

Chapter 13

Attempting to Distinguish Impairment from Disability in the Bioarchaeological Record: An Example from DeArmond Mound (40RE12) in East Tennessee

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Introduction

As described in this book's introduction, both archaeologists and bioarchaeologists have begun to pay special attention to questions related to numerous forms of social identity (Chap. 1). Among these, concepts of impairment and disability have been described as among the least established in this area of specialized (bio)archaeological scholarship (see Battles 2011; Buikstra 2010; Buikstra and Scott 2009; Insoll 2007; Knudson and Stojanowski 2008, 2009; Meskell 2007; Murphy 2000). Moreover, the notion of care provisioning has been refined and scholars can now use an index of care to further interpret bioarchaeological contexts (Tilley 2015; Tilley and Cameron 2014; Tilley and Oxenham 2011). These theoretical approaches have greatly enhanced bioarchaeology's ability to contribute to broad discussions about care and caregiving in the past and have significantly improved since Dettwyler's (1991) well-known critique.

While the bioarchaeology of care is now an area of inquiry in its own right, few bioarchaeological studies have explicitly engaged the disability studies literature to better understand and interpret human skeletal remains recovered from archaeo-

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logical contexts (Battles 2011; Buikstra 2010; Metzler 2006; Southwell-Wright 2013). In addition, it is uncommon for bioarchaeological contributions to explicitly discuss and/or differentiate between the key concepts of impairment and disability, though some scholars have been unambiguous in their use of terminology (e.g., Cross 1999, 2007; Roberts 1999, 2000, 2011; Zakrzewski 2014). While this might come as a surprise to bioarchaeologists working on questions of identity, disability theorist Carol Thomas has suggested that even the field of Disability Studies (DS) has struggled with defining, understanding, and operationalizing the terms (Thomas 2004a, b). Indeed, competing theoretical perspectives adopted by DS scholars has added to the debate about the meaning of the terms impairment and disability. Before applying these terms to bioarchaeological contexts, scholars working with human skeletal remains would certainly benefit from engaging with this literature to better understand the nuances of various DS theoretical paradigms.

Briefly, as Thomas (2004a, b) describes, a primary question for DS scholars involves *how* disability comes into being. On one side of the argument, social model theorists “understand disability to reside principally in the socio-structural barriers that serve to disadvantage people with impairments” (Thomas 2004b: 22). This perspective contrasts with adherents of the post-modern or post-structural model (later referred to as the interactional model by Shakespeare 2006) which maintains “being or becoming a disabled person is about being socially constructed and positioned as such by those who can exercise power through forms of knowledge” (Thomas 2004b: 23). In other words, scholars who adopt this position maintain that individuals in positions of power (e.g., medical professionals and/or legislators) are those who levy a designation of “disabled” onto others; while social modellers assert that inherent, everyday social obstacles are disabling. These two perspectives are obviously quite distinct, and Thomas (2004a) concludes her essay by underscoring that the concept of impairment remains a debated topic in the DS literature.

Riddle (2013) contributes to the discussion of terminology by further comparing and contrasting perspectives on impairment and disability between the social and interactionalist models. According to Riddle (2013), social model adherents suggest “that impairment ought to be defined in individual and biological terms, whereas disability ought to be defined solely in terms of social creation—how impairment manifests itself socially” (25). Riddle (2013) underscores that from the perspective of social modellers, disability is purely and solely associated with the social and built environment. The model does not recognize impairment as a causal factor. Riddle (2013) contrasts this approach with the interactionalist viewpoint and suggests that these scholars propose doing away with the dichotomy altogether. Rather, Riddle (2013: 25) suggests that interactionalists regard disability “as a complex interaction between various traits inherent to a person (or one’s impairment), and the manner in which those traits manifest themselves in the environment individuals find themselves (or the disabling facts of one’s impairment).” In sum, perspectives on causality between impairment and disability remain a contested area of disagreement among DS scholars (Charmaz 1995; Hughes and Paterson 1997; Riddle 2013; Shakespeare 2006; Thomas 2004a, b).

