A. How Should We Respond to the Bioethics Challenge? Introduction
1. Wonder leads to very old questions (Psalm 139 and Zoology 470)
2. Old question have new urgency
3. Thinking about embryos shouldn’t be left to “experts”
4. Christians are called to engage with society in love (Mt 5:13; Mark 9:50; Luke 14:34; Col. 4:6)
   “If the ordinary [person] may not discuss existence, why should [he or she] be asked to conduct it?”
   [G.K. Chesterton, George Bernard Shaw]
   “Christian love is always in search of a social policy” - Paul Ramsey (Basic Christian Ethics, p. 326)

B. How Do People Usually Think about Bioethics? A Case Study
1. Worldviews guide our decision-making
2. Worldviews are typically unarticulated
3. Worldviews are elaborated through lots of hard work to produce coherent views on the nature of reality (metaphysics), how we know things (epistemology), the nature of the good (metaethics), and how we achieve the good (ethics)
4. Worldviewish thinking should be a hallmark of all Christians

C. How Should We Think About Bioethics? Biblical Parameters Regarding Human Nature
1. What we were meant for
   a. image bearing (Gen 1:26-27; 9:6)
   b. creation stewards (Gen. 1:28; Psalm 8:5; more from Lindroth)
   c. procreation mandate (Gen. 2:23-24): image bearing is done in relationship, and communities arise via one-flesh unitive and procreative sexual union
   d. children are a “begotten gift” (Ps. 127:3-5)
2. Reality in a fallen world
   “The belief that surrogate mothers and clonal babies are inevitable because science always moves forward...represents a form of laissez-faire nonsense dismally reminiscent of the creed that American business, if left to itself, will solve everybody’s problems.” [James Watson, co-discover of the double helix, Moving Towards the Clonal Man: Is This What We Want” in Pence and Pence, Flesh of My Flesh, p. 7) 
   a. restoration (Gen. 3:16-19)
   b. human sinfulness requires restraints on knowledge and its uses (Gen. 2:16-17)
   c. taking of human life occurs according to divine mandate (Gen. 9:6; Ex. 23:7)
   d. neighbor love (e.g., Mt 19:19; 22:33-40), care for the weak and defenseless (e.g., Isa 42:19; 52:14)
   e. suffering is part of the human condition and shared by Christ (e.g., Rom. 5:3)
   f. humans are incredibly valuable because Christ died for them (Rom. 5:6-8)
   g. Jesus is the model for perfect humanness (1 Cor 15:45)

D. How Should We Think About This? Is the Embryo My Neighbor?
1. Defining embryos: Biology
   a. Biological nature of development: a continuum
   b. Potential watershed events that establish individuation during development
      i. Fertilization/syngamy (“conception”)
         “Human development begins at fertilization when a male gamete or sperm (spermatozoon) unites with a female gamete or oocyte (ovum) to produce a single cell - a zygote. This highly specialized, totipotent cell marked the beginning of each of us as a unique individual.” (Moore and Persaud, The Developing Human)
         Robert P. George (legal ethicist, Princeton): “The question is not about embryos’ eternal destiny. That is a religious matter...There is no need for any of us who oppose embryo destruction to appeal to religion. The science will do just fine...”(The Wall Street Journal, July 30, 2001)
         1. Strength: easy to define, clear landmark event
         2. Potential weakness: Intuition that “mere” organismal life is not the whole story
      ii. Implantation
         1. Often used in conjunction with IVF/potentiality
            “To me, a tiny mass of cells that has never been in a uterus is hardly a human being - even if it has the potential to become human.” (David Baltimore, The Wall Street Journal, July 30, 2001)
         2. Strength: Estimates of spontaneous miscarriage are high (~50%)
         3. Potential weaknesses:
            a. Not clear how implantation failures involve true embryos; high infant mortality rates don’t imply lack of value
            b. lack of a proper environment does not appear to be ontogenetically significant (e.g., adult humans in a room without oxygen)
      iii. Primitive Streak (14 days)
         1. Strength: twinning no longer possible
2. Weakness: it is not clear that no individual exists prior to twinning in the case of twins. Example: regeneration in planaria (flatworms)

