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THE TRUTH ABOUT "LUCY"

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It was a single arm bone—sticking out of the sandy hillside of a slope in Hadar, Africa. Paleontologist Donald Johanson noticed it on a routine trip searching for fossils. That one bone led to the unearthing of a skeleton nearly **40% complete**—a skeleton that was destined to become one of the most famous (and most controversial) fossils of all times. Eventually, in fact, it would shake every limb on the hominid family tree, turning upside down then-current theories about how man came to walk upright. Dr. Johanson named his find *Australopithecus afarensis*—the southern ape from the Afar depression of northeastern Ethiopia (Johanson et al., 1978, p. 8). The creature quickly earned the nickname "Lucy," after the Beatles' song, "Lucy in the Sky with Diamonds," which was said to be have been playing all through the celebratory night back at Johanson's camp. The fossil, officially designated AL 288-1, consisted of skull fragments, a lower jaw, ribs, an arm bone, a portion of a pelvis, a thighbone, and fragments of shinbones. It was thought to be an adult, and was dated at 3.5 million years. This fossil find was not only unusually complete, but also was believed to have walked in an upright fashion, and to have been the oldest ancestor to humans—the baseball equivalent of a grand slam.

We invite you to examine the scientific evidence regarding this famous hominid fossil, and then determine for yourself whether Lucy and her kin were, in fact, our human ancestors, or merely ancient apes. Consider the following anatomical discoveries that have been made since Johanson's initial declaration of Lucy as a new hominid species:

LUCY'S RIB CAGE

Due to the impossibility of reconstructing Lucy's skull from the few fragments available, the determination that Lucy walked upright (like a human) had to be derived from her hips and ribs. Peter Schmid, a paleontologist at the Anthropological Institute in Zurich, Switzerland, studied Lucy for quite some time, and summarized his efforts as follows.

> When I started to put the skeleton together, I expected it to look human. Everyone had talked about Lucy as being very modern, very human, so I was surprised by what I saw. I noticed that the ribs were more round in cross-section, more like what you see in apes. Human ribs are flatter in cross-section. But the shape of the rib cage itself was the biggest surprise of all. The human rib cage is barrel shaped, and I just couldn't get Lucy's ribs to fit this kind of shape. But I could get them to make a conical shaped rib cage, like what you see in apes (as quoted in Leakey and Lewin, 1992, pp. 193-194).

True, ribs can be "tweaked" and rotated so that they appear more "barrel-like" or conical, but the best (and correct) arrangement will always be the original morphology. The facets from the ribs that line up on the vertebrae provide a tighter fit when aligned correctly. In Lucy's case, her ribs were conical, like those found in apes.

LUCY'S PELVIS AND GENDER

From the beginning, Lucy was considered an adult female. Johanson's original assessment stated: "The most complete **adult** skeleton is that of AL 288-1 ('Lucy,' Fig. 5). The small body size of this evidently **female** individual (about 3.5 to 4.0 feet in height) is matched by some other postcranial remains…" (Johanson and White, 1979, p. 324). It would be from the shattered fragments of the pelvis that Donald Johanson and others would interpret the AL 288-1 fossils as being a female—primarily due to the diminutive size. But these bones were far from being problematic. As Hausler and Schmid discovered: "The sacrum and the auricular region of the ilium are shattered into numerous small fragments, such that the original form is difficult to elucidate. Hence it is not surprising that the reconstructions by Lovejoy and Schmid show marked differences" (1995, 29:363).

In regard to Lucy's pelvis, Johanson affirmed: "Lucy's wider sacrum and shallower pelvis gave her a smaller, kidney-shaped birth canal, compared to that of modern females. She didn't need a large one because her newborn infant's brain wouldn't have been any larger than a chimpanzee infant's brain" (1994, p. 66). That admission begs the question as to why this fossil was not categorized within the chimp family. But this gender declaration poses additional problems for Lucy. As Hausler and Schmid noted: "If AL 288-1 was female, then one can exclude this species from the ancestors of *Homo* because its pelvis is certainly less primitive than the pelvis of Sts 14 [designation for a specific *A. africanus* fossil—BH/BT]" (29:378). Both of the pelvises mentioned, displayed some degree of damage, and both were missing critical parts, but it should be noted that in regard to the Lucy fossil, more than one attempt was made at reconstruction.

