Evolution of Love

The Rev. Edmund Robinson
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Thursday we will celebrate the bicentennials of two of history's most important individuals: Charles Darwin and Abraham Lincoln. The stars must have been in an important alignment on February 12, 1809, to produce men who so changed the course of history. This Sunday I have devoted to Darwin; Lincoln will come next week.

Let me introduce the morning's topic by way of a parable: At a certain zoo, one of the zookeepers noticed that the orangutan was reading two books: the Bible and Darwin's Origin of the Species.

Surprised, he asked the ape, "why are you reading both those books?"

"Well," said the orangutan, "I just wanted to know if I was my brother's keeper or my keeper's brother."

Darwin's great contribution to modern thought is to give us an account of how we got to be the way we are, and thus of who we are. Before Darwin, people understood that things change, but believed that species were pretty much the same down through time. The first creation myth in Genesis has God making all the creatures and bringing them to Adam to name them.

Through close observation of the characteristics of species and subspecies, Darwin showed that species change over the years, and that the mechanism for this change is random mutation and adaptive selection. Thus chance would dictate that finches who live in an environment where the food supply is hard-shelled seeds might have some offspring with long beaks and some offspring with short, but the offspring with short beaks will do better at cracking the seeds, and will survive to pass on her genes to future generation so that, over time, the finches in that area will tend to have short stubby beaks.

Darwin did not know about genetics or DNA, but everything we have learned about the genome in the twentieth century has borne out the essence of Darwin's theory in great detail. We now know that not only physical traits but instincts, psychological and emotional traits, are subject to adaptive selection.

It's a random mutation of the calendar that Darwin's birthday occurs two days before St. Valentine's day, but I want to take adaptive advantage of that today to look at how evolution impacts on the religious value that many of us hold most highly, the value of love. What is love, from the point of view of evolution, and what is love, from the point of view of religion, and can these two views be reconciled?

What does evolution tell us about love? Love, like any other trait or instinct, is not going to stick around long unless it helps us to survive. It has to pull some weight in passing on those genes to the next generation.

Now my logic breaks this down into four levels: child-rearing or love between parent and child; the sex drive, or love between mates; tribalism, or love between kin; and love within a community.

When you look at the human life-cycle against that of the entire animal kingdom, the most immediate fact that stands out is the long period of dependency of human young. A human child would usually die if not nurtured by its parents for a period of four or five years. So we have had to develop strong parenting instincts to protect our offspring. The love of parent for child has an obvious evolutionary advantage; a child that is loved and nurtured is more likely to live to reproductive age and pass on her traits to her offspring.

And the instinct is reciprocal; the child has an evolutionary incentive to return the parent's love and to stick close by, rather than leaving and roaming about. Children who have roving instincts will get eaten by saber-toothed tigers before they can pass on those unloving instincts to

their offspring.

This powerful parent-child love is reflected in religious and cultural systems. God is often conceived as a heavenly father, the ideal parent whose love is constant and unconditional. This parental theme comes to the fore in one of the most poignant stories in the Hebrew Bible, when God orders Abraham to sacrifice Isaac, his only son, the miracle son, the offspring that Abraham believed he would never have and Abraham is caught between his loyalty to his heavenly father and his instinctual evolutionary bond to his seed. It has a happy ending, but the theme of sacrifice of one's only son gets resurrected centuries later by St. Paul to explain the Jesus phenomenon in terms meaningful to his Jewish readers.

The chemical basis of bonding between parent and child in humans is the hormone oxytocin, which is released into the mother's bloodstream during the delivery process and continues to be released during breastfeeding. Oxytocin and its male counterpart, vasopresin, are sort of like Love Potion Number 9, they cause us to become attached to whoever we see while under their influence.

Yet love is not reducible to chemistry. The love between parent and child may start with oxytocin, but the ideas and symbols start to mediate and the love stays long after the oxytocin is gone from the bloodstream. This is illustrated by a story about Charles Darwin himself[1]. Darwin lost his precious daughter Annie to tuberculosis at about age 10. Recently, Randal Keynes, Darwin's great=-grandson, discovered a box belonging to the child and some papers Darwin had written about her. According to Keynes, after Annie's death, Darwin no longer believed in a kind creator.