Outside of academia, discussions about the use of terminology have been described as context-specific, and vary among individuals and across communities (Chap. 12). Semantic discourse has also reached the highest levels of bureaucracy with legislative bodies such as the World Health Organization (WHO), the United States Congress, the Parliament of Canada, and the Parliament of the United Kingdom ascribing specific meaning to the terms “impairment” and “disability” (Table 13.1) (Chap. 12; Cross 2007; Forber-Pratt and Aragon 2013; Gadacz 1994). For example, in 1980 the WHO defined the terms in a document titled *International Classification of Impairments, Disabilities, and Handicaps*, and later updated those definitions in a 2001 document titled *International Classification of Functioning, Disability, and Health (ICF)*. The United States Congress defined the terms in the Americans with Disabilities Act (ADA) of 1990 (updated in 2010) as did the Parliament of the United Kingdom by enacting the Equality Act 2010¹ (Table 13.1).

Understanding nuances in terminology and appreciating the differences of various theoretical perspectives in DS on impairment and disability is a challenging task for bioarchaeological scholars. Indeed, if bioarchaeologists attempt to reconstruct this aspect of identity at all, some explicit assumptions are necessarily critical. Cross (1999, 2007) suggests that *impairment* can be identified from skeletonized remains alone while *disability* cannot. Cross (2007) notes that “in their concentration on ‘fossilized disease’ in the form of skeletal deformity, archaeologists dig up impairment, not disability” (191). Finlay (1999) mirrors this perspective, and cautions that scholars should be wary of interpretations which automatically link impairment with socially sanctioned discrimination. Taking the notions of impairment and disability a step further, we draw attention to the definitions presented by Kasnitz and Shuttleworth (2001: 2):

Individuals are impaired if they experience (or are perceived by others to experience) physiological or behavioral statuses or processes which are *socially identified* [emphasis ours] as problems, illnesses, conditions, disorders, syndromes, or other similarly negatively valued differences, distinctions, or characteristics which might have an ethnomedical diagnostic category or label....Disability exists when people experience discrimination on the basis of *perceived* [emphasis ours] functional limitations.

This definition presents a marked departure from widespread bioarchaeological definitions of impairment which have relied on a strictly skeletal presentation of pathological “otherness.” Kasnitz and Shuttleworth (2001) present a social component to impairment which oftentimes may be impossible for bioarchaeologists to interpret. In other words, paleopathologists and bioarchaeologists might erroneously assume that a pathological condition observable in human skeletal remains would have been met with some form of social stigma. At its most fundamental level, the definition proposed by Kasnitz and Shuttleworth (2001) reminds

¹Equality Act 2010 replaced Disability Discrimination Act 1995 (DDA) except in Northern Ireland where DDA still applies.

Table 13.1 Definitions of impairment and disability as presented by the WHO, ADA, and Equality Act 2010

	WHO—ICF	US Congress—ADA 1990	UK Parliament—Equality Act 2010
Impairment	<p>Any loss or abnormality of psychological, physiological, or anatomical structure and function.</p> <p>Impairment is characterized by losses or abnormalities that may be temporary or permanent, and that include the existence or occurrence of any anomaly, defect, or loss in a limb, organ, tissue, or other structure of the body, including the systems of mental function. Impairment represents the exteriorization of a pathological state, and in principle it reflects disturbances at the level of the organ.</p>	<p>A <i>physical</i> impairment is a physiological disorder or condition, cosmetic disfigurement or anatomical loss impacting one or more body systems. Examples of body systems include neurological, musculoskeletal (the system of muscles and bones), respiratory, cardiovascular, digestive, lymphatic, and endocrine</p> <p>A <i>mental</i> impairment is a mental or psychological disorder. Examples include mental retardation, emotional or mental illness, and organic brain syndrome.</p>	<p>No definition given</p>
Disability	<p>Any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being.</p> <p>Disability is characterized by excesses of deficiencies of customarily expected activity performance and behavior, and these may be temporary or permanent, reversible or irreversible, and progressive or regressive.</p> <p>Disabilities may arise as a direct consequence of impairment or as a response by the individual, particularly psychologically, to a physical, sensory, or other impairment.</p> <p>Disability represents objectification of an impairment, and as it reflects disturbances at the level of the person.</p>	<p>A mental or physical impairment that substantially limits one or more major life activities</p>	<p>(1) A person (P) has a disability if— (a) P has a physical or mental impairment, and (b) The impairment has a substantial and long-term adverse effect on P’s ability to carry out normal day-to-day activities</p>

bioarchaeologists that even unmistakable skeletal pathologies may not meet the criteria to qualify as impairment in all contexts.

