

Chapter 4: ‘Long Live the Knife’: Social Aspects of Castration in Humans

Castration had long-term, demonstrable effects on the social roles and lives of castrates. In order to understand these effects and how they led to the continuous use of castrates for at least six millennia, it is necessary to discuss some aspects of social theory which underpin current discussions about castrates, castration, and their uses. These include theories of liminality, sex, gender, sexuality, social identity, and hierarchical institutional processes. Since much work has centred on sex, sexuality, and gender, as well as trans- and omni- genders, identities, and third genders, this chapter will discuss some of the larger theoretical implications of an overall study of the sex, gender, and sexualities of castrates, especially as they relate to their treatment in daily life and therefor their bodily health. An assumption has been made that castrates had personal motivations and a sense of individualism, which guided their actions after castration, if not before. Whether a sense of individualism or group cohesion was ever felt by castrates is unclear, though there is some evidence from the correspondence between Farinelli and Metastasio that the castrati had a sense of fellow feeling, at least for those with whom they could sympathize.¹⁷⁹

4.1 Social Theory

4.1.1 Social Identity

Social identity theory states that social identity is a process by which one creates and projects a social image of oneself, whether real or imagined, in part through membership in one or more groups. These groups are normally described as units in which three or more individuals cognitively evaluate themselves according to shared attributes that distinguish them from other individuals.¹⁸⁰ It has been hypothesized that individuals also define themselves in terms of group membership, desiring positive social identity from the groups to which they belong. These positive identities are conferred by making favourable comparisons between the ingroup and outgroups, motivating individuals to create or enhance intergroup differences.¹⁸¹ McIntosh provides an interesting argument that social categories become, to a certain extent, self-fulfilling prophecies, as these categories can become highly differentiated and polarized from each

¹⁷⁹ (Savage, 2005)

¹⁸⁰ (Hogg, 2006)

¹⁸¹ (Oakes and Turner, 2006)

other,¹⁸² possibly as members of each category explore the distinctions and similarities between their own category and others. In this sense, the creation of a specific category or group may cause that outwardly labelled group to cling to itself and reject others through differentiation and, in many cases, xenophobia and stereotyping. Historical depictions of castrates demonstrate this, as they are criticised and lambasted as an entire group, not on an individual basis.¹⁸³ A sense of group identity may have driven castrates to join together against other individuals, despite differences in origin, ancestry, or religion, though whether the perception of castrates as a group was externally or internally derived remains unclear.

4.1.2 Liminality

The word *liminal* as it is used here follows the definition in the Concise Oxford Dictionary of Archaeology, which describes both a social group distanced from the main group of individuals in a society and the process of a stage of cultural progression, often a “rite of passage”.¹⁸⁴ Castration is, in a sense, a “rite of passage”, in that it is an incredibly transformative process for an individual. It takes a boy or a man, excludes them from their main social or cultural group, and puts them into a liminal position, either for the few seconds of castration or permanently, depending on how one wishes to view the process. These individuals are then reincorporated into the social sphere, but *not into the same cultural or social group from which they had been removed*. If one considers that a “rite of passage” normally occurs at a transition between one stage of life and another, the act of castration is the liminal moment in the passage between man or boy and castrate. However, once the liminal act of castration has occurred, castrates are left in a permanently socially liminal position, removed from the male cohort and put into their own social group.

In some respects, the process of castration “froze” individuals into the liminal position of progression – boy could not become man, man could not re-join the male fraternity. This may have led to the formation of a specific, liminal social group of castrates. The liminality of the social group, frozen in a between stage of transformation, was a transgression of social norms that allowed castrates to occupy and be used in many different social roles which would have been unacceptable for “normal” individuals to

¹⁸² (McIntosh, 1968)

¹⁸³ (Aucoin and Wassersug, 2006; Cameron, 1965; D’Ancillon, 1718; Procopius, 2010)

¹⁸⁴ (Darvill, 2008)

fill. How this liminality influenced castrates' social and gender roles, and how those roles and the liminality of castrates led to their treatment in life and death will be discussed in Section 4.1.3.

4.1.3 Sex, Gender, and Sexuality

4.1.3.1 Theory

Social and cultural identification with and assignment to specific sexes, genders, and, at least in the modern era, sexualities is one way in which group identity is formed and maintained. Sex, gender, and sexuality are three important, interrelated concepts used by biological anthropologists, historians, gender scholars, feminists, queer theorists, and others to discuss the concepts surrounding, created by, and creating socially distinct and historically continuous categories of (normally dichotomous) relationships between individuals such as male/female, masculine/feminine, active/passive, heterosexual/homosexual, and so forth.¹⁸⁵ Discussions of sex, gender, and sexuality generally agree that sex is the first characteristic that it is possible to understand about an individual, though even this can be complicated.¹⁸⁶ Babies are born with a sex, which in some cases may not be readily identifiable. As they grow and develop, they begin to express their gender, normally constructed within or against the culturally prescribed roles for their sex. As children age and enter puberty, their sexuality begins to emerge, though some think that sexuality may be expressed at a much younger age, but without the sexual impulses brought on by large doses of sex hormones.¹⁸⁷

In current formulations of these concepts, sex is seen as the biological, chromosomal sex of an individual, normally best expressed by the external genitalia and, postpubertally, through secondary sexual characteristics such as breasts, hair formation and dispersal, and body shape.¹⁸⁸ The development of the secondary sexual characteristics is controlled by the gonadal hormones of the individual. Unfortunately, this definition of sex tends to forget that rather than having binary chromosomal variations, human beings actually have twenty-six chromosomal variations, most of which will affect the appearance of the external genitalia and later secondary sexual

¹⁸⁵ (Dreger, 1998; Fausto-Sterling, 2000; Matta, 2005)

¹⁸⁶ (Dreger, 1998; Fausto-Sterling, 2000)

¹⁸⁷ (Bancroft, 2003; Haka-Ikse and Mian, 1993)

¹⁸⁸ (Butler, 2004; Gross, 1999; Laqueur, 1990)

characteristics.¹⁸⁹ In addition, there exist several hormonally controlled conditions that can affect the appearance of the external genitalia and the development of the secondary sexual characteristics.¹⁹⁰ Most individuals who possess either these different chromosomal combinations or hormonal conditions can present with ambiguous genitalia, such as micro penises and mega clitorises, two sets of genitalia (one of which is normally not linked to gonads), or even incorrect genitalia for chromosomal sex.¹⁹¹ These factors will all affect how a child is raised, the manner in which its parents and other adults relate to the child, and how the parents and others around them perceive the sex and gender of the child.¹⁹² The prevalence of most of these conditions is low, and the numbers of intersex individuals that might have existed in the past is uncertain. Since the majority of modern Western academic social science conceptions of sex, gender, and sexuality as applied to the past do not seem to take these variations into account, the nuances provided by these individuals are lost. The historical and modern perceptions of these individuals also affect studies into and perceptions of castrates as a “third sex”. If ambiguous genitalia are confounding, how much more confounding is the idea of deliberately removing external signifiers of sex?

