6.2

EARLY EVIDENCE OF COLLECTIVE LEARNING

0:12–1:00

EVOLUTION IS ABOUT DIFFERENCES

Evolution is about differences. In evolution, only differences matter. Now, what are the ways in which we humans differ from our near primate relatives is in the degree of our behavioral variability. Everything we humans do we do in more than one distinct kind of way.

Now, what enables that collective learning — or collaborative learning if you want to think of it that way — is that we can share information with one another. We can speak to one another and transmit information between individuals and across generations. Speech, spoken language underlies that ability. And so the origins of language, the origins of spoken language are major research questions for human origins research. This engages the attention of archaeologists, physical anthropologists and geneticists.

1:00–1:38

LOOKING FOR EVIDENCE

Now we archaeologists look for evidence of language in variation in the forms and the techniques used to make stone tools. The first point in the archaeological record where we see the kind of pattern variation among stone tools, similar to that in which we see in spoken languages nowadays is about 250,000 years ago. Prior to that, stone tools looked more or less the same from one end of Africa to the other and across continental scales. After about 250,000 years ago, stone tools made in South Africa begin to look different from those in East Africa. And those in East Africa are different from the stone tools in Europe, and in Asia, and so on.

1:38–2:35

SHARING INFORMATION

This suggests there's information being shared about stone tool designs and this information is differing from region to region. Now, around 200,000 years ago, more or less the same time on an evolutionary scale, we see changes in the human skull. Human skulls begin to look like ours, which have a flexed bottom and a flexed bottom of the skull enables people who have that characteristic to speak, like I'm doing now. To break sound up into very short bits, and to communicate effectively. That's an important change. We know this from physical anthropology because without a flexed bottom of your skull, it's very difficult to produce speech, but with a flexed bottom of your skull it's very easy to choke. So that had to be a really important characteristic. Speech had to be an important characteristic for humans to survive with that quality. That tells us that before that property emerged, there was some precursor to spoken language.

Something that actually doesn't exist any longer because all humans can speak who have this quality.

2:35–3:32

GENETIC EVIDENCE

Further insights into the origins of this ability to share information from one individual to the other come from genetics. We humans control the fine motion of our tongue and throat due to a gene called FOXP2. This FOXP2 gene is present in humans, it's also present in Neanderthals, an extinct relative of ours. This suggests that FOXP2 gene was present in the last common ancestor of humans and Neanderthals, who we think lived about 300,000 years ago.

So prior to the appearance of stone tool evidence for speech or morphological evidence from the fossils for speech. Thus, together archaeologists, paleontologists, and geneticists work together to understand the origins of a very distinct quality of human behavior — our degree of behavior variability.