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"Lucy" and the Pygmy Human Hypothesis

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Abstract

There are two primary views within the creation community with respect to the taxonomic identity of "Lucy" and her kind, *Au. afarensis*. The first view posits Lucy and her species were an extinct quadrupedal ape. Adherents of this view (Quadrupedal Ape Hypothesis) focus on the ape-like features of specimens assigned to the *Australopithecus* genus and reinterpret features which suggest human-like obligate bipedality. Meanwhile, there is a growing number of creationists who recognize bipedal morphologies in the partial skeleton of Lucy and the broader *Australopithecus* genus. Proponents of this second view (Bipedal Ape Hypothesis) argue Lucy's kind had an ape-like cranium yet walked upright in a manner similar to modern humans. In this paper, several reputed "*Australopithecus*-like" traits are examined and compared to features found in small-bodied adult human paleontological specimens such as the Flores "Hobbit" and *H. naledi*. Features commonly interpreted as indicators of arboreal propensities are found in these small-bodied adult humans. Since these same traits occur in humans, they cannot be considered diagnostic of *Australopithecus* taxa. This paper further identifies features in Lucy's skeleton that are entirely consistent with *H. sapiens*. These findings call into question the taxonomic assignment of numerous human-looking fossils attributed to *Australopithecus*. These lines of evidence support a new hypothesis, that Lucy was a genetically isolated small-bodied human, drawn from a pygmy population that lived in the Hadar region of East Africa, during the post-Flood African Humid Period (Pygmy Human Hypothesis).

Key Words: A.L. 288-1, *Australopithecus afarensis,* Hadar Ethiopia, "Hobbit," LB 1, Lucy, Paleoanthropology, Pygmy Human Hypothesis

Simple Summary

The article proposes the Pygmy Human Hypothesis, arguing that the fossil "Lucy" (*Australopithecus afarensis*) was not an extinct ape, but rather a genetically isolated, small-bodied adult human belonging to a pygmy population that lived in East Africa. This perspective is introduced as a third option beyond the traditional creationist views that Lucy was either a quadrupedal ape (Quadrupedal Ape Hypothesis) or an ape that walked upright (Bipedal Ape Hypothesis). The author supports this hypothesis by highlighting that Lucy's anatomy contains several features exclusive to human bipedalism, particularly her pelvis, which is short, wide, and bowl-shaped with specialized parts for upright walking, and her ankle joint, which is described as "fully bipedal." Furthermore, Lucy shares several unique traits—including nearly identical limb proportions and small endocranial capacities (brain size)—with *Homo floresiensis* (the "Hobbit"), a fossil widely considered a small-bodied human. The author also contends that many traits often used to classify Lucy and similar fossils as ape-like (such as curved fingers, funnel-shaped thoraxes, or laterally flaring ilia) are unreliable because they have also been found in known human fossils, including the Hobbit and *H. naledi*. Therefore, the paper suggests that Lucy's classification as *Australopithecus* led to the systematic misclassification of numerous other human-looking fossils.

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Introduction

Ever since Johanson's announcement of a new species at the Nobel Symposium in Sweden in 1978 (Johanson et al., 1979; Königsson et al., 1980), "Lucy" and the species she is claimed to represent, *Australopithecus afarensis*, have been promoted as the most likely root ancestor to the genus *Homo* (Figure 1). Over the past 50 years, few hominin discoveries have received more publicity than Lucy. The partial skeleton A.L. 288-1 is promoted as the quintessential "missing link" fossil in textbooks, museum displays, and popular science media outlets around the world. Given its prominence in the evolutionary paradigm, understanding where Lucy fits in the Biblical worldview is a question of vital importance.

Creationists have traditionally responded to these evolutionary claims by arguing Lucy is nothing more than an extinct ape (Quadrupedal Ape Hypothesis) while downplaying the purported bipedal morphologies in Lucy's skeleton and in the broader genus (Menton, 2003; Oard, 2013). However, there is a growing number of creationists who have recognized certain features that indicate bipedality (Brummel, 2023). Proponents of this idea argue that Lucy's kind was an obligate biped with a human-like postcranial anatomy, perhaps with some arboreal traits, and an ape-like cranium (Bipedal Ape Hypothesis).

Until recently, creationists have never seriously considered a third possibility, that Lucy was a small-bodied human (Pygmy Human Hypothesis). Indeed, the purported suite of ape-like morphological features among australopithecine specimens—e.g., curved phalanges, limb proportions, thorax shape, laterally flaring ilia, cranially oriented glenoid cavities, endocranial capacities, etc.—appears to preclude any possibility of human identity. In this study, a qualitative approach was used to compare key anatomical features of Lucy's skeleton with other hominin taxa and extant apes. Many of the features commonly reported as ape-like were found to be present in the small-bodied adult human from the Indonesian island of Flores, *H. floresiensis,* and to a lesser extent, in *H. naledi*. Together, these analyses support the interpretation that Lucy was a genetically isolated small-bodied adult human, drawn from a pygmy population that lived in the Hadar region of East Africa, during the post-Flood African Humid Period.

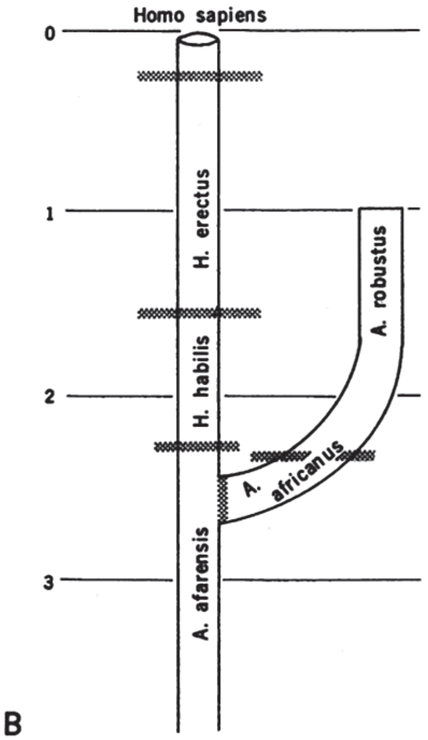

Figure 1. Johanson and White's tree diagram with *Au. afarensis* positioned at the stem, representing the immediate ancestor to early *Homo* and all descendant species of the genus, including *H. sapiens*. From: Johanson and White (1979).

The Anatomy of Lucy

Lovejoy's Reconstruction of Lucy's Pelvis

There is a popular PBS Nova clip that shows evolutionary anatomist, Owen Lovejoy, using a grinding saw to correct the damage on Lucy's ilium (Johanson, 1997). This clip has been played and replayed by many creationists as Christian audiences laugh at the sight of Lovejoy grinding the plaster replicas to "reshape" the ilium the way he wanted to promote Lucy as a credible "missing link" fossil. The allegation that creationists have made is that Lovejoy deceptively manipulated Lucy's iliac crest to make it appear more like a human, and he allegedly did so in full view of millions of viewers during a major television broadcast. It has been argued that the unreconstructed ilium (before the grinding saw) looked a lot more like a chimp with coronally oriented ilia, as opposed to more sagittally oriented, like in humans.

The allegations of fraud or a manipulated reconstruction do not stand up to scrutiny. Fossil casts of Lucy's os coxae (hip bone or pelvic bone) with the unrestored portion of the ilium can be purchased online. Anyone who has examined it will immediately recognize why it was necessary for Lovejoy to reconstruct the sacroiliac joint (Lovejoy, 2005a). That part of the ilium is badly damaged (Figure 2A), and obviously so—when one fits it to the sacrum, it rotates the os coxae such that the ischium ("sit bone") and pubis point straight out from the body and perpendicular to the sacrum, which is an anatomical impossibility (Figure 2B). It is only in this incorrect position that the iliac blades lay flatter, superficially, like that of a chimp. The "artificial joint" that formed as a result of the damaged sacroiliac joint has been described elsewhere by Johanson (Johanson et al., 1994).

Ape and Human Pelvises Are Morphologically Distinct

Functional anatomists universally acknowledge that "perhaps no anatomical structure between human and apes shows a more striking difference than that of the pelvis" (Zirkle, 2015). Lovejoy and Spurlock (2009) write similarly: "Virtually no other primate has a human-like pelvic girdle—not even our closest living relatives, the chimpanzee and bonobo."

The most obviously recognizable differences are seen in the overall shape of the pelvis (Lovejoy, 2005a; Gruss and Schmitt, 2015). The human pelvis is characteristically described as "short, wide, and basin-shaped" (Aiello and Dean, 1990). The human ilium itself is also distinct from apes (Wall-Sheffler et al., 2019). Zirkle and Lovejoy (2019) write, "The human ilium is unusually short and broad compared with those of all other primates." In contrast to the "greatly shortened" ilium in humans (Lovejoy and McCollum, 2010), the ilium of apes is flat and "exceptionally long" such that the blades entrap the lower lumbar vertebrae (Lovejoy, 2005a; Gruss and Schmitt, 2015; Zirkle and Lovejoy, 2019). These differences are equally dramatic in lateral view (Whitehead et al. 2005; Lovejoy, 2005a; Lovejoy and Spurlock, 2009; Wall-Sheffler et al., 2019). As Zirkle (2015) observes:

> "The stark contrast between human and African ape pelvises is appreciable as the human iliac isthmus is generously expansive. A lateral view of an African ape pelvis is nearly two-dimensional in appearance with only a slight iliac isthmus expanse."

