



Creating the Nation's first BioPark

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Letter from the Desk of David Challinor  
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In the first act of King Lear (scene IV), the Earl of Kent says to Oswald, Lear's steward, "I'll teach you differences." It is the fascination with differences in behavior or form of organisms that attracts young biologists to their discipline. The philosopher Wittgenstein wrote, "my interest is in showing that things which look the same are really different," and he goes on to explain how difficult it is to understand what you are looking at. This is exactly what the ethologist attempts to do. By observing a subject keenly and intently, he/she seeks to perceive or explain its behavior on the basis of differences noted from previously analyzed behaviors.

People who have kept flocks of pigeons or chickens, packs of hounds, or stables of horses realize that individuals soon become easily identifiable. The more time that is spent with individuals, the clearer their differences become. For example, after three years working on a plot of 1,000 trees almost daily, I was able to recognize most of them. Having experienced the euphoria of realizing that I could identify the differences between trees which I observed daily, I would like to describe, as an example, what scientists have distinguished in behavioral variation among chimpanzee populations.

Dedicated scientists such as Jane Goodall and her colleagues have concentrated on one population of these apes for many years. From past genetic research, we have learned that chimpanzees share 98% of our genetic material, and thus from an evolutionary perspective, may be more closely related to us (Homo sapiens) than we had previously believed. Because of this close genetic affinity, it is not surprising that, like us, chimpanzees are tool users, omnivores (eat almost anything: fruit, meat, insects, etc.), homicidal, polyandrous and polygamous.

The well-known work in Tanzania of Jane Goodall at the Gombe National Park and Toshisada Nishida in the Mahale Mountains reaffirmed earlier observations of chimpanzee tool use by Beatty in Liberia (1951). When chimpanzee researchers assembled recently in Chicago to discuss their research, they established once again that these primate populations are as diverse as human ones in their behavior and methods of communication.



1889-1989

"...for the advancement of science and  
the education and recreation of the people."

The explosion of knowledge about chimpanzee behavior has occurred not only because more scientists are studying it, but also because of the development of high quality portable video cameras. Just as astronomers shifted from photographic plates which "remembered" what they were observing to digital imagery for clearer dynamic recording of events, so have anthropologists and behaviorists made increasing use of video tapes to record actions that the scientist, despite intense scrutiny, might have missed.

Once behavior has been permanently recorded, primatologists can develop standard criteria to evaluate chimpanzee behavior and thus compare differences in tool use, for example, between populations. In fact tool use has been observed in over 30 populations of wild chimpanzees. Generally West African groups use tools more than East African ones, with troops in the Kibale forest of Uganda evidently not using any tools at all. There is no clear explanation for such variation, but one suggestion is that the food eaten by the chimpanzees in Kibale is so easy to acquire that there is no need to develop tool use.

Other differences between populations were noted in female bonding and in sexual behavior between the two species of chimpanzees (Pan troglodytes and P. paniscus, the pygmy chimpanzee), but the reasons are obscure. The causes of behavioral differences could be 1) environmental, as in the lack of tool use by Kibale forest chimpanzees; 2) cultural, as when behaviors are learned from adults by infants, thus perpetuating chance successful actions of an individual; or 3) genetic, and thus inherited. Although recent research indicates that chimpanzees may be four times as genetically diverse as humans, current evidence, as pointed out by Ben Beck, Associate Director for Animal Programs at the National Zoo, supports the idea that behavioral differences between chimpanzee populations are learned. For those who are interested in a more detailed report on the previously mentioned meeting in Chicago on chimpanzees and their behavior, I recommend Ann Gibbons' excellent summary in the 17 January 1992 issue of Science (page 287), from which some of this information was taken.

My final illustration of what can be learned from the careful observation of wild chimpanzees is their use of plants for medicinal purposes. A Harvard scientist, Richard Wrangham, observed individual chimpanzees in Tanzania leaving their troop to feed on Aspila leaves, which they normally do not eat. He watched his subjects select young leaves and swallow them without chewing. The leaves thus passed through the digestive tract with little apparent wear. When the leaves were chemically analyzed fresh from the plant, their surfaces were found to contain vermucidal compounds which were not present when the leaves were excreted. This evidence indicates that these young leaves are



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not consumed for nutritive purposes, but rather for medicinal ones. Another scientist, Walter Huffman, observed apparently sick wild chimpanzees carefully peeling the bark of Vernonia plants and eating the pith, which they chewed and swallowed after spitting out the fibers. Subsequent chemical analysis has shown that the pith of this plant contains compounds that are lethal to internal parasites but do not kill the host.

Such knowledge about primate behavior as described above was only acquired from close observation by many scientists. When they were able to share their thoughts and videotaped observations, they started to refine the subtle differences between the behavior of populations. Not only the differences but the similarities to human actions became evident. The remarkable and expanding evidence of developed cultural differences (if that is the appropriate word) between chimpanzee populations should give us humans pause. The great irony is that now that we have the time and talent to observe our close primate relatives, we are simultaneously squeezing them off the globe. Without mankind's prompt action, we may forever lose the opportunity to learn how we, Homo sapiens, might have evolved since splitting off from our joint family tree.

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