While bioarchaeological scholars routinely describe and document skeletal pathologies which may oftentimes qualify as impairments, particularly as they relate to previously defined definitions of the *ICF* and *ADA*, we caution that some DS scholars would argue that even “obvious” skeletal pathologies may not have been perceived in this way in the past. This distinction has been underappreciated in the literature and bioarchaeologists have typically imbued skeletons presenting biological “anomalies” with some form of social impairment during life (Kerr 1995; Knüsel et al. 1992; Trinkhaus and Zimmerman 1982; Wakely 1993; Wells 1982). However, Roberts (2000) argues that researchers must be wary of extracting social attitudes from the over-interpretation of physical remains, especially when archaeological data on mortuary context are lacking.

Additionally, the reality is that many forms of impairment (as defined by the *ICF* and *ADA*) leave no trace on skeletonized remains and are completely unobservable. Keeping in mind that bioarchaeologists rarely encounter remnants of soft tissue which could provide some additional clues to non-musculoskeletal impairments, we underscore that a majority of past contexts where impairment and/or disability were present remain undetectable. Finally, we highlight the importance of Buikstra’s (2010) assertion about the necessity of the archaeological context for interpretation of impairment and disability. In ideal scenarios, bioarchaeologists generate information about archaeological context by directing or supervising excavations, but as Martin et al. (2013: 122) note, bioarchaeologists often encounter human remains which have little to no contextual information available. These poorly documented instances pose problems for bioarchaeologists who might describe what they define as a skeletal impairment but have no corresponding contextual information which would allow for a more nuanced interpretation of disability.

Buikstra (2010) maintains that contextualized archaeological data, particularly related to grave and burial location, are compulsory elements if bioarchaeologists are to conjecture about any disabling effects of skeletal impairments. The remainder of this chapter focuses on a particular case study and describes a unique mortuary context which highlights the complexities of decoupling impairment and disability in the bioarchaeological record.

An Archaeological Case Study from East Tennessee

The DeArmond Site and Burial 50

The 500 years prior to the arrival of European colonists marked a time of tremendous social complexity through the Eastern Woodlands of what is now the United States. Known as the Mississippian period, this time period spanned from A.D. 900–1600 and was characterized by agricultural crop production, nucleated settlements, and earthen platform mounds surrounded by plazas, shared

iconography, and shell-tempered ceramic technology (King and Meyers 2002; Koerner 2005; Pauketat and Alt 2015; Schroedl et al. 1990; Smith 1986). Mississippian people lived in a large area which spanned across the interior Southeast, into the Midwest, the southern mid-Atlantic region, and reached as far west as the eastern Great Plains (Cobb 2003; Payne and Scarry 1998; Steponaitis 1986). Populations frequently chose to settle in river valleys due to the availability of natural resources (Smith 1978). Furthermore, many Mississippian communities, such as the one we discuss in this chapter, developed mortuary programs which included burial in platform mounds. These mounds have been the subject of large-scale archaeological excavations (Steponaitis 1978, 1986).

The skeleton we describe here was recovered as the result of a large federally funded archaeological project under the auspices of the Tennessee Valley Authority (TVA) and Works Progress Administration (WPA). These projects were initiated in 1933 as part of President Franklin D. Roosevelt's New Deal program, and were funded until 1941 when the United States government ceased subsidizing WPA projects and shifted federal resources to the war effort (Milner and Jacobi 2006; Sullivan 2006b). The main impetus behind the TVA/WPA projects was to control flooding and soil erosion through a system of reservoirs on the Tennessee River, and to bring electricity to the Tennessee Valley by building hydroelectric power plants in conjunction with the dams. William Webb, a physicist and avocational archaeologist at the University of Kentucky, led the successful effort to get the federal government to use WPA labor to do salvage archaeology on the sites that would be lost forever due to the inundation necessary for the power facilities (Milner and Jacobi 2006). These excavations resulted in the recovery of thousands of skeletons and artefacts at sites scheduled to be inundated from several southeastern states including Alabama, Kentucky, and Tennessee. A history of the TVA/WPA excavations in Tennessee can be found in Dye (2016), as well as an account of the excavations conducted for the Watts Bar Reservoir project, which included the DeArmond site (Koerner and Dalton-Carriger 2016). The DeArmond site, named after the twentieth-century family who farmed the land, is the location of the case study presented in the remainder of this chapter.