The shape of the human sacrum is, likewise, markedly different from African apes. The human sacrum is shorter and wider compared to the "extremely narrow," straight sacrum of African apes (Aiello and Dean, 1990; Whitehead et al., 2005; Lovejoy and McCollum, 2010; Gruss and Schmitt, 2015; Zirkle, 2015; Wall-Sheffler et al., 2019). Each of these visually distinctive features in human and ape pelvises relates to their differences in locomotory behavior (Aiello and Dean, 1990; Wall-Sheffler et al., 2019).

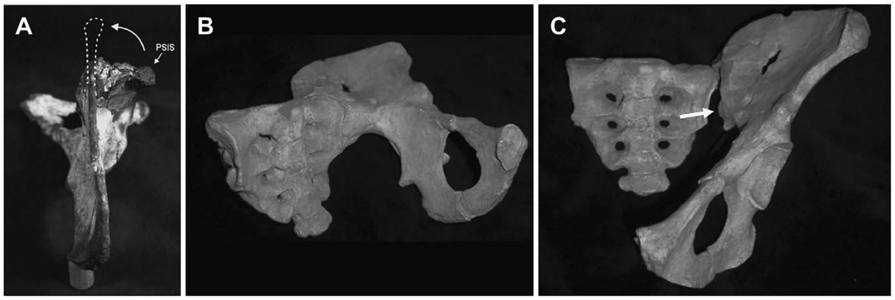

Figure 2. Reconstruction of Lucy's pelvis. (A) Lucy's unrestored iliac crest is viewed from above (superior view). Lovejoy (2005) describes the fossil damage: "While much of the iliac blade is well preserved, the posterior third has been crushed, crumpled, and bent anterolaterally almost 90°." The damaged portion includes the auricular surface that joins to the sacrum. From: Lovejoy (2005). (B) Lucy's sacrum joined together with the false joint of the ilium rotates the os coxae outward into an impossible orientation. From: M. Murdock (2006). (C) When left uncorrected, there is a small gap between the sacrum and the auricular surface of the ilium (right; arrow). From: M. Murdock (2006).

Lucy's Pelvis Preserves Several Exclusively Human Traits

Although Lovejoy's reconstruction of the sacroiliac joint remains controversial among creationists, the overall morphology of the pelvis is determined by more than just the sacroiliac joint. The shape is the result of the integration of several parts including the sacrum, ischium, pubis, and the larger, better-preserved part of the ilium.

Lovejoy's restoration did not alter the sacrum, which was found intact and well preserved with limited distortion, concentrated on one side and correctable by mirror imaging. The sacrum of primates with their characteristic narrow, elongated shape is morphologically distinct from humans (Whitehead et al., 2005). The shape of Lucy's sacrum is shorter and wider, consistent with humans and distinctly different from apes (Lovejoy, 2005a; Chene et al., 2015) (Figure 3). Moreover, the sacrum preserves inward curvature (sacral lordosis) that is described as "virtually identical" to modern humans, permitting fully human posture and gait (Lovejoy, 2005a). A reexamination of the vertebrae by Russo and Williams (2015) further indicates Lucy had five fused sacral vertebrae, the common condition seen in modern humans (Aiello and Dean, 1990).

The ilium itself is also morphologically human. Plots comparing the relative iliac height of Lucy's pelvis to apes support this claim; Lucy falls neatly within the human range and well outside the range of apes (Zirkle and Lovejoy, 2019). Even accounting for the damaged region to the ilium, the dimensions reveal it is wider than it is tall, which is unique to humans and the reverse of apes (Straus, 1929; Aiello and Dean, 1990; Whitehead et al., 2005; Zirkle, 2015; Wall-Sheffler et al., 2019). As a result of expanded ilium breadth, humans have a deeper greater sciatic notch compared to apes (Whitehead

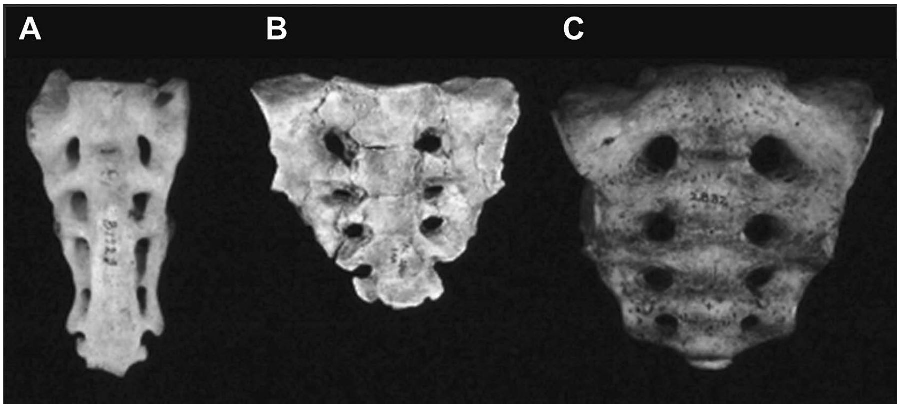

Figure 3. Anterior view of sacra belonging to (A) chimpanzee (*P. troglodytes*), (B) Lucy (A.L. 288-1an), and (C) *H. sapiens.* The narrow, elongated sacrum of chimps is distinct from the shorter, wider sacrum of Lucy and modern humans. From: Lovejoy and McCollum (2010).

Figure 4. Lateral view of os coxae. Both Lucy's (A) and *H. sapiens* (B) os coxae preserve the bony prominence of a "true" AIIS (white arrows). The equivalent site is flat in chimps (C). The relative iliac isthmus breadth is also markedly wider in Lucy compared to chimps and is morphologically similar to humans (red line). From: https://elucy.org/compant/oscoxae/.

et al., 2005). This may be considered another distinguishing feature that is apparent in Lucy's pelvis (Lovejoy and Spurlock, 2009). In addition, there is no "capture" of the lower lumbar vertebrae by the iliac blades, as seen in African apes (Lovejoy, 2005a).

In the undamaged part of the ilium, there is a bony prominence known as the anterior inferior iliac spine (AIIS). The AIIS is on the front of the ilium and anchors the quadriceps muscle in the front of the thigh, called the rectus femoris muscle, also known as the "kicking muscle." It is critical for knee extension and assists in hip flexion—the ability to lift our leg forward at the hip joint. It plays an important role in walking, running, kicking, and lifting the knee to walk up steps. In concise technical terms, the rectus femoris muscle "contracts during the 'toe off' portion of swing phase in bipedal locomotion." (Zirkle, 2015). Humans preserve a specialized AIIS to facilitate muscle attachment. The equivalent region of the AIIS in chimps is flat (Figure 4).

In some ape taxa, such as gorilla and the extinct quadrupedal ape, *Oreopithecus bambolii*, a bony prominence may be present (Harrison, 1986). However, ape prominences are not considered to represent a "true" AIIS like in humans (Zirkle, 2015; Zirkle and Lovejoy, 2019). Consistent with this evaluation, paleoanthropologists now reject earlier studies that argued *O. bambolii* was a habitual biped (Susman, 2005; Russo and Shapiro, 2013). The equivalent region of the AIIS in apes can be distinguished from humans by the absence of a secondary ossification center that is exclusive to obligate bipedal hominins (humans) (Lovejoy and McCollum, 2010; Zirkle, 2015; Zirkle and Lovejoy, 2019). Lovejoy and McCollum (2010) explain:

> "The degree of protuberance of its AIIS is not unusual for a nonhominid. What distinguishes the AIIS in hominids from those in apes is not its protuberance (those of Gorilla are often very prominent), but rather its emergence from a novel, separate physis, a hominid adaptation that is almost certainly associated with dramatic expansion of iliac isthmus breadth." (Lovejoy et al., 2009b)

A proxy for determining whether a fossil specimen bears a "true" AIIS is relative iliac isthmus breadth. In the lateral view, the human os coxae is morphologically distinct from apes: "the human ilium is significantly shorter and broader than those of all other primates." (Zirkle and Lovejoy, 2019). Measured in the lateral view, the relative breadth of the isthmus is significantly broader in humans when compared to African apes (Zirkle, 2015). Lovejoy and McCollum (2010), Zirkle (2015), and Zirkle and Lovejoy (2019) show that because this feature is so strongly associated with bipedal human pelvises and distinct from the narrow isthmus of apes, it can be "reasonably used to determine the presence/absence of a true AIIS in extinct taxa for which there are no appropriate subadult specimens" (Zirkle, 2015). The iliac-isthmus expansion alone appears to distinguish true bipedal human pelvises from quadrupedal apes (Zirkle and Lovejoy, 2019).

Lucy's pelvis, as in modern humans, has an expanded iliac isthmus and "a protuberant AIIS that appears consistent in size, location, form, and orientation (anteromedial) with the hominid condition" (Zirkle, 2015) (Figures 4A and 4B). That part of the ilium (anterior border) is well preserved in Lucy and was unaffected by Lovejoy's reconstruction of the sacroiliac joint (Lovejoy, 2005a). The integration of all these parts forms a distinctly human-looking pelvis—it is short, broad, and bowl-shaped—looking nothing like the long, flattened pelvis of a chimpanzee (Gruss and Schmitt, 2015) (Figure 4C and Figure 5). The differences in morphology are apparent regardless of the photographic orientation of the pelvis.

