The Hoplite Phalanx Effect of Pregnancy

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Research into the maternal/fetal interface of pregnancy (the complex psycho-somatic interrelationships of a mother and her developing baby) has recently generated some amazing data. The selected studies we will examine here definitely level the playing field between baby and mom – the nurturance/protection playing field, that is. As such, these projects stand the more traditional pregnancy paradigm – the mother gives and the baby takes – on its head. Evidentiary data gathered, first, from the effects of pregnancy on the maternal brain and, second, from the persistent post-partum presence of fetal cells in a mother's body explain why the "donation drama" of pregnancy is bilateral, not unilateral. Pregnancy and birth are an altruistic show-stopper definitely generated by a two-character cast.

In short, scientific research is making us more and more aware that pregnancy and birth are a mutual aid society. Mom helps baby; baby helps mom. You could say, then, that baby and mother form a line (a phalanx) where each, as a hoplite ("foot soldier"), uses his/her shield to protect the exposed side of the other. My interest here is to key in on the moral implications of what I call the *hoplite phalanx effect* of pregnancy.

The Research

In an article in *Scientific American* ("The Maternal Brain," January, 2006), authors Craig Howard Kinsley and Kelly G. Lambert review research results from the 1970s to the present which examine a topic they have been studying for a decade: the beneficial effects of pregnancy on the mammalian brain. The reported conclusions would be attention-grabbing enough if they applied only to rodents. But more and more, these findings have also been shown to pertain to the brains of human moms. In other words, there appears to be a common "maternal circuit in the mamma-

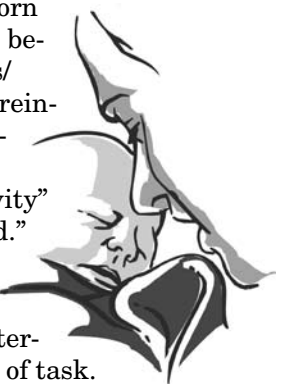
lian brain" which produces similar skills and behaviors whether in gravid rodents or pregnant women.

For example, hormone-induced changes in the female brain during pregnancy "ramp up" certain neurons and glial cells preparing the mother for the challenge of birthing and motherhood. Post-partum, these same neurons enable the mother to exhibit a set of behaviors that we have come to call maternal: concentrating on the needs of her offspring, extending care, nurturance and protection of the newborn.

The cited research also demonstrates that the hormones of pregnancy, birth and lactation not only trigger changes in areas of the female brain that control maternal behavior but also in brain regions that regulate spatial memory and learning. Craig Kinsley's lab has reported that pregnant rats consistently exhibited these latter cognitive skills at a level that excelled that of their virgin counterparts.

What's more, maternal mammals exhibited these proficiencies for as long as two years after lactation. Translated to human females, this would mean that mothers over 60 years of age would still exhibit these enhanced intellectual activities and would, during this same age-range, be less likely than their motherless counterparts to experience a steep decline in memory. The data from one study suggests that women in their 40s who had conceived naturally were "probably aging at a slower pace." Other investigators reasoned that the pregnancy-induced structural changes in the maternal brain could also help to explain why mothers are better able to "multi-task" (for instance, juggling the demands of home and career) than are fathers or women with no children.

Even more germane to the hoplite phalanx effect, studies showed that after the pregnancy hormones jump-start the maternal response, the mammalian newborn takes over the task of provoking maternal behavior. So, without losing a beat, the fetus/neo-nate steps up to the plate, as it were, reinforcing and co-opting the work of the pregnancy hormones: namely, to "rev up" the mother's "attention, vigilance and sensitivity" and to strengthen "the mother-infant bond."



Kinsley and Lambert are quick to emphasize that mothers have not been proven to be better than their virgin counterparts when it comes to any and every sort of task.

They do, however, point to incontrovertible evidence demonstrating that moms excel in "the behaviors affecting the survival of their offspring." And for those benefits, every woman who is or has been pregnant can thank their hormones as well as her pre-born and newborn children. Collectively, these pregnancy-induced elements, active during pregnancy, birth and lactation, remodel the female brain in such a way that the woman can rise to the challenge of gestation and motherhood.

The second selected study ("Transfer of Fetal Cells with Multilineage Potential to Maternal Tissue") was conducted by Diana W. Bianchi and her colleagues at Tufts-New England Medical Center and reprinted in the July 7, 2004, issue of the *Journal of the American Medical Association* (JAMA). The hypothesis tested in this research – that fetal cells persist in maternal blood and tissues postpartum and "may respond to maternal injury" by helping the moms heal themselves – reinforces what I have called "the hoplite phalanx effect" of pregnancy.