The DeArmond site was located in Roane County, Tennessee (Fig. 13.1). It consisted of an earthen pyramidal mound with an adjacent village, both dating to the Mississippian Period, and was located on the bank of the Tennessee River (Koerner 2005). Excavations were undertaken prior to the site's inundation by the Watts Bar Reservoir in 1942 (Fig. 13.2) (Koerner 2005). Of the six occupational levels of the mound, the individual of interest here (Burial 50²) was one of 77 burials³ in the uppermost level and dates to A.D. 1300–1500 (Koerner 2005). Burial

²“Burial 50” was the designation applied to this individual during the excavation in 1940.

We recognize that an individual is *associated with* the burial rather than the burial number being the *identifier* of the individual. However, the individual is referred to throughout the text as “Burial 50” in the interest of being succinct.

³Two Stage B burials contained two individuals; therefore, the total number of individuals recovered from Stage B was 79 (Koerner 2005).

Site Location

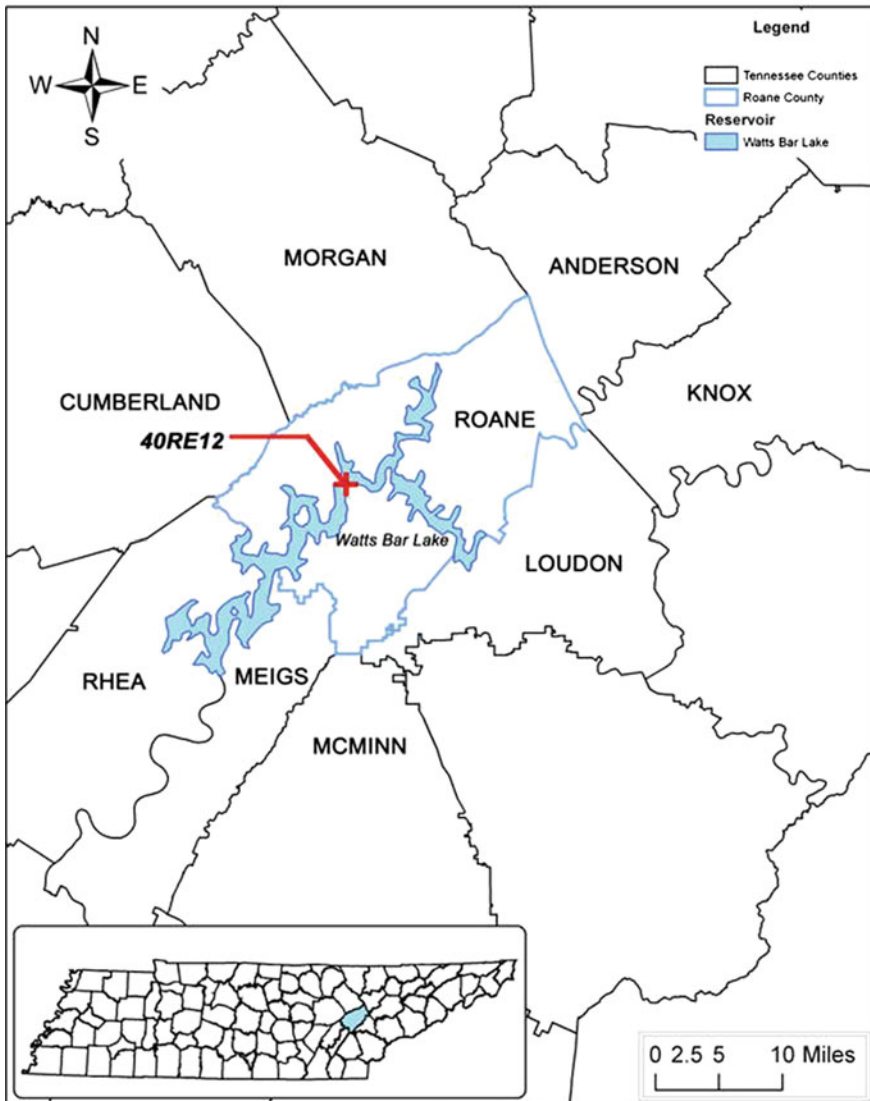


Fig. 13.1 Location of the DeArmond Site in East Tennessee (from Koerner 2005, p. 2) (Presented courtesy of Shannon D. Koerner)