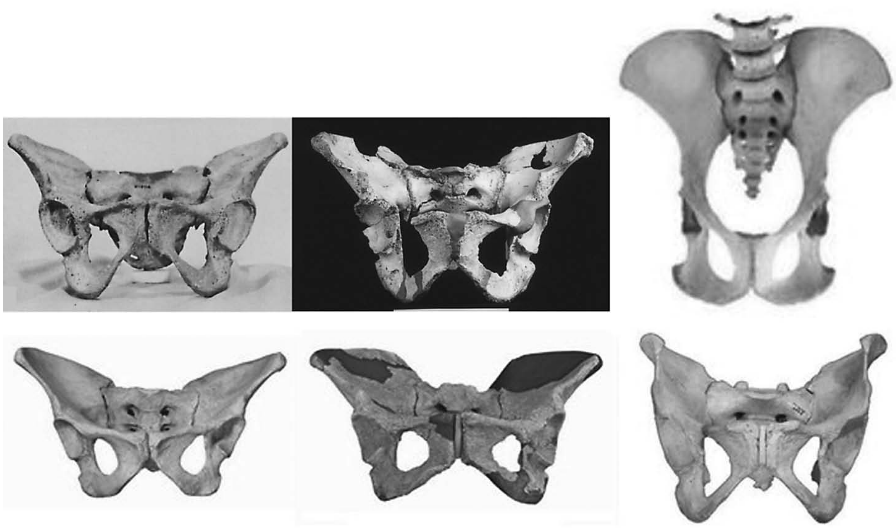

Figure 5. Comparison of pelvic girdles in ape and hominin specimens. Top row: American Indian, Neanderthal (SH 1) from the "Pit of Bones" site in Spain, and chimpanzee. Bottom row: Lucy (A.L. 288-1ao-an), *H. erectus* (BSN 49/P27), and modern *H. sapiens*. Lucy's short, broad, and bowl-shaped pelvis looks distinctly different from chimpanzee. Notice the laterally flaring ilia in the American Indian and hominin *Homo* specimens. From: Lovejoy et al., 1973.

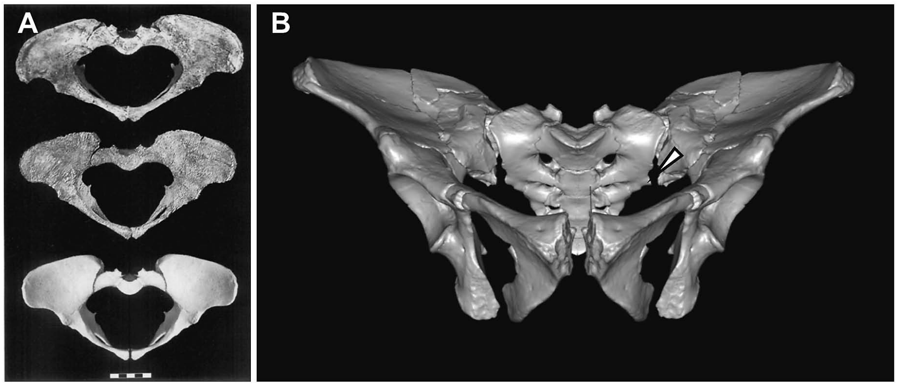

Figure 6. Various reconstructions of Lucy's pelvis. (A) Superior views of reconstructions from Lovejoy (1979), Schmid (1983) (a preliminary version), and Schmid and Häusler (1995) (top to bottom). Notice the consistency in the overall shape of the pelvis in these reconstructions. From: Schmid and Häusler (1995). (B) Frontal view of a "blind" reconstruction performed by O'Mahoney. Note the small gap between the auricular surface of the ilium and sacrum (arrowhead) due to the unrestored sacroiliac joint. From: Brassey et al. (2018).

A "Blind" Reconstruction Corroborates Lucy's Human-Shaped Pelvis

The apparent bipedal characteristics of Lucy's pelvis are not dependent on Lovejoy's reconstruction alone. Schmid (1983) and Schmid and Häusler (1995) did their own reconstructions of Lucy's pelvis, and the overall shape did not dramatically differ from Lovejoy's (1979). It is distinctly human and not at all like an ape. The pelvis is short, broad, and bowl-shaped in all three reconstructions.

The differences between the various reconstructions are subtle and mostly relate to the precise dimensions of the birth canal, as part of an obstetric analysis (Figure 6A). Schmid and Häusler (1995) concluded that "Lucy" was a male, whom they nicknamed "Lucifer." These researchers rejected the sexual dimorphism hypothesis proposed by Johanson and colleagues and argued that Lucy's kind, *Au. afarensis* represents "several distinct species which were previously jumbled together."

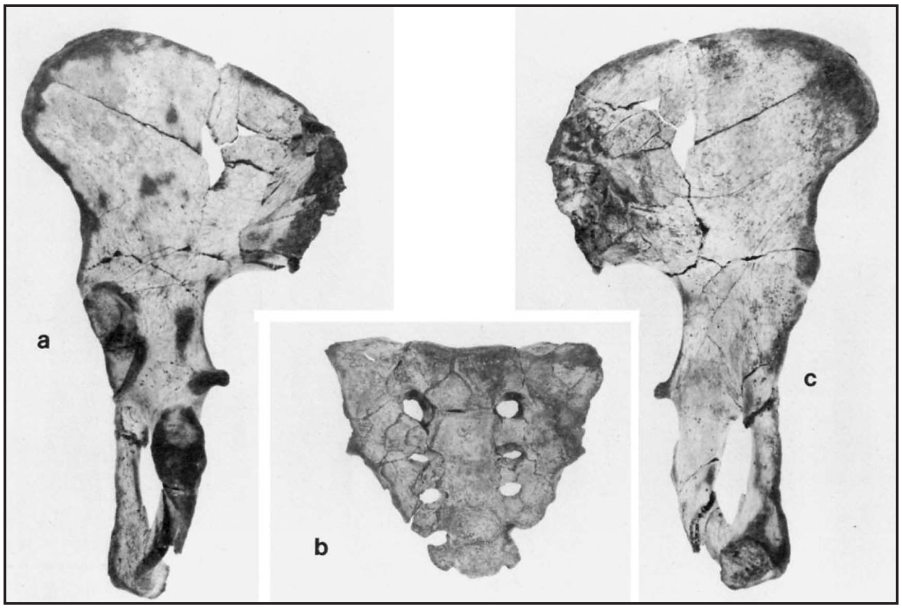

Figure 7. Lucy's intact sacrum (A.L. 288-1an) and assembled left os coxae (A.L. 288-1ao) with the sacroiliac joint unrestored. (A) Posterior view of os coxae; (B) anterior view of sacrum; (C) anterior view of os coxae. Notice the clean joins between the pieces of the os coxae with only small bits missing. From: Johanson et al. (1982).

A debate within the paleoanthropology community on "gender confusion in the Pliocene" ensued (Tague and Lovejoy, 1998). Tague and Lovejoy's obstetric analysis of Lucy's pelvis has remained unchallenged ever since. Today, the consensus in the paleoanthropology community is that Lucy really was a female. Regardless, the view that Lucy's pelvis is human does not hinge on any particular reconstruction since they all look distinctly human in morphology—nor does it depend on Lucy's gender. The pelvises of neither male nor female chimps look anything like the short, broad human pelvis.

A digital reconstruction of Lucy's pelvis was recently performed by Brassey et al. (2018) (Figure 6B). The original distortion to the sacrum that was concentrated on one side was mirrored to reveal its natural symmetry. In addition, the os coxae was reconstructed from its constituent pieces, using the internal arc as a guide. These researchers commented that "there is definitely crushing of the sacroiliac joint," however, they were able to reconstruct the pelvis without restoring the damaged part of the sacroiliac joint. This demonstrates that the human-like morphology of the pelvis does not depend on the reconstruction of the sacroiliac joint. Indeed, photographs of the os coxae prior to restoration of the sacroiliac joint show there are clear joins between the pieces of the pelvis (Johanson et al., 1982) (Figure 7), as can be seen in the digital model provided by Brassey et al. (2018), available for download here: //figshare.com/articles/dataset/Lucy_A_L_288-1_reconstructed_pelvis/4746886.

The overall human configuration of their reconstruction looks highly similar to the earlier reconstructions shown above. In fact, the co-author responsible for the reconstruction noted that he did so "blind" of the previous reconstructions to ensure an unbiased reproduction, yet he noted it happened to look remarkably similar to Schmid and Häusler's (1995) (T.G. O'Mahoney, personal communication, February 28, 2025). In terms of overall morphology, all four look distinctly human and not at all like a chimp or any other known primate.

In summary, the morphology of Lucy's pelvis bears several distinguishing features that are characteristic of human pelvises, including: 1) a short, broad, and bowl-shaped configuration 2) a short, wide sacrum; 3) short relative iliac height that is wider than it is tall; 4) a deeper greater sciatic notch; and 5) a specialized AIIS that is unique to obligate bipedal hominins (humans). As explained above, the presence of a "true" AIIS consistently correlates with an expanded iliac-isthmus breadth, which may be considered a sixth distinctive trait of human pelvises that is also represented in Lucy's pelvis. Other features that may not be considered conclusively diagnostic are nonetheless typical of modern humans and further corroborate this interpretation. These include the absence of "captured" lower lumbar vertebrae by the iliac blades, sacral lordosis, and five fused sacral vertebrae. The presence of all these traits combined in a single specimen strongly supports the human taxonomic identity of Lucy's pelvis.