Gender is normally described as the outward expression of the biological sex of an individual through the socially accepted constructions of what it means to be “male” or “female” in a specific society.¹⁹³ These constructs can change from society to society and from one period to another, and individuals within specific societies can conform to and/or transgress these socially constructed categories. In this manner, sex informs gender, and gender can inform perceptions of one’s sex (that is to say, what it means to be of that sex). Gender conceptions can vary widely. For example, some societies view gender as very fluid, making it possible for males and females to perform different or the same gender “roles” at different times. In contrast, some societies view it as a sliding scale, with some individuals (normally biological, adult males) at the desirable, top end of the scale, whereas women and children reside lower on the scale, but with the possibility for males to move down the scale and women and children to move up. Furthermore, other societies maintain rigidly bimodal concepts of gender identity, with “male” and “female” as the only categories of sex and gender, although the extent to

¹⁸⁹ (Blackless et al., 2000)

¹⁹⁰ (Dreger, 1998; Marcus et al., 2000; Matta, 2005; Plymate, 2003)

¹⁹¹ (Bardin and Catterall, 1981; Blackless et al., 2000; Dreger, 1998; Fausto-Sterling, 2000)

¹⁹² (Reis, 2005)

¹⁹³ (Butler, 2004, 1999; Laqueur, 1990)

which these categories maintain rigid boundaries is debateable.¹⁹⁴ Gender is often described as the social performance of a role inscribed by biological sex, but which does not necessarily have to maintain the larger social definition of what it means to have that sex.

Sexuality is described as the sexual attraction to and sexual interaction with individuals of one or more of these sexes.¹⁹⁵ It has most recently been broken down into categories such as heterosexual (attraction to and sexual activity with individuals of “the opposite” sex), homosexual (attraction to and sexual activity with individuals of “the same” sex), bisexual (attraction to and sexual activity with individuals of “both sexes”), and asexual (no attraction to and sexual activity with individuals of “either sex”).¹⁹⁶ There are certainly many different permutations of these four categories (and more than four categories), and many ways to define the extent to which an individual falls into one or more of these categories (for example, the Kinsey Scale),¹⁹⁷ but one thing that many of these categories fail to take into account, much like concepts of biological sex, is that there are technically more than two sexes. This is true even if one is basing the category of biological sex entirely upon external genitalia. What sex is an individual with both male and female external genitalia? How should their sexuality be classified? What sexuality (or specifically, sexual orientation) does an individual attracted to someone with both sets of genitalia possess? What about ambiguous genitalia, such as micro penises or mega clitorises? In the modern era, DNA tests provide the chromosomal sex, which in turn assigns an individual to a biological sex. How then should those with ambiguous genitalia be considered when it comes time to discuss their sexuality, especially if chromosomally they are neither “male” nor “female” (that is, they do not possess either XX or XY chromosomes)? This, as one would expect, ignores any consideration of the difficulties of gender identity experienced by genitally ambiguous intersex individuals, as parents, aware that their child is not genitally unmistakably “male” or “female”, can form strict, often stereotypical views of what it “means” to be male or female gendered and then raise their child within these strict views, frequently punishing any behaviour which falls outside that (commonly narrow) view.¹⁹⁸ Another facet of this

¹⁹⁴ (Asher-Greve, 1997; Boydston, 2008; Brownell and Wasserstrom, 2002; Brubaker and Smith, 2004; Laqueur, 1990; Winkler, 1990)

¹⁹⁵ (Fausto-Sterling, 2000; Haka-Ikse and Mian, 1993; Matta, 2005)

¹⁹⁶ (Fausto-Sterling, 2000; Halperin, 2000; Kinsey et al., 1948)

¹⁹⁷ (Kinsey et al., 1948)

¹⁹⁸ (Bardin and Catterall, 1981; Bogaert et al., 2009; Fausto-Sterling, 2000; Reis, 2005)

difficulty is found in individuals with hormonal conditions that manifest in the opposite genital appearance to that which would be expected from their chromosomal sex, such as individuals with androgen insensitivity syndrome, who often appear female phenotypically but chromosomally are male.¹⁹⁹ These individuals can live the majority of their lives believing themselves to be one sex, only to discover that they possess the chromosomes of the “opposite” sex, sometimes with disastrous consequences.²⁰⁰

Studies have shown that in the modern world, parents of children with ambiguous genitalia are unsure of how to respond to their children or to other adults and children who wish to know the sex of their child. This can be detrimental to the mental health of the child, the parent-child relationship, and the child’s reception within a peer group and society as a whole.²⁰¹ However, there is evidence that the currently rigid, bimodal view of the male and female sexes, with the ambiguous intersex falling into a troubling middle ground, may be just as artificial a concept as gender categories.²⁰² Reis argues that there has been a cultural impetus in the Western world to maintain a two-sex system since at least the 17th century. This bimodal system is maintained by the medical profession ruling that those individuals who display ambiguous external genitalia are only “true hermaphrodites” if they are found to have both ovarian and testicular tissues. All other individuals are classified as either male pseudohermaphrodites or female pseudohermaphrodites, maintaining and reinforcing the idea of a bimodal sexual system. In Reis’ view, the insistence on forcibly defining individuals as either male or female is evidence of social constructionism.²⁰³

4.1.3.2 Discussion

Modern conceptions of the biological, chromosomally or hormonally derived phenotype of the intersex individual have only been possible for the last fifty to one hundred years, due to the development of genetics and endocrinology. This begs the question: how can sex, gender, or sexuality in the past best be understood? Given that sex is biological but can be complicated by ambiguous genitalia, and gender is acted at least in part in reaction to a society’s notions of what is “normal” for a specific sex, and, furthermore, sexuality is defined in a modern, Western-dominated context by both one’s

¹⁹⁹ (Fausto-Sterling, 2000)

²⁰⁰ (Fausto-Sterling, 2000)

²⁰¹ (Bardin and Catterall, 1981; Bogaert et al., 2009; Reis, 2005)

²⁰² (Dreger, 1998; Reis, 2005)

²⁰³ (Reis, 2005)

sex and the sex of the individual(s) for whom one has sexual desire, then what happens when an individual with ambiguous or no external genitalia is involved?

While biologists and many osteoarchaeologists would like to claim that sex is biological and gender is cultural, it is difficult to do so if one does not also acknowledge that, to a certain extent, sex is just as socially constructed as gender. Biological sex is not a binary, and the varying genetic, hormonal, and environmental factors which combine to contribute to the phenotype of biological sex can make it difficult to sex living individuals.²⁰⁴ Though osteoarchaeology accounts for this variation and the resulting variation in skeletal dimorphism by using five sex categories rather than two (Male, Possibly Male, Indeterminate, Possibly Female, and Female),²⁰⁵ when the results of a skeletal study are discussed, often the Possibly Male and Possibly Female categories are subsumed within the Male and Female categories, respectively, and the Indeterminate skeletons are either briefly discussed or exempted altogether. In this way, the variation in sexual dimorphism, used to demonstrate osteologists' awareness of the complications of human biology, is repacked into the traditional, rigid sex and gender binary system. This, together with an insistence on the solely biological basis of sex and sex's complete detachment from gender, means that intersex, trans, and other sex and/or gender transgressive individuals may not (and possibly *can not*) be recognized in skeletal populations. The formation of the modern concepts of sex, gender, and sexuality and their ensuing effect upon the study of castration will be discussed below. These three concepts and their relation to castrate internal and external perception will be further expanded in later sections of this chapter.

