

Upright Perception:
Parallel Inclinations in Philosophy and Biological Anthropology

Audrey Bryant

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Thesis Advisor

Dr. Alison Cool, Department of Anthropology

Committee Members

Dr. Steven Leigh, Department of Anthropology

Dr. Carol Cleland, Department of Philosophy

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“What is above for a human being accords with
the above of the whole cosmos;
for man alone among the animals is upright.”

— Aristotle, *Parts of Animals* 656a3-13

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Chapter 1: Introduction

Throughout history, there has been a constant struggle to define what it means to be human. Many even argue that the preliminary ability to question and the desire for an answer is the definition we search for. Philosophy began this questioning first in the dialectical investigation of the world around us and its relation back to us. As modern science developed, philosophy mirrored the evolutionary study of human morphology and anatomy. These parallels remain woven throughout the biological specialization of anthropology focused on human form and evolution. We understand our experience of the world through human perception, which then forms the essential foundation for any scientific study. The boundary set by humans between themselves and other animals is influenced and shaped by the human body. As the human body exists in the world, both philosophy and modern science explain its place and environment. These two fields are tied together, not only through the object of their inquiry, but also from the origin of the inquiry within the human self.

Inquiry, rooted in the physical human body, begins and acts through the mechanism of the body. In its essential form, the human body is labeled upright. This defining trait is enabled by the scientific classification in categorizing animals by their posture and movement, as seen in the work of anthropologists such as Preuschoft (2004), Stutz (2014) and Cartmill (1990), as well as other scholars like theoretical biologist Uexküll (1934), natural philosopher Aristotle (1927), and phenomenologist Erwin Straus (1952). As the human is reflexively observed by itself to be upright, the body also observes itself to be different from other animals (Straus 1966). The human is bipedal, walking on two legs with the torso and head balancing on those two legs as a column, with two limbs branching out from the torso, as claimed by biological anthropologist Lovejoy (2005). The bipedal body is the beginning of human perception of the world (Aristotle

1937a) and according to anthropologist and history of science scholar Gould (1977), the bipedal body is frequently used as a distinguishing trait for classifying humans and hominin precursors. We can tie this to the work of philosophical anthropologist Helmuth Plessner ([1928] 2019) who states that the bipedal body, as it perceives itself and the world outside itself, considers its body the line for definition and difference. Definition and difference are integral ideas to scientific investigation, and through the foundation of bipedalism, we see the influence that self-definition has had in biological anthropology.

Historically, numerous philosophical writings center around the postural quality of human anatomy (Gould 1977; Gregorić 2005; Lennox 1999; Straus 1966). Upright posture has long been a focal point of anthropological efforts to understand human intelligence and cognitive development (Gould 1977). Anthropologists have attempted to define the transition to and the nature of modern human cognitive ability in relation to humans' particular anatomy (Brooke 2014; Gould 1977; Musitelli 2014). Some scholars have suggested that humans appear to instinctively connect their upright posture to the unique intelligence of their species (Gould 1977; Straus 1952). This connection between upright posture and human distinction and intelligence can be seen in influential philosophical scholarship spanning across centuries, from Aristotle's (2000, 1937) zoological philosophy to Friedrich Engels' ([1883] 1925) analysis of the anatomical basis of society and labor (Gregorić 2005; Weikart 1998). My thesis will suggest that the philosophical emphasis on upright posture has informed scholarly understandings of human distinctiveness from early natural science to contemporary biological anthropology (Gould 1977; Lambek 2011; Vaughan 2001).

Paleoanthropology, the scientific study of human origins with fossil remains, stemmed from the work of theorists and early biologists like Charles Darwin and Ernst Haeckel (Gould

1977). After the turn of the twentieth century, paleoanthropology became an increasingly influential scientific discipline. Longstanding questions about the origins of human intelligence and anatomy could be answered by paleoanthropologists with their theories about the hominin family tree and the evolution of *Homo sapiens* (Trinkaus 2018). Later developments included previously unknown ancestors that were found with different markers of hypothetical bipedal morphology, offering evidence to support theories of the role of upright posture in the development of humans' intelligent and social nature (Ko 2015). The discovery and analysis of the well-known and influential "Lucy," the partial skeleton of an *Australopithecus afarensis* in 1974, was a large step forward for the academic community and popular understandings of human origins (Johanson 2004). Lucy's notable features were a mix of bipedal locomotion indicators alongside more primitive or non-hominin anatomy (Johanson 2004; Trinkaus 2018). Since the discovery of Lucy, other species in *Australopithecus* and *Homo* have shown striking evidence for the development of bipedal posture and movement, alongside theorized different markers of the development of social intellect and complex, abstract thought (Crompton et al. 2010; DeSilva et al. 2019; Lovejoy 2009; White et al. 2015).

Philosophical thinking developed in tandem with these anthropological discoveries (Gould 1977; Irika and Sakura 2008; Straus 1952). The contemporaneous growth of science and philosophy has informed the historical development of anthropological thought (Court 2020; Lambek 2011). Because of the apparent conflict between objective and subjective inquiry, this historical connection between science and philosophy—as well as its impact on the formation of the discipline of anthropology—has often been overlooked. As I argue in this thesis, an interdisciplinary perspective offers the most promising route to understanding the complex constitution of the human (Desjarlais and Throop 2011; Tesar 2021).

Natural philosophical thought began with the problem of identification and the following need for classification (Aristotle 1937a; Cartmill 2018; Mayr 1982; Tesar 2021). The need to record differences and find reliable similarities to enable the work of contrast, became known as the practice of definition. For Aristotle and other scientific philosophers, definition was an essential step to making any claim or statement about the surrounding world, or even one's self (Aristotle 1937a; Lennox 1999). In philosophical investigation, humans began trying to define the external world (Tesar 2021). In science, classification has similar importance as it does in philosophy. Classification is a concept integral to understanding the foundations of Aristotle's philosophy, and the following centuries of scientific thought (Gregorić 2005; Lennox 1999; Mouracade 2013).

One of the recurring themes in the history of philosophy and anthropology is the questioning of transitions in human cognitive development. The ongoing occurrence of this strange intelligence in humans has been recorded in innumerable scholarship across various eras of organized thought. Questioning of human cognitive distinction and differentiating the unique human quality of upright posture have been consistent themes in this investigation (Gould 1977; de Sousa and Cunha 2012; Iriki and Sakura 2008; Straus 1952).

In biological anthropology, the evolution of culture and human cognition is a difficult and controversial field. I propose that a better understanding of the evolution of culture and human cognition might be reached with the recognition of the connection between philosophical narratives about human perception and biological understandings of the development of the human physical form. The distinction between animals and humans is a consistent theme throughout philosophy and biological sciences. By better understanding the patterns of animal/human distinctions in philosophy and science, we might also advance anthropological

theories of human evolution and distinction (Cartmill 1990; Iriki and Sakura 2008). I suggest that an investigation of how philosophy has directly informed the development of contemporary biological principles can help us to create a more accurate and better definition of the human.

The following chapters of my thesis recreate the levels of the human body as understood and separated by patterns in grouping of analyses in philosophy and biological anthropology. This represents how parallels in these fields come together to present the body as a whole. By identifying these parallels, I propose a possible future path for the field of biological anthropology, one that considers the hidden influences of human perspective as explored in philosophy and addresses them through valuing possible philosophical additions and theory to the field.

For the first chapter, I address the beginning of bipedalism and its acquisition. To understand the nature of bipedalism, we must investigate its origins. Both anthropological theories on the development of bipedalism in early hominins and philosophical theses on humans becoming upright show this importance for the human understanding of self and how the sciences are formed by this understanding. Anthropologists Hunt (1996) and Lovejoy (2009) have posited how fossil evidence supports particular theories of hominin bipedal acquisition. Comparative analysis of these theories alongside philosophical ideas of the human beginning to stand upright show similarities in foundational principles.

The next chapter covers how this bipedalism, once it began, was embodied by humans through their upright movement. This inhabitation shows intentional bipedal movement then enabled by the human understanding of self. The purpose of movement, as shown in both anthropological and philosophical fields of inquiry, is based on the human identifying themselves as the center of their understanding and the world around them and then moving from

that center with an intention to do so. This intention stems directly from the constitution of that center. Through analyzing the theories of natural philosopher Aristotle (1927c) and anthropological philosopher Helmuth Plessner ([1928] 2019), we see the human center of self must enable bipedal movement through an explicit desire to be bipedal and move around in that specific form.

Branching out from the center of self, the human arms and hands are integral to the importance of bipedalism in philosophy and biological anthropology. Aristotle (1927a) values the hand and its associated abilities as an important and distinguishing part in the human body. This sets the tone for later philosopher Friedrich Engels ([1883] 1925) to connect bipedally enabled and freed hands to human labor, which he identifies and values as incredibly important to human advanced development. Phenomenologist Erwin Straus (1952) also places emphasis on the human hand and its role within the importance of upright posture. These philosophers' ideas parallel the various anthropological ideas of how tool use and fine motor control that followed the human hand morphology are integral to contemporary human cognitive development (Gould 1977; Kivell et al. 2016; Pennock 2013; Richmond et al. 2016).

Human cognitive development is an important factor of human individuality as identified by numerous scholars in both philosophy and biological anthropology. As we see in Aristotle (1937) and Straus (1952), rational human thought is a direct result of the specific orientation of the human bipedal body in relation to the orientation then of the earth and surrounding cosmos. Straus (1952) also remarks on the importance of human cognition in understanding the bipedal human body. The intellect of humans is a difficult concept to rationally approach, because of the biases inherent in the starting point of this inquiry, the human intellect itself. Through this parsing of the human body and its subsequent perception in the sciences and philosophy, I

propose a path forward in anthropology for establishing better theory—theory that better encapsulates and recognizes the flaws of the human origin of the field.