50 was excavated on August 2, 1940 and represents the remains of an edentulous middle-aged or elderly adult female individual (DiGangi et al. 2010). She was buried in a partly flexed position, with her head oriented to the northwest and her



Fig. 13.2 DeArmond Mound prior to excavation in 1940, facing north. Image from the WPA/TVA Archives, presented courtesy of McClung Museum of Natural History and Culture, The University of Tennessee

Fig. 13.3 In situ photograph of the individual interred in DeArmond Burial 50. Note the shortened left femur and right humerus. In addition, one effigy vessel is visible underneath the left ankle. Image from the WPA/TVA Archives, presented courtesy of McClung Museum of Natural History and Culture, The University of Tennessee



body supine, with her knees to the right and her hands placed over the right side of her chest (Fig. 13.3).

As described by DiGangi et al. (2010) and summarized here, Burial 50 presented a rare pathological condition which resulted in marked asymmetry between her right and left femora and humeri. Her right humerus was 82 mm shorter than the left humerus and the left femur was 58 mm shorter than its complement (for images

see DiGangi et al. 2010). According to DiGangi et al. (2010), the condition most likely responsible for these limb-length discrepancies is a rare cartilaginous dysplasia called enchondromatosis (for differential diagnoses refer to DiGangi et al. 2010).

Enchondromatosis is characterized by the presence of multiple benign cartilaginous tumors (enchondromas) located in the growth plates of the long bones, especially the femur, tibia, and fibula, but several other bones, including those of the pelvis, metacarpals, metatarsals, phalanges, and skull base can also be affected (D'Angelo et al. 2009; Sunny et al. 2016). Due to the location of these tumors at the metaphysis, they can impede normal growth and result in limb shortening and deformity (Pannier and Legeai-Mallet 2008; Silve and Jüppner 2006). Pathological fractures and limb angulation are also common signs (Tiet and Alman 2003; Pannier and Legeai-Mallet 2008). The disease is commonly asymmetrical but bilateral (Aufderheide and Rodríguez-Martín 1998; Kaibara et al. 1982; Silve and Jüppner 2006). The disorder is not hereditary and is caused by a somatic error in endochondral ossification during development (D'Angelo et al. 2009). It appears during the first decade of life, and can resolve as the growth plates fuse, due to cartilage in the metaphysis being replaced by mature bone (Silve and Jüppner 2006; Tiet and Alman 2003). Further, there are several types of enchondromatosis (Kumar et al. 2015). The type most relevant to this case is known as Ollier disease, which in addition to asymmetric location of the enchondromas, is characterized by limb-length discrepancy and gait issues among other signs (D'Angelo et al. 2009; Kumar et al. 2015; Wejjakul et al. 2013).

DiGangi et al. (2010) determined that enchondromatosis was the most likely candidate in the differential diagnosis for the asymmetric limb shortening pathology, even though other common signs, such as affected hand and foot bones and pathological fracture of affected bones were not observed. However, this may be related to the skeletal preservation in this case. While most of the metacarpals (9 of 10) and all ten of the metatarsals were recovered, less than half of all hand and foot phalanges (20 of 56) were recovered and present with the rest of the skeletal remains.

In addition to the pathology affecting the humerus and femur, the tibiae of the individual associated with Burial 50 demonstrate depressed surfaces in the region of the tibial tuberosity consistent with Osgood–Schlatter's disease (DiGangi et al. 2010). The quadriceps muscle, the major extensor of the thigh, converges into a single tendon inserting on the patella, and in a continuous line from the patellar ligament inserts into the tibial tuberosity. Osgood–Schlatter's disease occurs when part or all of the unattached epiphysis for the tibial tuberosity is avulsed by a recurring strain or microtrauma from the patellar ligament originating from the quadriceps muscle (Dunn 1990; Gholve et al. 2007; Ortner 2003). Common to both sexes, it occurs during the pre-adolescent years (8–13 in girls, 10–15 in boys) and is bilateral about a quarter of the time (Scotti et al. 1979). Following avulsion, the anterior metaphyseal area of the tibia will develop a characteristic concave or depressed surface (Aufderheide and Rodríguez-Martín 1998; Ortner 2003).