After reconstructions of the inlet and midplane of Lucy's pelvis, and comparisons to other fossils and modern humans, it has been shown that the shape of Lucy's pelvis was not structured correctly to give birth. The pelvis was just too narrow to accommodate an Australopithecine fetus. Hausler and Schmid noted that Lucy's pelvis was ridgeless and heart-shaped, which means that "she" was more likely a "he." They noted:

> Contrary to Sts 14, delivery in AL 288-1 would have been more complicated than in modern humans, if not impossible, due to the protruding promontorium…. Consequently, there is more evidence to suggest that AL 288-1 was **male** rather than **female**. A female of the same species as AL 288-1 would have had a pelvis with a larger sagittal diameter and a less protruding sacral promontorium…. Overall, the broader pelvis and the more laterally oriented iliac blades of AL 288-1 would produce more favourable insertion sites for the climbing muscles in more heavily built males…. **It would perhaps be better to change the trivial name to "Lucifer" according to the old roman god who brings light after the dark night because with such a pelvis, "Lucy" would apparently have been the last of her species** (29:380, emp. added).

This declaration has received an enormous reaction from the evolutionist community, as many scientists work diligently to defend Lucy. If Hausler and Schmid's conclusion is correct, then this implies that the equivalent female of this species would have been even smaller—something unheard of in trying to compare this creature to modern humans! Lucy's pelvis is not what it should be for an upright-walking hominid—but the dimensions **do** fall within **primates** found among the ape family.

LUCY—BIPEDAL, OR SWINGING FROM THE TREES?

But what do Lucy's arms and legs tell us in regards to her locomotion? If she were a biped, surely her upper and lower extremities would point toward an upright stance. After all, the bone that led to Johanson's discovery of Lucy was that of the arm. Yet the bony framework that composes Lucy's wrists may be the most telling of all. Brian Richmond and David Strait of George Washington University in Washington D.C. experienced what many might call a "eureka!" moment while going through some old papers on primate physiology at the Smithsonian Institute.

"'We saw something that talked about special knuckle walking adaptations in modern African apes,' Dr. Richmond said. 'I could not remember ever seeing anything about wrists in fossil hominids.… Across the hall was a cast of the famous fossil Lucy. We ran across and looked at it and bingo, it was clear as night and day'" (see BBC News, 2000). The March 29, 2000, *San Diego Union Tribune* reported:

> A chance discovery made by looking at a cast of the bones of "Lucy," the most famous fossil of *Australopithecus afarensis,* shows her wrist is stiff, like a chimpanzee's, Brian Richmond and David Strait of George Washington University in Washington, D.C., reported. This suggests that her ancestors walked on their knuckles (Fox, 2000).

Richmond and Strait discovered that knuckle-walking apes have a mechanism that locks the wrist into place in order to stabilize this joint. In their report, they noted: "Here we present evidence that fossils attributed to *Australopithecus anamensis* (KNM-ER-20419) and *A. afarensis* (AL 288-1) retain specialized wrist morphology associated with knuckle-walking" (2000, 404:382, parenthetical in orig.). They went on to note:

> Pre-bipedal locomotion **is probably best characterized as a repertoire consisting of terrestrial knuckle-walking, arboreal climbing and occasional suspensory activities, not unlike that observed in chimpanzees today.** This raises the question of why bipedalism would evolve from an ancient ancestor already adapted to terrestrial locomotion, and is consistent with model relating the evolution of bipedalism to a change in feeding strategies and novel non-locomotor uses of the hands" (p. 384, emp. added).

Not only have Lucy's wrists and arm-bones been called into question, but there also is a mountain of evidence that demonstrates this fossil was better adapted for swinging through trees, like modern-day chimps. After thoroughly examining *A. afarensis* fossils, Stern and Susman noted: "It is demonstrated that *A. afarensis* possessed anatomic characteristics that indicate a significant adaptation for movement in the trees" (1983, 60:280). They went on to comment: "The AL 333-91 [designation for specific *A. afarensis* fossil—BH/BT] pisiform [bone of the hand—BH/BT] is 'elongate and rod shaped' and thus resembles the long, projecting pisiform of apes and monkeys" (60:281). Stern and Susman's research details the fact that the hands and feet of *Australopithecus afarensis* are void of the normal human qualities assigned to hands and feet. In their concluding remarks, they noted:

> It will not have escaped the reader's attention that the great bulk of evidence supporting the view that the Hadar hominid was to a significant degree arboreal.... We discovered a substantial body of evidence indicating that arboreal activities were so important to *A. afarensis* that morphologic adaptations permitting adept movement in the trees were maintained (60:313).

So not only were Lucy's ribs and pelvis wrong, but her limbs were physiologically more conducive to swinging in the treetops.

