clear and does not allow a State to impair the very essence of such an important right, either through an interference or by non-compliance with its positive obligations. We do not

174. *Id.* ¶ 71. Note: this author agrees with the UK on the principle that *in vivo* fertilization and embryo transfer should be seen as biologically equivalent. He disagrees, however, with the application of this principle by the UK, to wit: that because prenatal human beings are not entitled to a full complement of human rights at law in the UK, they may be retained or disposed of at will by the mother in cases of in vivo fertilization but only retained or disposed of at will by her following embryo transfer in cases of in vitro fertilization. See *supra* note 19 and accompanying text.

175. *Id.* ¶ 66.

176. *Id.* ¶ 68.

177. *Id.*

> think that a legislative scheme which negates the very core of the applicant's right is acceptable under the Convention.[178]

The dissent argued that fundamental human rights should *not* be made to depend on consensus: "We believe that the duty to protect everyone's right to respect for private life should not be made to depend on any European consensus, however sensitive the matter may be."[179] Rather, it is the duty of the European Court of Human Rights to determine what the substance of human rights are and then to strike a balance, not merely outlining the procedure by which one reconciles contradictory human rights in different state members of the European Union:

> So, the United Kingdom chose to strike a balance by allowing for the possibility to withdraw consent up to the point of implantation of the embryo. Other countries, such as Austria and Italy, have decided that the revocation of consent can be effective only up to the point of fertilisation. This is within their margin of appreciation, but the duty to strike a fair balance between individual rights in conflict remains nevertheless the same invariable and imperative requirement under the Convention for all member States.[180]

Distinguishing the facts in *Evans* from those in some American cases, i.e., *Davis*, the dissent pointed out that Ms. Evans' male partner had no fear she would donate their embryos to another third party for implantation: "The involvement of a surrogate has been one of the reasons why the American courts have declined to enforce contracts on public policy grounds; but, we have to underline, such issues of public policy do not apply here."[181]

They concluded their dissenting opinion by proposing a legislative scheme very similar to the one imposed in *Davis v. Davis*. It upholds the right of the genetic mother to go back and implant her frozen embryos in her womb, but denies her the right to assign her right of implantation to a genetic stranger:

> In conclusion, if we apply these principles to the case in hand, the correct approach in our view would be as follows: the interests of the party who withdraws consent and wants to have the embryos destroyed should prevail (if domestic law so provides), unless the other party (a) has no other means to have a genetically-related child; and (b) has no children at all; and (c)

178. *Id.* ¶ 2 (Traja, J. & Mijović, J., dissenting).
179. *Id.* ¶ 5 (emphasis omitted).
180. *Id.*
181. *Id.* ¶ 6.

> does not intend to have recourse to a surrogate mother in the process of implantation. We think this approach would strike a fair balance between public and private interests, as well as between conflicting individual rights themselves. This test is neutral, because it can equally apply to female and male parties.[182]

In sum, in both of these highly publicized cases, the courts made no distinction between those women who wish to engage in prenatal embryo adoption to fulfill their desire for a child and those who wish to simply save the life of the frozen embryo—they referred to both as surrogates. However, on both sides of the Atlantic, courts distinguished between heterologous embryo transfer and homologous embryo transfer; they favored homologous embryo transfer especially in the case where the genetic mother would be unable to conceive again.

IV. POLICY RECOMMENDATIONS

The conclusion reached by the dissent in *Evans*—in the opinion of this author—seems to conform to the moral criteria laid out in *Evangelium Vitae* concerning material cooperation in evil under circumstances when a complete ban on an immoral practice is infeasible, but a partial restriction would tend to mitigate the extent of the harm.[183] The opinion of the dissent in *Evans* also conforms to the interpretation of *Dignitas Personae* advanced in this Article; that is, a woman who becomes pregnant through heterologous embryo transfer is recognized at law as a surrogate, no matter what her motives may be. However, the genetic mother who seeks to become pregnant through homologous embryo transfer ought to be treated differently at law than a surrogate.

In 2006, I had the opportunity to briefly address the Bioethics Committee of the European Parliament concerning *Evans*. In private conversation later with a Catholic member of the European Parliament, I advanced the opinion that permitting Ms. Evans to become pregnant with her own frozen embryos while, at the same time denying any other woman a right to become pregnant with Ms. Evans' frozen embryos, appeared to be a moral solution that a Catholic parliamentarian could embrace.[184] Allowing Ms. Evans to become pregnant with her own embryos would remove the offense to "the dignity

182. *Id.* ¶ 9 (emphasis omitted).

183. *Evangelium Vitae*, *supra* note 104, at ¶ 73.

184. On March 16, 2006 at the headquarters of the European Parliament in Strasbourg, France this author spoke with European Minister of Parliament, Kathy Sinnott, after she provided him opportunity to address the Bioethics Committee of the European Parliament regarding United States law relevant to their consideration of *Evans v. United Kingdom*.

and the right of the child to be conceived, carried in the womb, brought into the world and brought up by his own parents."[185] IVF demonstrates most clearly that sin is separation, primarily from God, but it, also, profoundly deprives the child of his or her right to uninterrupted genetic, gestational, and social parenting. Heterologous embryo transfer compounds this fracture. Homologous embryo transfer, on the other hand, mends and reunites what has been separated through in vitro fertilization.