Chapter 2: First Steps and Acquisition of Bipedalism

Human upright posture followed from early hominins first acquiring obligate bipedalism. There are many different theories that have been proposed to explain this phenomenon, but most center around either mechanical or resource-based necessities or advantages. This emphasis on advantage is also found in philosophical theories. In philosophy the acquisition of bipedalism or upright posture has been connected to human labor, community and social developments, moral aptitude, and even the wrath and jealousy of the gods (Aristotle 1937, Engels [1883] 1925, Gregorić 2005, Gould 1977, Straus 1952). In both science and philosophy, theories have pointed towards a cause shaped by necessity.

Though the differences between scientific and philosophical perspectives on the human are apparent, they also have much in common (Iriki and Sakura 2008). The necessity of upright posture, regardless of why it is deemed necessary, is the underlying and key principle of many hypotheses. Bipedalism is natural and pivotal for the human; it is something that came about and was acquired because of what or who the human being is (Aristotle 1937b; Pennock 2013). Aristotle remarks on the behavior of “Nature” throughout his biological works, stating repeatedly that Nature always acts with a purpose and intention (Aristotle 1937; Lennox 1999). Many of the scientists and philosophers who have investigated bipedalism have been influenced by this idea, even though contemporary notions of evolution and development hold there is no magical guide or purpose to evolution and development. Even so, the apparent necessity of upright posture has been a foundational problem in the investigation of bipedal development.

Mechanically focused notions of bipedal acquisition have centered around understanding the similarities and differences between human and non-human primates’ locomotion (Crompton et al. 2010; Pennock 2013). Non-human primates can be divided into two large groups of either

terrestrial locomotors or arboreal locomotors. Comparative analysis of non-human primates, either terrestrial or arboreal, shows similarities between human bipedal locomotion and arboreal primates' occasional bipedalism (Kimura 2019; Ko 2015; Pennock 2013). Because of this, bipedalism is theorized to have originated alongside primary arboreal locomotion.

Anthropologist Kimura (2019) states, “when humans began terrestrial locomotion, they likely performed proficient bipedalism from the first step” (1). According to Kimura (2019), arboreal primates have robust hindlimbs and strong hindlimb dominance. This has similarity to humans' reliance on hindlimbs in upright posture. The mechanical and metabolic efficiency of human erect walking outperforms that of non-human primates, though arboreal primates experience significantly less of a loss of energy compared to terrestrial primates when walking bipedally (Kimura 2019; Pennock 2013). The locomotion of extant non-human primates has led biological anthropologists to believe hominins developed bipedalism as they descended from the trees, beginning sole bipedalism purposefully and fluently, having already adapted the necessary physiology while arboreal (Kimura 2019; Ko 2015; Pennock 2013).

There are numerous different models theorizing the transition to upright locomotion in biological anthropology (Kimura 2019; Vaughan 2003). The terrestrial model points out the scarcity of bipedalism in extant terrestrial primates, linking the current terrestrial bipedalism of humans to the lack thereof in other terrestrial primates (Kimura 2019; Ko 2015). There is also the savanna-based theory, which posits terrestrial primates living in a savanna environment would have developed bipedalism gradually (Kimura 2019; Ko 2015), without the immediate familiarity with uprightness that arboreal primates would have had (Kimura 2019). Because of the significant differences between human bipedalism and the extremely limited bipedalism of extant terrestrial primates due to necessary morphological constraints, as Kimura (2019) states,

“human bipedal acquisition is therefore difficult to establish from terrestrial quadrupedalism”

(6). If this is the case, we can then conclude that bipedalism stemmed from arboreal locomotion, not terrestrial.

Other mechanical models of primate locomotion, such as the “knuckle-walking model” (Richmond and Strait 2000), do not successfully compare to human bipedalism or the preliminary hominin transition to bipedalism (Crompton et al. 2010; Kimura 2019; White et al. 2015). Anatomically, knuckle-walking primates simply have different morphological features (Crompton et al. 2010), for example, opposite limb lengths to bipedal humans (Erikson 1963; Kimura 2019). Likewise, because of anatomical constraints, other models of primate locomotion do not fit into in the timeline of bipedal development (Crompton et al. 2010; Kimura 2019; Ko 2015).

Generalized arboreal activity is determined by many biological anthropologists to be the most likely adaptation pre-bipedalism (Kimura 2019). Though the topic is controversial and frequently debated, the general arboreal lineage for upright posture is mostly agreeable (Crompton et al. 2010). Various morphological traits have been linked to pre-habitual bipedal walking necessary to the eventual singular bipedal movement. When traveling through the trees, brachiating primates rely on highly developed visual systems necessary for safety like “stereoscopic vision, depth perception, and distance judgement” (Crompton et al. 2010; DeSilva et al. 2019; Kimura 2019; Pennock 2013). Humans maintain many of these morphological features today (Crompton et al. 2010; Gruss and Schmitt 2015; Pennock 2013), allowing biological anthropologists further analysis on the possible precursors to modern humans (Crompton et al. 2010; Kimura 2019; Pennock 2013). Arboreal adaptations are foundational to

human morphology and the eventual transition to bipedalism (Crompton et al. 2010; Kimura 2019; Lovejoy 2009; Pennock 2013; White et al. 2015).

Before hominins walked upright, the physiological requirements must have already been developed. The generalized arboreal activity model theorizes the similarities in various adaptations resulting from occasional upright walking and arboreal locomotion (Kimura 2019). Though this connection is important in understanding possible precursors to bipedal movement, it is not the sole catalyst for bipedalism (Crompton et al. 2010; Kimura 2019). This shows the variability of possible preliminary adaptations even contained to mechanical necessities (Crompton et al. 2010). General arboreal locomotion would provide a starting point for bipedalism by allowing the development of essential morphological features and the ease of starting to walk on the ground while latching on to the crutches of the trees (Crompton et al. 2010; Hunt 1996; Kimura 2019). This includes the postural feeding hypothesis that claims bipedal traits arose based on temporary upright positions assumed for food collection and consumption (Hunt 1996; Kimura 2019). For example, standing on a branch to reach out and collect fruit from another branch (Hunt 1996; Kimura 2019, Pennock 2013). Bipedal morphology must have developed before bipedal locomotion became obligate.

Other theories focus not on the mechanical components of bipedal development, but rather the possible survival advantages secured by bipedalism. The provisioning model proposed by Lovejoy (1988) posits that bipedal locomotion freed hand use for increased food collection ability and more effective partnership with others. Bipedalism proves a distinct advantage when carrying food with the two hands freed by standing upright (Crompton et al. 2010; Ko 2015; Lovejoy 1988). This enabled pair bonding between an infant-raising mother and a provisioning father, and social groups were able to form as competition for mates decreased due to resource-

motivated monogamy (Ko 2015; Lovejoy 1988). Lovejoy (1988) and Ko (2015) theorize this to be a proper interpretation of the reduced sexual dimorphism, a pro-social morphological trait, seen throughout the hominin fossil record. Bipedalism not only stemmed from mechanical factors, but also the advantages of improved social structure and easier resource access.

As biological anthropology investigates the beginnings of bipedalism, philosophy does as well. In philosophy, upright posture is what could also be considered a pro-social morphological trait (Engels [1883] 1925; Ko 2015; Straus 1952). It has enabled the development of numerous behaviors and structures that define human life as it has been for as far back as there is record (Engels [1883] 1925; Gould 1977; Straus 1952).

Phenomenologist Erwin Straus was one of the first contemporary scientists to connect upright posture in science to a greater philosophical understanding of human studies. With his particular use of phenomenological studies in psychiatry, he brought philosophy together with scientific investigation to widen his field into valuing individual human experience (Brooke 2014; Chessick 1999; Wagner 1989). As Straus describes in *Phenomenological Psychology*, the standing upright of a child as they grow and learn about the world can be understood in certain terms as a mirror reflecting the standing upright of hominins and eventual *Homo sapiens* (1966). Humans are familiar with the beginnings of existence in two manners (Brooke 2014; Straus 1952), first, the beginning of our species seen in developing hominins (Gould 1977) and second, the beginning of an individual's existence in the development of a human newborn to adulthood (Aristotle 1937; Straus 1952). Whether humans came down from the trees and placed our feet on the ground with our hands still clasped to branches or if we pushed ourselves gradually off the ground like a human infant beginning to stand upright, philosophical inquiry emphasizes these

beginning steps in human self-distinction (Aristotle 1937; Gould 1977; Engels [1883] 1925; Straus 1952).

In the first section of his essay *Upright Posture*, Straus investigates the emotional surroundings of the developing human posture, particularly as seen in modern human children growing up (1952). He establishes a theory of human determination and strength being integral to the essential existence of upright posture and how it is possible. No actual physics, mathematical, or geometrical principles apply here, but the conceptual space a human being occupies, and the magnitudes that exist within, is the foundation for his investigation into upright posture. Straus (1952) believes human determination seen in the growing child mirrors the hominin acquisition of upright posture.

Straus (1952) then remarks on the late development of uprightness in human children as they must learn to walk and stand as they grow. It is a struggle: “man has to become what he is” (1952, 534) Straus says, and this ‘becoming’ is one that requires purposeful, forceful opposition to the existing world and nature, namely gravity (1952). “It seems to be his nature to oppose, with natural means, nature,” (1952, 535) he says, pointing again to the character of upright posture and the strain one must voluntarily commit themselves to be upright. In upright posture, there must be a purposeful and voluntary commitment to be upright since it is a struggle that takes effort and strength.