Lucy's High Bicondylar Angle

Although the pelvis is the most definitive, it is just one in a suite of skeletal features which are characteristic of human bipedality. The bicondylar angle is the angle between the femur's shaft and a vertical line passing through the knee, perpendicular to the bicondylar plane. The bicondylar angle of quadrupedal primates "hovers around

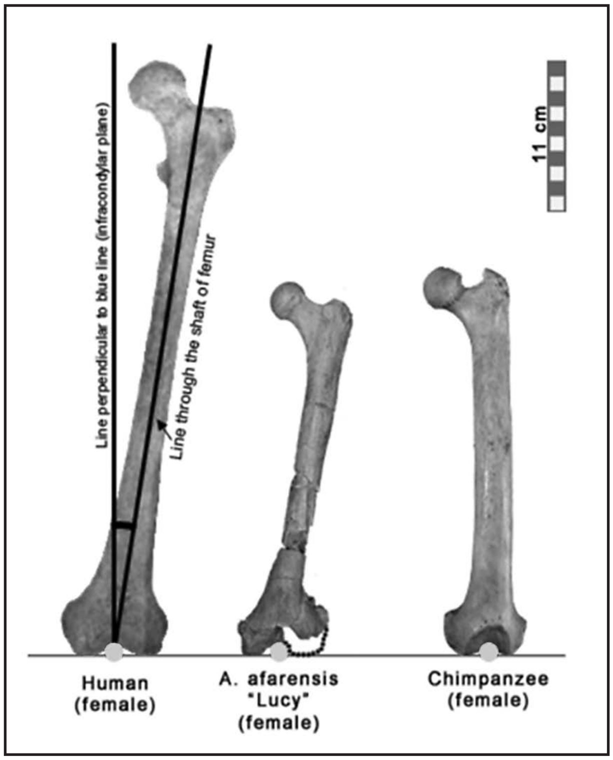

Figure 8. Lucy's high bicondylar angle falls within the human range. This feature combined with her human-shaped pelvis supports her true human identity. From: https://iho.asu.edu/about/lucys-story.

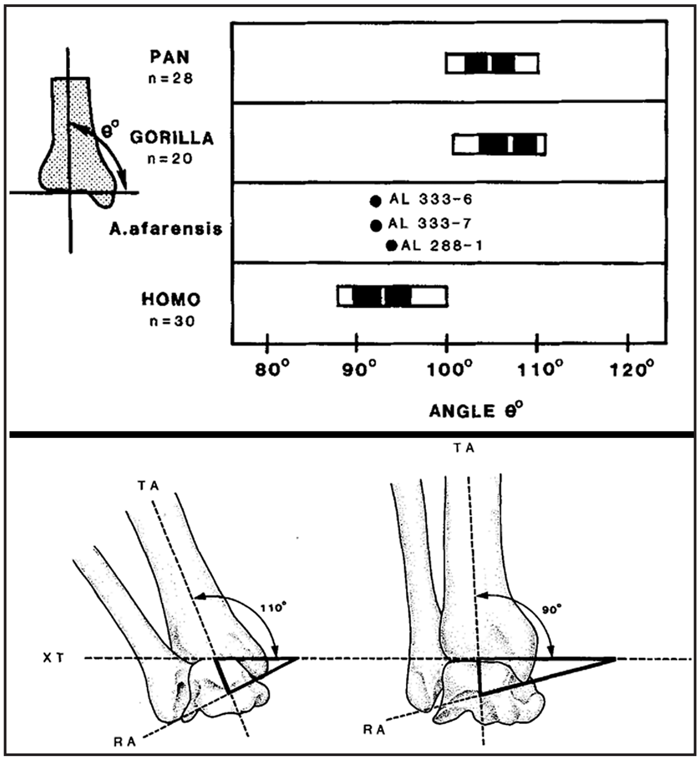

Figure 9. Top: The midline of the tibial shaft is nearly perpendicular to a midcoronal plane along the distal articular surface. In addition to Lucy's, the specimens from the "First Family" site (A.L. 333-6 and -7), fall in line with the mean value of the human range. This is consistent with the strikingly modern human-looking foot bones recovered from the same site (DeSilva et al., 2020; Johanson, 1976); and Johanson's original attribution of the "First Family" site to *Homo* (Johanson, 1976). Vertical white line = mean; black rectangle = ±1 S.D.; white bar = total range. Bottom: The human ankle configuration shown on the right forms a nearly perpendicular angle with the midshaft of the tibia and the distal articular surface, whereas in pongid an obtuse angle is formed. See Fig. 8 in Latimer et al. (1987) for a more detailed description.

a value of zero" whereas humans have a significantly higher bicondylar angle ranging between 8–11° (Lovejoy, 2007; Miller and DeSilva, 2023). Some creationists have argued that a high bicondylar angle is not a diagnostic feature when considered in isolation, since some primates have been shown to have higher bicondylar angles (Mehlert, 1996). However, Miller and DeSilva (2023) note that the bicondylar angle measured in humans is "at least one standard deviation above the largest angle seen among extant primates (5.3° in Macaca)."

Regardless of whether it is diagnostic of human bipedality, when a high bicondylar angle occurs in combination with other features that are distinctly human, such as the morphology of the pelvis and/or femoral condyles (i.e., raised patellar lip, deepened patellar groove, inferiorly flattened condyles, and elongation of the condyles in lateral view), the bicondylar angle is an important corroborating piece of evidence. The association of all those traits in a single distal femur is compelling evidence of human morphology and bipedality.

Unfortunately, Lucy's distal femur is damaged and does not provide an adequate lateral view of the condyles. However, Lucy's wider sacrum and broader, bowl-shaped pelvis correspond well with the higher bicondylar angle of her femur at 12° (Lovejoy, 2007; Miller and DeSilva, 2023), which places the center of gravity directly above her knees and feet, and closer to the midline of the body for stable bipedal locomotion (Figure 8).

Figure 10. Lucy’s sacrum articulated with the os coxae of the small-bodied human from the Indonesian island of Flores. From: Jungers et al. (2009).

Lucy’s Human-Like Ankle Joint

Lucy’s talus was recovered together with the distal end of a fibula and a tibia. The ankle joint, technically referred to as the talocrural joint, is formed by the articulation of the distal tibia and fibula with the talus. The shape of Lucy’s talus is robust and morphologically similar to modern humans and distinctly different from apes (Kappelman et al.), though it’s smaller than an average adult human and comparable to the size of the small-bodied human, *H. floresiensis* (Pablos et al., 2013). In describing the talocrural joint of Lucy and comparing it to great apes and modern *H. sapiens*, Latimer et al. (1987) state, “In every functionally significant feature examined, the A.L. 288-1 talocrural joint is fully bipedal.” One particular diagnostic feature they examined was the angle between the midline of the tibial shaft and the inclination of the distal articular surface, shown above (Figure 9). They note that “there is no overlap between pongid and hominid ranges, and this angle is nearly perpendicular in all hominin tibiae” (Latimer et al., 1987; Prang, 2015).

Lucy’s Morphological Similarities to the Small-Bodied Human from Flores (Hobbit)

When Johanson first brought the skeleton to show anatomist Owen Lovejoy, Johanson asked, “You don’t think it’s a dwarf, do you?” Lovejoy reassured him saying, “Nah, the skeleton doesn’t show any pathology. And what’s more,” Owen pointed to the leg bones, “these are about the same size as the knee joint from last year [A.L. 129-1]. I’ll bet you the females were small and the males were large” (Johanson et al., 1994).

Lovejoy’s response was interesting. He claimed that Lucy could not be a dwarf because the bones do not show any signs of pathology. That’s a good response to a question about dwarfism, but why didn’t they consider the possibility of a pygmy? Even today, there are populations of small-bodied humans living in central Africa. Pygmies don’t suffer from dwarfism; they have naturally short stature and normal body proportions. Anthropologists define pygmies as populations in which adult males are on average less than 155 cm (~5′ 1″) in height (Migliano et al., 2007); females are a little shorter, so sexual dimorphism would not be dramatic. Males and females would both have small skeletons, and therefore small hips, small limbs, and small knee joints. Given the striking, human-like features found in A.L. 129-1, is it possible Lucy and other specimens from the Hadar Formation belonged to a population of pygmies? To examine this hypothesis, Lucy’s skeleton was systematically compared to *H. floresiensis* (Hobbit), a fossil human of short stature.

The Pelvis of Lucy and the Hobbit

The late paleoanthropologist, William Jungers, from Stony Brook University, was astounded when Lucy’s sacrum fit seamlessly with the sacroiliac joint belonging to the small-bodied human, *H. floresiensis*, from the Indonesian island of Flores (Jungers et al., 2009) (Figure 10). Jungers et al. (2009) report:

> “If one articulates casts of the sacra of australopithecines such as either AL 288-1 (“Lucy”) or STS 14 (or a

> sacrum from a very small human) with LB1/7 in order to establish anatomical planes, one can better assess the degree of lateral iliac flare. The anterior margin of "Lucy's" sacrum fits remarkably well with the anterior edge of LB1/ 7's auricular surface (Fig. 4)."

The "remarkable" fit makes sense if we assume Lucy was an adult small-bodied human (the sacrum shows the complete fusion of the five sacral vertebrae). *H. floresiensis* is also widely considered an adult small-bodied human by creationists and evolutionary paleoanthropologists alike. In fact, the former head of Indonesia's national paleoanthropology institute, Teuku Jacob (Jacob et al., 2006), among other evolutionary paleoanthropologists (Hershkovitz et al., 2007; Berger et al., 2008), have argued that the Hobbit was a pathologic and/or inbred modern human pygmy (*H. sapiens*).

Jacob et al. (2006) have claimed the Hobbit was drawn from the Rampasasa pygmy population that still lives on the island, not far from Laung Bau cave, where Hobbit fossils were found. Pygmy populations are also thriving in the Congo Basin of Central Africa and may have lived in East Africa during the African Humid Period. And so, if both Lucy and Hobbit were small-bodied humans, it makes sense the two parts of the pelvis would fit together. It's only puzzling if they are assumed to belong in entirely separate genera, with two very different locomotor behaviors, as creationists have traditionally supposed. This is because the shape and size of the auricular surface of human ilia are unique, and do not fit the sacrum of quadrupedal apes for reasons directly related to their differences in locomotory behavior (Wall-Sheffler et al., 2019). Due to some fossil distortion to the sacrum, one might raise suspicions that the auricular surface was too severely deformed, and so the fit with the Hobbit's sacrum might have been fortuitous. However, Johanson et al. (1982) note that both auricular surfaces "appear in good condition." The auricular surface of LB1/7 likewise appears sufficiently well preserved, and Jungers et al. (2009) describe the fit of Lucy's sacrum with the auricular surface of the Hobbit's left os coxae (LB1/7) as anatomical.