4.2 Social Identity and Castration

4.2.1 Theory

Physical differences that were inscribed on their bodies through the act of castration have always formed castrates into a group that separates them from other groups within cultures. A physical "lack" is used to define and divide them from males and females, but in what ways did this separation define an identity for castrates? How much of this separation was imposed upon castrates by the perceptions of the individuals around them? Did this common factor actually create cohesiveness within the castrate cohort, or did intragroup differences matter more to castrates? Did they view themselves

²⁰⁴ (Fausto-Sterling, 2000; Karkazis et al., 2012)

²⁰⁵ (Brickley and McKinley, 2004; Buikstra and Ubelaker, 1994)

as different? Transgressive? Not male? Not female? In what ways did it affect their personal identities in the areas of sex, gender, or sexuality, if such ideas existed as concepts in the times and places in which they lived? How much of the (modernly perceived) difference was an actual difference? How much of the social identity of castration was imposed upon castrates by others in their culture(s)? How much did they assume themselves? Did they perceive themselves as powerful or powerless? Many of these questions will, inevitably, be impossible to answer. Other answers will depend entirely upon the time, place, personality, and circumstances of the individuals examined.

Much of the writing about castrates seems to identify them as a whole, i.e., as a singular, monolithic group.²⁰⁶ It is a matter of debate as to whether this is because a sense of individuals as single persons was not yet a concept or because all castrates were regarded as falling into these broad characterisations (with one or two exceptions). What is most important here is the concept of “Eunuch” or “Castrati” as a monolithic group. It appears that, in certain societies, once a male was castrated, he was regarded as part of the “castrate” group, and that this identity subsumed all other forms of identity, including race, religion, class, and profession, at least to those outside the castrate cohort.²⁰⁷ It is difficult to determine whether castrates themselves felt any sense of group identity as castrates.

Social identity theory postulates that categorizing castrates as “castrates” would create a sense of group identity that would lead castrates to favour ingroup members (i.e., castrates) over outgroup members (i.e., everyone else).²⁰⁸ This might be true, as, in addition to the label of castrate, all castrates shared the traumatic experience of castration. However, most discussion we have of castrate behaviour (from non-castrate, normally elite, male sources) indicates that castrates were more inclined to stockpile wealth for themselves rather than the “group” of castrates as a whole.²⁰⁹ The few exceptions, such as Farinelli and Metastasio’s fraternal-seeming bond,²¹⁰ the well-documented Skoptsy reciprocal care and exchange,²¹¹ and the cohabitation and communal life of the *hijra*,²¹² seem to be based upon specific, personal relationships between or among the individuals

²⁰⁶ (Aristotle, 1984 (8(9).50); Jay, 1993; Rosselli, 1988; Tougher, 2013)

²⁰⁷ (Marmon, 1995)

²⁰⁸ (Huddy, 2001)

²⁰⁹ (Anderson, 1990; Hathaway, 2005; Huang, 1981; Procopius, 2010 (Wars 8.3.1); Tougher, 2008)

²¹⁰ (Savage, 2005)

²¹¹ (Pittard, 1934)

²¹² (Agrawal, 1997; Mukherjee, 1980; Nanda, 1994)

concerned. Farinelli and Metastasio, as stated above, had a fraternal relationship related to their singing careers and a sense of camaraderie based on their personal experiences, not just their status as castrates. They wrote each other affectionate letters in which each addressed the other as his “twin”.²¹³ This relationship seems to have more to do with a personal connection between the two than any sense of identity as castrates, although their physical condition did factor into their bond. In the case of the Skoptsy, it seems that rather than a sense of castrate identity driving relationships (though it did affect how certain members of the sect related to others), it was the overriding sense of religious community which drove the Skoptsys’ relations with each other.²¹⁴ In the same manner, it appears that the *hijra* practice of living together and providing for each other is driven more by religious identity than castrate identity.²¹⁵

4.2.2 Discussion

What might these competing concepts mean for an understanding of castrate identity and, specifically, castrate group identity? It almost certainly means that the sense we currently have of “castrates” as one monolithic group, unchanging through time, is wrong. It is possible that castrates identified as castrates over any other possible group membership, but uncritically accepting chronicler’s accounts of castrates as a single group without first considering the individual castrates within that group will continue to perpetuate potentially incorrect information. In addition, it is necessary to query those accounts which label castrates as monolithic groups. For example, when it is stated that once a foreign individual or slave became a castrate, race, religion, and homeland became irrelevant,²¹⁶ to whom did it become irrelevant? It is likely that it was still very relevant to the castrates themselves, at least in the beginning. Therefore, it most likely became irrelevant to those utilizing the castrates, as individuals simply became another castrate, expected to fulfil certain duties without question and with no tangled loyalties.²¹⁷ It seems that often in these circumstances, “castrate” was a label that could be adhered to or overcome, but it is the choice of when this label was overcome or adhered to that makes this discussion so interesting.

²¹³ (Savage, 2005)

²¹⁴ (Koch, 1921; Pittard, 1934)

²¹⁵ (Mukherjee, 1980; Nanda, 1999)

²¹⁶ (Marmon, 1995)

²¹⁷ (Aucoin and Wassersug, 2006; Marmon, 1995; Mitamura, 1970)

The assignment of a singular group identity to all castrates may have actually fed the “undesirable” behaviour of castrates, as they could accrue large fortunes for themselves (note: not the “group” as a whole but each individual himself) as long as they paid a nominal lip service to the notion that they were exactly as they were expected to be. There is evidence for this in the course of the Qing Dynasty in China, during which eunuch power grew as they were granted more privileges and freedoms by the emperors, but also during which individual eunuchs clearly demonstrated that they were taking advantage of preformed opinions about eunuchs in general.²¹⁸ It may be that the culturally assigned group categorization of “castrate”, while not actually pertaining to any major personally held sense of identity for castrates, provided enough of a cultural definition to make those who utilized castrates comfortable,²¹⁹ while providing a stable and strong enough group identity that castrates could use that identity like a mask when it suited them and otherwise discard it. In this sense, the assignment of group identity to castrates did create a sense of social identity, but the extent to which individual castrates experienced or internalized that identity is not well understood and perhaps was not ever that salient for castrates.

This attitude of “individuality” within the wider castrate community may have been due at least in part to the manner in which individuals became castrates. It is entirely likely that an individual who actively pursued castration, whether it was to provide for himself or his family, would be regarded suspiciously and perhaps even distastefully by an individual who had been forcibly castrated and sold into slavery. Both individuals could have been found in the same location, performing the same duties, and seen as the same by non-castrates, but the castrates themselves may have regarded each other as completely different groups of individuals. Taking this into consideration, is it accurate to speak of a castrate group identity, or is this an externally, socially imposed identity to which castrates themselves felt little to no allegiance? How complicit were castrates in the formation of this perception? Was it entirely socially imposed, or was there active encouragement by castrates of these ideas? As discussed above, there is some evidence that Qing Dynasty castrates were taking advantage of socially constructed narratives of castrate personality to fulfil their own purposes,²²⁰ but little research into these questions in other societies which used castrates has been conducted.