In the philosophical understanding of our upright beginnings, theorists claim the origin to be found in the nature and being of humans (Aristotle 1937a; Gregorić 2005; Lennox 1999; Straus 1952). First steps are seen as an accomplishment in the undertaking of a difficult task and a commitment to the continuation of this upright posture for an untold future time (Straus 1966). This voluntary submission to a difficult task is proof humans are capable of great strength to

endure such a struggle (Aristotle 1937; Straus 1952). Philosophers believe humans to undertake the difficult, but due to our unique prowess and self-reflective abilities, we understand our endeavors to have value and stay the course (Aristotle 1937a; Gould 1977; Lennox 1999; Plessner [1928] 2019; Straus 1952). The philosophical beginning of upright posture connects the difficulty of being and remaining upright to a truth about human nature.

If we are to attempt to understand scientific analyses of human bipedalism alongside these philosophical narratives, we must be careful not to associate statements on the truth of human nature with scientific theories of human development. However, there still are patterns and similarities that if recognized, could further the growth of each field of questioning.

Classifications of primates have varied in accordance with scientific paradigm shifts, but in general, have often relied upon certain morphological traits for classification (Cartmill 2018; Guy et al. 2003). These morphological traits have been tied to certain behaviors, leading to the classification of groups because of differences in locomotion patterns, preferred community structures, and others (Crompton et al. 2010; Guy et al. 2003). For hominin classification, the physiological steps towards the modern human and its behavior are identified as markers of these behavioral traits (Kelley and Schwartz 2012; McHenry and Coffing 2000; Kimura 2019; Pennock 2013). Remains found with markers of both arboreal and bipedal locomotion in the morphology of the skeletal remains, like seen in *Ardipithecus ramidus* with the pairing of an opposable hallux and a shorter pelvis among other signs of both types of locomotion (Lovejoy 2009; White et al. 2009), are significant developments for the field. It presents opportune information on a possible step towards later hominins and humans (Prang et al. 2021; White et al. 2015). Hominin remains are significant because of physiological traits indicating specific

behavioral steps along the path towards modern humans (Johanson 2004; Lovejoy 2009; Prang et al. 2021; White et al. 2015).

If we were to look at our bipedal qualities solely with the understanding that bipedalism is what makes us different from other animals correlating directly with our self-described advanced and complex cognitive abilities, than how do we approach understanding the cognition of a being with both bipedal and arboreal capabilities? Can we understand the cognition of hominins through bipedal markers?

Many like to think, whether scientifically or not, that the further along a developmental timeline an organism is, the better and more advanced that organism is. When an evolved being is exposed to frequent environmental changes and opportunities to grow, it is not necessarily progression objectively labeled as better or worse. When we look at general changes from *A. ramidus* to the modern human (Lovejoy 2009), there is a temptation to think the development away from arboreal locomotion specialization was somehow beneficial or a "correct" choice for increased survival or quality of life. Forward development is not always good, and in assessing the hominin timeline, we should be careful to not heighten ourselves over others because we are the furthest on the timeline so far.

In Diogenes' well-known colloquial rebuke of Plato's statements on bipedalism being the significant difference between humans and other animals, Diogenes proclaims a plucked chicken a man (Laërtius 1972). Though humorous, the story highlights an important truth in the distinction of man. Many markers of higher or complex cognition in humans can be identified in some shape or form in other animals, including bipedalism (Bentley-Condit and Smith 2010; Cartmill 1990). Tool use has been witnessed not only in other primates but also in other groups like octopi and many different birds (Bentley-Condit Smith 2010; Finn et al. 2009). Dogs and

horses, under the instruction of humans, have demonstrated the ability to use language containing abstract ideas to communicate (Cartmill 1990). Bipedalism has also been identified in different species throughout time, like in birds (Aristotle 1937b) and even the recently found extinct bipedal crocodylomorphs (Kim et al. 2020). Markers we label as uniquely human are often not. The acquisition of human bipedalism is an important focus of anthropological studies, but even in these studies, non-human primates are used as comparisons to assess different theoretical models (Pennock 2013). Even as we try to identify humans as distinct based on specific qualities, it often proves fruitless. For the origination of bipedalism, philosophy points towards a determined intention behind standing and remaining upright as a human (Aristotle 1937c; Engels [1883] 1925; Straus 1952). Scientific analyses of this origin claim necessity, whether mechanically, socially, or resource based, to be the cause for the push towards immediate bipedalism (Crompton et al. 2010; DeSilva et al. 2019; Gruss and Schmitt 2015; Kimura 2019; Ko 2015; Lovejoy 2009; Pennock 2013; Vaughan 2003). In both cases, I argue there is a foundational principle of intention and preparation, either physically in physiology or mentally in determination, for humans to have upright posture.

Chapter 3: Purposeful Movement and the Center of the Self

Through the upright self, the human experiences the world around them through their bodily perception and awareness. Their body forms the center of this organized world and the movement that then stems from that body. Humans first stood upright as their bodies were oriented in relation to the potential of movement around their bodies (Aristotle 1937a; Straus 1952). In anthropological inquiry, the possible movement of the bipedal body is theorized to have enabled certain developments necessary for human evolution (Gould 1977; Vaughan 2003). In various natural philosophies regarding the theory of bodily movement and the center of self, the upright body is the beginning of self-perception and purposeful movement (Aristotle 1937; Hume 1896; Plessner [1928] 2019).

In Aristotle's (1937b) theory of movement, the human has potentiality and actuality. The potentiality of the human body is the possibility of movement and the actuality is fulfilled by the soul enabling the human body to move (Aristotle 1937b). The foundation of this theory of movement relies on the existence of an immovable object from which to push off to move (Aristotle 1937b). This immovable origin is the prime mover, the origination of all movement (Aristotle 1937b). In the human body the prime mover is the beginning and intent of motion, which then all movement of the body originates from (Aristotle 1937b). As humans are bipedal, I argue the movability of their bodies is reliant on a prime mover inherently linked to and defined by the bipedal form. As the human body moves bipedally, the purpose and intention behind this movement is both defined and fulfilled by the bipedal nature of the body moving. The actuality contained in the self of the human must have the bipedal intention for the body to enact this bipedality. In the Aristotelian understanding of why and how humans move bipedally, the center of self contains the purpose and intent for bipedal movement (Aristotle 1937b). This

understanding is one of the first theories regarding human movement. Aristotle (1937b) lays the foundation for further investigation into bipedal movement (Lennox 1999).

In scientific questioning, the purposeful bipedal movement is referenced through different theories stemming from morphological traits and patterns as previously discussed in the preceding chapter. As mentioned by Kimura (2019), necessary bipedal morphology must have been in place before bipedal movement was fully adopted by hominins. When bipedal movement developed, hominins began upright walking as soon as they left their previous arboreal habitat (Crompton et al. 2010; Kimura 2019; Ko 2015). The specific intention behind this change, in terms of exact survival or environmental motivations, is unknown and perhaps impossible to know. However, we can understand this motivation at an essential level as the desire to be upright and the choice to interact and struggle with this upright purpose with their whole body (Straus 1952). Given the purpose of the human fulfilled by the body, we understand upright posture to be a manifestation of the human intention to be upright.

While the human being is shaped by its bipedal form, it also contains bipedal intention and purpose as posited by philosophical anthropologist Helmuth Plessner ([1928] 2019). In *Levels of Organic Life and the Human*, Plessner ([1928] 2019) defines the difference between animals and humans as the manner of the relation between the body and self. Animals are limited to experiencing their body only within the present and are unable to reflect onto their inner or center of -self outside the exact moment they inhabit. In contrast, humans can reflect on their center within their body, not limited in their form to only experiencing current inhabitations and situations. The human is set apart from their body in the distance between their physical self and their center of self, with this distance enabling the self to look back upon it and reflect. This distance is not an exact magnitude contained within the physical construction of the human body.

Rather, the distance is defined as the ability of humans to think outside these physical magnitudes and comprehend distances not explicitly realized in their physical environment (Plessner [1928] 2019). Alongside Aristotle's (1937b) theory of the human prime mover, in which the human body moves by the intention of this center of self, we can understand the human's desire and purpose of being upright as enabled by their reflexive nature and separation of body from their being's center. Within this center is the desire and purpose to be and move upright and by this center the body moves. In Plessner's ([1928] 2019) theory of human and animal organization, the center of self enables self-reflexivity. Alongside Aristotle's (1937) theory of movement, we know then the center of self not only enables self-reflexivity, but also bipedal intention.

Plessner ([1928] 2019) believes the center of the human self is different from the center of another, non-human animal, because of the ability and choice of self-reflection. The centricity of the human, the sphere of the human, circles around the body in its entire bipedal form (Plessner [1928] 2019). The center is where this movement begins. In his *On the Gait of Animals*, Aristotle (2000) describes the rational mechanism of movement from this center,

When then one leg is advanced it becomes the hypotenuse of a right-angled triangle. Its square then is equal to the square on the other side together with the square on the base. As the legs then are equal, the one at rest must bend either at the knee... (Aristotle 2000, 9)

This demonstration shows the mathematical foundation for movement. Human movement relies on mechanical reason, a certain instinctual understanding that enables our movement. The balance of bipedalism is a difficult and straining task (Pennock 2013, Straus 1952). As the leg moves from the prime mover, the center in the torso and joints, it determines to undertake an instinctual but complex mathematical action. Though humans and animals move alike in terms of

joints in a physical sense, the movement of the upright body is a particularly difficult task because of the necessary balance and composure it must maintain. As Aristotle (2000) describes the mathematics that set up the motion of the legs, he establishes a theoretical requirement for participation in the strange human bipedal movement. Through the proof set up by Aristotle regarding the geometrical relationship between prime mover and the moved, we see an early theory on the difficulty of and necessary balance required in bipedalism.