To prove the hypothesis, two groups of women were studied. The first group, ten women between the ages of 34 and 74 and suffering from autoimmune and non-autoimmune diseases (group A), had conceived male babies. The second group, 11 women suffering from comparable diseases and of similar ages (group B), had no prior male pregnancies. (The reason only women with male pregnancies were studied is a practical one. The identification of the male fetal cells [XY+] with their dangling Y chromosome amongst maternal cells [XX+] are more easily detected than female fetal cells. Isolating the latter from maternal cells would be like looking for snowflakes in a snowstorm. Bianchi and colleagues concluded that the ostensible therapeutic power of post-partum fetal cells in a mother's body would apply equally to those from female fetuses.)

The results of this study were variously described as "dramatic" and "stunning." Without exception, the diseased maternal tissue of women in group A contained transformed or differentiated male cells. The diseased maternal tissue of women in group B contained no male cells.

So, what does this all mean? It means that the male fetal cells which were of bone marrow origin either fused with or morphed into liver cells, white blood cells and epithelial cells. They did so in response to the respective maternal diseases involving liver, blood and epithelial tissue injury. The most striking example is that of a woman in group A suffering from hepatitis C. She subsequently

was healed of her disease through male liver cells from her offspring. As Bianchi remarked to a reporter, this woman's "entire liver was re-populated with male cells."

In short, the preliminary conclusions of this experiment underscore that pregnancy is a bilateral "donation drama" where baby and mother form a "phalanx" (albeit only a two-person line) in which both "hoplites" – mother and developing baby – actively work toward the common goal of a gestational victory, each "soldier" providing "cover" for the other.

In this case, the mother hoplite provides the warmth and shelter of her uterus where the placenta/umbilical cord not only provides nutrients to and removes waste products from the developing baby. But it also shields the fetus by means of hormones that prevent a new ovulation and menses. The embryonic/fetal hoplite – as if not to be outdone in generosity – deposits some of its youthful cells in the mother's body. After pregnancy (and despite the fact that the mother may have lost the baby through miscarriage or even by an induced abortion), those fetal cells appear to have the long-term capacity, first, to morph into the specialized cells needed to repair the respective maternal injury, second, to migrate to the point of injury and, third, actually to repair and replace the mother's damaged cells and tissues. This study, then, demonstrates that the umbilical cord is undeniably a two-way street where "the nurturing process [between mother and baby] goes both ways."

Moral Implications

What is the moral significance of these fascinating scientific findings?

First, these studies highlight the personal nature of the developing human being *in utero*. They confirm that the powers defining personhood, both natural and functional, are present in the organic structure of every human being as essential to its nature. One of those person-defining powers, the capacity to love – to give self and to receive the other as gift – resounds in the nature of every human being, no matter how nascent. Before the age of reason and the existence of the more mature human brain, these acts of self-donation, though non-voluntary, are a prolepsis – rudimentary predictors – of the voluntary acts of love that will hopefully manifest themselves when the embryonic/fetal human being is at his or her more mature stage, at or beyond the age of reason. The protective, therapeutic effects that follow directly from

the embryonic/fetal human being during pregnancy are vestigial actions, actions of a person forever marked by the fact that he or she comes from the creative hand of the Person of God, the Radical Giver.

Second, the scientific data of these studies, pointing as they do to the personal nature of the embryonic/fetal human being, help us understand better why a mother's putative right to privacy is always trumped by the right to life of the human being developing within her uterus.

As I have argued, the research we have just examined shows that pregnancy is a mutual aid society between two persons, the woman and the baby. The mother together with however many children she has conceived form a hoplite phalanx. At the same time that each baby (*in utero* and beyond) is protecting the vulnerable side of his/her mother, the mother is sheltering and supporting each of her children (*in utero* and beyond). The whole notion of the developing embryo/fetus as a parasite whose presence, especially if unplanned, entitles the pregnant woman to the right to abort simply does not square with the two-way maternal/fetal donation of pregnancy so strikingly documented in the cited research.

As the pre-natal baby is no parasite, so the protection and nurturance of pregnancy do not have their sole provenance in the mother. Effects emanating from the fetus itself – the ameliorative effects of pregnancy on the maternal brain and the apparent long-term therapeutic capacity of fetal cells in the mother's body – demonstrate that pregnancy (and its consequent parenting) does not constitute a one-way giving street. No, indeed. Pregnancy and child-rearing are a mutual aid society between a mother and her child that starts in the womb and culminates decades later. The altruism of the developing human being, the baby, now appears to provide protection and care, safety and nurturance for a length of time that rivals the gifting from that of the mother.

By dint of these research conclusions, then, the baby can be defined as a self-developing human organism whose pre-and post-natal gifting and receiving, though unconscious, stand as a prolepsis of the deliberately willed giving that the child has been called to from his or her conception by God, the Radical Giver. In other words, the person-defining significance of the research findings that we have examined here constitutes a moral indictment against any alleged right of a pregnant woman to abort her baby based on a putative right to privacy.