²¹⁸ (Kutcher, 2010)

²¹⁹ (Huddy, 2001)

²²⁰ (Kutcher, 2010)

Theories about how rituals affect group coherency, consistency, and cohesion state that “imagistic” rituals, which involve rare, traumatic activities such as beating, scarring or self-mutilation create a sense of group cohesion and strong bonds among those who experience them together.²²¹ This may explain why individuals who are castrated for religious reasons subsequently form close cohorts, such as the *galli* priests/devotees of Cybele, the Skoptsy, or the Indian *hijras*.

4.3 Sex and Castration

There has been an effort to divorce sex and gender as two, at times completely different, categories: one rooted in biology and the other in sociology.²²² However, it can be argued that gender and sex should be discussed as intertwined and interacting factors in social negotiations of gender, power, and identity.²²³ While sex and gender are distinct categories, both feed into each other, as sex determines the outward expression of gender, which can in turn affect how and whether the secondary sexual characteristics are displayed or concealed.²²⁴ Castrates, as a socially constructed and maintained group of intersex individuals, are excellent demonstrators of these intertwining factors, as castration takes established modes of sex and gender perception and twists them.

Prepubertal castrates lack the necessary hormones to create and express the external markers of secondary sexual characteristics, immediately marking them as different from both “males” and “females.”²²⁵ While all castrates remain chromosomally male, the majority of biological sex markers, including the gonads, the hormones, the secondary sexual characteristics, the internal genitalia, and, in some cases, the external genitalia,²²⁶ are removed. In many cases, this means that the outward expression of castrates’ maleness has been subsumed by an overall impression of intersex androgyny. Castrates are repeatedly called a “third sex,” “monsters,” “freaks,” and “unnatural” in both ancient and modern sources.²²⁷ While the process that creates them is unnatural, it is perhaps most telling of specific societal viewpoints that what makes them a “third sex” is the loss of generative power and the symbol of that power - the testicles and, sometimes,

²²¹ (Atkinson and Whitehouse, 2011; Swann et al., 2012)

²²² (Butler, 2004; Fausto-Sterling, 2000; Grauer and Stuart-Macadam, 1998; Matta, 2005)

²²³ (Butler, 1999; Fausto-Sterling, 2000; Hood-Williams, 1996)

²²⁴ (Grauer and Stuart-Macadam, 1998; Sofaer, 2006)

²²⁵ (Callewaert et al., 2010; Eng et al., 2010; Wilson and Roehrborn, 1999)

²²⁶ (Karkazis et al., 2012)

²²⁷ (Magie, 1924; Patterson, 1982; Scholz, 2001; Tougher, 1997)

the penis²²⁸ - the symbols of male sexual identity, sexuality, and therefore male gender identity.²²⁹ In the case of castrates, regardless of the number of gender roles in their society, the removal of the outer signs of virility, the testes (and sometimes the penis), relegates these individuals to the realm of in-between, an unstable position between the two widely acknowledged sexes (the number of born intersex individuals and therefore their status in many historical populations is not known). These individuals then become “feminine” in character, lacking standard masculine attributes.²³⁰ In some past cultures, androgyny may have been seen as a highly desirable bodily form,²³¹ making castration a viable method of freezing the body in a state of transition. This may be seen in the concept of castration as a method of preservation, not only of a boy’s voice, but his beauty and youth in Rome, Byzantium, Persia, and the early modern period in Europe.²³²

It has been argued that refining definitions of sexual difference is a crucial method of reinforcing sexual order and hierarchy.²³³ The historical arguments for and about sex identity, gender, and sexuality are most complex for the Greek and Roman periods, for which there is a large body of textual and material evidence.²³⁴ In the late Roman (and subsequently the early medieval) world, castrated slaves were considered unmanly, passive agents of sexual pleasure, as they did not or could not display two of the most important signs of sexual masculinity: sexual aggression or dominance and fertility.²³⁵ In addition, the *galli* priests/devotees of Cybele, sometimes self-castrating Roman citizens, were perceived as neither men nor women, making Romans uncomfortable about them and the cult they represented.²³⁶ Taylor argues that Martial states that the *galli* took both the penis and testicles off when self-castrating, although to what extent this was practised commonly is unclear.²³⁷ It is possible that because the cult of Cybele originated in Anatolia, both testicles and penis were removed by the *galli*, but it is also possible that if castration were left to the individual, only the testicles would have been removed. It is also entirely possible that within the category of *galli*, there

²²⁸ (Ringrose, 1994)

²²⁹ (Nanda, 1994)

²³⁰ (Gershick, 2005; Jay, 1993; Ringrose, 1999; Teply, 1968)

²³¹ (Scholz, 2001)

²³² (Freitas, 2003; Scholz, 2001; Tougher, 2013, 1999)

²³³ (Behrend-Martinez, 2005)

²³⁴ (Karras, 2000; Laqueur, 1990; Skinner, 1996; Staples, 1998; Williams, 2010; Winkler, 1990)

²³⁵ (Ringrose, 1999, 1994; Tougher, 2013)

²³⁶ (Beard, 2012, 1996; Bowden, 2010; Staples, 1998; Tougher, 2013)

²³⁷ (Taylor, 1997)

were those who had removed only the testicles, those who had removed testicles and penis, and those who had removed neither (the latter is at least partially attested).²³⁸ The simple fact of *galli* voluntary castration was enough to unnerve the Romans, who were deeply entrenched in the idea of patriarchy and male (citizens') rights to and duty to maintain bodily integrity, as represented by intact, virile male genitals.²³⁹ This led to a disconnect in the minds of the Romans that ultimately informed state policy regarding voluntary castration: a man "could not be both a *Gallus* and a *Roman*."²⁴⁰

There are indications that as early as the middle ages in Spain, genital anatomy was used as a marker of woman or manhood, indicating that external genital morphology may have been as important if not more important than many other characteristics in the identification and classification of the sex and gender of individuals.²⁴¹ In China, a common term for castration implied a relationship between power, mutilation, and male physical identity, indicating that removal of the male reproductive organ removed the power normally associated with the male sexual identity. Not only did castration make it impossible for a man to produce biological heirs (one of the necessary symbols of masculinity), it also changed his physical appearance, setting him apart both physically and socially.²⁴²

4.4 Gender and Castration

As most studies of gender in the past focus on differing versions and views of masculinity and femininity, rather than the role that physiognomy played in defining those categories, castrates allow for new and interesting insights into gender categories as defined by specific cultures.²⁴³ In those societies with rigid, bimodal gender categories, castrates consist of and construct, not only a troublesome third sex, but also a third gender.²⁴⁴ In a society obsessed with bimodal gender assignments, the perceived "otherness" of castrates makes them a difficult and uncomfortable topic. The absence of obvious external secondary sex markers further confuses the matter,²⁴⁵ blurring the lines between the "male" and the "female." A male is turned into something not quite male,

²³⁸ (Beard, 1996; Bowden, 2010; Carroll, 1992; Staples, 1998; Tougher, 2013)

²³⁹ (Laqueur, 1990; Tougher, 2013)

²⁴⁰ (Staples, 1998: 119)

²⁴¹ (Behrend-Martinez, 2005)

²⁴² (Jay, 1993)

²⁴³ (Behrend-Martinez, 2005)

²⁴⁴ (El-Cheikh, 2005; Ringrose, 1994)

²⁴⁵ (Bilharz, 2005)

something that becomes almost impossible to define in a bimodal gender schema. This confusion may be exacerbated by the removal of only the testes, as the process removes the generative power of an individual, but not what could be argued to be the most important symbol of maleness, the penis.