The disease is typically seen in children active in sports-related behaviors (DiGangi et al. 2010; Dunn 1990), and most cases will resolve once skeletal growth of the knee is complete (Çakmak et al. 2014; El-Husseini and Abdelgawad 2010).

Mortuary Context of Burial 50

As argued in this chapter, in order for bioarchaeologists to begin interpreting both impairment and disability, a nuanced understanding of the archaeological context is compulsory. In the case of Burial 50, an analysis of Stage B burial demographics and associated material culture help provide some insight into the question of whether or not this individual experienced disability during her lifetime. For example, the composition of the Stage B burial assemblage suggests that burial in the mound was not limited to particular cohorts of community members or that Burial 50 was segregated from others at the time of her death. Of the 51 individuals who could be identified as to sex, 36 are male and 15 are female (Koerner 2005; Smith 1990). Of the individuals for whom skeletal age data are available, 58 individuals are adults, 13 are adolescents, two are children and one is an infant (Koerner 2005; Smith 1990). The burial population in this level thus is skewed toward males and adults, as is the case with many Mississippian mounds (e.g., Anderson 1996; Hatch 1976; Peebles 1974; Sullivan 2001, 2006a).

Twenty-nine burials were oriented to the southwest and an additional 21 were oriented towards the northwest. About 55% (n = 44) of all Stage B individuals were interred with grave offerings (Koerner 2005). Nine individuals contained graves with ceramic vessels, and of these, five were adults, three were young children, and one was an infant (Koerner 2005). Four of the nine individuals interred with pots could be sexed as female, and two as male (Koerner 2005). This pattern of females more often interred with pottery than males is typical for the time period of the region (Hatch 1976; Lewis et al. 1995; Sullivan 1986). Interestingly, the only shell-tempered ceramic vessels with effigy were recovered with Burial 50. One of these was a human effigy bowl placed directly under her left lower limb at the ankle; and the other was a frog effigy bowl placed to the southwest of her flexed right knee (Koerner 2005). While Burial 50 was the only individual interred in the DeArmond mound with effigy-modeled vessels, these types of ceramics are not uncommon in Mississippian mortuary contexts and have been recovered from numerous sites in East Tennessee and around the Southeast in general (Hatch 1976; Lewis et al. 1995; Power 2004).

Discussion of Burial 50s Impairment and Disability

The skeletal data observed in the case study of Burial 50 presents a unique opportunity for bioarchaeologists to grapple with the concepts of impairment and

disability. As discussed previously in this chapter, scholars from DS have not reached consensus on the meanings of these terms. While debates about terminology continue among academics, legislative bodies, and disability advocacy groups, the terminology used here is consistent with that defined by the *ICF* and ADA and other scholars who have worked on this question (e.g., Cross 1999, 2007). It is suggested here that bioarchaeologists do have some ability to infer impairment through careful paleopathological observations. Indeed, if *ICF* and ADA frameworks are followed, paleopathological diagnosis of the cartilaginous dysplasia described in Burial 50 meets the definition of *impairment*.

Symptoms involved with enchondromatosis (the likely condition responsible for the asymmetric femora and humeri lengths) include localized pain and swellings and difficulty walking, or limping (if the legs are affected) (D'Angelo et al. 2009; Kumar et al. 2015; Silve and Jüppner 2006; Sunny et al. 2016). Further, the only modern treatment available is surgical intervention to remove the benign tumors and/or to induce remodeling and growth in any shortened limbs using one of a variety of modern orthopedic surgical techniques (D'Angelo et al. 2009; Sunny et al. 2016; Wejjakul et al. 2013).