Walking upright on two legs is not only harder in terms of balance, but also more advanced theoretically in the ways we experience the self, according to Straus (1952). The self relies on composure and relation to the center in its form to maintain physical and sensible composure. Straus (1952) explains that the two definitions of the word “upright” demonstrate the connection between physical and sensible composure: “the term ‘to be upright’ has two connotations: to rise, to get up, and to stand on one’s own feet; and the moral implication, not to stoop to anything, to be honest and just, to be true. . .to stand by one’s convictions, and to act accordingly” (Straus 1952, 530). Both these concepts are contained in the human body in its upright posture: the possibility and desire to be upright physically and in character. In the reflexive distance between the body and being, there is a requirement for balance. As movement in the human body originates in the center of self and relies on the prime mover this origin must be first balanced as well. Aristotle (1937b, 1937c) describes movement of the human body stemming from the soul or place of reason, and our reason understands this movement potential in our body to actualize it (1937b, 1937c). The human is both upright and balanced in physical and personal composure.

“The things which move the animal are intellect, imagination, purpose, wish and appetite” (Aristotle 1937c, 459), and so movement is originated in “the object of pursuit or

avoidance in the sphere of action” (Aristotle 1937c, 467). Movement is not only the result of an immovable origin point, it requires the desire and intention of movement for the origin point to result in motion. In studying the human journey towards upright posture, “it is essential to realize from the start that wanting to stand is also being able to stand” (Buytendijk 1974, 228–230 as cited in Dekkers 1999, 120). The desire to walk upright must be accompanied by the actual ability to walk upright, and here we again see the interconnectedness of the human prime mover with the movement and posture of the body. One is impossible to understand, or even exist, without the other, so we must study them together. The human body has both the prime mover and the body, and by this, the intention for bipedalism and actualized bipedality.

As the human body and being relate to each other, within the upright posture and form, the external environment remains influential. The entire human self will always exist in an external environment, and this environment maintains the definition of upright posture (Aristotle 1937b, 1937c; Lennox 1999, Plessner [1928] 2019). The human body cannot be defined as upright if not in an environment it can reflect on to define itself. As Plessner says of the human, “it stands at the center of its standing” (302), and it cannot stand without its placement in the world. The human stands in this external environment at the origination point for itself. I argue human thought conceptualizes the universe and world as forming around the human. As we relate to the world around us, we relate the world to our own body (Dekkers 1999; Plessner [1928] 2019; Straus 1952). Early Astronomer Ptolemy recognized this phenomenon as a necessary flaw in human scientific inquiry, particularly in how humans’ place on Earth will always skew their interpretation of the skies and that outside of the Earth (Ptolemy 1984). As Hume discusses in his *Treatise on Human Nature*, the human body is the only place we will receive our perceptions of the outside world (Hume 1896; Tesar 2021). Perception is an intimate

part of inhabiting our own individual bodies (Hume 1896). As one is within their human body, they are contained in a sphere that is defined by the boundary between itself and outside (Aristotle 1937c; Plessner [1928] 2019). The human perceives the world through its body as its center of understanding and experience.

As the human is understood to be apart from the natural environment, Straus (1952) defines them then to be of opposition or resistance to their habitat. This boundary of resistance mirrors the human reflexive self and distance between the body and center. Straus states that “the natural stance of man is ‘resistance’” (Straus 1952, 536). The human stance, even its own natural form, resists the outside natural form of its environment. When humans stand, Straus (1952) theorizes them to resist the ground. When they look around at the world around them, they resist their perceptions of the now through the ability of reflection (Straus 1952). As they stand and reflect, they resist all other beings around them by inhabiting an internal world where judgement and reason is possible (Straus 1952). The motion of walking is a repetition of pushing away, of resistance. When humans walk, they resist the anchor of staying still and they move forward, as Straus (1952) understands to then further enable their reflexive nature by using the concept of past and future in physical action. The human bipedal form is connected by Straus (1952) to the philosophical place of the human in the world through which it understands and functions.

This concept is important not only in philosophy, but also the biological understanding of the human self within locomotion. As the human moves with intention as defined in philosophy, so must human movement be investigated in scientific inquiry as posited by philosophical anthropologist Wim Dekkers (1999), pointing to the examples of Straus (1952) and Plessner ([1928] 2019). How bipedalism fits in the scientific investigation of humans highlights similarities and differences between the two fields. Philosophy classifies the human body by its

upright posture, requiring a body with intention and purpose to define and consider the world around and within them (Aristotle 1937; Dekkers 1999; Plessner [1928] 2019; Straus 1952).

Scientific investigations use different methods and claim objective intentions, but philosophical principles remain its unobserved foundation (Cartmill 1990; Dekkers 1999; Gould 1977; Mayr 1982; Wagner 1989).

Upright posture changed the movement of hominins from relying on other structures like trees or grasses to becoming actualized in their individuality. No longer restrained by environmental regulations for movement, hominins began to move towards increased generalist ability in adaptation and fitting within a highly flexible niche connected to the integral cognitive development according to biological anthropologist Stutz (2014). I posit that the environmental change to self-reliance as a bipedal being is a step toward the modern human mechanism of motion.

The postural feeding hypothesis can be interpreted to connect this principle with biological anthropology theories (Hunt 1996). When humans began to move around upright, their hands were free to move about and assess their environment through tactile perceptions. The ability to hold an object apart from the body is foundational for the distance created between the center of self and the external object of focus. As Plessner ([1928] 2019) theorized, this distance enables reflexivity towards the self, the form of unique human self-perception that judges the objects and external environment one gauges by the distance between the held and the self. This distance also enables the theoretical mechanism behind the collection and holding of provisional gathering. Moving about and collecting objects and food items known and identified to be positive for survival necessitates a preliminary judgement and analysis of particular objects, or the ability to make similar judgements in the moment with awareness of possibilities and

events happening outside of the direct moment (Kivell et al 2016; Uomini and Meyer 2013). By moving about freely and collecting objects like food and possible tools, cognitive development surrounding object assessment and collection was enabled through bipedalism. In analyzing Plessner's ([1928] 2019) theories alongside the postural feeding hypothesis, there are parallels shown in the foundational assumptions and perceptions stemming from a postural bias.

This free movement that coexists with the theoretical qualities of the human defined by philosophy can be seen in other movement theories in biological anthropology, like Bramble and Lieberman's (2004) endurance running hypothesis. With the upright stance, humans gained a certain amount of freedom in movement (Aristotle 1937b, 1937c; Straus 1952). As one walks, with one leg pushing the ground out from beneath to move forward, either directionally or relatively. With the endurance running hypothesis, human movement is centered around long-distance movement different from most other land animals that remain within certain areas. This hypothesis was significant to the field at its time of publication (Crompton et al. 2010). Because of the anthropological focus on investigating the purpose behind bipedalism, this paper seemed to answer long unknown questions. Though the hypothesis has now been replaced by numerous others over the past two decades, the patterns of the human bipedal investigation are still present. In the theory, we see the bipedal hominin embody a symbolic freedom from being contained to one specific area or habitat, which is a necessary principle in the philosophical idea of how the human developed. The development of the endurance running hypothesis shows human curiosity for labeling hominins as having a unique purpose in upright movement.

Both aforementioned hypotheses rely on the foundational principle of bipedal locomotion, benefitting resource access, and promoting other evolutionary patterns like increased

social behavior and metabolic preparedness for proportionally larger brain sizes (Crompton et al. 2010; Kimura 2019).

Similar to Straus' (1952) hypothesis that upright posture is an integral part of the relationship between the self and others, anthropologists have theorized that bipedality increased pro-social behaviors and characteristics that greatly improved conditions for the development of human physiology and cognitive ability (Ko 2015; Lovejoy 2009). Engels ([1883] 1925) also spoke of this in his theory on "The Part that Labour Played in the Transition from Ape to Man," positing that through bipedalism and the associated ability of freed hands to use tools, humans were able to develop labor and organized communities to further benefit their greater evolution (Weikart 1998).

Both philosophers and scientists believe bipedalism is integral to the particular social and relational quality of humans. Investigations within both fields into the intention and purpose behind human movement show the importance of valuing both fields and their respective perspectives.

Chapter 4: The Branches of the Body as Arms and the Leaves as Hands

The unique and particular structure of the human hand is important in investigations into human posture and the whole of the bipedal body. The morphology of the human hand is a consistent object of questioning not only in biological anthropology, but also in the study of philosophy and other similar narratives of the human experience (Gould 1977; Dekkers 1999; Straus 1952)). The hand is tied to multiple notable behaviors of humans, including but not limited to: measurement, foraging, climbing, tool use, weapons, and creative efforts (Aristotle 1937; Engels [1883] 1925; Straus 1952; Richmond et al. 2016). Engels believed that when the human hand was freed by upright posture, it enabled labor to become a community and social catalyst ([1883] 1925). The development of societies, he claims, is due to the freed hand enabling labor which then brings people together to form labor-based communities (Engels [1883] 1925). Straus (1952) discusses the importance of the hand in the context of societal development similar to Engels ([1883] 1925), but also in regards to human posture and the correlated human growth.

The evolution of the human hand was driven by an increase in tool use alongside a decrease in locomotion use. As cited in Richmond et al. (2016), "Marzke (1997) argues that what makes human dexterity unique is the ability to firmly pinch objects, and precisely handle objects, with one hand" (519). The value of the human hand in daily life is immeasurable. The human body balances to hold something with one hand and functions in its daily life through this process and effort. This shows the influence of the whole of upright posture, as shown in Straus' (1952) position on the coordination of upright posture and the use of the hand. Many other researchers come to a similar conclusion (Crompton et al. 2010; Kivell et al. 2016; Marzke 1997; Prang et al. 2021; Richmond et al. 2016.) The part of the human hand in bipedal anatomy is

essential. Though the body stands upright on the foundation of its two legs, it also then frees half of its body for other potential uses.

