## The Infant Ape Mind Blowing Ideas Series By Rev. Dr. Todd F. Eklof May 30, 2021

You may be familiar with F. Scott Fitzgerald's short story, *The Curious Case of Benjamin Button*, about an infant born with all the maladies of an old man but grows younger throughout his life and dies an infant in his eighties. When researching the story online, I was surprised to see that the number one question asked about it is if it's a true story? Needless to say, *The Curious Case of Benjamin Button* is not a true story. Nobody has ever been born in their old age and grown toward infancy, and least not physically. But what is true is that *Homo sapiens*, as a species, can be said to have come from apes that devolved. Unlike all other primates, humans alone, retain our juvenile characteristics throughout our entire lives. We are, as science writers John Gribbin and Jeremy Cherfas call us, "a form of infant ape."<sup>1</sup> We are the Peter Pan of apes, the *Puer aeternus*, the child who never grows up.

This is so because of a little-known process in biology known as *neoteny*, the tendency of some creatures, relatively few, that become sexually mature while retaining juvenile qualities throughout their lives. *Neo*, the root of neoteny, means "new." Neotenous animals always look "new," like they were just born. I know, just one look in the mirror tells me that at age 57 I hardly look "new" anymore, and the increasing pains I sometimes have in my shoulder, knee, and back remind me I'm no spring-chicken. Yet if you look at a photograph of Charles Darwin in his eighties and compare it to the photo of a mature chimpanzee and an infant chimpanzee, you will see that he more resembles the infant ape even at his ripe old age. Like the infant ape, his facial features are small and flat, nor have his teeth, brow, and jaw erupted outward, as they have for the mature chimpanzee. And unlike the mature ape, which has grown strong, able to toss and suspend itself from the branches of trees with its powerful arms, Darwin, like all humans, remains relatively weak compared to all other apes. This is why, as early as 1936, the Dutch anatomist, Louis Bolk described the human species as "a primate foetus that has become sexually mature."<sup>2</sup>

We are not the only neotenous animal on Earth. Axolotl (or Mexican) salamanders, for instance, remain in a larval stage their entire lives, retaining their gills and, at best, growing underdeveloped limbs and digits, yet they are perfectly capable of reproducing. Dogs are, likewise, neotenous kinds of wolves. Unlike their fully developed progenitors, however, dogs are wolves that have been bred over time to remain puppy-like even after they mature. They are generally smaller, have flatter snouts, and remain more playful than adult wolves, although they become sexually mature within just a few months of birth.

Human beings, however, are, by far, the most neotenous creatures ever. Even at birth, as biologist Stephen Jay Gould once suggested, it is clear that a human baby is "still an embryo."<sup>3</sup>

Human beings are born with the remarkable ability to continue gestating outside the womb. We are all born premature. At birth, human bones are not fully ossified (hardened) and our skulls aren't entirely closed. Our spines remain attached toward the base of our skulls, where they begin with all primates, but, otherwise, moves upward toward the top of the skull during fetal development, giving most apes a stiffer and sturdier look. Our brachiated limbs also remain relatively weak our entire lives. Brachiated (meaning "broken") shoulders are a defining characteristic of apes. (Monkeys, by contrast, have shoulders in front of their chests, more like cats, allowing them to walk atop branches.) But apes have evolved to swing from below the branches of trees to reach upward for hanging fruit. Regardless of our brachiated shoulders, however, human arms are too weak to gather food by swinging from branches. Our teeth also erupt only after we're born, and we remain mostly hairless, lack opposable toes, and, again, retain the same flat faces and oversized heads other primates are born with but eventually outgrow. We are the Benjamin Button of the Great Apes.

Gribbin and Cherfas suggest it is our lifelong youthfulness that explains why humans look so different from other apes despite having DNA that is nearly identical to theirs. "Neoteny resolves the problem," they say. "The one-and-a-bit difference could easily reside in the genes that control the rate of development, making human beings a form of infant ape that has learned to reproduce without reaching physical maturity."<sup>4</sup>

To me, this is among the most mind-blowing ideas I've ever heard. It's not quite as magical as Benjamin Button's fictional tale, but the idea that a species of ape, somewhere along the line, found it beneficial to remain premature throughout its existence still sounds like something a good science fiction writer would come up with. How on Earth could there be an advantage to remaining weaker and more vulnerable than any of our primate cousins? The answer is simple. By continuing to gestate outside the womb with skulls that are not yet fully closed, has allowed us to grow larger brains, which, despite our other physical disadvantages, has given us the greatest advantage of all—superior intelligence. The brains of chimps and gorillas, for example, are already 70 percent of their final size at birth, a milestone not reached by humans until our second year. In fact, we are born with brains only a quarter of their eventual size and that continue to develop throughout our lives.

As a result, instead of our entire species having to wait millions of years to adapt to environmental changes before we go extinct, each one of us has the ability to dramatically alter our behaviors to survive in almost any environment, which is why we inhabit the entire planet, including some of its harshest environments, and have learned to explore the deep blue sea despite not having gills, and are even encroaching into outer space.