Osgood–Schlatter's disease presents in pre-adolescence with pain, swelling, and tenderness in the region of the tibial tuberosity (Bloom and Mackler 2004; Çakmak et al. 2014). Modern treatment involves activity modification, quadriceps strengthening, ice, anti-inflammatory medications, and surgery in extreme cases (Bloom and Mackler 2004; Dunn 1990; El-Husseini and Abdelgawad 2010). It may take years to resolve completely, and while the long-term outcome of the disease is favorable, some individuals will maintain chronic knee joint mobility limitation (Bloom and Mackler 2004; Çakmak et al. 2014; Krause et al. 1990). For example, a modern study demonstrated that college-age athletes having a history of Osgood–Schlatter's disease in their early teens performed worse on knee mobility and sports activity surveys than athletes with no history of the disease, and this difference was statistically significant (Ross and Villard 2003). Considering the clinical literature and the individual of interest's femoral length discrepancies, as well as the bilateral presentation of Osgood–Schlatter's disease on her tibiae, Burial 50 would have experienced decreased mobility as compared to her peers without such leg length discrepancies or tibial tuberosity avulsion (i.e., gait restrictions due to the asymmetric femora, and possible chronic unilateral or bilateral knee flexion limitations). At the very least, there would have been times during her life when her knees and possibly shortened femur and humerus caused pain.

Moreover, by understanding the functional limitations which accompany asymmetric limb lengths, as well as recognizing the developmental component of her musculoskeletal impairment (i.e., this is an impairment which manifested itself during her childhood), this individual negotiated and managed her impairment throughout her life. She would have almost certainly experienced reduced or at least restricted locomotion of both her affected upper and lower limbs, especially due to the pain that often accompanies enchondromatosis and Osgood–Schlatter's disease (e.g., Bloom and Mackler, 2004; D'Angelo et al. 2009).

However, this interpretation is a modern perception of impairment on Burial 50 herself and the whole of the DeArmond community. Following Kasnitz and Shuttleworth (2001), it is worth noting that Burial 50 (and her contemporaries) may not have perceived her limb length differences in the same way that we are, even in spite of her unequivocal physical differences. While this is the case, we caution that if this perspective is adopted in every instance of observable skeletal paleopathology, bioarchaeologists will severely limit their ability to interpret this aspect of identity and would be unable to consider how community members interacted with people with physical impairments.

Turning to a discussion of Burial 50 and disability, we call attention to terminology defined by the *ICF* and ADA. A common theme between these statutes concerns the way in which impairments hinder day-to-day activities. In this case study from the DeArmond community, we can imagine a scenario in which the individual associated with Burial 50 did experience a restriction in performing major life activities involved with the use of the lower limbs (i.e., walking, running). Despite these skeletal impairments (to use the *ICF* and ADA definitions) which clearly indicate that Burial 50 would have presented visible physical differences to other DeArmond community members, her mortuary treatment does not suggest marked differentiation from others (DiGangi et al. 2010). Her manifestations of reduced upper and lower limb lengths, and subsequent mobility and gait restrictions do not appear to have ostracized her from individuals with typical limb morphology, given that her burial treatment was not atypical. It is necessary to emphasize this point, underscoring that Burial 50 had atypical physical dimensions throughout most of her life, beginning in childhood. Other DeArmond community members would have certainly observed her movement restrictions; however, we will obviously never know how Burial 50 perceived her own mobility and how community members would have interpreted her unique and different gait. Whether or not the ceramic effigy vessel placed under the left ankle of Burial 50 offers some insight into community members' perceptions of her differences or is sheer coincidence, remains unanswerable.

As described by DiGangi et al. (2010), the inclusion of Burial 50 with other Stage B interments suggests that she was not spatially segregated from the community and that her burial in the platform mound afforded her mortuary treatment less commonly observed among females. Previous work which has developed a model for Mississippian mortuary contexts in Southern Appalachia proposes that the burial of females in mound contexts is less common than for males and may suggest importance at the community or town organizational level of an individual, as opposed to kinship group or clan leadership (Sullivan 2001, 2006a, b; Sullivan and Rodning 2001). For example, an analogous distinction is made in early Cherokee society between male chiefs who brokered trade and other intercommunity political relationships, as contrasted with the (matrilineal) clan and kinship group leadership positions held by senior women (Rodning 1999; Sullivan and Rodning 2011). These gendered distinctions are reflected in spatial distinctions in grave placements; male community leaders were buried in or near the community structures associated with male leadership roles, including mounds and council

houses, while senior females who served as kin group leaders were interred in the houses of their respective kin groups (Rodning 1999; Sullivan and Rodning 2011). Following this ethnohistoric analogy and derived model for Late Mississippian groups in Southern Appalachia, Burial 50's mortuary context was a place more suggestive of a role of community as opposed to kinship leadership (Sullivan 2006a; Sullivan and Rodning 2011). However, it is difficult to speculate as to what this role might have been. This is despite Burial 50's age and skeletal manifestations of reduced upper and lower limb lengths and subsequent mobility restrictions.

