

# “How did we become humans?”

What do you mean, “become humans?” You have always been a human. Everybody you know has always been a human. Of course, we're talking about evolution – how earlier species evolved into the human species.

But this leads to another question: “Why does it really matter?” After all, this happened a looong time ago (we're talking millions of years). Now that we're here, what does it matter how we became what we are?

It matters because it helps determine how we look at human society. That means, how we look at what people do in their everyday life. And if we can get a clear understanding of that, we can change it too. But to understand it, we have to look at how we got there, starting with how we – the human species – became what we are.

## Religion vs. Science

It starts with the issue of evolution. And let's not forget that a third of the people in the US don't even believe in evolution.<sup>1</sup> What does this mean? In the US today, almost all people who reject evolution base their ideas on the Bible. This means that they simply accept that “god” has ordered things in a certain way; that's how it always was and always will be. It means that they refuse to see that there are certain laws of nature. And that the number one law is that nothing stays the same; everything is changing – sometimes slowly and sometimes quickly, but change it does. That's what we mean by a “law” - not like the laws like what congress passes, but simply general principles, general ways, in which nature operates. For instance, at sea level, when water is heated to over 212 degrees Fahrenheit it “boils”, meaning it turns into vapor. That is a simple law of nature, but a lot of other laws are much more complex.

The human species is not separate and apart from nature. The same laws that determined how we evolved – that is, how we changed over

millions of years - determined how our societies evolved and developed. And, as we say, once we understand those laws we can use them to our advantage.

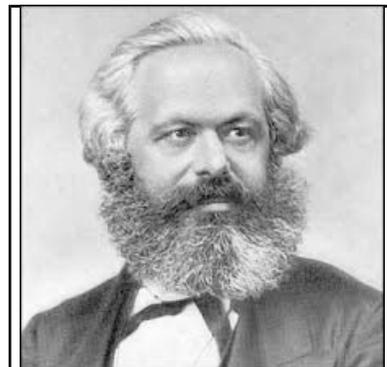
## What is Evolution?

So, first, what is *evolution* and how does it work?

Think of any animal in the wild. Take a cheetah, for instance. It lives by hunting other animals like antelope, and over a short distance it is the fastest mammal on the planet. Antelope can run fast, but cheetahs run faster (over a short distance). Suppose a cheetah was born that could run at that same fast speed, but over a little longer distance. What would that mean?

It would mean that that cheetah would be able to catch more game, meaning it could live longer. That would mean it would be able to have more babies over time, and some of those babies would inherit that cheetah's ability to run fast over a longer distance. Over many generations, there would therefore be more and more cheetahs with that characteristic. This is called *survival of the fittest*.

Over many millions of years, it's not just that one species, like cheetah's, changed a little; entirely new species evolved. It's that same



*“Philosophers before me have only tried to understand the world. The point, however, is to change it.”* So spoke Karl Marx, the great revolutionary philosopher of the 19<sup>th</sup> century. He was involved in the movement of working class people to fight for a better life and for socialism, and he believed that understanding the world and struggling to change it – to make it a better place for all – were connected together.

principle, that same law of nature, that determined how we human beings evolved as a species. But there's something else also: We aren't biologically that different from some of the other "primates". The DNA is the main protein "building block" of all animals. It determines what we are as a species. Human DNA is less than 2% different from some other primates like chimpanzees and bonobos. This shows that we evolved from a common ancestor in the way we describe (survival of the fittest). And when we look at a human and a chimp, really in the greater scheme of things, we aren't all that different – our bodies are pretty similar compared to other animals – giraffes, dogs, whales, etc.

### **What makes us different from all other animals?**

But when we look at what we do – our behavior – we can see a huge difference, one that sets us apart from all other animals. Of course, today, with most people living in cities, the difference is so huge that we can't even compare ourselves to them. But for the great majority of human history, people lived in "the wild", whether that was jungles or plains, whether it was in mountains or on a coast. But they still were very different from other animals. What is the main difference between the human species and all others?

All animals change their environment, meaning their surroundings. Goats, for instance, eat plants to the point that they can chew it all down to the ground, which prevents new plants from growing. If heavy rains follow, then there won't be plants to hold the soil in place and a lot of soil will be washed away ("erosion"). There can even be landslides. People, too sometimes do the same thing - cut down all the trees in a forest. The difference is that the goats are completely unconscious of what they are doing; they are not able to see into the future and see the long term results of their actions. But people can. Why they cut down all the trees on a hillside and create landslides and all sorts of other problems is another question. But at least they are capable of seeing and planning into the future.