In arboreal locomotion however, the hand grasps and pushes off branches and trees, facilitating the entire ability of movement from its beginning. As hominins began terrestrial bipedalism, leaving the trees behind, they kept the strong and developed forelimb and hands of arboreal locomotors (Crompton et al. 2010; Pennock 2013). Hominins did not stand up from the ground, lifting their hands up and moving them around us to eventually start figuring out tool use. Rather, the existing morphology enabled the specific movement of the hands to stretch out and about and around, using them to support weight from above before stepping on the ground with two feet (Crompton et al. 2010; Pennock 2013). In the generalized arboreal model of bipedal development, we see the structure of the human hand stemming from the development needed to hold and travel along tree branches.

The philosophical concept of upright posture and the emerging scientific evidence regarding the hominin acquisition of bipedalism both remark on this possible development of hand specialization. Though some premises conflict, such as Straus (1952) believing that hominins stood up from the ground to reach above them rather than the process of brachiating primates descending from the trees with developed hands, the same intention of investigating the importance of the human hand centers around the motivations of upright walking. Science and philosophy may disagree, but they still attempt investigations into similar topics with similar preconceived notions.

In this philosophy, the human hand represents the human cognitive ability and its development. Aristotle (1937a) states that “man is [not] the most intelligent animal because he possesses hands, but he has hands because he is the most intelligent animal” (371). Humans, to

him in this instance, are believed to have developed hands then as a result of their intelligence, rather than the opposite pattern theorized by Engels ([1883] 1925) and Straus (1952). Hand possession is directly associated with bipedal posture, so Aristotle (1937a) then insinuates that humans developed bipedalism and the associated physiological traits as a result of human reason or cognitive ability. This theory of Aristotle (1937a) states human hands, and therefore also bipedalism, resulted from human cognitive ability rather than resulting in cognitive development after the development of bipedalism. This Aristotelian order of events can be reconciled with the modern anthropological understanding of human hand development as a process brought about by necessity due to already present and increasing tool use alongside the decreasing locomotive use (Aristotle 1937a; Kimura 2019; Richmond et al. 2016).

The coordination of hand development and bipedal development must not be ignored. As discussed in the previous section, the human prime mover actualizes the human body, which in turn moves only as a result of the immovability and character of the prime mover. “Man by the upright walk obtains his character,” writes nineteenth-century biologist Lorenz Oken, “the hands become free and can achieve all other offices. . . With the freedom of the body has been granted also the freedom of the mind” (Oken 1809 cited in Gould 1977). Many natural philosophers believe the intellectual ability of the human to be enabled by their upright posture and the freed hand (Gould 1977; Straus 1952), which in return grants the freedom of the body to move upright (Aristotle 1937a, 1937b). This reconciliation between these conflicting orders is cyclical; as the human body and prime mover enable each other at the same time, so does the human body and the human hand (Aristotle 1937c; Straus 1952). There is a circular process for the enablement of upright posture in coordination with the hand, as seen previously with movement in Chapter Two, where the hand and bipedal body exist and function mutually (Gould 1977; Straus 1952).

The provisional feeding hypothesis reflects on the necessity of the human hand in the survival benefits of bipedalism (Hunt 1996; Kimura 2019). As upright walkers moved about, they were able to reach and grab and hold objects around them (Ko 2015), transforming the manner of being in the world (Gould 1977). Even in contemporary science outside anthropology, the importance of gathering and holding objects for humans is significant (Brooke 2014; Dekkers 1999; Mayr 1984; Uexküll 1934). Humans can find, take, hold, and possess objects while also forming emotional attachments to the objects (Dekkers 1999; Gould 1977; Straus 1952). This sentimentality has a strange place in the mechanism of upright posture but can be contextualized in the origination of human hand morphology.

Human hands also have the unique ability to hold weapons. As Aristotle (1937a) writes in *Parts of Animals*,

For man . . . many means of defense are available, and he can change them at any time, and above all he can choose what weapon he will have and where. Take the hand: this is as good as a talon, or a claw, or a horn, or again, a spear or a sword, or any other weapon or tool: it can be all of these, because it can seize and hold them all (Aristotle 1937a, 373).

Humans are often discussed as being great generalists and as having a higher chance of surviving environmental changes because of a wider adaptation ability (Crompton et al. 2010; Stutz 2014). This includes, as Aristotle (1937a) speaks of above, the ability to have a number of variable weapon and survival objects within reach. For example, a shark fighting a bear may be a strange and difficult struggle for both animals, but a human could hypothetically fight off either because of the tools and weapons developed and used by our hands. Human hands are able to hold weapons that then puts them at a significant strategic advantage (Aristotle 1937c; Richmond et al. 2016).

Hands also allowed for the organization of labor and social groups, according to Engels ([1883] 1925). Engels ([1883] 1925) wrote on the importance of upright posture in the development of labor for humans via freeing of hands. As many other scholars also theorized, the anatomically possible movement of human hands is incredibly important to understanding the nature of upright posture (Aristotle 1937a; Gould 1977; Oken 1809; Straus 1952). In the case of Aristotle (1937c), he assigns great importance to hands in relation to immaterial qualities of humans. To quote his work *Progression of Animals*, “nature never creates anything without a purpose” (1937b, 487). This is a foundational principle Aristotle (1937c) relies on through his “natural investigation” into the nature of animals (Lennox 1999; Tipton 2006). Aristotle (1937c) continues, explaining that according to the ways of Nature, man was “given” the possession of hands after intelligence was already present (371). Lennox (1999) also notes the importance of this idea within Aristotle’s entire zoology. He says, “uprightness in humans is, in essence, a consequence of their being properly constructed for reasoning, . . . it is the proper functioning of reason that seems to be the primary cause” (Lennox 1999; 12). A section of Aristotle’s original text further explains:

Hands are an instrument; and Nature, like a sensible human being, always assigns an organ to the animal that can use it (as it is more in keeping to give flutes to a man who is already a flute-player than to provide a man who possesses flutes with the skill to play them); thus Nature has provided that which is less as an addition to that which is greater and superior not vice versa. We may conclude, then, that, if this is the better way, and if Nature always does the best she can in the circumstances, is it not true to say that man is the most intelligent animal because he possesses hands, but he has hands because he is the most intelligent animal. (1937a, 371)

He goes on further to bolster his claim of human superiority,

Now it must be wrong to say, as some do, that the structure of man is not good, in fact, that it is worse than that of any other animal. Their grounds are: that man is barefoot, unclothed, and void of any weapon of force. Against this we may say that all the other animals have just one method of defence [sic] and cannot change it for another: they are

forced to sleep and perform all their actions with their shoes on the whole time, as one might say; they can never take off this defensive equipment of theirs, nor can they change their weapon, whatever it may be. For man, on the other hand, many means of defense are available, and he can change them at any time, and above all he can choose what weapon he will have and where. Take the hand: this is as good as a talon, or a claw, or a horn, or again, a spear or a sword, or any other weapon or tool: it can be all of these, because it can seize and hold them all. (1937a, 373)

Here we see human superiority theorized and demonstrated by Aristotle (1937a) and his understanding of the advantages allowed by the bipedal body and freed hand. As Nature would not give an animal a quality or feature which it would not have the ability already to use and use well, Aristotle (1937a) understands the human to already have the innate ability to use its hands the most effectively out of all animals.

Aristotle (1937) anticipates contemporary theoretical questions of anthropology, directly connecting human distinction to the physical characteristics that resulted, as he believes, from humans' superior intellect. The remarkable ability of hands as tools, a concept frequently described and questioned by contemporary anthropologists (Crompton et al. 2010; Kivell et al. 2016; Richmond et al. 2016), is explained by Aristotle (1937a) in a few sentences. The presence of hands, he explains, is because of the pre-existence of human intelligence (Aristotle 1937a). Aristotle (1937a) claims that the ability to use hands as tools is unique to humans because their intelligence is greater than other animals, which then results in the specific necessary development of its physical form (Aristotle 1937a). Further, not only are other animals not capable of using the instruments of hands, but this anatomy of human beings makes manifest that, "it must be wrong to say, as some do, that the structure of man is not good" (Aristotle 1937a, 373). The word translated as "good" in English is "καλώς" (687a23), the Greek for "noble, the good, or beauty" (Liddell-Scott-Jones Greek-English Lexicon). Aristotle (1937a) thus demonstrates that the entire physiological form of humans is inherently good and capable of

reason in its construction. Humans have their specialized physical form because of their higher ability among the animals for reason. Lennox (1999) describes Aristotle's (1937a) view this way, "Mankind, in virtue of its ability to employ theoretical reason, is a participant in the divine" (13).

The ability of humans to fight and survive through tool usage is an important result of bipedalism, as demonstrated in various biological anthropologists' research (Iriki and Sakura 2008; McHenry and Coffing 2000; Uomini and Meyer 2013). Existence depends on ability to survive, and humans took on much of what we now consider distinctly human when they gained increased ability to ensure their survival through the creative use of tools and techniques of fighting. As biological anthropologist Cartmill (1990) states in "Human Uniqueness and Theoretical Content in Paleoanthropology," natural selection alone cannot explain the peculiar traits of humans, as "our natural weapons are too puny to have been generated by survival of the fittest variants among ape-like ancestors" (1990, 176). There must be another element, one not connected to a singular part or trait of humans.

The human hand not only enables protection and confers strategical advantages by helping humans adapt to various environments and situations (Crompton et al. 2010; McHenry and Coffing 2000; Richmond et al. 2016; Uomini and Meyer 2013), but is also implicated in the metaphysical idea of humans' ability to hold and judge things that are distinct from themselves (Aristotle 1937a; Engels [1883] 1925; Dekkers 1999; Straus 1952). In the philosophy of Aristotle (1937) and Engels ([1883] 1925), the hand is an important factor in the identification of humanity and its distinct characteristics because of the associated behavioral and cognitive developments (Lennox 1999; Weikart 1998). In biological anthropology, the hand is a key to understanding the nature of bipedalism and the importance of posture and locomotion in the

development of humans (Crompton et al. 2010; McHenry and Coffing 2000; Richmond et al. 2016; Uomini and Meyer 2013).