A recent contribution by Kamnikar et al. (2015) described a contemporaneous Mississippian context at the Upper East Tennessee site of Holliston Mills. In this case study, Kamnikar et al. (2015) described the burial of an adult female impaired by chronic treponemal disease. Contextualized mortuary data found no differences in her burial treatment with regard to spatial segregation or variance in the distribution of artefacts recovered in a large sample of 660 burials.

While Burial 50 as well as the woman from Holliston Mills were interred in contexts with other adults lacking congenital musculoskeletal impairments, we must remain tentative about inferring too much about their experience with disability across their entire life course based on mortuary context alone. We do not want to suggest or assume that Burial 50 would have never experienced disability or felt disabled at times throughout her life. In this regard, we echo Cormier and Buikstra (Chap. 12) who highlight this point and suggest that bioarchaeologists remain cautious even when mortuary data do not indicate marked differences between persons presenting musculoskeletal impairments and those whose skeletal morphology appears unaffected.

A related point that needs to be addressed is instances where mortuary treatment of individuals with musculoskeletal impairments differs from that of the majority of community members. For these contexts, we pose a question to the readership of this chapter: What, if anything, do these contexts tell us about the experience of disability in the past? As was discussed by DiGangi et al. (2010), the mortuary treatment of Burial 50 was quite different from two individuals with congenital achondroplastic dwarfism at the Moundville site, a large Mississippian mound center in Alabama. One individual was male and one was female, and both were found buried face down (Fig. 13.4) (Jacobi 2002; Snow 1943). Jacobi (2003) relates the prone burial of the achondroplastic individuals to a worldwide custom in which prone burial signifies individuals whom the living did not want to return. Therefore, it is suggested that this example of prone burial fits the criterion of a deviant burial, as defined by Tsaliki (2008). While we do not wish to overreach by implying that all individuals who faced disability would have been buried in a deviant manner (see Tsaliki 2008: 3), we suggest that comparative analysis of burial positioning provides a framework for continued discourse on utilizing contextualized mortuary data to better understand impairment and disability in the bioarchaeological record. Finally, we suggest that bioarchaeologists might find useful the detailed ethnographic literature which may enrich contextualized archaeological mortuary data. For example, Murphy (2000: 75) suggests that the differential burial of individuals of "unusual" appearance is known from a variety of ethnographic



Fig. 13.4 In situ photograph of male individual from Moundville presenting achondroplasia. Note prone burial position. Image from Snow (Snow 1943, p. 9). Photograph by Walter B. Jones. Courtesy of the University of Alabama Museums, Tuscaloosa, Alabama

contexts; and Raji and Hollins (2000) have described contexts where people with intellectual disabilities are oftentimes excluded from participating in funerary rituals.

Conclusions

This chapter outlines the complexities of defining and applying the terms *impairment* and *disability*. Bioarchaeologists who are interested in working on this aspect of identity should explicitly define these terms before drawing conclusions from visible skeletal pathologies indicative of musculoskeletal impairment. Modern frameworks such as the *ICF* and *ADA* are helpful for understanding the ways in which a host of skeletal impairments restrict major life activities, however, modern concepts related to these restrictions may have little to no application in past bioarchaeological contexts. While there is evidence that Burial 50 from the DeArmond site in East Tennessee had several musculoskeletal impairments, no mortuary evidence suggests that her body was stigmatized after death. Rather, she was provided mortuary treatment not out of line with other members of her community, though fewer females typically are interred in platform mounds in Southern

Appalachian Mississippian mortuary contexts. We conclude with a cautionary note to bioarchaeologists to carefully consider context before equating visible skeletal pathologies with impairment and extending that interpretation to include disability. In addition, we note that even well-contextualized mortuary data nevertheless may be insufficient to truly understand the scope of disability experienced by people in the past.

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