> "I found this note written by Darwin about Annie's condition ..." Keynes said. "It was Darwin trying to find out what was wrong with her and hoping he could treat her. But they couldn't find anything that would help."
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> "What he realized is that he just went on caring for Annie. He just couldn't stop caring for her, even though she was dead, and year after year he found he still cared for her as much as he did when she was alive. He realized how fundamentally important the affections are between parent and child and how --to use a modern phrase -- it must be a kind of hardwired part of our makeup."

Your see, even between parent and child, love may start with chemistry, but it doesn't stay there. It gets all involved with our ideas, or words, our symbols our memories.

Now let's move to the next level of love, love between mates. Here we encounter the sex drive. Obviously for human and all animal sexual reproduction, there must be some instinct which leads the sexes to mate.

Let me add a disclaimer here, because we are joyfully welcoming in this church to those of various kinds of sexuality as well as those who are celibate. In society, we recognize many reasons for marriage or long-term partnership other than procreation. But when we speak in evolutionary terms, we have to concentrate the effect anything has on making babies.

So let's look at dating and mating. When you look at human mating behavior in the context of the rest of the animal kingdom, what stands out are two facts: (1) human pairings are generally for life and (2) humans are interested in sex even during periods when they are not fertile. Most animals do not form lifetime bonds, and for most mammals, the female is only receptive to sex when she is ovulating, and the male is only interested in coupling with her at that time.

The article I read from makes a link between these two facts. The author cites evidence from working with small mouse-like creatures which suggests that the oxytocin system, which

[1]Article by Tatsha Robertson, Boston Globe Thursday, November 24, 2005, with thanks to my colleague Rev. Art Severance for bringing it to my attention.

originally evolved to cement the mother-child bond, then further evolved to a role in dating and mating. Oxytocin is released when the parts of the body involved in childbirth and nursing are stimulated. The chemistry of love which was evolved to bond parent to child also serves, with some variation, to bond mate to mate. The authors say this may explain the fact that human females desire sex when they are not ovulating or the erotic role of the female breast.

This information is fascinating, but my gut instinct is that the chemistry is not the whole picture. I may have been under the influence of oxytocin when I first fell in love with my mate or first made love to her, and oxytocin or vasopressin may be released when I hear her voice on the phone or look at a picture of her. Oxytocin may be a necessary component of love but it is not all there is.

And in particular, oxytocin and vasopressin don't make the selection of who we fall in love with, a selection that has enormous consequences for evolution. Darwin spilled a lot of ink on the question of sexual selection. Why does the male peacock have a gaudy tail? Is it to win over females in a sexual competition with other males?

A few years ago, I heard a lecture about a study of a group of Mennonites whose records of births, death and marriages go back several generations. They always tended to marry other Mennonites, so it provided kind of a laboratory in genetics. There was a genetic trait which was carried by some men and some women, and if both parents had the trait, there was trouble – the women would have trouble getting pregnant and would have many miscarriages.

The scientists knew how prevalent this genetic trait was in the population, and thus they could calculate the rate at which it would produce these problem pregnancies if the men and women chose their spouses at random. Then they looked at the actual rate of problem pregnancies, and found it was less than half of what random chance would predict. So the conclusion was that somehow the Mennonite men and women could tell which mates were genetically right for them and which mates were genetically wrong.

The professor who was telling us all this said he had no idea how people knew what mates were biologically good ones and which were not, but he suspected that it had something to do with saliva or sweat. That made sense to me. Evolution may have evolved ways for us to tell whom it is best to love, and the mechanism for this would be whether the partner smells good and tastes good to us.

Now the love in the first two categories you could call selfish, in that the drive to mate and to protect our offspring directly helps each of us perpetuate his or her own genes. There is a third type of instinct called kinship altruism, and the idea behind this is we protect those who are kin to us because they are carrying more or less the same genes. So I would throw myself on the hand grenade to save the life of my brother because I know he will continue the family lineage. And I might throw myself on the hand grenade to protect my first cousin, but then I might draw the line at my second cousin.

This sibling and extended cousin relationship also has mythical and metaphorical expressions: He's not heavy, he's my brother. The Sisters of Mercy, the Christian ideal a generation ago, was expressed in the hymn *Because All Men Are Brothers*. Universal brotherhood meant that one would extend to the whole race the feelings and behavior which instinct gives us as to close sibling kin. I'll return to this in minute.

