

The Long Apprenticeship

How Evolution, Children and Time Created Human Values

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THIS ARTICLE PROPOSES THAT THE LENGTHY AND INCREMENTAL DEVELOPMENT of pre-human and human intelligence would have paralleled the development of tool making, which now has been dated by archaeologists at over three million years. Because the development of higher intelligence required hugely prolonged and vulnerable childhood, these smarter children would not have survived without evolution having invented new mechanisms to permit this to happen. The solution that natural selection produced was the gradual development in our ancestors of the unique survival values of kindness, love, community and co-operation which created the conditions for smarter but more vulnerable children to survive. And in the process made us human.

Marine plant life began in the seas on earth about 800 million years ago and eventually created a breathable atmosphere. This opened the way for simple forms of animal life about 500 million years ago. As cell division (one parent) was supplemented by sexual reproduction (two parents), evolution was enabled and began to work its apparent magic. It is difficult to imagine the vastness of the time scale and the uncountable generations that evolution had to work with. For hundreds of millions of years, it produced an extravagant proliferation of life forms. Dinosaurs are the best known, but there were many other waves of exotic life forms, punctuated by periodic mass extinctions. Out of the billions of species experimented with by evolution, only one line was to develop higher intelligence.

From this chain of life, human ancestors eventually evolved. The earliest tools fashioned by our human antecedents have recently been dated at 3.3 million years.¹ This new evidence pushes back tool making and by implication

the rise of human and pre-human intelligence by an additional seven hundred thousand years. It is not yet known for certain who made these tools but some evidence points to our ancestor, *Australopithecus* or a close relative to it. This line of pre-humans emerged about 4 million years ago and became extinct about 2 million years ago.

These new facts require an attempt to better understand the connection between much earlier tool making and the related rise of intelligence. Even the earliest tool making implies that the makers had already evolved a fair degree of intelligence. While some animals have been observed to use tools found at hand, such as rocks for cracking nuts and sticks for probing for ants, the manufacture of tools required a different order of intelligence because it required abstract and conceptual thinking. While *Australopithecus* had smaller brains than modern humans, they seem to have been sufficiently intelligent to fashion razor sharp tools.² It appears that intelligence is correlated not solely to brain size but to complexity as well.



*Neanderthal family, as depicted by the
Field Museum, Chicago*

Modern humans appeared over 150,000 years ago but it is clear, because of the evidence we have of much earlier tool making, that human ancestors had been evolving an incrementally increasing order of intelligence over a much longer time frame. Earlier intelligence requires us to consider the possibility that language also developed far earlier than has previously been believed, since we think with words. A persuasive case has long been made that the evolution of higher intelligence and the development of language were closely linked.³

The story of how human ancestors acquired and universally shared intelligence, along with the enablers and precursors of intelligence, namely co-operation, community, kindness and love is worth reflection. The story begins with the prolonged childhood of humans, unique among all species. Many sentient, warm-blooded creatures have only the briefest period when they receive care from adults. For some it is only a few months before they are cast loose on their own in the world, to survive or not to survive.

Our intelligence is orders of magnitude beyond that of any other species. This gradual achievement required overcoming almost impossible odds. Larger and complex brains require both increased food intake and a hugely extended childhood to allow for brain growth. Ultimately humans required twelve to fourteen years or more of care, protection and nourishment as opposed to a few months in many species.

How did this occur? Apparently it was a near run thing. Archaeologists have found that there were times when the human lineage came close to extinction. There would have been many evolutionary changes that fell by the wayside and were snuffed out. Evolution is both extravagantly prolific and cruel. Genetic changes are caused by random mutation and most changes are not beneficial and do not survive. Only a very few changes are beneficial and are passed on through the mechanism of natural selection. The slow development of higher intelligence was clearly a benefit for our ancestors but exacted an enormous cost on parents, extended family and supporting community.