The Limb Proportions of Lucy and the Hobbit

The limb proportions can be a useful proxy for distinguishing extant apes and humans, including fossil hominins. The limb proportions of the small-bodied human, Hobbit (LB 1), are reported in the scientific literature as a humeralfemoral index value (100 x humerus length/femur length). The humerus and femur length for LB 1 are 243 mm and 280 mm, respectively, yielding a humeralfemoral index of 86.8 (Jungers et al., 2016). The humerus and femur length for Lucy are remarkably close, 239 mm and 280 mm, respectively, yielding an index of 85.4 mm (Jungers et al., 2016). Interestingly, the humeralfemoral index for modern human pygmies ranges between 69.7–73.5 (Jungers et al., 2016). Thus, while the humeralfemoral length of Lucy differs from modern pygmies, the limb proportions of an ancient small-bodied human (LB 1) and Lucy are nearly identical.

The Thorax Shape of Lucy and the Hobbit

It is often assumed that Lucy had a conical or funnel-shaped thorax, as in apes (Leakey and Lewin, 1992; Line, 2010). However, some paleoanthropologists argue Lucy's thorax was more barrel-shaped. The fact that paleoanthropologists have a fundamental disagreement on this is not surprising. It may not be something that can be conclusively determined due to the fragmentary condition of Lucy's thorax. Brassey et al. (2018) acknowledge this, stating:

> "The subject of the shape of the *Australopithecus* thorax has been one of considerable debate (Schmid, 1983; Lewin and Foley, 2004; Haile-Selassie et al., 2010a, 2010b; Schmid et al., 2013; Latimer et al., 2016). Both a human 'barrel shape' and hominoid 'funnel shape' ribcage have been proposed for *A. afarensis*, with previous reconstructions being based on very limited fragmentary remains."

The fragmentary condition of the thorax explains why anatomists cannot confidently identify Lucy's rib numbers, aside from the first rib. Ironically, the only identifiable rib is described as looking distinctly like those of *H. sapiens* and different from what is observed in all primates (Johanson et al., 1982; Ohman, 1986; Kimbel and Delezene, 2009). Primates have two articular surfaces on the first rib; one articulates to the first thoracic vertebra and the other to the seventh cervical vertebra. Humans have a single articular surface on the first rib, which articulates with the first thoracic vertebra. Kimbel and Delezene (2009) note, "as in *H. sapiens*, the *A. afarensis* first rib [referring to A.L. 288-1ax and A.L. 333-118] has a single articulation with the first thoracic vertebra, as opposed to a "bivertebral" articulation, with the superior portion of the first thoracic centrum and the inferior portion of the seventh cervical centrum, as is observed in all non-human primates."

Regardless of how Lucy's thorax should be reconstructed, a funnel-shaped thorax is not exclusive to apes. Humans have been shown to have funnel-shaped thoraxes, including the small-statured *H. naledi* (Berger et al., 2015), Neanderthals (Tattersall, 2015), Turkana Boy (Hershkovitz et al., 2007), and pathologic modern humans (Hershkovitz et al., 2007). Indirect evidence suggests the Hobbit may have also had a funnel-shaped thorax. Thus, even if Lucy's thorax was funnel-shaped, it cannot be considered diagnostic of *Australopithecus* nor of apes. Instead, it might count as yet another feature shared by the short-statured Hobbit.

Complicating things further, recent findings have suggested a barrel-shaped vs. funnel-shaped thorax is an "overly simplistic dichotomy" (Latimer et al., 2016; Williams, 2017). Consistent with this thinking, the latest reconstruction of Lucy's pelvis shows a more *bell-shaped* thorax (Brassey et al., 2018), as is seen in the "Big Man" skeleton[1] and other archaic humans such as Neanderthals with laterally flaring ilia (Latimer et al., 2016). Researchers have noticed there is an anatomical correspondence between flaring ilia and flaring lower thoraxes (Hershkovitz, 2007; Latimer et al., 2016). Given the observation that Lucy's first rib matches the human configuration, combined with her laterally flaring ilia, a bell-shaped thorax is likely the best approximation, as seen in other *Homo* specimens.

The Endocranial Capacity of Lucy and the Hobbit

The A.L. 288-1 cranium is highly fragmentary. Only six fragmentary pieces are preserved (A.L. 288-1a = occipital fragment, 1b = left parietal fragment, 1c/g = biparietal fragment, 1d = left zygomatic fragment, 1e = parietal fragment, 1h = right frontal fragment) (Johanson et al., 1982), which do not reveal any key diagnostic features of the skull, such as the foramen magnum orientation. Since most of Lucy's cranium is missing, her endocranial capacity cannot be directly measured (Johanson and Taieb, 1976). Estimates can range between 365-417 cc and are typically modeled based on ape endocranial capacities (Gunz et al., 2020). As a result, Lucy's endocranial capacity may be underestimated. Regardless, the upper estimate cited above is approximately the same as the pygmy human from Flores (380-426 cc) (Falk et al., 2005; Kubo et al., 2013), and so, it is entirely possible Lucy's cranium belonged to an adult, small-bodied human.

Lucy's cranial vault shape was likewise far too fragmentary to reconstruct without relying on composite skull reconstructions (Kimbel et al., 1984; Kimbell 1988), and later discoveries of more complete specimens as cross-references, such as the distinctly ape-like skull attributed to *Au. afarensis*—e.g., A.L. 444-2 (Kimbel et al., 2004). Consequently, the cranial vault shape of Lucy's skull is an open question and could be more human-like. For example, Ferguson (1987) challenged the earlier ape-like reconstructions and produced a more human-like rounded cranial vault with only moderate prognathism. On this basis, he rejected the *Australopithecus* designation and argued Lucy should be reclassified in the human genus as *Homo antiquus.*

Summary of Unique Features Shared by Lucy and the Hobbit

Lucy and the Hobbit have several unique features in common, including flat-footedness (DeSilva et al., 2010; Henneberg et al., 2014), curved fingers and toes, nearly identical endocranial capacities (Falk et al., 2005; Kubo et al., 2013), nearly identical limb proportions (Jungers et al., 2016), nearly identical height (Jungers et al., 2016), broad pelvises with laterally flaring ilia (Stringer, 2014), non-projecting chins, and possibly more funnel- or bell-shaped thoraxes. The commonality of all these aberrant features makes sense if both belonged to small, genetically isolated pygmy human populations. Several of these reputed "*Australopithecus*-like" features are also found in *H. naledi* specimens from South Africa (Feuerriegel et al., 2017; Hawks et al., 2017), and to a lesser extent in pygmy humans from Palau, Micronesia (Berger et al., 2008). Apparently, the same suite of traits can arise independently in geographically separated populations, which suggests they are likely developed by similar processes. Perhaps parallel processes include genetic isolation, insular dwarfism, inbreeding, and fixation events associated with founder effects, just as evolutionary paleoanthropologists have proposed (Berger et al., 2008; Rupe and Sanford, 2019).

Further Evidence of a Post-Flood Pygmy Human Population in East Africa

A Small Adult Knee Joint (A.L. 129-1)

The Pygmy Human Hypothesis is further supported by the small A.L. 129-1 knee joint that was discovered by Johanson during his first International Afar Research Expedition, a year before he found Lucy, at an entirely separate locality. A high bicondylar angle (15°) is visually apparent in the A.L. 129-1 specimen (Figure 11A). The distal part of the femur preserves inferiorly flattened condyles that are elongated in lateral view (Lovejoy, 2007). This feature is both measurably and visually distinct from apes (Miller and DeSilva, 2023). Inferiorly flatted condyles are critical for increasing the contact surface in the knee joint for load dissipation in bipedal locomotion (Aiello and Dean, 1990; Miller and DeSilva, 2023). Apes have inferiorly rounded condyles, which is why they cannot stand upright in a

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[1] "Big Man" is a partial skeleton attributed to *Au. afarensis*, however, Rupe and Sanford (2019), among other creation scientists, argue that the skeletal morphology is distinctly human and should be reclassified as such.