The fourth stage of love, which is somewhat more complicated and controversial among evolutionary theorists, is reciprocal altruism. The idea here is that we evolve instincts to cooperate with others in a community, and this involves social skills such as language, a symbol system, doing favors for others and having them do favors for us in a reciprocal arrangement. This creates a community and creating community tends to ensure the protection of the offspring, so those humans who have developed the instincts which allow for social cooperation are more likely to pass those instincts on to descendants. As Stephen Pinker says,

> "Reciprocal altruism can evolve because cooperators do better than hermits or misanthropes. They enjoy the gains of trading their surpluses, pulling ticks out of one another's hair, saving each other from drowning or starvation, and baby-sitting each other's children.[2]"

Some evolutionists say that religion evolved as a mechanism of reciprocal altruism. Our churches are, among other things, institutions to ensure our evolutionary success by cooperatively raising our children, passing on traditions, engaging in mutual support of a variety of factors.

But altruism has its limits, and the instinctual basis for love has its limits. Evolution takes us only to a love which extends to our own tribe or our own community. The Universal love ethic preached by Jesus is in some ways contrary to human nature as it has evolved.

Let's take the story of the Good Samaritan. Generations of Christian ministers have spun this story as Jesus' ethic of universal love. The Jews of Jesus' time saw themselves very much as a tribal people, united by their reading of the Torah, worship of one God and the rituals of the Temple in Jerusalem. The Samaritans, on the other hand, were a people hated by the Jews; they worshiped Yahweh but also local tribal Gods, so they were considered apostates[3]. In a passage one chapter before the Good Samaritan story in the Gospel of Luke, the Samaritans reject Jesus and Jesus' disciples ask him if they should call down the fire of heaven against the Samaritans[4]. So they were not a popular lot.

In the prologue to the Good Samaritan story, Jesus is asked by a lawyer what one must do to inherit eternal life. Jesus, in turn, asks him what is written in the law, and the lawyer responds *"love the lord your God with all your heart and with all your soul and with all your strength and with all your mind, and your neighbor as yourself."* Now this was an interesting response because the two parts of this rule come from two different parts of the Torah. But Jesus accepts the rule as the lawyer has stated it and tells him to do this, but the lawyer, as lawyers are wont to do, have a quibble about the terms of the rule. Who is my neighbor?

Jesus tells the story of the Good Samaritan to answer this question. The poor victim is robbed and left for dead. Presumably he is Jewish, and thus he is a member of the tribe of Israel. You would expect the tribal instincts of the Priest and the Levite to impel these people to come to his aid, but they pass by on the other side. The Priests and the Levites were supposed to be the guardians of the law, but they were not a neighbor to the injured man. Only the Samaritan, the person who was despised by the Jews, actually acts as a neighbor, actually goes out of his way to help.

I have said before that the basis of all religion is the recognition that the other is like me. In Buber's terms, we stop seeing the other as an "it," and see the other as a "thou." We see our neighbor as someone like us. We bridge the chasm between the subjective interior and the objective exterior.

But the Good Samaritan story goes further than just seeing any old other as like me. In the Good Samaritan story, the neighbor is my enemy, the other tribe, the group our tribe is sworn to resist. The logic of tribalism dictates that a large part of the identity of any "we" is formed in distinction from a "they". Who are "we," the Jews? We are people who are not Samaritans. So Jesus' demand that we treat the Samaritans as our neighbor waters down the definition of a Jew.

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Steven Pinker, *The Blank Slate: The Modern Denial of Human Nature* (New York: Viking Press 2002) p. 243

[3]See 2 Kings 17:24-41.

[4]Luke 9: 52-55

"Who is my neighbor?", the lawyer's question, is in evolutionary terms equivalent to saying, what are the limits of my altruism? Where is the edge of my tribe, where my duty to protect changes into a duty to oppose the enemy? And Jesus' answer is, your tribe has no edge.

And this is why I suspect that when we try to harmonize religion and science, we must acknowledge is that the love ethic of Jesus, which is the basis for the love ethic of Universalism and through that, Unitarian Universalism, is in a sense, unnatural. It's not that human nature won't bear it. It's that human nature resists it, and if we are to spread this love ethic, if we are to preach it and practice it, as I certainly think we should, we need to recognize that evolution has made it a hard sell. We need to evolve further in order to hear it, in order to take it to heart, in order to realize it in our lives.

I think this is why the early Christian Church decided that they couldn't sell this love ethic undiluted. They thought they had to dress it up in all kinds of magic. They tried to shoehorn Jesus into the old prophecies of a Messiah. St. Paul tried to make him a new Adam, and with John, put forth the notion that his heavenly father gave him as a sacrifice to atone for the sins of the world, echoing Abraham's near-sacrifice of Isaac.