CONCLUSION

When pregnancy flows from marital sexual intercourse, most people tend to view it as "sacred" in the sense of being set-apart, within the penumbra of spousal intimacy. However, pregnancy seems shriven of its sacral halo when a human embryo is conceived *in vitro*. Embryos conceived through in vitro fertilization have never known sanctuary in their mother's womb. It seems only natural, to some, that we should compare their fate to that of vulnerable orphans.[186] In the context of heterologous embryo transfer following IVF, the ensuing pregnancy tends to be regarded as something mundane and instrumental—a mere shelter, a home, a means to provide food and lodging for the needy little ones. Knowledge of semen induced maternal immune suppression contributing to successful implantation and fetal microchimerism can help to correct this sympathetic, though fundamentally flawed, vision of pregnancy. Due to the relational nature of the human person, pregnancy cannot be reduced to a mere function or biological process as it is in other mammals. Pregnancy is a state of being "with child," in which both father and mother play a fundamental biological role that begins a life-long triune interpersonal relationship upon which divine grace builds.

Rome has spoken authoritatively on the issue of prenatal adoption. Even if one believes that *Dignitas Personae* Section 19 is not definitive, still, a Catholic ethicist should no longer recommend heterologous prenatal adoption as a means to satisfy the desire to have a child. Even non-definitive authoritative statements are binding in conscience when they reflect the manifest mind of the Church.[187] This injunction applies also to

185. *Donum Vitae*, *supra* note 89, at pt. 2(A)(3). *See also* PONTIFICAL COUNCIL FOR PASTORAL ASSISTANCE TO HEALTH CARE WORKERS, CHARTER FOR HEALTH CARE WORKERS 35 (1995).

186. *See generally* John Berkman, *Virtuous Parenting and Orphaned Embryos*, *in* HUMAN EMBRYO ADOPTION: BIOTECHNOLOGY, MARRIAGE, AND THE RIGHT TO LIFE 13 (Thomas V. Berg & Edward J. Furton eds., 2006).

187. Pope John Paul II, *Ad Tuendam Fidem* [*Apostolic Letter* Motu Proprio *by Which Norms are Inserted into the* Code of Canon Law *and into the* Code of Canons of the Eastern Churches] ¶ 2 (1998) (third proposition); *cf.* Second Vatican Council, *Lumen Gentium* [*Dogmatic Constitution on the Church*] ¶ 25 (1964), *reprinted in* THE SIXTEEN DOCUMENTS OF VATICAN II 109, 135–36 (Nat'l Catholic Worker

those who wish to adopt a frozen embryo to save its life, as Cardinal Antonelli reminds us:

> *Dignitas Personae* . . . declared that the practice of *prenatal adoption* (even if carried out with the praiseworthy intention of respecting and defending human life) presents various problems not dissimilar to those listed by the Congregation in connection to the practice of artificial heterologous procreation . . . .[188]

Recent studies in immunology confirm that the same act of intercourse that initiates conception also initiates implantation, "in two waves in the reproductive process."[189] These two events, distinguishable chronologically, are united causally forming one moral deed. For a woman to prime her immune system with heterologous sperm-free semen (presenting the same antigens as the heterologous embryo) is a truncated quasi-sexual act regardless of her ulterior motive (to improve the implantation success rate). The conceptus she primes herself to receive will shed fetal stem cells within her body, introducing the male DNA of its father's linage, which, years later, may differentiate and repair her tissues and organs with cells bearing his genetic heritage. Hence, seminal fluid priming and fetal microchimerism confirm the emerging authoritative position of the Church that casts heterologous prenatal adoption in the same light as any other variety of artificial heterologous procreation, such as IVF and surrogacy.

The moral problems that seminal fluid priming and fetal microchimerism pose in cases of heterologous prenatal adoption would also seem to affect the moral analysis in the worst case scenarios of homologous embryo adoption. For instance, should a widow or a woman who is divorced and/or canonically annulled wish to become pregnant through homologous embryo transfer, it would seem that problems not dissimilar from those associated with heterologous embryo transfer might exist. Moreover, a Catholic legislator ought to protect the institution of marriage by legislatively proscribing post-mortem embryo transfer, regardless of whether it is heterologous or homologous.

The best case scenario of homologous embryo transfer occurs when a married couple repents of their sin of IVF and makes amends by attempting to implant and carry to term in her womb their frozen embryos. The law

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Conference trans., 1967); Congregation for the Doctrine of the Faith, *Profession of Faith and Oath of Fidelity* (1988) (level three teaching), *available at* http://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_con_cfaith_doc_1988_professio-fidei_en.html.

188. Antonelli, *supra* note 139 (author's translation).

189. Robertson et al., *supra* note 30, at 112.

should allow them to do so. Her husband would prime her immune system, so as to enhance the likelihood of a successful implantation, through morally licit acts of marital intercourse. Their embryo once it implants, will further their one-flesh union through normal fetal mircochimerism. The maternal-fetal cells that pass from her into her child during pregnancy and that may continue to pass into it, should she breastfeed, will not complicate her child's genetic identity. The frozen embryo that enters its genetic mother's womb under these best of circumstances has its right to genetic, gestational, and social parentage vindicated. This child does not trespass upon the dignity of marriage, a child who in its flesh furthers the one-flesh union of its fallen but repentant procreators.[190]

190. The conclusion to this Article reflects the position of this author in his presentation at the Pontifical Council for Justice and Peace on February 25, 2010. *See* Andrea Kirk Assaf, *Interview with Law Professor Brian Scarnecchia*, ZENIT, Feb. 25, 2010, http://www.zenit.org/article-28463?1=english.