How did that planning and understanding develop? The answer to that is important for understanding how human society developed – what are the laws of human social history (the development of human society) – in the first place. In other words, if a scientist wants to understand more about how an animal behaves in the wild, or what makes a plant grow or die, or what makes the weather, she or he has to start by having some idea about *how* to go about studying the subject, what is important and what not so important; where to look first. It's the same with understanding our history.

So, back to the main question: *How did our understanding and ability to see into the future develop in the first place?*

### **"Idealism" vs. "Materialism"**

There are two ways of trying to answer that question: One way is to see the ancestors to the human species as having been smarter than other animals. And the smartest of these ancestors survived the best and over time evolved into human beings. Out of their intelligence came language and culture. (By "culture" we mean the behaviors that are passed down from one generation to the next – not only art and music, but making a living, how we act with each other, etc.) In other words, thinking and ideas created the human species.

This way of looking at history is called "*idealism*". There are different ways of using that term, but here we mean simply that ideas came first and those ideas shaped our culture and general behavior. But there is another way of looking at human history – what is called "*materialism*". Nowadays, when most people use that word, they mean living only for material possessions – a new car, fancy clothes, etc. But materialism also means something different; it means looking at *material conditions* – what physically exists in the real world around us – as the main thing that shapes our behavior and culture and how that changes over time, meaning our history. It also means that if we want to understand the thinking of people, we have to look at the world around them to see what helped

shape that thinking.

First of all of all those material conditions is our “*means of production*”. What do we mean by that? We mean what we use to create what we need (or think we need) to live. Do we use a simple stick to dig up roots, or do we use machines and computers? Or something in between?

### “Means of Production”

This was one of the main points of Karl Marx and his co-thinker Frederick Engels back some 150 years ago. Marx and Engels lived in the period when machines were first becoming the main way that people produced what they needed. And arising from the rise of machinery, all of their society where they lived was changing. Because so much was changing around them, this helped and made possible their rethinking how we viewed human history in general. And they were the ones who first most clearly explained that it was the level of development of the means of production (how far those means of production had developed) that was the starting point for the development of human society. (Some people interpret this in a simplistic way to ignore everything else – the form of government, the culture, etc. That was never the point of view of Marx and Engels.)

And what was the first means of production and how did it arise?

### “Bipedalism”

Well, think about one main difference, physically, between the human species and every other mammal: We are the only ones that use walking on two legs as the main way of moving. (This is called “bipedal”. “Bi” refers to two, and “pedal” refers to feet.) Other animals – gorillas, monkeys and chimps, and even dogs – can walk on two legs. But we are the only ones who use it as the main way of moving. We are the only bipedal mammal.

How did our biological ancestors arrive at bipedal movement? Nobody knows for sure, but there are different ideas. And remember, that for

our ancient (millions of years ago) ancestors, there had to have been some advantage to bipedalism. Some scientists think that a change in the climate forced some of our ancestors to come down from the trees and live on the savannahs – vast grasslands in parts of Africa. The advantage of bipedalism may have been that these ancestors could see above the tall grass to see both danger (animals that might eat them) as well as prey (animals that they might hunt and kill.) There is another theory – held by a minority of scientists – that our ancient ancestors evolved from an ape that lived mainly in the water. At some time, when the waters receded, these water apes were forced to live on land. But their bodies – their skeletons and muscles - had already adapted to living in the water – mainly swimming – and this sort of skeleton and bone structure was better suited for walking on two legs than on four.