Chapter 5: The Upright Embodiment of Human Cognition and Reason

Bipedalism, as discussed in the previous chapters, is a certain foundation to scientific and philosophical investigation regarding human self-distinction. In both fields, human perception is centered around and connected to cognitive reason. The investigation into this phenomenon is approached through the human conceptualization of self. Though bipedalism is a physical trait frequently noted in anthropology, human cognitive ability dominates as the main identifying factor of the species. We must inquire into how this is connected to upright posture and the related parts of our understanding as identified in the previous chapters. As bipedalism is theorized about by various natural philosophers as well as anthropologists, the parallels in foundational thought demonstrate the influences of human self-perception. Starting with natural philosophers like Aristotle (1937) and Straus (1952), this chapter illustrates the philosophical ideas stemming from human perception regarding upright posture. Phenomenologist Straus (1952) heavily influences the contemporary concept of bipedalism in philosophical anthropology because of his novel methods bringing together social sciences with philosophical inquiry into the human experience and consciousness. His work relies on Aristotle's (1937) zoological treatises, which also form a bridge between natural philosophical ideas branching from subjective human experience and the possibility of objective scientific analyses.

As the human stands, the body aligns itself in orientation with the earth and the sky, with the cosmos above the head, and the ground below the feet, as established in Aristotle's (1937a) *Parts of Animals*. In his understanding of human posture, Aristotle (1937a) associates the main

defining characteristic of the human to be this upward orientation. Likewise, many other natural philosophers like Straus (1952) and Buytendijk (1974) theorize that the uprightness of human posture results directly from the hierarchy of animal intellect, with humans occupying the highest category (Brooke 2014; Dekkers 1999). Aristotle (1937a) connected human upright posture with the strange human intellect that seemingly distinguishes us from all other animals.

Aristotle (1937) makes multiple claims that the postural orientation of humans is distinct because of the alignment with the true orientation of the universe (Lennox 1999). He says that the superior direction of the human body, up, is aligned with the superior direction of the cosmos, also up (Aristotle 1937a). One has their head in the stars and their feet on the earth, remaining grounded while also having the freedom of thought to ponder the heavenly bodies (Ptolemy 1984; Straus 1952). The orientation of the human in relation to the sphere of the earth and the skies above demonstrate to these natural philosophers that the orientation of the human body is associated with intellect (Aristotle 1937a; Dekkers 1999; Ptolemy 1984; Straus 1952).

Throughout different subfields of philosophy, such as phenomenology, natural ancient philosophy, and philosophical anthropology, thought and intellect are connected to the upright posture of humans (Dekkers 1999; Gould 1977). Many theorists investigating human self-distinction regard the capacity for complex thought as a certain classification and defining trait of the human (Cartmill 1990; Gould 1977). Erwin Straus' *Upright Posture* (1952) discusses how integral human posture and locomotion – bipedalism – are to the conceptualization of human thought. The connection between human cognitive ability and standing upright, is not a set theory in philosophy (Buytendijk 1974; Dekkers 1999; Straus 1952), nor is it a certain, proven theory in modern anthropology or the sciences (Gould 1977; Straus 1952; Vaughan 2001). This connection predominantly forms the foundation for a lot of inquiry, as two prominent

distinctions between humans and other animals seem to be bipedalism and rational or abstract thought (Cartmill 1990). Human posture is then connected through philosophy to human cognitive ability (Buytendijk 1974; Dekkers 1999; Brooke 2014; Straus 1952).

Not much is known about the specific cognitive experience of hominins through their development (Kelley and Schwartz 2012). In the journey evidenced through archaeological detailing of the beginning of advanced thought to the earliest form of communication indicative of modern human cognition, the idea of the self can be estimated to have emerged (Bridges 1995; Cartmill 1990; de Sousa and Cunha 2012). I propose this idea, an awareness of the self and the difference between the self and others as discussed by Plessner ([1928] 2019) and Straus (1952), is essential to understanding the definition of humanity. The human ability to reflect and classify is an essential premise for recognizing the intellect behind self-distinction and scientific ability (Cartmill 1990; Plessner [1928] 2019). Plessner ([1928] 2019) discusses the ability of the human to reflect in comparison to other animals as referenced in Chapter Two. Aristotle (1937a) formed one of the first systems of classification in his zoological treatises (Lennox 1999; Mouracade 2013). Classification is a cornerstone of Aristotle's (1937) philosophy and it has provided a foundation for following centuries of scientific thought (Aristotle 1937, 2000; Lennox 1999; Mouracade 2013; Tipton 2006). Classification, a human position, is an important building block for the development of science and the preliminary cognitive ability (Mayr 1982).

Stephen Jay Gould, a paleoanthropologist, writes of the importance of conceptual upright posture in his article "Posture Maketh Man" (Gould 1977). In developing scientific theory, upright posture persists as a troublesome but informative topic (Brooke 2014; Cartmill 1990; Straus 1952). The concept pervades unexpected fields of study, with important academics like the influential political philosopher Friedrich Engels ([1883] 1925) holding it as integral to their

parsing of human nature (Engels [1883] 1925; Gould 1977). Engels ([1883] 1925) theorized labor, which he identifies as a key characteristic of human nature, as developing alongside the anatomy of humans led by the transition to bipedalism (Engels [1883] 1925).

Aristotle's (1937) recorded theses on the organization of the natural world are concrete evidence of attempts to define the difference between humans and other animals based on posture and locomotion (1937, 2000). His scientific philosophy holds root in his principles of metaphysical movement and he understands all movement to be caused by a prime mover. In previous sections, we have established the Aristotelian understanding of the human prime mover to be intention and reason embodied by the soul. The cognitive ability of the human to classify and actualize these concepts fulfills Aristotle's (1937c) theories on the actualization ability of the human.

In Aristotle's zoology, metaphysical qualities of humans are connected to physical traits labeled as unique to humans. As noted in Aristotle scholar Lennox's (1999) paper on "The Place of Mankind in Aristotle's Zoology," Aristotle has difficulty clarifying the proper place of human "reason" within the specific physiology of humans, and natural science in general. For Aristotle (1937a), reason is the ability of intellect. Lennox (1999) presents the specific word "reason" using his own personal translation of the word, "νοῦς" [nous] which is used in Greek to indicate the rational intellect or perceiving mind of a person, or as referenced in Chapter Two, the human prime mover (Aristotle 1937a; Lennox 1999). Lennox (1999) notes the problematic contradiction of Aristotle in his different zoological treatises. Aristotle (1937a) claims the investigation of reason has no place in natural science, although throughout his work reason reoccurs as an important part of the entire human being or even certain animal characteristics (Lennox 1999).

For Aristotle (1937a), even as he tries to separate scientific investigation into physical qualities from philosophical theories of human reason, the two remain inextricably linked.

An integral piece of Aristotle's (1937a) understanding of mankind is developed in Book IV, Chapter Ten of *Parts of Animals*. Lennox (1999) explains this section as the "greatest challenge" to Aristotle's previous insistence on separating the reason or the intellectual soul from natural science and his zoology (Aristotle 1937a; Lennox 1999, 11). Aristotle (1937a), in the attempt to limit his natural science from the theoretical investigation of reason and soul, claims the inherent separation of the human body from reason by locomotion. In *Parts of Animals*, he claims that since the act of motion exists in all animals, it cannot be connected to any sort of trait unique to humans which in this case is reason (1937a). Something else is present alongside human movement, rather than movement happening alone. Lennox (1999) states this point, "this argument shows only that reason is not a necessary condition for locomotion. It does not show that it is not sufficient in animals which have reason, nor does it show that it is not necessary for human locomotion" (5). Aristotle (1937a) clarifies that, although reason can seem to be a cause for movement, as humans can be irrational in their actions, desire is the true and only motivation behind locomotion. This points back to the previously mentioned human prime mover, connecting the intention and purpose to be bipedal to the true and only motivation behind locomotion.

In *Progression of Animals*, Aristotle (1937b) defines specific dimensions within the natural world that govern living beings through the spatial understanding of the human body. All living beings have the Superior and Inferior dimensions, some have more, but only humans have all six dimensions relating to each direction in the physical world as we understand and perceive it (Aristotle 1937b). These dimensions relate to the upright posture as defined and discussed in

Parts of Animals (Aristotle 1937a). The first cause of upright posture is the superior head placement to the rest of the body (Aristotle 1937a). This placement is due to cognition creating a certain amount of heat that rises throughout the body to the head, lifting the weight of the body upwards as to not press downward on the heart, allowing for the rational part of the body to function without undue burden:

And there is still greater variety among those whose nature partakes not only of living but, in addition, of living well. Such is mankind; for of the animals known to us either mankind alone, or mankind most of all, partakes of the divine. . . For straight-way the natural parts are disposed according to nature in this kind alone, that is, *what is above for a human being accords with the above of the whole cosmos; for man alone among the animals is upright.* (Aristotle 1937a, 367, italics mine)

The movement of the body in its orientation strives to fulfill and connect to the previously noted intention behind human movement. Here, the human body itself is moving within and standing itself upright to allow for intellectual ability (Aristotle 1937a). The bipedal body actualizes human reason by enabling the mechanical freedom of the form to support the physical strain and requirements of reason (Aristotle 1937a; 1937c).