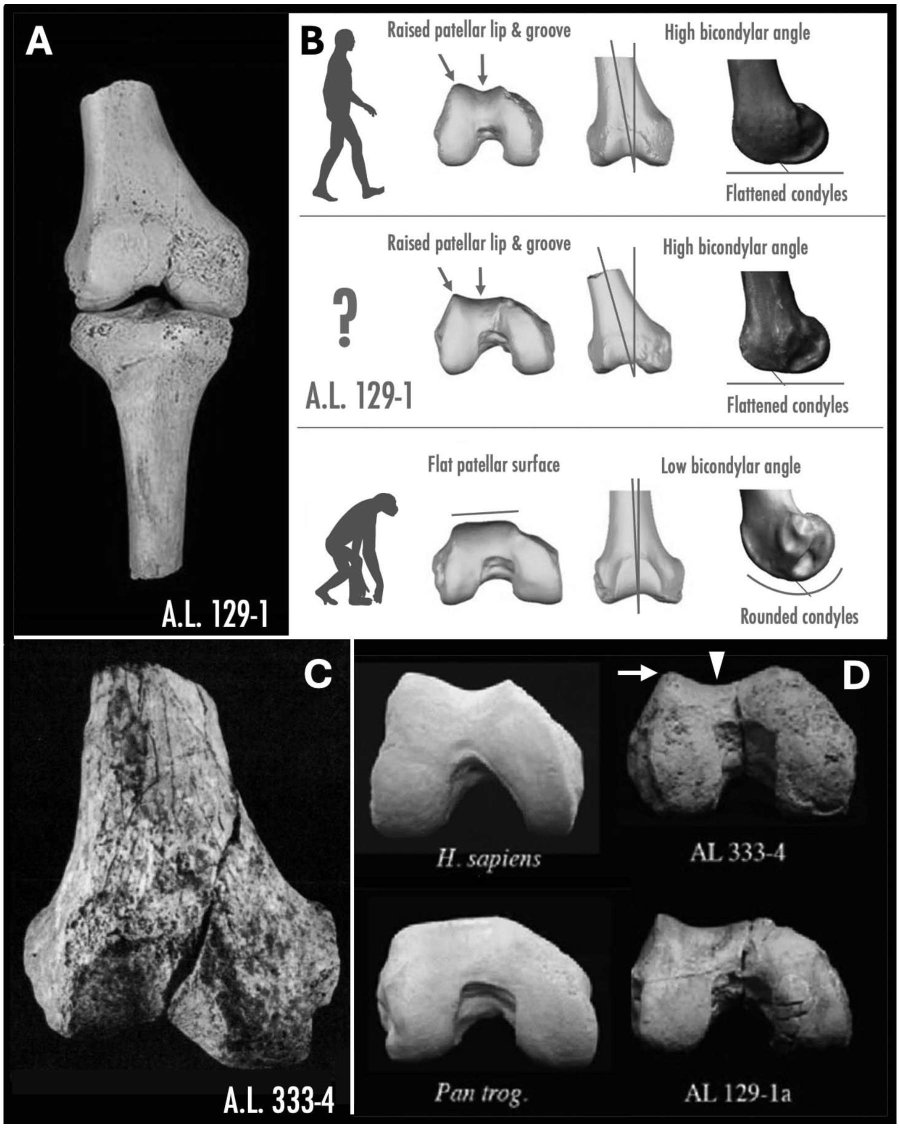

Figure 11. Features of the distal femur in australopithecines. (A) A.L. 129-1 knee joint exhibiting a high bicondylar angle. (B) Inferior and lateral views of femoral condyles in *H. sapiens* (top row), A.L. 129-1a (middle row), and chimpanzee (bottom row). (C) A.L. 333-4, a larger distal femur recovered from the "First Family" site displaying a high bicondylar angle. (D) Clockwise: Femoral condyles of *H. sapiens,* A.L. 333-4, A.L. 129-1a, and chimpanzee (*Pan trog.*). A.L. 333-4 reveals a raised patellar lip (arrow) and a deep patellar groove (arrowhead), as can be seen in A.L. 129-1a and *H. sapiens*. A and B adapted from: Miller and DeSilva (2023). C from: Lovejoy et al. (1982); and D from: Schwartz (2014).

restful, lock-kneed position. In addition, the patellar groove is deep, and there is a raised lateral patellar lip, which is typical of modern humans and necessary to prevent patellar dislocation when associated with a high bicondylar angle (Aiello and Dean, 1990; Miller and DeSilva, 2023) (Figure 11D). The presence of all these traits together in one knee joint—i.e., high bicondylar angle, raised lateral patellar lip, deep patellar groove, inferiorly flattened and laterally elongated condyles (Figure 11B)—is strong evidence for bipedality and modern human anatomy (Lovejoy, 2007). Johanson and Taieb (1976) recognized these distinctly human features in their earlier *Nature* paper (see also: Johanson, 1976) in which they originally reported their Hadar collection consisted of two separate genera, *Australopithecus* and *Homo*.

The complete fusion of growth plates further suggests the knee joint belonged to an adult human of small stature, nearly identical in size as Lucy's. Thus, we now have evidence of two small-bodied individuals having lived in the same general vicinity of the Hadar region. Lucy is one individual and the second is the owner of the isolated knee joint found at Afar Locality 129.

In this same Hadar Formation, a distal femur was recovered from the "First Family" site (A.L. 333-4) during the 1975 field season. It is very similar in terms of overall morphology to the A.L. 129-1a distal femur, though noticeably larger in size (Lague, 2002). The larger distal femur has all the same diagnostic bipedal human features as A.L. 129-1a (Figure 11C) (Lovejoy, 2007). In a study describing these small and large specimens (A.L. 129-1 and A.L. 333-4), Lovejoy (2007) concludes, it is "patently obvious from their distal femora alone that *A. afarensis* locomoted with complete knee extension" as in modern humans. Johanson and colleagues have attributed these small and large distal femora, as well as other homologous anatomical elements, to sexual dimorphism (Lague, 2002; Kimbel and Delezene, 2009; Johanson, 2017). However, if Lucy represents a small-bodied human, then these larger human-like bones suggest the presence of humans of "normal" stature living in the same region.

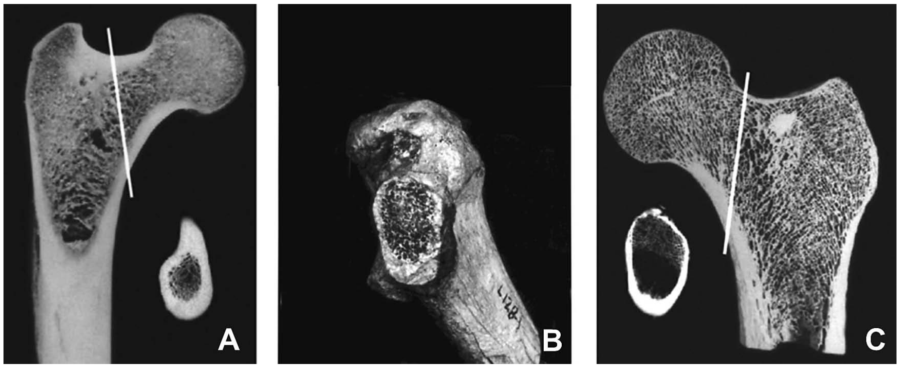

Figure 12. A comparison of the ossification pattern in the femoral necks of (A) chimpanzee; (B) *Au. afarensis*, A.L. 128-1; and (C) *H. sapiens*. The ossification pattern matches modern human femora. Images originally from: Lovejoy (2005b) and Ohman (1997); combined from: Hogervorst et al. (2009).

Small Adult Proximal Femora (A.L. 129-1c and A.L. 128-1)

Other findings further corroborate the presence of small-bodied humans during the time of the Hadar Formation in East Africa. In October of 1973, right and left proximal femur fragments (A.L. 129-1c and A.L. 128-1) were recovered near where the A.L. 129-1 knee joint was found (Johanson and Taieb, 1976). Johanson suspected they probably belonged to the owner of the A.L. 129-1 knee joint (Johanson and Edey, 1981). The fragments preserved the upper end of the femur yet lacked the heads. The left proximal femur (A.L. 128-1) was better preserved, with the shaft broken ~38.0 mm below the lesser trochanter (Johanson and Taieb, 1976). A cross-sectional view of the relevant part of the femoral neck provides information relating to load bearing during locomotion. The thick layer of cortical bone at the bottom of the neck is consistent with human bipedal locomotion; the ossification pattern is distinctly different from quadrupedal apes (Ohman et al., 1997; Lovejoy, 2005b). An X-ray image described by Lovejoy supports the human identity of the A.L. 128-1 femur (Figure 12):

> "X-rays show dramatic differences between the femur necks of a chimpanzee, on the left, and a modern human. The chimpanzee has a thick layer of dense bone that forms a bony ridge at the top. This design withstands the physical forces that a chimp encounters while climbing trees. The human design, with more spongy bone inside and a thick outer layer at the bottom, withstands the forces of two-legged walking. The Hadar fossils are almost identical to the human pattern." (Johanson et al., 1994)

Researchers reporting in an orthopedics research journal examined the ossification pattern seen in the A.L. 128-1 proximal femur, originally described by Lovejoy, and affirmed his assessment (Hogervorst et al., 2009). These human-like proximal femora (A.L. 128-1; A.L. 129-1c), together with the knee joint (A.L. 129-1), strengthen the position that pygmy humans lived during the time of the Hadar Formation in East Africa.

Extinct Ape or Human?

Non-Diagnostic Traits Complicate Creationist Taxonomic Assignments

Creationists have historically considered Lucy and her kind to be an extinct quadrupedal ape that belonged to the *Australopithecus* genus. These claims are largely based on traits that are assumed to be diagnostic of *Australopithecus* taxa, such as funnel-shaped thoraxes, laterally flaring ilia, curved phalanges, and cranially oriented glenoid cavities (discussed below). However, these traits are not exclusive to *Australopithecus*; they occur in true human fossils. Treating them as if they were diagnostic of an ape-like australopithecine has led to the potential misclassification of several hominin fossils that preserve similar features. These examples demonstrate why it is so important to identify key morphological features that can be used to distinguish extinct fossil apes and true *Australopithecus* fossils from humans. The Pygmy Human Hypothesis does not assume that all hominin fossils from the Hadar Formation are pygmy humans, but rather that there are two genera present, a smaller and larger *Homo* (e.g. A.L. 288-1 and KSD-VP-1/1) and the "true" *Australopithecus* (e.g., A.L. 444-2 and A.L. 822-1), which was an extinct ape similar to extant great ape species with a bent-hip, bent-knee posture (see FM orientations in Kimbel and Rak, 2010).

Claims made about certain fossils displaying distinctly human-like bipedal morphologies are a tell-tale sign that those fossils may not belong to *Australopithecus*, and careful reexamination is warranted. Once all the distinctly human fossils that were falsely attributed to *Australopithecus* are identified and reclassified as *Homo* (not arbitrarily, but on the basis of key morphological indicators), what remains are the fossils of extinct members of the Hominidae family. Determining the "key morphological indicators" to distinguish between *Homo* and "true" *Australopithecus* is not a trivial task and should consider the total range of morphological variation observed in both modern and ancient human remains.