The increased need for nurturing and the sometimes overwhelming demands of children, both historically and currently, have been well described.⁴ These smarter offspring were and are extremely vulnerable and there were dark sides to the story. The excessive demands were sometimes beyond the parents' ability to cope, which led at times to neglect and abandonment. It is suggested that the demands were so great that our line could only have survived with the coincidental evolution of strong human values and instincts for compassion and altruism that made the survival of defenceless children possible. Otherwise we would not be here to ponder the question.

Evidence for this exists in the fossil and cultural record. For example, it has been discovered recently that our ancient relatives, the Neanderthals, share most DNA and some genes with modern humans. They emerged about 250,000 years ago and became extinct about 40,000 years ago. In our time, Neanderthals are sometimes depicted as cartoonish cave men and the term sometimes is used derisively to describe brutishness and low intelligence. Yet we now find that Neanderthals buried their dead and may have created some of the earliest cave paintings. Even more telling, the fossil record shows that at times they cared for severely disabled children and elderly who could not have survived without support and nurturing. This is not brutish behaviour. The Neanderthals clearly had already learned about kindness.

In addition, *Australopithecus*, the suspected first toolmaker mentioned earlier, also left us the first record of upright walking or bipedalism. The well-preserved tracks from 3.6 mil-

lion years ago have been interpreted by some as showing footprints on the left side as more burdened, as though the female was carrying a child.⁵ Some claim that the need for greater care for intelligent children helped bring about bipedalism, so that the mother could hold a child in one arm while pursuing other tasks such as foraging for food. Smarter children were more helpless and could not cling to mothers as our earlier more ape-like ancestors did.

Charles Darwin wrote in 1871 that altruism posed a potentially fatal challenge to the theory of natural selection but he also wrote that "communities with sympathetic members would flourish best and produce the greatest number of offspring." He did not appear to explain the contradiction.

The following proposed four step process suggests a possible resolution. Step One: random

gene mutation produces incremental increase in intelligence, a plus for survival. Two: more demanding, vulnerable children, a negative for survival. Three: greater burden and stress on parents, a further negative. Four: evolution selects for more vigorous effort, commitment and altruism in adults, promoting survival. These four steps would have been repeated through many generations. Altruism which extends beyond close relatives may appear on first examination to be inefficient for the strict objective of survival. Perhaps this is the reason that Darwin thought it might pose a challenge to his theory.

However, altruism extended outside of family could have built co-operation and community support, which in turn came back to help the individual family survive, thus add-

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ing a net plus to the survival equation. This is illustrated when we examine societies today that continue to exist by hunting and gathering without modern technology. We observe that children are raised, fed and protected not only by their parents but by grandparents, extended family, and by the whole community, whether related or not.⁶

Some researchers have suggested that the gradual extension of human lifespan, which is far longer than most related species, was a necessary prelude to the survival of smart children because the parents could not have coped with the excessive demands without help.⁷ Grandmothers and elders were needed.

It is further proposed, based on the evidence provided by contemporary children, parents and communities, that evolution continued through our history to create stronger mechanisms to protect the young. As children increased in intelligence and the need for care, they often must have tested the capability of parents and supporters to cope. Evolution's solution to the problem of incrementally increasing intelligence was to compensate by inventing the near irrational love and all-consuming commitment that most parents and families feel towards their children. Parents, without thinking, are often ready to die for their children and sometimes do. In every community we can observe the quiet heroism of many families who at times devote their lives to caring for a child or family member in need of help.⁸ In addition, because evolution gave us such an enormous dose of this instinct, there is a spillover of benign kindness that comes from the same source and applies to other children, other adults and even to strangers that we have never met. This obviously is not true in all cases,⁹ but it is sufficient to have made us the most successful and widespread species by far.

Because there was such overwhelming need for care to enable survival, nature in the long run was profligate, as it often is, and we were given an oversupply of parental caring. So much so that it overflows in most humans. This is possibly the reason behind the common occurrence of extreme anxiety among some new

parents, which can be manifested, for example, by the urge to check a new baby constantly. This is normally charming but in some cases the instinct can be so strong that it can lead to dysfunction.

We have been given so much of this caring instinct that, as another example, we adopt children and treat them no differently than our own. In fact, adoptive parents regularly report that they feel no distinction between adopted children and natural born children.