Throughout history castrates have been viewed unfavourably, especially from the point of view of male writers, who tend to revile and deplore castrates. A considerable number of gendered adjectives were used to describe castrates: effeminate, womanly, weak, “half-man” (*semivir*), “gelding” (*eviratus*), “womanish man” (*mollis*), “castrated catamite”, “womanish” (*effeminatus*), “man who dances like a woman” (*malakos*), “unmanly” (ἀνάνδρος - *anandros*), and “little men” (ἀνδράριον - *andrarion*).²⁴⁶ The discourse of gender as it relates to castration, especially in the Greek, Roman, Byzantine, and early modern Western European periods, owes a large debt to historical and philosophical studies of sex and sexuality, especially of the Romans and Greeks. Many of the notions espoused by Freitas in his discussion of the erotic possibilities of boys and castrati inherent in their gender status come from ideas posited by Classicists discussing sex, sexuality, homosexuality, and the various categories thereof.²⁴⁷

Discussions of gender and sex in the Classical Mediterranean world featured complicated notions of the two sexes, male and female, being opposite but also at polar ends of a traversable continuum in which masculine or feminine identities or traits could be assumed by either sex. Within this continuum, which could be perceived as a ladder reaching toward perfection, females were at the bottom, boys and adolescents were partway up, and males, full of the outward, ultimate signs of masculinity, including fully functioning genitalia capable of fertility, were at the top, reflecting their “superior” attributes.²⁴⁸ Adolescent males and boys could “move up” the ladder with maturation, but castrates were “stuck” in an arrested development that then affected their gender role.²⁴⁹ Prepubertal castrates in the Roman world, therefore, were not only caught between male and female, but also child and adult.²⁵⁰ Additionally, adult castrates could be and often were seen as men who had been made into women or even transformed into a third sex.²⁵¹

²⁴⁶ (Hester, 2005; Ringrose, 1994; Scholz, 2001)

²⁴⁷ (Freitas, 2003; Halperin, 2000; Karras, 2000; Skinner, 1996; Williams, 2010; Winkler, 1990)

²⁴⁸ (Ringrose, 1994)

²⁴⁹ (Freitas, 2003; MacLeod, 1996; Ringrose, 1994: 87)

²⁵⁰ (Krimmer, 2005)

²⁵¹ (Freitas, 2003; MacLeod, 1996; Ringrose, 1994)

In this conception of gender, “masculinity” and the privileges associated with it were predicated upon the continuous struggle to maintain appropriately “masculine” characteristics, such as the mastery of desire, but masculinity could also be “invaded” by women.²⁵² For the Greeks and Romans, gender was related to, and intertwined with, sex and sexuality, but not in the same way as conceived by modern Western cultures. “Masculinity” was derived at least in part through one’s actions, including a resistance to excessive sexual relations, and necessitated being the penetrator, or “active,” partner in any sexual acts undertaken.²⁵³ The gender identity most closely related to the *galli* of Cybele was that of the *cinaedus* (borrowed from and essentially identical to the Greek *kinaidos*), but whether a direct comparison between the two could be drawn is doubtful, as the *cinaedus* would supposedly come from the Roman citizenry, and Roman citizens were not supposed to be *galli*.²⁵⁴ However, the excessive venom used to refer to the *kinaidos* and *cinaedus*²⁵⁵ may explain some of the discomfort with and distaste for castrates, especially in Rome, where the main two categories of castrates were self-castrating adult male priests and “boy” slaves mainly retained for sexual purposes.²⁵⁶ These strongly patriarchal views were carried into and upheld through the Byzantine and early modern Western worlds, where they solidified into the modern, Western, rigidly bimodal sex and gender categories.²⁵⁷

In China, castrates existed along a fluid, sliding scale of gender,²⁵⁸ and in contrast to most of the rest of the world, castration did not seem to change a man’s gender identity.²⁵⁹ Castrates were referred to in male terms, wore male clothing, and were allowed to marry.²⁶⁰ The *hijras* of India are regarded as neither male nor female, while at the same time being man *plus* woman – erotic and sacred female men – imbued with the beneficent and destructive power of the Mother Goddess. This stems from the complementary opposition of gender roles in Hinduism, in which the female principle is seen as having two aspects: one positive and life-giving, the other destructive and life-

²⁵² (Halperin, 1998; Winkler, 1991, 1990)

²⁵³ (Halperin, 1998; Karras, 2000)

²⁵⁴ (Halperin, 1998; Staples, 1998; Williams, 2010)

²⁵⁵ (Karras, 2000)

²⁵⁶ (Tougher, 2013)

²⁵⁷ (Freitas, 2003; MacLeod, 1996; Ringrose, 1994)

²⁵⁸ (Huang, 2006)

²⁵⁹ (Jay, 1993)

²⁶⁰ (Devereux, 1982; Jay, 1993)

destroying, and must be controlled and restrained by male authority.²⁶¹ *Hijras*, as men plus women, actively dress and take on feminine roles, similar to the devotees of Cybele in ancient Rome.²⁶²

The formation of modern Western concepts of sex, gender, and sexual roles were solidifying by the 18th century, at least in England. This modern concept of gender proceeded from the assumption that all men exclusively desired women sexually, and that their behaviour proceeded from that desire.²⁶³ Consequently, men had to portray themselves as sexually active, never passive (i.e., always the inserter, never the inserted), once they reached puberty, and any hint of sexual passivity could permanently deprive men of masculine status.²⁶⁴ Trumbach argues that in the 17th century, the English only conceived of the existence of two genders (male and female), despite the known presence of at least three physical types of body (men, women, and hermaphrodites).²⁶⁵ In the early part of the 18th century, a third gender emerged, represented by a lower class, effeminate sodomite culture in which some male individuals dressed and acted as females most of the time, though they would still dress and act as males some of the time. Trumbach argues that the emergence of this third gender role can be best explained as a shift to a perception of two types of physical bodies (men and women) and three genders (male, female, and sodomite), but only for men. He presumes that women continued to be perceived by the old system and that hermaphrodites were seen as more or less female. He therefore argues that men in 18th century England could constitute a third gender category based entirely upon their sexual activity, if it mainly or exclusively involved sexual activity with other males.²⁶⁶ However, this new gender role and those who fulfilled it were treated with open contempt and even corporal or capital punishment. Judicial cases brought against some adult males indicate that the sexual ambiguity of the male adolescent body was an attractive feature for adult, sexually active males, even and especially in this period. It may have been this popularly conceived desire for the gender-neutral, sexually ambiguous body of the adolescent male that made castrates such

²⁶¹ (Nanda, 1994)

²⁶² (Nanda, 1994; Scholz, 2001)

²⁶³ (Trumbach, 1991)

²⁶⁴ (Trumbach, 1991)

²⁶⁵ (Trumbach, 1991)

²⁶⁶ (Trumbach, 1991)

popular targets for vicious rhetoric, as their bodies were the ultimate example of sexual ambiguity.²⁶⁷

4.5 Sexuality and Castration

Sexuality plays a large role in how individuals in modern, Western countries perceive each other. Due to the largely bimodal, heteronormative, and deeply misogynistic culture in which most modern Western individuals are raised, questions of sexuality can have a large influence on how one is treated, where one is safe to exist, and how one can externally display markers of sex and gender. This is even more important for trans- or intersex individuals, who are discriminated against or physically harmed, depending on their outward appearance. While many of the modern attitudes to homosexual, transsexual, or intersex individuals have arisen in the last two to three hundred years, an investigation into the sexuality of castrates, both as perceived by others in the past and ourselves now, may provide interesting and useful information on how castrates were perceived in the past, affecting how they were treated, and in some cases, indicating why they were castrated.