Paul may have had to spin it this way to get Jewish converts, but it doesn't convince me; I think Jesus' death had nothing to do with a sacrifice by God; he was crucified because people were not ready to hear a message that salvation lay in loving your enemy. People are still not ready to hear it, much less practice it. But under two thousand years of its pressure, we can evolve, we have evolved.

Human nature, our evolutionary heritage, is not stacked in favor of loving your enemy, but I'd like to think that it does not forbid it. Lincoln in his First Inaugural, on the brink of the most disastrous war in American history, refers to the "better angels of our nature." Would that they had been kept in mind. We are given some hard wiring by our genetic inheritance, shaped by evolutionary forces. But we also have the instinct to make meaning of things, and to use words and other symbols, and we know how to wire those symbols down deep into the substrate of instinct which our heritage gives us. So we use myth and metaphor to say that we are all family, that all people are children of God, and thus all are our brothers and sisters and we owe them the care which instinct says we owe to our blood brothers and sisters.

To the orangutan's question, we can answer: both. We are both our brother's keeper and our keeper's brother. The task of the age, the task of an evolutionarily enlightened religion, is to get these symbols of brotherhood accepted down at the level of our oxytocin. Can we hardwire ourselves for universal, unconditional love?

Amen.

Reading: |

"Love: Neuroscience reveals all" by Larry J Young

Nature 457, 148 (8 January 2009)

In his Love's Trinity, the Victorian poet laureate Alfred Austin sums up the holistic view of love that has long held sway:

Soul, heart, and body, we thus singly name,
Are not in love divisible and distinct,
But each with each inseparably link'd.

Now researchers are attempting to isolate and identify the neural and genetic components underlying this seemingly uniquely human emotion. Indeed, biologists may soon be able to reduce certain mental states associated with love to a biochemical chain of events. This has implications

for the evolution of human sexuality, and raises important societal issues given our increasing use of genetic tests to screen for certain behaviors, and of drugs to modulate mental processes.

We are not alone in being able to form intense and enduring social ties. Take the mother–infant bond. Whether or not the emotional connection between a ewe and her lamb, or a female macaque and her offspring, is qualitatively similar to human motherly love, it is highly likely that these relationships share evolutionarily conserved brain mechanisms. In humans, rats and sheep, the hormone oxytocin is released during labor, delivery and nursing....

Long-term bonding between mates is rare in mammals. It may be regulated by the same brain mechanisms as those involved in maternal bonding. For instance, pair bonding in the female monogamous prairie vole is stimulated by oxytocin released in the brain during mating. A female prairie vole rapidly becomes attached to the nearest male if her brain is infused with oxytocin. The hormone interacts with the reward and reinforcement system driven by the neurotransmitter dopamine — the same circuitry that drugs such as nicotine, cocaine and heroin act on in humans to produce euphoria and addiction.

There is intriguing overlap between the brain areas involved in vole pair bonding and those associated with human love. Dopamine-related reward regions of the human brain are active in mothers viewing images of their child. Similar activation patterns are seen in people looking at photographs of their lovers.

The notion that pair bonding in humans may have evolved through a tweaking of the brain mechanisms underlying maternal bonding could explain certain unique characteristics of human sexuality. For example, female sexual desire may have become decoupled from fertility, and the female breast may have become an erotic stimulus for males, to activate ancient maternal-bonding systems....

Pair bonding in males involves similar brain circuitry to that in females, but different neurochemical pathways. In male prairie voles, for example, vasopressin — a hormone related to oxytocin — stimulates pair bonding, aggression towards potential rivals, and paternal instincts, such as grooming offspring in the nest. Variation in a regulatory region of the vasopressin receptor gene, avpr1a, predicts the likelihood that a male vole will bond with a female.

Similarly, in humans, different forms of the AVPR1A gene are associated with variation in pair bonding and relationship quality. A recent study shows that men with a particular AVPR1A variant are twice as likely as men without it to remain unmarried or when married, twice as likely to report a recent crisis in their marriage. Spouses of men with the variant also express more dissatisfaction in their relationships than do those of men lacking it. For both voles and humans, AVPR1A genetic polymorphisms predict how much vasopressin receptor is expressed in the brain.

The view of love as an emergent property of a cocktail of ancient neuropeptides and neurotransmitters raises important issues for society....