Whatever the reason, all serious scientists agree that bipedalism is what developed first. The way they know that is by looking at the earliest fossils of our human ancestors. Consider some of our ancient ancestors, starting with the earliest “homonids”, probably the *Sahelanthropus tchadensis*, whose skull was discovered by a team of scientists and their helpers in 2001 and 2002 in Chad, central Africa. *Sahelanthropus* lived some 6 to 7 million years ago. They can tell by what is called “carbon dating” of the skull. But they can also tell a lot of other things from just that skull alone. Although some scientists don't agree, most scientists think that *Sahelanthropus* walked upright. They think this from where the spinal column exits the skull – underneath it (like us) instead of towards the back. What many scientists aren't sure about is whether *Sahelanthropus* was one of the earliest species that started the evolutionary tree towards the human species (as opposed to chimpanzees) or whether it was one

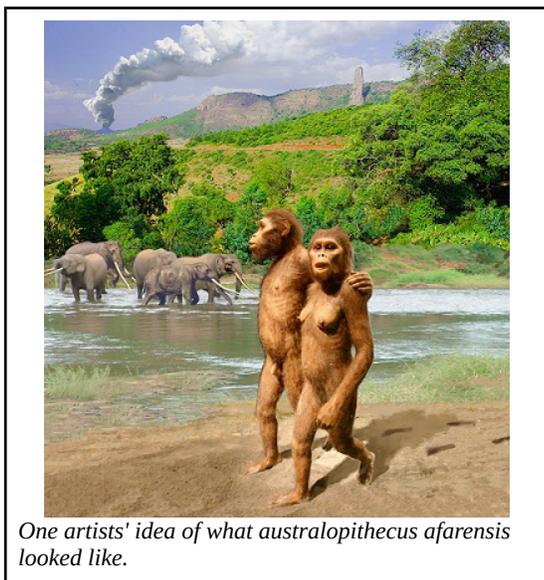
#### What does a million years mean?

When we talk about a million years, that can seem like just a number; it's hard to get a real sense of how much time that is. So think about this: Up until around the industrial revolution the average life expectancy was around only 25 years. That means in a million years, some 40,000 generations would have passed!

of the last common links between chimps and humans.

But another fossil of a species that lived some 4 million years ago, it is agreed, was an early homonid. That was australopithecus, of which there were several types (*Australopithecus afarensis*, *A. africanus*, *A. anamensis*, *A. bahrelghazali*, *A. garhi* and *A. sediba*). They lived throughout Africa, and these were some of the earliest definite homonids; their ancestral line had already diverged from – moved away from – the line that later became the chimpanzee. Australopithecus's direct descendants became our species – the human species or homo sapien. And we know from their bone structure that Australopithecus definitely did walk upright.

There is another important fact about the australopithecines: They had small brains, which we know from their skull size. This means that their intelligence was closer to that of an ape than that of a human. ***This is key to understanding all of human history.***



What were the steps in which australopithecines evolved into homo sapien – the human being?

Australopithecus evolved into different “genus's”, most important the “homo” genus – the earliest of which was homo habilis, some 2.3 million years ago. *That is the first species for which there is definite evidence that they made and used stone tools.* But they still had a relatively small brain size, meaning they weren't all that intelligent.

A real increase in intelligence came later, with the “genus” that evolved from h. habilis – homo erectus, whose brain size was about double that of h. habilis.

Remember the explanation of idealism vs. materialism? The fact that our earliest ancestors walked upright – and later skeletal remains show also developed the modern hand (which we'll talk about more later) – shows that *it was changes in how we related to the world around us that created the change in our mental abilities.* As Karl Marx's co-thinker, Frederick Engels, put it: “*tools created humans*”.

Think about it: When our earliest ancestors started walking upright, this freed up their other limbs and those things at the end of their limbs – their hands. Look at the chimp and human hands. What stands out? Of course. It's the difference in the thumb. The chimps' hand is adapted to mainly either walking on all fours or swinging from trees. It works great for that. But look at the thumb. What's it not so good for? Gripping and manipulating things. Yes, it can grip and manipulate things, but nowhere nearly as well as the human hand. And it's not just a matter of having a strong grip; it's also a matter of being able to manipulate things – like using a rock to chip away at another rock, for example.

So, take a look at your hand. That is really the earliest *means of production* of the human species.

### **Tool Making**

Several different animals make primitive tools. Chimps, for instance, in some areas will take a stick, strip it of its leaves and shove it into a termite nest to allow the termites to crawl up the stick so that the chimps can eat them. This is a primitive kind of tool.

But our earliest ancestors did two things that were completely different: First, they used tools to *make* tools. They learned to take a kind of rock and chip away at another rock to sharpen an edge. They then used this sharpened rock to cut meat, etc.