We, collectively through our governments and charities, send massive amounts of assistance to people that we have never met nor ever will meet. Our instincts for caring extend beyond humans to other species. It is common experience that pets, for example, are often treated in a way that seems very close to parental love.¹⁰

The effusion of love and kindness that is part of the human parenting gene also underlies and permeates the sense of community, co-operation and conscience that developed simultaneously and symbiotically. Together with our intelligence, for which these qualities were a necessary precursor, these are the values that made us human. When we fail to apply them, both individually and as a society, we also fail to uphold our shared humanity. Critics may legitimately say that not all people treat children and others with kindness and share these values. However, those who do not do so are considered to be aberrant in some way and they are vastly in the minority.

In total then we have five new qualities that developed co-dependently: intelligence, co-operation, community, kindness and love, in sum, human values. These are not small achievements. As far as we know and probably ever will know, these are unique anywhere in the universe.

These universal values, imposed by evolution working through natural selection and the need to care for vulnerable children, gave us our common humanity. They were impressed on our ancestors gradually and increasingly as a condition of survival for many thousands and even millions of years. It can be argued that these values must have found their way into the

more benign aspects of various religions, when religions appeared only a few thousand years ago, literally yesterday on the evolutionary timescale. This argument could be summarized as: “God did not create children so much as children created God,” or at least the benign values that are, by some, attributed to God. The bible does say in one of its oldest books, “a little child shall lead them”.

Life on earth as we know it is the product of evolution, using elements that could only have been forged in explosions of ancient massive stars. We are some of the leftover debris and dust from those stars. As far as we know, the rest of the universe is mindless, hostile, swirling matter and energy. Some may reference these facts to support the argument that there is no meaning. However, evolution and uncountable generations of children have bequeathed to us both intelligence and in addition, the human values that permitted children’s intelligence, our intelligence, to survive and grow. Possessed as we are with human values and intelligence, it is within our power to lead our lives in such a way as to give life meaning, to create meaning. And in the process, perhaps, give some continuing meaning to the universe. We have a lot riding on us. •

References

1. Thompson, Helen. 2015. “The Oldest Stone Tools Yet Discovered Are Unearthed in Kenya.” Smithsonian.com.
2. Those who have attempted to make stone tools have learned that it requires knowledge of the various types of stone, as well as skill, practice and skinned knuckles. It is not simple and must have required perseverance, intelligence and presumably, the capacity to teach others.
3. Langer, Susanne. 1942. *Philosophy in a New Key: A Study in the Symbolism of Reason, Rite, and Art*. Cambridge. Harvard University Press.
4. Hrdy, Sarah. 2009. *Mothers and Others: The Evolutionary Origins of Mutual Understanding*. Cambridge. Harvard University Press.
5. “Laetoli Footprints.” Evolution Library, WGBH Educational Foundation. [2001]

6. Most of these so called primitive societies provide, in effect, daycare for all children. Even though vastly more affluent, most modern societies do not provide the same level of support. Hence perhaps the continuing incidence of neglected and abandoned children.

7. Kristen Hawkes, “Grandmothers and the Evolution of Human Longevity.” *American Journal of Human Biology*, Vol. 15, No. 3 [2003].

8. This type of activity has appeared in the fossil record for a quarter million years. See Neanderthal reference earlier.

9. In history there have been movements which, by preaching hatred towards other groups, have been successful in subverting innate human instincts for varying periods of time, some shorter, some longer. Examples: fascism, 23 years, soviet communism, 70 years, inquisition, 600 years. However more benign basic human values have always seemed to reassert themselves eventually. Currently there are thousands carrying out violence and oppression in the name of religion but there are many millions more who, rather than joining in, are rejecting these values and are seeking lives more in keeping with innate human values.

10. The affection felt between people and pets can put us in closer touch with our own innate kindness. Paradoxically, in this way animals can make us more human.

[Comments are invited in the interest of clarifying the issues raised, especially around the question, “If not this, what?” tom.campbell@foxcliff.ca]

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