Another advantage of being so intelligent is that our behaviors become more complex in a relatively short period of time, which allows our entire societies to advance, along with our technologies. This is why things are so different for us today than they were thousands, hundreds, and even just a couple of decades ago. Unlike most other animals that are born

with all the essential knowledge they'll ever need to survive, humans can learn nonendogenous behaviors. Birds don't have to go to school to learn how to make nests and squirrels aren't taught to bury acorns. But humans have language, stories, and schools for teaching their young things like construction and agriculture that they otherwise wouldn't know. In this way, individuals can specialize in certain areas, compared to other species in which all individuals are defined by the same specialization, the instinctive knowledge. Some of us program computers, some of us construct buildings, some of us teach philosophy, and our entire society benefits and advances because we can all do more by contributing in different ways.

All of our individual differences contribute to increasing complexity as a society, which means it's taking even longer for our young to learn all of the information they now need to thrive. This is requiring us to become even more neotenous than our ancestors were. In other words, it takes longer for our children to mature today than theirs did. In the past, our kids became adults at puberty. Today formal education has gone from being taught to read by family members, to getting at most a sixth-grade education, and later at most an eighth-grade education (which were considered quite the accomplishment back then and nothing to be ashamed of) to at least a high school diploma just a few decades ago, to, today, trade certification or a college degree and, increasingly, post graduate degrees and continuing professional development and certification. As our society becomes more complex, the longer it takes us to learn all we that must and, thus, the longer we are extending childhood and youth.

In his book, Stages of Life, psychologist Clifford Anderson writes that, "For most of history, the average person's life cycle reflected a pattern of psychological growth in childhood followed by a permanent commitment—that is, to marriage, childrearing, and work—in the early teenage years."<sup>5</sup> But in recent years he points out that instead of just two stages of maturation, childhood and adulthood, we have been adding new stages. This is why, in 1904, developmental psychologist G. Stanley Hall described the "emergence into the general population of a new type of teenager, documenting for the first time a new stage in the human life cycle."<sup>6</sup> Hall, who was the first president of the American Psychological Association, suggested that after the Civil War children who worked alongside their parents in fields and factories began to disappear, due largely to advances in industrial technology and productivity, allowing millions of teenagers, once considered adults, to remain outside the labor force, leading to a new stage of development called *adolescence*. Anderson says that today this new transitional stage between childhood and adulthood is taken for granted. "Hall's concept of adolescence is unshakably enshrined in our view of human life," he says. "A stage of life that barely existed a century ago is now universally accepted as an inherent part of the human condition."7

Since then, MIT's esteemed professor of Human Development, Kenneth Keniston, added yet another stage by referring to those who transcend adolescence as "youth," who only emerged

on the scene in the tumultuous 1960s. "If neither 'adolescence' nor 'early childhood' quite describes the young men and women who so disturb American society today, what can we call them?" Keniston asks. "My answer is to propose that we are witnessing today the emergence on a mass scale of a previously unrecognized stage of life, a stage that intervenes between adolescence and adulthood."<sup>8</sup> So, over time, as our society has become more complex, our neotenous species increasingly extends the process of maturation to coincide with the amount of nonendogenous (nongenetic) information we require to thrive. We went from just childhood to adulthood, to adding an adolescent stage, then a youth stage.

The significance of bigger brains to exchange nonendogenous information should not be overlooked. As I said, other species are born with most the information they need to survive contained inside their genes. Humans exchange information nongenetically through the sharing of ideas. In this way, our species has liberated information itself from biology, which had greatly restricted it. Instead of being confined to genes, information can now be exchanged through memes, through the sharing of knowledge and thoughts.

If you stop to think about it, this is a profound development! The disorganized information contained in stardust combined and organized to form elements, then chemicals, then RND and DNA, then simple cells, then complex cells, then complex multicellular life forms, to, most recently, humans who represent a bifurcation point in which information is becoming liberated from biology. In the form of thought, information has entered what we might consider a spiritual dimension, or, at the very least, an energetic dimension which is about to organize further and exponentially evolve in ways we can't yet imagine. Homo sapiens is extraordinarily special in this regard. No other species on Earth has accomplish such a feat, not, to our knowledge, has any other being in the Universe.

All of this is because neoteny has allowed us go grow bigger brains. In a 2017 *Scientific America* article, anthropologist John Hawks says, "Humans are known for sporting big brains. On average, the size of primates' brains is nearly double what is expected for mammals of the same body size. Across nearly seven million years, the human brain has tripled in size, with most of this growth occurring in the past two million years."<sup>9</sup> The speed with which this growth occurred is one of evolution's unexplained mysteries. But something just as astonishing, if not alarming, is that during the past 10,000 to 20,000 years the human brain has been shrinking at a rate far faster than it ever grew.