The unique nature of castrates' bodies as an intentionally created category of intersex and the ensuing sex and gender conflicts created by that new category of sex have led to frequent, often prurient, interest in castrate sexuality. Could castrates have sex? Were they interested in having sex? With whom did castrates have sex? As with any aspect of humanity, the answers likely varied across time and place. Physically, castrates were capable of being the passive (i.e., penetrated) partners in homosexual activity and potentially would have been capable of being the penetrative partner in both homo- and heterosexual activity.²⁶⁸ Additionally, there is evidence that they may have been able to please at least female partners without necessarily needing to be able to penetrate their partners. There are some oblique references to sexual activity between castrates and females that involved mostly non-penetrative acts.²⁶⁹ It is also likely that sex toys may have been used by castrates, as shown by their presence within the private collections of at least one palace castrate in China (**Figure 4.1**).

²⁶⁷ (Freitas, 2003; Trumbach, 1991)

²⁶⁸ (Berry, 2012; Freitas, 2003; Hester, 2005; MacLeod, 1996; Tougher, 2013) (I am utilizing Williams' definition of sexual activity as indicative of acts only, not necessarily identities and not necessarily consistent across time. (Williams, 2010))

²⁶⁹ (Aucoin and Wassersug, 2006; Hester, 2005; Kuefler, 2001; Ringrose, 2003)



Figure 4.1: Image of sex toys from the collection of the Eunuch Museum, Beijing, People's Republic of China. (image by author)

Records of the fascination with and speculation about the sex lives of castrates by non-castrated individuals date to at least the Greco-Roman period.²⁷⁰ This has led to questions about castrate sexuality and sexual practices, including whether they could physically have penetrative sex, whether they *wanted* to have penetrative sex, with whom they might have wanted to have penetrative sex, and whether they would have wanted to have male/male penetrative sex as either an active or a passive partner. Exempt from this discussion seems to be the conception of castrates as either exclusively homosexual or heterosexual (by which I mean the modern concepts of hetero- and homosexual as individuals who prefer to have sexual relations with one sex or the other, i.e. have a sexual orientation), despite much historical discussion of castrate sex with both males and females.²⁷¹ Evidently, as with discussions of castrate sex and gender, castrate sexuality is seen as a third category, exterior to the current discussions and debates about hetero- and homosexuality in the past. This may be partly due to a perception that the majority of male/male sexual practices by castrates were not initiated by or wanted on the part of the castrates themselves, but rather “forced” upon them through the process of slavery, poverty, or power dynamics. Alternatively, it may be a result of the idea that castrates, lacking a definable sex, lack a definable sexuality and

²⁷⁰ (D’Ancillon, 1718; Finucci, 2003; Freitas, 2003; Kuefler, 2001; Tougher, 2013)

²⁷¹ (D’Ancillon, 1718; Freitas, 2003; Tougher, 2013)

therefore slip between “heterosexual” and “homosexual” with the same ease as they move between “male” and “female.”

Classical notions of sexuality have been a recent focus of work by scholars,²⁷² as the ideas of homosexuality, heterosexuality, the emergence of sexuality, and the definition of sexuality, amongst others, are being argued between feminist and self-identified or supporting homosexual Classical scholars. Specific categories of sexual practice and individuals defined in ancient texts by their sexual practices have been used to argue a range of interpretations, mostly centred around the acceptance or rejection of Michel Foucault’s assertion that the modern concept of the homosexual did not exist before the 19th century.²⁷³ The discussion of sexualities in the Greek and Roman world often centres around male, citizen, mostly elite individuals, and whether “homosexual acts” (such as the active role in penetrative sex) conferred upon them within their own societies the same sort of sexual identity or even sexuality that it would in modern Western society. In other words, if an elite male Roman citizen were to be the penetrative partner in a male/male sexual relationship (or even sexual encounter), would he be considered homosexual in ancient Rome?

What is rarely mentioned in these discussions, although it might greatly profit them, is the perception within these societies of males who were castrated specifically for sexual use, and what gender, sex identity, and sexuality they were assigned. If a *cinaedus* was considered gender deviant, how were these castrates perceived? Did they fall into the same sexual category, or did their gender and sexual identities not matter because they were castrated, slave, non-citizen foreigners? Karras argues that an adult (presumably citizen) male who was penetrated would be scorned and mocked, deemed unmanly, and might face a lowering of social status, but his “woman’s experience” would not actually make him a woman.²⁷⁴ How then were castrates who worked as prostitutes or were the “mistresses” of wealthy Roman elites perceived? Did their lack of (at least) testicles make their sexual role unimportant? Halperin argues that several of the categories used to discuss specifically male/male forms of sexual behaviour in premodern conceptions of sexuality (and specifically homosexuality) rely on notions of gender, both within the societies which used those concepts and more generally.²⁷⁵ He

²⁷² (Halperin, 1998; Karras, 2000; Winkler, 1990; Zeitlin et al., 1991, 1991)

²⁷³ (Halperin, 1998; Karras, 2000; Skinner, 1996)

²⁷⁴ (Karras, 2000: 1261–1262)

²⁷⁵ (Halperin, 2000)

goes on to argue that in “premodern systems of sex and gender, the notion of ‘sexuality’ is dispensable, because the regulation of conduct and social status is accomplished by the gender system alone,”²⁷⁶ but in that case, how can and do the strained notions of castrate gender affect their positioning in terms of sexuality?

In 18th century England, adolescent males without secondary sexual characteristics were allowed to be sexually passive, creating both a sexual role and legitimate space for castrate passive sexuality. However, the transgressive actions of sexually active women and sexually passive men in this period may have been seen as dangerous to the standard gender order as it had recently been formulated.²⁷⁷ Within wider studies of sexuality and marriage in 17th and 18th century England specifically, and Europe generally, it has been found that fewer younger sons and daughters were married, with the assumption that these younger siblings remained celibate throughout life. It has been proposed that this was due to the inheritance systems of the period, which favoured the first-born (surviving) son to inherit.²⁷⁸ This may suggest one of the reasons that large numbers of boys were being castrated in 17th and 18th century Italy, as it is commonly presumed that they were younger sons who would not necessarily have had an inheritance.²⁷⁹

Ross and Rapp believe that sexuality generates wider social relations while being refracted through each society’s specific constraints, meaning that sexual activities and feelings display the contradictions of power relations such as gender, age, race, and class. They argue that because sexuality is shaped by complex, changing social relations, it has a history, that this history can be examined, and that perceptions of that history may change as more information is uncovered or as concepts evolve.²⁸⁰ Arguing that gender and race are social rather than biological constructs, Rubin makes the point that while the brain, body, genitalia, and language are necessary for sexuality, they do not determine its content, experiences, or institutional forms.²⁸¹ Of particular bearing in the case of castrate sexuality is the social constructionist argument that the categories by which we think about sexuality are not universal but rather a construction of our own culture.²⁸²

²⁷⁶ (Halperin, 2000: 114)

²⁷⁷ (Trumbach, 1991)

²⁷⁸ (Ross and Rapp, 1981)

²⁷⁹ (Rosselli, 1988)

²⁸⁰ (Ross and Rapp, 1981)

²⁸¹ (Rubin, 1999)

²⁸² (Karras, 2000)

However, the Foucauldian notion of sexuality as at least partially formed from some sort of self-awareness may change this interpretation.²⁸³ What has previously been discussed, in various permutations, are concepts of castrate sex acts and castrates as sexual beings,²⁸⁴ but an investigation of castrate sexuality seems to be missing.