Don't forget, the evolution of the hand took place over hundreds of thousands of years through the process of “natural selection” or survival of the fittest as we explained. And the

fossil record shows something else: It was bipedalism and the hand and *opposable thumb* (the human thumb vs. that like a chimp or another ape) that developed first and greater intelligence later. Scientists can tell this because the larger skulls – meaning larger brains – developed after bipedalism and the human hand developed. (Incidentally, Frederick Engels figure this out back in 1876, which was way before scientists had discovered the fossils that proved he was right. And for almost a hundred years after him, most scientists thought just the opposite – they thought that the brain and intelligence had developed first. In other words, despite the fact that they were scientists, they had something of an idealist view of the world. It was only after the discovery of these fossils that Engels' idea was proven right.)

And another thing: They transported their tool making rock to another site to make the sharpened rock. But what also seems likely is that if they carried their tool-making rocks over distances, then they also carried their food over distances – back to their cave or wherever they lived. And this would have been made necessary by other evolutionary changes. Our walking upright made necessary certain changes in our skeleton, including narrower hips. This meant a narrower birth passage for our babies. The narrower birth passage and the larger skull made it necessary that our babies would be smaller and less mature when they were born. This meant a longer period of time when they would have to be cared for completely by the adults – mainly the mother.

### **Food Sharing**

All of these changes led to something else unique among mammals: Real, true food sharing, where food is brought back to the home site (a cave or a nest or den). Other animals feed together. Especially pack animals like wolves or lions, who hunt and kill together, also feed together. But it's not real food sharing. Just the opposite; they compete with each other for who will get the most meat. (In the case of wolves and some other animals, they do bring the food back to their young, but inside their stomach. The regurgitate – throw up – the food for their young

to eat. That's not the same as bringing the food back “home” for all to share.)

### **Food Sharing Today**

It seems that sharing food – that is, eating together - is important for the development of the human species. And it seems to be important still today. One study of the children of alcoholic parents found that the children who were least likely to become alcoholics themselves were those who grew up in families where, despite the fact that the parents drank too much, they still ate together as a family at meal time.

Yet think about many families today. Instead of really eating *together*, they may be in the same room, or even around the same table, but they're watching TV or playing on their “smart” phone.

Eating together is important.

But that evolution – into a large-brained, tool-making, food-sharing mammal with complex speech and thoughts (homo sapien, or human beings like you and me) took millions of years more and there were many steps in between. Before that, over one million years ago, homo erectus evolved and they spread out throughout all of Africa and into what is now Asia and Europe between 1.3 and 1.8 million years ago. In those different continents, h. erectus evolved into different species. In Europe, for instance, homo neanderthalus, or neanderthals, evolved. We'll return to them later.

### **Human Intelligence**

It was pretty recent – just some 250,000 years ago, a blink of an eye compared to how long his and her ancestors were around – a revolutionary new species evolved. They not only were bipedal and had the human hand, they not only further developed tool making; they had an unusually large brain. This was *homo sapien* – or human beings. People more or less like you and me.

Why did this larger brain – and more brain power – develop?

Well, think about it: Over a few million years, the ancestors of this unique species – the only mammal that walked upright and had this amazing tool, the hand – had developed tools.

Why? Because they could! Their physical ability to make tools meant that it was useful to plan further into the future – as in making a tool to make another tool, for example. More brain power served a very useful purpose; it allowed them to use their hands even more.

### **Speech and Ideas**

But then there came another step: The making and use of tools, the caring for their young over a longer period of time, the fact that they really shared food – all this meant not only planning, but sharing their plans. Communication, in other words. And that's something else that is unique to homo sapiens – the human species.

All animals communicate in some way or another. Birds have different kinds of calls that indicate danger, or that they're looking for a mate, etc. Mammals have even more complex ways of communicating with sounds. But only humans can communicate complex and *abstract ideas*. What do we mean by abstract ideas?

A chimpanzee (probably the most intelligent of all animals after human beings) can show its young that if you put a stick into a termite nest, the termites will crawl up the stick and the chimp can grab them and eat them. He or she can *show* this. But only the human species can *explain* the general process, like we just did in writing. This is related to another huge difference: All other animals use uttered communication (that is, sounds they make) to communicate something in the here and now – “food is here,” “danger”, etc. *Only the human species, though, uses these sounds to communicate something about the past or the future.*

There have been some studies that show that chimps seem to be able to learn language as in sign language. (They could never speak like we do because their larynx – the “voice box” – throat, mouth and tongue are made so differently.) But the evidence is that this “learning” sign language might be just a learned response to a stimulus. And there is also another huge difference: Human babies learn speech from the adults, but chimp mothers who have “learned” sign language don't teach it to their

young. In other words, it doesn't become part of their culture.