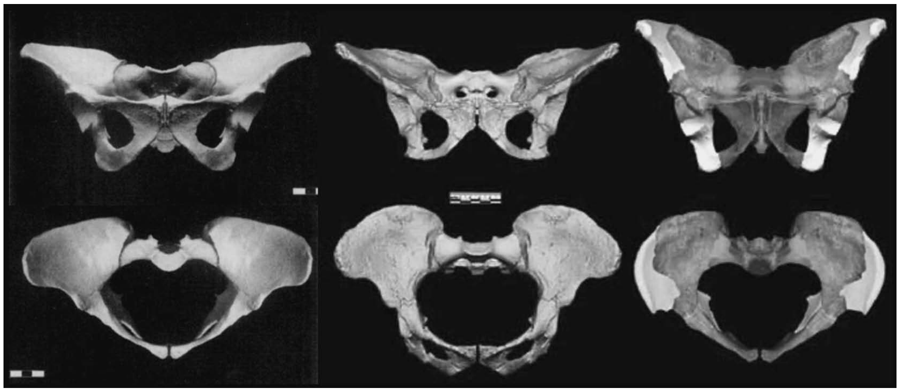

Figure 13. Examples of potentially misclassified human pelvises. Left to right: Lucy (A.L. 288-1); *Au. africanus* (STS 14); *Au. sediba* (MH 1/MH 2 composite). From: Schmid and Häusler (1995); STS 14 and MH 2 from: Kibii et al. (2011).

Funnel-Shaped Thoraxes Diagnostic of *Australopithecus*?

A funnel-shaped thorax is typically regarded by creationists as a diagnostic feature of *Australopithecus* taxa. This has led to the classification of *H. naledi* as *Australopithecus* partly on the basis of thorax shape (O'Micks, 2017). However, as noted above, humans have been shown to have funnel-shaped thoraxes (or more accurately, *barrel-shaped*), including *H. naledi* (Berger et al., 2015), Neanderthals (Tattersall, 2015), Turkana Boy (Hershkovitz et al., 2007), pathologic modern humans (Hershkovitz et al., 2007), and possibly the Hobbit (Hershkovitz, 2007; Latimer et al., 2016). Since this feature is not unique to *Australopithecus* and is found in humans, it should not be considered diagnostic of *Australopithecus* taxa.

Laterally Flaring Ilia Diagnostic of *Australopithecus*?

Lucy's laterally flaring ilia has also been used to argue she was an ape-like australopithecine (Clarey, 2018). However, several *Homo* pelvises, including Neanderthals (SH 1) (Arsuaga et al., 1999), *H. erectus* (BSN 49/P27) (Churchill and VanSickle, 2017), *H. floresiensis* (LB 1) (Henneberg et al., 2014), *H. naledi* (VanSickle et al., 2017), American Indian (Lovejoy et al., 1973), and pathologic modern humans (Hershkovitz et al., 2007) exhibit laterally flaring ilia (see Figure 5 above). Additional examples of hominin *Homo* pelvises with laterally flaring ilia have been documented (Rosenberg, 2017). Clearly, this feature is not exclusive to *Australopithecus.* It may even be argued that lateral iliac flare in humans is unique in that it is produced by sagittal rotation of the iliac blades, rather than by the flat, coronal-plane orientation typical of apes (Harrison, 1991). Consequently, *Australopithecus* pelvises with more sagittally oriented iliac flare may actually be misclassified human pelvises. Regardless, some creationists have considered this feature indicative of *Australopithecus* genera (Clarey, 2018; Tomkins, 2019). This perception has caused creationists to overlook the overall distinctly human form of these bowl-shaped pelvises.

The classification of Lucy's pelvis as *Australopithecus* has led to the potential misclassification of a series of other hominin pelvises that look similar to Lucy's—a "domino effect" if you will. Consequently, when this trait is found in other hominins such as *H. naledi* or *Au. africanus,* creationists may be inclined to conclude that those pelvises must therefore belong to *Australopithecus*. Indeed, some creationists have argued (at least in part) on the basis of flaring ilia that *H. naledi* was an australopithecine-human hodgepodge (Tomkins, 2019). This view is based on a study by VanSickle et al. (2017) who noted the degree of lateral flaring in the ilia of STS 14 (*Au. africanus*), and A.L. 288-1 (Lucy) is similar to that of *H. naledi.* Yet, it's possible that these three pelvises may share similarly flared ilia because all three are human in origin. For example, STS 14 closely resembles Lucy's, in terms of morphology and size (Johanson and Taieb, 1976). Interestingly, the co-discoverer, Robert Broom, compared the STS 14 pelvis to a pygmy human pelvis (Broom et al., 1950). He pointed out some differences in the pelvis compared to humans, yet acknowledged in terms of overall morphology it was "essentially like that of modern man." Indeed, it may therefore be another example of a misclassified human pelvis (Figure 13). Supporting this interpretation, the STS 14 pelvis was found with a human-shaped vertebral column with lumbar lordosis (Broom et al., 1950; Johanson and Edgar, 1996). This specimen was classified by paleoanthropologists as *Au. africanus* (it was considered "too old" to qualify as *Homo*), a taxonomic designation that creationists have uncritically accepted. In addition, as with Lucy, the auricular surface of the small sacrum of STS 14 articulates with the Hobbit's os coxae (Jungers et al., 2009), which is expected if both are small-bodied humans with human pelvises.

The iliac blades of *Au. sediba* are described as more derived compared to other australopiths, in that they are less flared and more vertically oriented, as in later *Homo* (Kibii et al., 2011). Perhaps, since the pelvises of *Au. sediba* are morphologically similar to humans, they should be classified as *human* (Figure 13).

If, as proposed, these pelvises, which have been classified as *Australopithecus*, are actually human in origin, this undercuts the evolutionary narrative that the australopithecines, including Lucy, were obligate bipeds with human-like pelvises, yet with ape-like skulls—an "ideal" transitional form.

Curved Fingers and Toes Diagnostic of *Australopithecus*?

Curved fingers and toes are yet another feature that has led creationists to classify human fossils as *Australopithecus*, such as those who have argued *H. naledi* is an *Australopithecus* (Mitchell, 2015). Once again, curved fingers and toes should not be considered a diagnostic trait since they can occur in humans. For example, finger bones belonging to another small-bodied human were discovered in Callao Cave on the Philippine Island of Luzon (Détroit et al., 2019). The finger bone was found together with other undisputed human bones. Like the small-statured *H. naledi*, the finger bones of the pygmy from Luzon are curved (Figure 14).

Figure 14. The upper profile of finger is curved like that of an ape, yet there can be no question it belonged to the small-bodied human, *H. luzonensis*. From: https://www.donsmaps.com/luzon.html.

The Flores "Hobbit" was also found to have curved fingers (and curved toes). The hand bones belonging to the individual LB 6 were described by Kivell (2015) as follows: "...although *H. floresiensis* has a broad pollical distal phalanx with a human-like FPL attachment, the proximal phalanges are curved to a similar degree as in *Au. afarensis*…" (Kivell, 2015). The author mentions the presence of a flexor longus pollicis (FLP) attachment at the base of the distal phalanx of the thumb. In humans, the FLP is a long muscle in the forearm that extends through the carpal tunnel as a tendon to where it attaches to the base of the thumb, which allows us to flex our thumb. Apes have a rudimentary or absent FPL muscle. The presence (or absence) of a well-developed attachment site is a more decisive taxonomic indicator than curved fingers alone. This feature is well-preserved in a thumb bone attributed to *Au. afarensis,* labeled A.L. 333-159. The researchers observe, "A distal pollical phalanx confirms the presence of a human-like flexor pollicis longus muscle in *A. afarensis.*" (Ward et al., 2012). Thus, A.L. 333-159 may represent yet another example of a misclassified human bone, which would make sense since it was found from the same "First Family" site where all the other morphologically human hand bones (Johanson, 1976; Alba et al., 2003) and morphologically human foot bones were found (Johanson, 1976; Latimer and Lovejoy, 1990; Ward et al., 2011; DeSilva et al., 2020; Rupe, 2025). Again, this is the same fossil assemblage (site A.L. 333) that Johanson originally considered to be *Homo* (Johanson, 1976; Willis, 1992). Thus, just as the potentially misclassified pelvis of Lucy can create a "domino effect" of other "misclassified" pelvises, the same can happen with the composite human hand and human foot bones that were classified as *Au. afarensis*, especially when they are found in strata that allegedly date older than the genus *Homo,* such as the Hadar Formation in Ethiopia.

Cranially Oriented Glenoid Cavities Diagnostic of *Australopithecus*?

Lucy preserves a small part of the scapula that articulates with the humerus to form the shoulder joint, known as the glenoid cavity. Paleoanthropologists study several scapular landmarks that may be used to infer the propensity for arboreal behavior. A more cranially orientated glenoid cavity is typically considered to be more ape-like, since it allows for habitual elevation of the arm, as would be used in climbing (Aiello and Dean, 1990).