Nevertheless, it is difficult to discuss the actual sexuality of castrates in any real depth. There are some instances where individual castrate sexuality was clearly demonstrated, such as the marriage of castrati in the early modern period²⁸⁵ or the participation of castrated Skoptsy in sexual relations,²⁸⁶ but the majority of references to castrate sexual experience is either conjecture²⁸⁷ or refers to potentially coerced relationships with powerful, non-castrated males.²⁸⁸ Few historical texts written by castrates themselves are currently known, and as most of these texts do not discuss sexuality or sexual practices, definitive statements about how castrates individually or as a group perceived their sexuality or how these perceptions changed in different cultures over time cannot be made.²⁸⁹ It is also necessary to pick out the differences between a castrate's own sexual actions and the sexual action(s) imposed upon them by their social circumstances, remembering that these may not necessarily have coincided.

4.6 Imperial and Religious Eunuchism

As Rosselli notes, “Jokes and anecdotes have kept the castrati safely on the margin of everyday life.”²⁹⁰ Due to their distinctive appearances and unique physical characteristics, castrates were often given specific and special tasks. Their lack of the distinctive external markers of masculinity led to their classification as a “third gender,” leading to their use in positions that might otherwise have been denied them. Castration symbolizes both the degradation and social ostracism of the individual,²⁹¹ literally

²⁸³ (Halperin, 1998; Skinner, 1996)

²⁸⁴ (Aucoin and Wassersug, 2006; D’Ancillon, 1718; Freitas, 2003; Heim, 1981)

²⁸⁵ (Berry, 2012; Finucci, 2003)

²⁸⁶ (Koch, 1921; Tandler and Grosz, 1910b)

²⁸⁷ (D’Ancillon, 1718; Freitas, 2003)

²⁸⁸ (Kuefler, 2001; Tougher, 2013)

²⁸⁹ There are a few texts written by castrates, such as those by Farinelli, Balatri, and Sima Qian, but these only ever slyly hint at sexuality, when it is mentioned at all. Their perceptions of their own sex and gender are difficult to grasp as well, as Farinelli and Balatri wrote mostly in satirical form, and Sima Qian was more concerned about defending his choice of castration over death (Qian, 1976; Savage, 2005; Wunnicke, 2001). Discussions with *hijras* in modern India can lead to mixed results, as prostitution is commonly reported (Jani and Rosenberg, 1990) but often denied (Nanda, 1986).

²⁹⁰ (Rosselli, 1988: 143)

²⁹¹ (Scholz, 2001)

cutting him out of his society and placing him into a different gender role and social status. The gender confusion and resulting liminal social role caused by castrates' androgynous states is most likely what led to their enduring presence within the imperial hierarchy of many countries.

Coser, Hopkins, and Patterson combined the concepts of sex, gender, liminality, and social grouping to propose a practise that they called "imperial eunuchism."²⁹² This entailed the idea that – due to castrates' differently-sexed, differently-gendered, liminal social status – they could serve as the semi-permeable barrier between a semi-divine ruler and his people. The separation of ruler and subjects would protect the ruler from the "contamination" of his subjects and the subjects from the "danger" inherent in a semi-divine ruler. As they noted,²⁹³ once a ruler has instituted a system whereby he becomes an isolated, semi-divine individual, it is no longer possible for him to meet regularly with most of his subjects. He must therefore have some form of filter between himself and the outside world that reflects his semi-divine status, but he must also be able to obtain information from the outside world. In acting as this barrier, castrates filtered the types of information moving to and from the ruler, influencing decisions and courses of actions a ruler might take. Androgynous, intersex castrate forms blurred the boundaries between male and female, making them ideal for blurring other boundaries, such as those between the sacred space surrounding the ruler and the profane space of the outer world, or the public spaces of the palace and the private spaces surrounding the inner areas of the ruler's household. Therefore, castrates became both barriers to and exclusive sources of access to rulers, giving them privileged status and allowing them to contribute to or even dictate state policy, either directly or through their influence over the ruler.²⁹⁴

Castrates, in their role as mediators, were the only group which could both form and cross the boundary between ruler and subjects, and both bolstered and benefitted from the idea of sacred kingship, often taking bribes or other remuneration for putting forward one cause over another to the ruler.²⁹⁵ This uninhibited access quite often brought resentment from those excluded by the social and physical barrier of castrates.²⁹⁶ However, given that Assyria is both the earliest reliable example of castrates in a court system and an empire known for purposely uprooting people from their homelands in an

²⁹² (Coser, 1964; Hopkins, 1978; Patterson, 1982)

²⁹³ (Coser, 1964; Hopkins, 1978; Patterson, 1982)

²⁹⁴ (El-Cheikh, 2005; Hopkins, 1978; Patterson, 1982; Ringrose, 2003)

²⁹⁵ (El-Cheikh, 2005; Hopkins, 1978; Patterson, 1982; Scholz, 2001)

²⁹⁶ (El-Cheikh, 2005; Tougher, 1997)

effort to suppress uprisings,²⁹⁷ how much of what is propounded in the theory of imperial eunuchism is due to the intrinsic nature of imperial institutions, and how much is directly related to the legacy of the imperial institution formed by the Assyrians and passed on to the world through the Persians?

While Coser, Patterson, and Hopkins' theory of imperial eunuchism provides a reasonable framework for the use and continuation of castration in imperial societies, what of castrates in societies which did not have a history of strong imperial use or for whom religion was the motivating factor for castration? There is a secondary category under which these castrates could fall: religious eunuchism. Religious eunuchism is here defined as eunuchism driven in part or wholly by religious convictions or requirements and as part of a formal, semi-rigid hierarchical religion in which castrated individuals have some prestige or specific position. It is in many ways similar to imperial eunuchism and is arguably driven in some cases by similar thought processes, but differs in that many religious castrates likely were self-castrating or chose castration for themselves. Examples of this category include the *galli* of Cybele, the castrated early Christian church fathers, the Skoptsy, the *hijra*, and to a certain extent, the *castrati*.²⁹⁸

As this form of eunuchism tended to be more voluntary, castration tended to occur later in life (i.e., postpubertally). However, in societies in which castration was practised as a religious norm, such as the Skoptsy or the *hijra*, castration could occur at a very young age.²⁹⁹ Whether these castrations were a genuine choice on the part of the castrated individual is not always clear, and in many cases there is evidence that the castrated individual had no choice in whether he would be castrated or not. There is documentary evidence for the Skoptsy that parents or other members of the community regularly castrated children (possibly exaggerated to fit preconceived notions on the parts of those studying the Skoptsy).³⁰⁰ In addition, some Byzantine, Ottoman, or Chinese castrates may have been sold into slavery, castrated, and then ended up in religious institutions.