Straus (1952) furthers Aristotle's (1937a) theory on the place of the human being in the orientation of the world: "upright posture, which distinguishes the Human Genus from all other species, pre-establishes a definite mode of being-in-the-world" (1952, 529). I propose being-in-the-world is the specific placement of the human body within the physical world and its orientation. As Plessner ([1928] 2019) says, "[the human] stands at the center of its standing" (302). This standing, within the world, is established by Straus (1952) to begin and be formed by upright posture.

Straus (1952) defines the nature of questioning one's own physical being. As aligns with his background in psychiatry, he argues that the consideration of one's own "physical well-being

is alarming” (530) and is pathological. Upright posture, and the human experience of it, is directly connected to the idea of danger and threats as perceived by the human. Straus emphasizes the connection between the pure, technical anatomy of upright posture and the human physical form, and the phenomenological psychology of the human, that which is mostly considered to be outside the human physical form.

In theories about upright posture by Straus (1952), Buytendijk (1974), and Plessner ([1928] 2019), as pointed to by anthropologist Dekkers (1999), thinkers use the fleeting evidence of one’s own experience that happens almost, if to be assessed technically, by chance when compared to the theoretical, pure directed data-seeking of more modern and developed scientific processes. Buytendijk (1974), Plessner ([1928] 2019), and Straus (1952) take this data collected only through life experience, rather than external, objective scientific inquiry, to put forth theory on the human self and its nature (Dekkers 1999).

For Straus (1952), the human life is best parsed through the most apparent and accessible observations. These observed parts of human life, he believes, are the most foundational to understanding human life and experience (Straus 1952). Throughout his work, language and basic communication between humans hold key truths for Straus (1952) in his postural investigation. Straus (1952) proposes an intriguing linguistic example to support his claim for a connection between moral norms and human upright posture:

The term ‘to be upright’ has two connotations: to rise, to get up, and to stand on one’s own feet; and the moral implication, not to stoop to anything, to be honest and just, to be true to friends in danger, to stand by one’ convictions, and to act accordingly, even at the risk of one’s life. We praise an upright man; we admire someone who stands up for his ideas of rectitude. (1952, 530-531)

For Straus (1952), the dual meaning of the phrase, “to be upright,” reflects on the anatomical positioning and stance of a physical body as well as a certain, immaterial value of a

being. A person who is described as “upright” is considered worthy of respect and praise, suggesting that they are morally good and of solid, true character. Straus’ (1952) argument about upright posture and morality resonates with Aristotle’s (1937a) argument that man’s upright posture is connected to the orientation of the heavenly bodies, which are viewed as divine, noble, and good (see the Greek *καλώς*). Straus (1952) believes the upright man is physically and morally upright, secure and ensuring the security of others, and someone held “high” in the mind of others.

Straus claims that, “whether upright posture is an excellence or not, in any case it is a distinction” (531). This point is significant as Straus (1952) now clarifies his earlier definition of “to be upright” as morally so, and therefore one might believe then is in excellence. We can see that the importance of uprightness being defined, even when evaluating excellence, as a social or psychological immaterial concept related to the specific character of man is the significance of this repeat self-distinction (Straus 1952). The word is defined as those two parts, physical and abstract, relating to man as a being described by one word in those two states, and that is what is proposed to mirror the meaning of upright posture to Straus (1952).

The causal sequence of cognitive development and upright posture in human development is a common point of investigation in anthropological inquiry, and in any questioning of human development by most persons who come to that point in their investigation (Cartmill 1990; Stutz 2014). Through this paper, Straus (1952) shows he is no different though he has little anthropological training (Brooke 2014). In the introduction of *Upright Posture*, Straus states his interest as being “in what man is, not how he supposedly became what he is” (533). Despite this, he continues to question the beginning of humankind as well as the human individual.

Straus (1952) believes the emotional surroundings of human posture developing can particularly be seen in modern human child growing up. He establishes a theory of human determination and strength that is integral to the exact existence and possibility of upright posture (Straus 1952). As discussed previously, Straus (1952) believes the human being to constantly be in a state of struggle and opposition to the surrounding external world. The development of bipedal posture and locomotion in a human child is a difficult process, one which Straus (1952) proposes as a parallel to the human adoption of bipedal posture and locomotion as a species.

Straus continues his attempts to balance the beginning of bipedalism with his wishful non-answer. The idea that man opposes nature is not novel, nor is it at all a possession of science or anthropological studies. For Straus (1952), it serves as an explanation for the beginning of man's ability and purpose in the production of "society, history, and conventions" (536). Straus (1952) states that man's fundamental opposition to nature through being upright, which is a continuous effort against gravity and other natural constraints, enabled man to be able to create such structures and organizations that seem so separate from nature in form and character. This struggle and the subsequent development of complex organizations show how bipedalism enabled the higher cognitive ability of humans (Straus 1952).

At the end of this subsection, Straus (1952) presents the beginning of his theory on upright-informed orientation affected humans. In Aristotle's (1937a) zoological works, specifically in Book X of *Parts of Animals*, he speaks of the orientation of the earth and heavenly bodies being aligned with the postural orientation of a human, with the higher portion being the head and the lower portion being the legs, and the cosmos being higher, divine, and the earth being lower, apart from the divine. But here, Straus (1952) remarks on the balance of the earth

and the human being that walks on it. “Upright posture as counteraction cannot lack the forces against which it strives” (536). The orientation of the human body is also connected by Straus (1952) to higher cognition, which connects to his principle of humans being in opposition to the world, as humans must expend effort to reason.

The struggle of being upright and enduring the oppositions of nature is a continuous exertion, but an effort that with success comes the acceptance and even praise of fellow humans (Straus 1952). Straus (1952) connects this to the importance of upright posture to the societal counterweights in human development and purpose. The evaluation of a being through anatomical form alone is not complete, nor is the ignorance of the anatomical form in favor of abstract traits or behaviors. The balance of both is the most effective at maintaining group security and strength, and within the particular consideration of posture, uprightness shows a great ability to resist and maintain a course of inner strength. Upright posture enables greater social connections that are influential to the life and being of humans as they live in social states.

Straus (1952) theorizes that upright posture also creates a measure of distance between the upright self and others. The measure is one of distance, of the separation between the upright human and, “the ground,. . .things, and. . .our fellow-men” (548). One stands upright, and they stand apart from everything else that is not themselves. In this standing apart, man finds themselves distinct from others (Straus 1952). Similar to Plessner ([1928] 2019), Straus (1952) believes this distance enables the self-reflection integral to human reason and intellect. We can see self-distinction by upright posture, as demonstrated by Straus (1952), is inherent in the physics of being upright and therefore being apart from everything else.

There are two main categorizations of the value of human intellect. First, that the human is inherently good. Human development and evolution led to tool use and technological

advancement that benefits larger groups of people and make great impacts we cannot fully understand even today (Engels [1883] 1925; Plessner [1928] 2019). Complex social and community structures enable humans to help not only themselves but also other animals in need (Engels [1883] 1925; Straus 1952). Our cognitive ability has enabled numerous actions in the name of improvement (Engels [1883] 1925; Stutz 2014)). In philosophy, human cognitive development can be understood to be for the better in its essential value (Plessner [1928] 2019).

The second categorization is that humans, and their development, cognition, intellect, and being are bad or harmful developments. As Plessner ([1928] 2019) states:

The human in this conception is the victim of the parasitic development of an organ. This cerebral parasitism, possibly caused by a disorder of the internal secretion process, gave him the poisoned chalice of intelligence, insight, knowledge, and consciousness of the world--this consciousness, the spirit, may be nothing more than a grand illusion, the self-deception of a biologically degenerate creature sucked dry by brain polyps (291).

Human cognition can be interpreted as a burden and a delusion, set up to feed itself like a parasite with no good or true purpose like philosophers would want to believe (Plessner [1928] 2019). But in either interpretation, human cognitive development is viewed as the main source for delineation of humans as other-than other animals. Humans define intelligence by the boundary they have drawn between themselves and other animals, according to Cartmill (1990). He states, “what we mean by the word ‘intelligence’ is whatever distinguishes the human mind from those of beasts” (Cartmill 1990, 184). Humans will consistently find something to distinguish themselves from other animals, and then label that as intelligence.

In *On the Gait of Animals* and *Parts of Animals*, Aristotle (1937a, 2000) posits that the human is the most natural and divine of animals, because of its bipedality and superiorly placed head. In reconciling these two ideas, one a theory of reflective anthropology (Plessner [1928] 2019; Straus 1952) and the other a treatise on zoological philosophy (Aristotle 1937a, 2000), we

may be able to understand the placement of the humans' own head above all other animals. "Now the business of that which is most divine," Aristotle (1937a) writes, "is to think and to be intelligent..." (367). In this context, the divine would be understood to be the boundary between animals and human. A boundary that humans define for themselves, without intervention or input from other beings (Aristotle 1937a; Straus 1952). In the context of the cosmos however, the divine is understood to be above or higher, which humans embody outside their control because of their innate morphology (Aristotle 1937a). The understanding of this human animal boundary is founded on the principle that humans and animals are different, and the inherent human is the divine by nature, rather than understood in the context of a scientific organization (Aristotle 1937a; Straus 1952).

Scientific studies, particularly within anthropology, approach intellect and the related human place in the world with different methods than philosophy. For the development of anthropological theory, we must recognize and study the bias of our own perception and preference for self-importance. Understanding the connection between biological and philosophical investigation into upright posture shows the possibility of the future of the field of anthropology. To further the anthropological investigation of our evolution, we may have to steer away from the technical and evaluate the possible contribution of older philosophy and narratives and how they have developed to show our underlying reasoning for investigating bipedalism in the first place. Examining philosophical and scientific theories together can better help us understand the faults and hidden biases that our perception processed through the human body enables.