AUSTRALOPITHECINE TEETH: MORE EVIDENCE LUCY REMAINED IN THE TREETOPS

One of Donald Johanson's specialties is identifying differences within the teeth of alleged hominids. In fact, a great deal of attention is given in his original description to the dentition of this species. By measuring the various differences in molars and canines, he systematically assigns various fossils to predetermined groups. However, his highly observant eyes may have missed some important microscopic data. Anthropologist Alan Walker has been working on ways of extracting behavior from the fossil record. One of these methods includes quantitative analysis of tooth microwear. Using image enhancement and optical diffraction methods of scanning, Walker believes he might be able to reconstruct ancient diets from paleontological samples. In speaking of Walker's material, Johanson noted: "Dr. Alan Walker of Johns Hopkins has recently concluded that the polishing effect he finds on the teeth of robust australopithecines and modern chimpanzees indicates that australopithecines, like chimps, were fruit eaters.... If they were primarily fruit eaters, as Walker's examination of their teeth suggests they were, then our picture of them, and of the evolutionary path they took, is wrong" (Johanson and Edey, 1981, p. 358). So rather than foraging on the ground for food, we have microscopic evidence that Australopithecines were fruit eaters.

AUSTRALOPITHECINE EARS—HUMAN-LIKE OR APE-LIKE?

Knowing that modern human bipedalism is unique among primates (and other mammals), Fred Spoor and colleagues decided to evaluate the vestibular apparatus of the inner ear—an area designed to help coordinate body movements. Modern human locomotor activity requires that the vestibular apparatus of the inner ear be able to maintain body posture, even though we are constantly balancing all of our weight on very small areas of support. Anyone who has suffered vertigo knows firsthand just how crucial this area is for balance and everyday activities. Using high-resolution computed tomography, Spoor, et al., were able to generate cross-sectional images of the bony labyrinth that comprised the inner ear. They wrote: "Among the fossil hominids, the earliest species to demonstrate the modern human morphology is *Homo erectus*. In contrast, the semicircular canal dimensions in crania from southern Africa attributed to *Australopithecus* and *Paranthropus* resemble those of the extant great apes" (1994, 272: 645). With that single declaration, Spoor and his colleagues have drawn a line which unequivocally states all fossils prior to *Homo erectus* have ape-like morphology that allowed them to climb trees, swing from branches, or walk hunched over on their knuckles. So, not only were the ribs, pelvis, limbs, hands, and feet of this "fruit eater" chimp-like, but there also is evidence which suggests that the organ required for balance in *Australopithecus afarensis* was chimp-like as well.

LUCY—HOMINID OR CHIMP?

When Lucy first arrived on the scene, news magazines such as *Time* and *National Geographic* noted that she had a head shaped like an ape, with a brain capacity the size of a large chimp's—about one-third the size of a modern man's. Adrienne Zihlman remarked: "Lucy's fossil remains match up remarkably well with the bones of a pygmy chimp" (1984, 104:39). It should be no surprise then, that in Stern and Susman's analysis of *A. afarensis*, they pointed out:

> These findings of ours...all seem to lead ineluctably to the conclusion that the Hadar hominid was vitally dependent on the trees for protection and/or sustenance (60:311).

All of these facts point toward the truth that Lucy was simply an ape- like creature.

CONCLUSION

You might be asking yourself why this charade has been allowed to go on for so long. The answer—woven around power, fame, and money—can be found in Johanson's own words.

> There is no such thing as a total lack of bias. I have it; everybody has it. The fossil hunter in the field has it.... In everybody who is looking for hominids there is a strong urge to learn more about where the human line started. If you are working back at around three million, as I was, that is very seductive, because you begin to get an idea that that is where *Homo* did start. You begin straining your eyes to find *Homo* traits in fossils of that age.... Logical, maybe, but also biased. **I was trying to jam evidence of dates into a pattern that would support conclusions about fossils which, on closer inspection, the fossils themselves would not sustain** (Johanson and Edey, 1981, pp. 257,258, emp. added).

He went on to admit: "It is hard for me now to admit how tangled in that thicket I was. But the insidious thing about bias is that it does make one deaf to the cries of other evidence" (p. 277). In the March 1996 issue of *National Geographic*, Dr. Johanson himself admitted: "Lucy has recently been dethroned" (189[3]:117). His fifteen minutes of fame had ended. As Lee Berger declared: "One might say we are kicking Lucy out of the family tree" (as quoted in Shreeve, 1996). Isn't it ironic how often that family tree gets pruned and trimmed?

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