3. De facto position of many pro-stem cell reports in the UK and US, including the 1990 Human Fertilisation and Embryology Act in the UK

iv. Brain/neural function
1. Strength: brain function is a crucial aspect of human life
2. Weaknesses
   a. Embryos will, typically develop brain function.
   b. Leads to odd language
      "...we do not begin to exist until approximately 28 to 30 weeks after fertilisation - assuming that current estimates of when in the course of fetal development consciousness becomes possible are roughly accurate. This, of course, is well after our organisms begin to exist." (Jeff McMahan, 1999. Cloning, killing, and identity. *Journal of Medical Ethics* 25:77-86)
   c. Leads some to anti-human exceptionalism
      "In this respect, experimenting on a human embryo is not to be compared in significance with experimenting on a living, sentient mouse… what is the moral significance of mere species membership, if there are no morally relevant properties that go with it?" (Peter Singer, *new Assisted Reproductive Technologies*, reprinted in Kuhse, H. and Singer, P., eds, *Bioethics: An Anthology*, p. 99)

   c. Is Biology sufficient?
      "We cannot go looking for ‘moral status’ or ‘value’ as if it were a feature we might locate under a microscope if only we had one powerful enough." (Sondra Wheeler, in Walters and Cole-Turner, p. 154).

2. Defining embryos: Biblical data
   a. God is depicted as being active during development, and embryos are treated as individuals, especially ex post facto (Psalm 139:13-16; 51:5; Luke 1:41-43; Job 10:8; Jer. 1:5; Isa 49:1)
   b. The Incarnation may be important
   c. The Bible is a pre-scientific document without our knowledge of development
      "Such passages do not establish when human life begins, but they establish God’s care and involvement from the very beginning." (A Theologian’s Brief on the Place of the Human Embryo within the Christian Tradition, and the Theological Principles for Evaluating Its Moral Status. In Walters and Cole-Turner, p. 192.
   d. Caution seems in order when we are uncertain
      "If we are genuinely baffled about how best to describe the moral status of that human subject who is the unimplanted embryo, we should not go forward in a way that peculiarly combines metaphysical bewilderment with practical certitude by approving even limited [use] for experimental purposes." (Gilbert Meilaender, *Begetting and Cloning*, 1997)

3. Cautious approach: the intentional destruction of human organisms throughout their development should be avoided.

E. How Should We Treat Human Embryos? Case studies
"If human embryonic stem cell research does not make you at least a little bit uncomfortable, you have not thought about it enough" James Thomson, *New York Times*, Nov. 22, 2007

1. Preimplantation Genetic Diagnosis
   a. Biology: totipotency makes it possible
   b. Potential uses: disease prevention, sex selection (eg. China)
   c. Ethical evaluation and personal reflection
   d. Alternatives: polar body biopsy, etc.

2. Stem Cells and Therapeutic Cloning
   a. Biology: pluripotency makes it possible
   b. Technology: how they are made and why it matters
   c. Potential uses
   d. Ethical evaluation
      i. The “Puzzle of Profound Respect”
      ii. "Therapeutic" cloning and stem cells
   e. Alternatives: induced pluripotent stem cells
      i. Biology: pluripotency
      ii. Potential uses: promise and problems

F. How Should We Respond as Christians? Conclusions
1. Be informed
2. Be critical thinkers
3. Be loving advocates for restraint and alternatives
Helpful References on Bibliically Based Bioethics (* = especially helpful)

General Christian Worldview and Christian Ethics References

Biblical Bioethics
http://cbhd.org/content/abortion-bioethics-and-personhood-philosophical-reflection
Philosophical discussion of the status of the human embryo.
* Buratovich, M.A. (2013). The Stem Cell Epistles: Letters to My Students about Bioethics, Embryos, Stem Cells, and Fertility Treatments. Prof at Spring Arbor Univ. writes as if he emailing his students about bioethics and early embryos.
Roman Catholic resources:
  Web site for a major Vatican "think tank" on bioethics.
  Pope Paul VI (1968). Humanae Vitae (On the Regulation of Birth). Online at:
  http://www.domestic-church.org/CONTENT.DCC/BASEDOCS/P6_HV.HTM

Other Useful References
Bioethics National Advisory Committee reports. Although their charter expired in 200 and been replaced by more recent Presidential panels, this site contains many useful reports on cloning, stem cells, and other issues. Available online at: https://bioethicsarchive.georgetown.edu/nbac/pubs.html