Cartmill (1990) believes that paleoanthropology should reduce the marking of human uniqueness to better establish theoretical content the field is lacking. For us to understand

humans within nature, we cannot continuously draw a boundary between us and other animals, limiting our patterns to exceptions and “singular occurrences [that] cannot be explained with reference to the laws of nature” (Cartmill 1990, 177; Hume 1896). Although we rely upon human concepts of self-distinction and uniqueness based on moral or cultural differences between us and animals, since they are not empirical or scientific, they do not benefit the science of paleoanthropology.

The human perception of possessing greater intelligence compared to that of animals is easily be debunked. Cartmill (1990) describes the study of the German horse named Hans who was thought to be able to communicate and undergo basic cognitive tasks at the instruction of his owner and trainer. When investigated by scientists, they eventually determined that the horse could not understand the questions and material as originally thought, but was instead noticing slight cues from the trainer to then establish the action preferred by the humans around him, which would in turn be the “correct” answer to an arithmetic question or the like (Cartmill 1990). Although this seems to be evidence the horse could not understand basic math or conceptual questions like originally thought, it shows an instance of the horse having greater cognitive skill in perceiving slight behavioral cues from the humans around him that they themselves were unable to notice until a thorough and lengthy investigation (Cartmill 1990). Animal behavior, often not easily understood by humans, is quickly wrote off as less intelligent or unreasonable. may be the opposite, or an example of how certain natural phenomena are able to be completely beyond the reach of human cognitive ability.

Animals then can be established as having high-functioning cognitive ability. But still, according to White and Cartmill (1990):

The difference between the behavior of man and other animals, then, is that the lower animals may receive new values, may acquire new meanings, but they cannot create and bestow them. Only man can do this. . .And this difference is one of kind, not of degree... (White 1949, 24-35 as cited in Cartmill 1990, 185)

Anthropologists must be able to reconcile these differences in intelligence, rather than the separation of intelligence from non-intelligence as the study of human uniqueness may imply. As Cartmill concludes, “[we must aim] to explain as much as possible: to find animal analogs for human traits and to seek. . .common patterns of adaptation underlying those analogies” (189) and that:

A cardinal tenet of "scientific" social "science" is that there can be no knowledge of "values," in the sense that ethical questions, as one observer declared, "cannot be answered by means of rational cognition. The decision of these questions is a value judgment, determined by emotional factors, and is, therefore, subjective in character, valid only for the judging subject" (Kelsen 1949, 6). Hence social "science," aiming for objectivity, should rigorously separate fact from value. (Wagner 1989, 169)

The persistence of human thought focusing on self-identification and eventual distinction is shown through intentional investigation and analysis. Though a balanced differentiation using objective and subjective boundaries may be difficult, the effort has value to the field of anthropology. Through parsing this strange re-occurrence of this concept questioned throughout different, indirectly connected fields of study, we can more fully understand the current and hopeful future of the field of anthropology.

Chapter 6: Conclusion

Humans habitually focus on the experience of being upright being tied to their feeling of uniqueness. Many thinkers, scholars, or others with thoughts and theories recorded for current, modern recollection have followed this pattern individually. Many natural philosophers, or periscientists, are often found with little or no established natural science around them. Evidence of the novelty of each persons' proposals is found in the conflicting analysis of the casual order of upright posture and complex cognition, as the current-day philosopher Pavel Gregorić (2005) points out. Gregorić (2005) makes note of how Darwin is later proven incorrect by the modern anthropological discovery of *Australopithecus afarensis*, or the fossil colloquially known as Lucy. *A. afarensis* was established to be an early, mostly bipedal or upright hominin with a surprisingly large cranial capacity for such an early human ancestor (Gregorić 2005; Vaughan 2001). This went against many theories at the time, such as Darwin's initial hypothesis or Aristotle's zoological theories, which all relied on the guess that higher intelligence predated upright posture (Aristotle 1937a; Gregorić 2005). But Engels ([1883] 1925), despite having no archaeological experience nor any sort of compatible scientific prescience to predict the data that would come many decades later (Weikart 1998), proposed the concept that upright posture begat human intelligence and cognition. Natural philosophers throughout history, even if they were eventually proven incorrect, show the ability of humans to question themselves and their surroundings.

Gregorić (2005) also speaks of Bramble and Lieberman's (2004) endurance running hypothesis. This paper was published to present the researchers' conclusion that humans developed upright posture to support a long-distance lifestyle of gathering food over large areas to support the nutritional demands of a large brain (Bramble and Lieberman 2004). Engels

([1883] 1925) presents a similar line of thought to Bramble and Lieberman (2004), theorizing that labor enabled upright posture as it grew into a robust necessity for human life and nature. As the hands and arms were free from weight-bearing or locomotion responsibility, work and tool usage enabled by the hands harbored the development of social and community ties that grew the intelligence and emotional dexterity of humans (Engels [1883] 1925). But although this claim is based on little scientific evidence, it still mirrors the contemporary, scientifically produced ideas of Bramble and Lieberman (2004). As seen in the similarities between Bramble and Lieberman (2004) and Engels ([1883] 1925), theory in philosophy and science can maintain surprisingly similar principles.

The value of studying the human experience within the sciences, particularly regarding the influence of the bipedal body on this experience, is emphasized in the field of phenomenology as led by Erwin Straus (Brooke 2014; Dekkers 1999; Straus 1952). The lived experience of being in an upright-postured body is investigated in his work as a psychiatrist (Brooke 2014; Straus 1952). Straus (1952) revolutionized psychiatry by recognizing the impact attention to human experience and consciousness could have in the sciences. Bridging the gap between philosophy and scientific practice, Straus (1952) used phenomenology to understand and posit how the upright posture of humans defines their character and being (Brooke 2014; Dekkers 1999), showing how the bipedal form influences its being and perception.

The theory of experience has long been, though often unintentionally, intertwined with the essential scientific inquiry as it developed through the past millennia (Desjarlais and Throop 2011; Dekkers 1999). As seen in previous chapters, the foundational thought for learning or understanding anything in the sciences is integrally linked to beginning philosophy. We must

commit ourselves to recognizing the flaws and ignored contexts found in the precursory thought we rely on.

Currently, the behavior of human self-distinction purely in the theoretical sense is upheld by the phenomenological studies as mentioned before. Phenomenology is the study of experience as related to consciousness. The field of phenomenology has been of particular interest to certain social scientists who aimed to transform the research within their field away from the technical flatness of data-driven inquiry to valuing the more qualitative parts of the research subject matter, in particular the value of noting human experience in investigating the human being in research (Desjarlais and Throop 2011; Dekkers 1999; Straus 1952). The whole of human experience and what we know of the world, though not easily sorted in either objective or subjective categories, can be used to develop scientific theory within biological anthropology past this technical flatness.

These ideas branch from the foundation of upright posture being integral to being human. The concept of the upright human relies not only on bipedal anatomy and locomotion, but also the human experience of upright posture. This focus of the experience of human beings connected to scientific principles is incredibly significant to the anthropological field and then also to its possible development (Desjarlais and Throop 2011; Dekkers 1999; Plessner [1928] 2019). Defining what the human is, and then what the human experience is, does not always result in answers. To begin understanding why the experience of being upright is so frequently connected to the experience of being human, we need to understand the theory of human experience or the beginning of thought surrounding human experience.

The human obsession for self-distinction is threaded throughout every step from the first records of attempted investigations of the surrounding world. Humans have obsessed over

themselves throughout their history, watching their own movements and behaviors and recording their thoughts. If we look at the beginnings of organized, epistemological thought in Western history, in particular the development of theory on what knowledge is, there remains the underwriting of self-distinction. As scholar of education and anthropologist Deborah Court states, “knowledge does not actually begin somewhere” (2020, 17). Individuals, and their individual experiences, are the origin of any theory or belief (Brooke 2014; Straus 1952). In the case of human definition, the human is the one who defines the human (Cartmill 1990; Straus 1952). While derivative, circular questioning is a necessary step to this investigation. We must look at recorded human experiences of learning how to explain and define. Since knowledge must come from somewhere, recognizing the origins of science in philosophy can help further the field, rather than dragging it backwards.

Many efforts into world-explanations, such as different mythologies, mirror these attempts. As recorded in Plato’s *Symposium*, the great playwright Aristophanes gives a long speech on the origins of humans, and their intrinsic desire to wander and search for their soulmate (Plato n.d.). He speaks of humans in their proper, original form (Plato n.d.). Connected to their soulmate, their other half, humans form pairs in a barrel-cartwheel shape to then roll about on the ground to move (Plato n.d.). Zeus, a key figure in Greek religious narratives at the time, became jealous of the pairing of humans (Plato n.d.). He cleaved them all in two, setting them upright as we are now today, forcing the curse of separation on humanity (Plato n.d.). In Aristophanes’ tale, his theory is delivered with ornamental rhetoric. The rhetoric form takes precedence over scientific inquiry. But in his speech, the concept of upright posture is firmly placed in the realm of metaphysical connection and consequence. These stories of early upright-

centered mythology show the importance our posture has held for humans throughout different narrative contexts.

Many papers speak of bipedalism in conjunction with the functional development of human species identification in similar tones to the previously mentioned natural philosophers and scholars, continuing the curious stream of focus on the importance of upright posture (Vaughan 2003). Understanding of how bipedalism within Biological Anthropology mirrors the recurring focus on upright posture in precursory philosophical thought will prove integral to the balance and reflective assessment of the field (Gould 1977; Vaughan 2003). As Iriki and Sakura (2008) stated, “The sciences of mind, brain, body and society must cooperate in this effort, guided by the insights of philosophy” (2229).

As Cartmill (1990) theorized, acknowledging the human inclination to starkly contrast and divide humans from other animals with no exceptions only harms the field of anthropology by limiting it. This prevents the production of theory and progress in furthering investigations into humans. In developing anthropological theory, balancing human experience and its inherent biases with our understanding of objective phenomena is important to the future development of the field and its possibilities.

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