And what is the importance of speech?

Think about when you try to explain something to somebody. The very act of explaining it makes you understand it better. And that is what speech does. By developing words to generalize, or abstract, we actually develop this very ability.

This, by the way, gets us back to that point about idealism vs. materialism. Remember what we said about that – that idealism sees thinking first and materialism sees the material conditions as shaping the ideas? Well, we must not see this in a simplistic way. It doesn't mean that ideas don't matter. If that is what materialists (like the writer of this booklet) thought, then there would be no point in writing anything! Take the idea that the world is round, not flat, and that it revolves around the Sun, not the other way round. We'll get to more about that idea later, but consider the importance of that idea. Once it became generally accepted, that enabled some huge changes in the world. Those who had the technology (and we'll also get to why that technology developed where it did) were able to use the idea about the shape of the Earth to travel round the world, destroying entire societies, and conquering one continent after another.

So ideas matter; once they are seized upon by masses of people and put into practice, then they become a material force. But the whole point is that speech is essential – it is completely necessary – for the rise and the spreading of ideas.

So, back to the question: How did speech arise? What was the process?

This isn't like the question of which came first, bipedalism and the hand or human intelligence. That question can be clearly answered by studying those ancient fossils. As far as how speech developed, all we can do is guess, and different scientists have different theories on this. The theory that seems most likely to this writer is one held by anthropologists like Ashley Montagu. He connects human speech with our ancestors' tool-making abilities. The fact that our ancestors made tools to make other tools means that they were thinking and planning into the

future. And the use of these tools as well as the fact of food sharing meant also planning as well as group cooperation. More complex tools also meant something else: More complex ways of using those tools. As Engels said, humans developed speech because “we had something to say.” Or, we had some more complex ideas, including thinking into the future, to communicate, and it was necessary to communicate in order to accomplish what we (or our ancestors) were planning on accomplishing.

Look at it another way: Our ancient ancestors made tools to make tools to change the world around them. It was a step, or even two steps, removed from directly changing their world. And what are words? They express an experience – or an idea or feeling that comes from experience – but they are a step or two steps removed from direct experience. Not only that, but just as they are used to express an experience – or more likely a series of experiences (remember *abstract generalization?*); and then those same words are used to *change the world around us*. They can be used to organize a group to hunt an animal, for example. Or they can be used, today, to get a whole group of people to do organize to do something. (But let's not get carried away; people only respond to these words – meaning feelings and ideas – based on their own experiences in life.)

Of course, we cannot know for sure when human speech first developed, but some scientists think that the earliest evidence of human speech is some 75,000 years old. If they are right, this means that homo sapiens had been around already for 175,000 years before real speech developed. The reason they think real speech developed around then is that the earliest evidence of “art” that they have is around that old – some sort of scratchings of abstract things which were found in Africa that are about 75,000 years old. So some scientists think that this earliest evidence of abstract thinking is connected to the rise of complex human speech.<sup>ii</sup>

### **Some Conclusions**

We have focused here on how the human species evolved.

Today, the world is rapidly changing, but

evolutionary change was extremely slow – we're talking millions of years. To give some idea of what that means, think about this: Up until a couple of hundred years ago, average human life expectancy was around 25 years. That means that 40,000 generations would have passed in one million years! As for homo sapiens – who are only 250,000 years old (just a baby) – it means there would have been some 10,000 generations.

There were huge and relatively rapid changes in the world at times – due to a huge volcano changing weather patterns suddenly, or something like that. But evolution of the human species – or any other species – is a very slow affair. That's because evolutionary change is kind of a hit-or-miss affair. It isn't consciously thought out and planned.

Once our species evolved, even then social change – how they “made a living” and lived and worked together – changed slowly compared to today, although it was a lot more rapid. It took a mere few tens of thousands of years for people to develop language, for instance. And to get from there to the huge changes that led to growing crops and raising animals was quicker still.

i <http://www.pewforum.org/2013/12/30/publics-views-on-human-evolution/>

ii <http://www.colorado.edu/news/releases/2011/04/20/evolution-human-super-brain-tied-development-bipedalism-tool-making>