According to Hawks' research, based on measuring the volume of human skulls over time, people everywhere on Earth have smaller brains today than we did prior to the emergence of agriculture about 12,000 years ago. Hawks says, "This decrease of approximately 240 ml in 10,000 years is nearly 36 times the rate of *increase* during the previous 800,000 years."<sup>10</sup> Nobody knows for certain how to explain this shrinkage, or if it means our species is getting dumber. Some suggest it's because the brain requires so much energy that evolution has made it more efficient over time and we can now do more with less. The inventions of

computers and rockets and other amazing technologies, things our larger-brained ancestors didn't think of, might indicate we have little to worry about. But, Hawks says, "If our brain keeps dwindling at that rate over the next 20,000 years, it will start to approach the size of that found in Homo erectus, a relative that lived half a million years ago and had a brain volume of only 1,100 [cubic centimeters]."<sup>11</sup> That's down from 1,350 cc's today, and from 1,500 cc's 10,000 years ago. To date, we've lost brain volume amounting to about the size of a tennis ball, and, despite our many modern accomplishments, some experts are worried about what this means.

"You may not want to hear this," says cognitive scientist David Geary of the University of Missouri, "but I think the best explanation for the decline in our brain size is the idiocracy theory."<sup>12</sup> Geary is referring to the comedy about a postapocalyptic society run by complete idiots. The idiocracy is mounting, Geary and other scientists hypothesize, because of the increase in human population density after the emergence of agrarian societies. With more people specializing in certain areas, within larger communities, none of us knows everything we need to know to survive. "When population numbers were low, as was the case for most of our evolution, the cranium kept getting bigger," Geary says. "But as population went from sparse to dense in a given area, cranial size declined, highlighted by a sudden 3 to 4 percent drop in [brain volume to body mass (EQ)] starting around 15,000 to 10,000 years ago."<sup>13</sup> As a *Discover Magazine* article put it, "As complex societies emerged, the brain became smaller because people did not have to be as smart to stay alive... individuals who would not have been able to survive by their wits alone could scrape by with the help of others—supported, as it were, by the first social safety nets."<sup>14</sup>

If our brain atrophy is due to population density in which we don't have to think for ourselves as much, it would explain a lot about the world we live in today which, I believe, can fairly be described as an idiocracy. [Incidentally, this would also explain why the number one online question about Benjamin Button is if it's a true story.] And this point, really, is why I have gone to such great lengths to discuss the extraordinary evolutionary history of our human brains. We have come so far, through an amazing and rare evolutionary anomaly called neoteny, to become the first and only species we know of to liberate information from its extremely tight genetic confines, and we are on the cutting edge of establishing nonbiological super intelligence. Yet, at once, our brain size is plummeting in an unprecedented freefall as fewer and fewer people in our crowded societies are becoming incapable of thinking for themselves, and all of us, as citizens of countries and members of organizations, are increasingly discouraged from doing so. Groupthink isn't thinking. It is intellectual atrophy, the shrinking of our minds.

This is why, as societies, we must foster a new Renaissance in which we rediscover and reembrace Immanuel Kant's enlightenment motto, *"Sapere Aude!* [dare to know] Have courage to use your own understanding!"<sup>15</sup> As societies and organizations, we must embrace individual freedom, individual expression, and free speech, so that all of us learn and feel

encouraged to think for ourselves so that we don't go mindlessly along with the crowd like brutish apes. Advertisements for the United Negro College Fund use to say, "A mind is a terrible thing to waste." I think that goes for all of us. The human brain is an evolutionary marvel. I hope we remain worthy of it by using it wisely and courageously and freely.

<sup>3</sup> Gould, Stephen Jay, Ever Since Darwin: Reflections in Natural History, from the chapter *Human Babies as Embryos*, Penguin, 1977.

<sup>5</sup> Ibid.

<sup>7</sup> Ibid., p. 122.

<sup>9</sup> https://www.scientificamerican.com/article/how-has-human-brain-evolved/

- <sup>11</sup> https://www.discovermagazine.com/the-sciences/if-modern-humans-are-so-smart-why-are-our-brains-shrinking
- <sup>12</sup> Ibid.
- <sup>13</sup> Ibid.

<sup>&</sup>lt;sup>1</sup> Gribbin, John, & Cherfas, Jeremy, *The First Chimpanzee*, 2001, Barnes & Noble, Inc., 2003, US p. 177.

<sup>&</sup>lt;sup>2</sup> Ibid. p. 178.

<sup>&</sup>lt;sup>4</sup> Gribbin & Cherfas, ibid., p. 177.

<sup>&</sup>lt;sup>6</sup> Ibid., p. 121f. [From, Adolescence: Its Psychology and Its Relations to Physiology, Anthropology, Sociology, Sex, Crime, Religion, and Education, Hall, 1904]

<sup>&</sup>lt;sup>8</sup> Ibid., p. 123.

<sup>&</sup>lt;sup>10</sup> http://johnhawks.net/research/hawks-2011-brain-size-selection-holocene

<sup>&</sup>lt;sup>14</sup> Ibid.

<sup>&</sup>lt;sup>15</sup> Kant, Immanuel, *An Answer to the Question: What it Enlightenment?* Konigsberg, Prussia, September 30, 1784.