The ventral/bar glenoid angle is one such feature commonly used to indicate arboreal behavior (Figure 15). Lower angles closer to 130° indicate a more cranially oriented glenoid cavity. Lucy's bar-glenoid angle measures 132.3°, compared to 134.0° in "Big Man" (KSD-VP-1/1), 137.6° in "Turkana Boy" (KNM-WT 15000), 131.6° in *Au. sediba* (MH 2), 142.3° in *H. sapiens*, 157° in the "Hobbit" (LB 6/4), 127.8° in chimps, and 130.6° in gorillas (Churchill et al., 2019). Note that the anatomical association of the MH 2 scapula with a morphologically human hand strongly suggests the scapula is also human.[2]

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[2] A fossil hand described as "hauntingly similar to that of modern humans" was attributed to *Au. sediba* (MH 2). It preserves a long relative thumb length diagnostic of human hands (Alba et al., 2003; Berger and Aronson, 2012). The distinctly human hand recovered from the limestone arm block "refits perfectly" with the scapular fragment block (Val, 2013), confirming both parts are human. Discussed in: Rupe and Sanford (2019), p. 185 and Fig. 6 on p. 188, revealing the human proportions of MH 2. See also: Rak et al. (2021), evolutionary paleoanthropologists who argue *Au. sediba* is a commixture of *Homo* and *Australopithecus* fossils.

Figure 15. Bar-glenoid scapular landmarks. From: Churchill et al. (2018).

Figure 16. The scapular fragment of A.L. 288-1 compared to an equally small-statured Amerindian's scapula with similar degree of preservation. From: Haile-Selassie et al. (2010).

A low bar-glenoid angle has been used to argue that Lucy had a more ape-like orientation of the glenoid cavity (Aiello and Dean, 1990). Even so, the bar-glenoid angle in *Au. sediba* (MH 2) is nearly the same as Lucy's; Big Man's is also close to Lucy's, which is consistent with the perspective that all three are human scapulae. Lovejoy has noted Big Man's scapula "differs very little from a modern human scapula, save the fact that its glenoid cavity (to which the humerus articulates) is slightly more angulated upward…" (Lovejoy, 2014). If Big Man's scapula is human, as the rest of the skeleton suggests (Haile-Selassie et al., 2010; Lovejoy, 2014; Ward, 2016), it logically follows that humans can have low bar-glenoid angles, too. Yet, that doesn't mean those scapulae belong to apes. In describing the bar-glenoid angle in Lucy, Haile-Selassie et al. (2010) make a fascinating observation relating to supposed scaling effects when they compared it to a small-statured human scapula:

> "The "bar–glenoid" angle has been used to orient the glenoid plane in A.L. 288–1 (29), but the specimen's small size may have had scaling effects (30, 31), an observation supported by the fact that its bar–glenoid angle can be matched exactly by comparably sized humans (SI Appendix, Fig. S21)."

These researchers are both surprised and puzzled by the small-statured American Indian's bar-glenoid angle, which perfectly matches Lucy's in her corresponding scapula fragment (Figure 16). Haile-Selassie et al. (2010) describe the striking similarity in the supplementary information of their published paper, stating: "The specimens from opposite sides have been aligned based on the orientation of their glenoid planes. Note the virtual identity of their bar-glenoid angles."

All things considered, there can be a broad range in bar-glenoid angles (and glenoid-axillary angles) in humans. Indeed, researchers have found that among smaller-sized scapulae, the bar-glenoid angle in arboreal species and humans overlaps:

> "We have found that the data scatters for the African apes and humans converge at the smaller size ranges, and Lucy's value for bar-glenoid angle is not tightly correlated with function and, as such, cannot be used as a morphological signal for arboreal behavior, especially in the smaller size ranges at which arboreal and nonarboreal species overlap" (Inouye and Shea, 1997).

The important question to consider is whether a more cranially oriented glenoid cavity can be considered a diagnostic taxonomic indicator, especially since lower angles are measured in human scapulae, such as Big Man, MH 2 (classified as *Au. sediba*), small-statured American Indian, *H. naledi*, and *H. erectus* specimens from Dmanisi, Georgia. When describing an adult scapula from Dmanisi, Lordkipanidze et al. (2007) observe: "The glenoid cavity [D4166] is more cranially oriented relative to the midaxillary border than in modern humans, and thus closer to the condition found in australopiths (Sts7 and AL288-1) and African apes."

Likewise, Feuerriegel et al. (2019) describe the glenoid cavity of a partial scapula from a small-bodied human from the Dinaledi Chamber as markedly cranially oriented:

> "The Dinaledi Chamber preserves one partial scapula, U.W. 101-1301, with bar-glenoid and axillary border/spine angles indicative of a markedly cranially-oriented glenoid fossa and very oblique scapular spine, respectively (Feuerriegel et al., 2017). This scapula configuration is similar to what is seen in *Hylobates* and *Pan*, and is inferred to reflect the habitually overhead posture of the arm in suspensory apes to assist with efficient arm elevation."

In an earlier paper, Feuerriegel et al. (2016) describe the shoulder girdle configuration of *H. naledi* as "more similar to that of *Australopithecus* and distinct from that of modern humans." It is clear from these findings that a "markedly" cranially-oriented glenoid occurs in human fossils—therefore, it should not be considered a diagnostic trait.

In summary, several traits have been used to argue that Lucy and other Hadar fossils from separate localities belong to *Au. afarensis*. Those traits include funnel-shaped (or bell-shaped) thoraxes, laterally flaring ilia, curved phalanges, long arms relative to femur length, small cranial capacity, and cranially oriented glenoid cavities. However, those traits should not be considered diagnostic of australopithecines since they have been shown to occur in human fossils.

This paper proposes that there are more reliable traits that can be used to distinguish human fossils from the true ape-like *Australopithecus* genus. Some of those features include: the overall morphology of the pelvis (discussed above); a high bicondylar angle in combination with a suite of features seen in femoral condyles (discussed above); long relative thumb length and a well-developed flexor longus pollicis attachment site at the base of the thumb (discussed above); a talocrural joint that is perpendicular to the tibia (discussed above); a rigid mid foot; transverse and longitudinal arches, and an adducted hallux, to name a few.

Conclusion

Lucy was an unprecedented find for the evolutionary paleoanthropology community. For the past 50 years of paleoanthropology investigations, Lucy has remained one of the best-preserved fossil hominins for her presumed age. Therefore, whenever new fossils are found, the corresponding elements are always compared to Lucy's. This sets the stage for a serious error if Lucy was misclassified. If Lucy's skeleton is human and it preserves key diagnostic features indicating obligate bipedalism, as in humans, yet it was misclassified as an *Australopithecus* species, all subsequent fossil discoveries that preserve similar features would be impacted.

The impact would be devastating, leading to the systematic misclassification of many fossils. If Lucy is actually a small-bodied human, then this is precisely what has happened in the field of paleoanthropology, and it has directly impacted the creation movement by creating a lot of confusion. We have unwittingly participated in the ongoing practice of misclassifying true human bones as *Australopithecus*. For example, creationists who classify Lucy's pelvis as *Australopithecus* will tend to classify other hominin pelvises that resemble Lucy's—such as *Au. africanus* (STS 14), *Au. sediba* (MH 1/MH 2), and *H. naledi*—as *Australopithecus*, even though they are all morphologically human (Figure 13). This not only creates confusion, but it also reinforces the evolutionary claim that the australopithecines exhibited human-looking postcranial anatomies that are well-suited for bipedal locomotion, making their "missing link" claims appear more credible to the general public.

Generally speaking, there are two different perspectives in the creation community. The proponents of the "Quadrupedal Ape Hypothesis" include those who insist Lucy and her kind were an extinct, knuckle-walking quadrupedal ape. This view generally accepts the *Australopithecus* taxonomic designation of Lucy and her kind, but in order to maintain their chimp-like interpretation, they downplay the bipedal features and argue that those bones belonged to quadrupedal apes. This position is easily challenged by informed evolutionists because those fossils, such as Lucy's pelvis, really do show bipedal morphologies.

In the more obvious cases of mistaken identities, the "Quadrupedal Ape Hypothesis" proponents have correctly pointed out the true human identity of fossils attributed to *Au. afarensis,* such as the "Big Man" skeleton (Line, 2010) or the fourth metatarsal found at the "First Family" site (Werner, 2007; Thomas, 2011). Yet, in other cases, non-diagnostic traits (i.e., curved fingers and toes, funnel-shaped thoraxes, laterally flaring ilia, cranially oriented glenoid cavity, small cranial capacity, etc.) and false allegations about Lucy's pelvis reconstruction being fraudulent, have led proponents of the Quadrupedal Ape Hypothesis to overlook the potentially human status of Lucy, as well as several other "misclassified" bones attributed to her kind.

The second perspective, the "Bipedal Ape Hypothesis," recognizes the bipedal traits seen in Lucy and the broader genus of *Australopithecus*. However, rather than interpreting those as human features, proponents of this hypothesis view *Au. afarensis* as a hominin species with obligate bipedal locomotion, a human-like postcranial skeleton, and distinctly ape-like skulls. In essence, they have no bones to pick with the popular museum displays of Lucy.

This paper proposes a different stance, the "Pygmy Human Hypothesis." The "Bipedal Ape Hypothesis" proponents are correct to insist Lucy's skeleton preserves human-like bipedal anatomies; however, the "Pygmy Human Hypothesis" takes this one step further—Lucy's skeleton preserves human-like bipedal anatomies *because she is human*.

The approach presented in this paper is highly reliant on identifying key morphological features that are exclusively human. For instance, rather than trying to dismiss clear bipedal anatomies, this approach uses these skeletal features as some of the best indicators to identify true human bones. A compelling case can be made that the hypodigm of *Au. afarensis* from 3-4 million years ago (according to conventional age assignments), as well as the *Australopithecus* genus more broadly, includes true human bones that were misclassified—far more than has been previously recognized. Lucy is just one of many. This supports the Biblical model of coexistence of *Homo* and *Australopithecus* far deeper into the hominin fossil record and presents major challenges to the prevailing ape-to-man evolutionary model.

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