The importance of religion in motivating castration and the importance of castration to certain religions meant that there was always a steady supply of castrated religious leaders and reasons to castrate for religion. Moreover, there was a certain

²⁹⁷ (Parpola, 2004; Tougher, 2008)

²⁹⁸ (Barbier, 1998; Engelstein, 1999; Kuefler, 2001; Nanda, 1999; Pittard, 1934; Rosselli, 1988; Tougher, 2013; Vermaseren, 1977)

²⁹⁹ (Engelstein, 1999; Finucci, 2003; Koch, 1921; Nanda, 1999; Pittard, 1934; Rosselli, 1988)

³⁰⁰ (Koch, 1921; Tandler and Grosz, 1910b)

amount of crossover between religious and imperial eunuchism, as castrates serving in religious roles could sometimes become involved in the government or politically powerful castrates could enter religious life upon retirement. For example, in the Byzantine Empire, a castrated individual could be patriarch, the head of the Orthodox Church, and therefore involved in government life.³⁰¹ Alternatively, important government castrates could retire to life in a monastery, as evidenced by certain individuals in China and Byzantium.³⁰² Some castrates also had mixed religious and imperial roles, such as the castrati in Baroque Europe, who ostensibly served in private, elite choirs as choristers and occasionally priests, but could also serve as envoys between rulers.³⁰³ While not all of these individuals were castrated for religious reasons, religion could become a refuge for them, causing a blending between imperial and religious eunuchism. This blending can often be seen in societies with a strong imperial eunuch presence as well as a strongly religious community. It may also indicate that what really drove castration as a long-living practice was the formation of highly hierarchical institutions based around a divine or semi-divine individual, requiring either complete or partial celibacy on the part of some or all of its adherents.

4.7 The Eunuch Ideal (The Ideal Eunuch)

There is growing evidence that despite the overall contempt for castrates, there were traits or characteristics of castrates (beyond the sexual infertility of the castration itself) that attracted individuals to castrates. Young castrates, especially young, beautiful castrates, were more highly prized than older castrates in several cultures around the world, including China and Rome.³⁰⁴ It could be argued that for many of the (normally educated, wealthy, and political) male writers within castration societies who discussed castrates, the ideal castrate, if castrates had to exist, would be young, tractable, beautiful, loyal, obedient, silent, clever but not ambitious, discreet, and completely asexual or only sexual when it suited a man. In fact, it appears that the ideal eunuch would have been everything that eunuchs supposedly were not.

In essence, the ideal eunuch would have been similar to a castrated animal. They would be available for the extraction of all value, with no resistance or free will. Given

³⁰¹ (Ringrose, 2003; Tougher, 1997)

³⁰² (Jay, 1993; Tougher, 1997)

³⁰³ (Barbier, 1998; McGeary, 1998; Rosselli, 1988; Wunnicke, 2001)

³⁰⁴ (Freitas, 2003; Kutcher, 2010; Tougher, 2013)

the general opprobrium with which castrates were regarded, probably due to the fact that they were not animals and could indeed think and make decisions for themselves, to their own benefit, it is interesting that castration as an institution closely bound with hierarchical structures continued to exist for as long as it did. It was because these individuals were castrated that they were able to fulfil given social roles. Without castration, they would not have been able to fill those roles, but would these roles have existed without castration? It is possible that similar roles would have existed, but that other individuals, such as adolescent males or boys, would have filled them. In light of this, did the perception of castrates and the social structures surrounding them evolve to justify the continued practice of castration, or was there something specific about these roles that actually required castrated males? Current historical knowledge does not supply answers to this question.

Chapter 5: ‘Neither Male nor Female’: Physical Effects of Castration

Through the millennia that human castration has existed, popular opinion of castrates and consequently how the physical aspects of castration are perceived has been recorded often. Antique and early medieval opinions directly influenced the perception of castrates in later periods, thus influencing the manner in which they were scientifically studied beginning in the 19th century. Several wars and a general decrease in large-scale castration concurrent with the decline in empires and interest in castrated singers caused a lack of study of castrate bodies for nearly eighty years. It is obvious that the early 20th century investigators of castration were heavily influenced by Roman and Late Antique attitudes to castrates, which influenced the reasons why and the manner in which they undertook investigations into castration. Historically, castrates’ different outward appearance caused comment and raised interest in their study. In the 19th and early 20th centuries, studies of castrates were more possible as live and recently deceased individuals were readily available, which is not true today. Therefore, to understand existing knowledge of castrate bodies and how such knowledge was acquired, it is necessary to comprehend past perceptions and analyses of castrate physicality. This contributes to our modern knowledge about castrate bodies and impacts the detection of castrates in archaeological contexts. Funerary archaeology (such as grave goods, position, and location) may also play a part in the identification and recognition of castrate bodies archaeologically (discussed in Chapter Seven). Since European or American individuals performed most of the studies of castrate bodies currently available, Western, post-industrial, imperialistic notions of what constitutes the normal configuration, sex, and gender of a body have biased perceptions of castrates within the literature.

5.1 Physical Changes Expected In Humans

5.1.1 Castrates in Historic Literature

A number of ancient authorities, including Aristotle and Galen, described castrates as men made into women, which led to a mostly unchallenged assumption in post-Roman Europe that castrates were physically and physiologically similar to women.³⁰⁵ Additional descriptions of castrates as long-limbed, round-hipped, slightly-to-morbidly obese individuals created a distinct image of castrates in the historical literature.

³⁰⁵ (Ringrose, 1999)

The persistence of this perception is demonstrated by the modern scholarly designation of an individual portrayed on an ancient Egyptian sarcophagus with long extremities, small head, and mammary development as a prepubertal castrate.³⁰⁶ Castrates in one source are described as having longer legs, ‘light’ pelves, and stunted growth of the chest and arms.³⁰⁷ In the early A.D. 1920s, the eunuchs of the late Ottoman Empire were described as thin when young but increasingly fat with age, with wrinkled faces, jutting teeth, stunted chins, long, flabby arms and legs, and disproportionally short torsos.³⁰⁸ More recently, they were described as beardless individuals who resembled old, disfigured women.³⁰⁹

In China, castrates were traditionally thought to lose or never develop a beard, body hair, or signs of masculine balding; to have high-pitched voices, disproportionately long arms and legs, and fat deposits in their hips, buttocks and breasts; and to look handsome in youth, gain weight in middle age, and look feminine with deep wrinkles in old age.³¹⁰ European castrati were described as effeminate and boyish with disproportional limbs, small heads and shoulders, large pelvic girdles and ‘barrel’ chests.³¹¹ They were additionally described as tall, with smooth, beardless faces; wrinkles later in life; plentiful scalp hair; narrow shoulders; rounded hips; enlarged breasts; a tendency for obesity; and a female speaking voice.³¹² Indian *hijras* have been described as feminine with high-pitched voices, slender and delicate limbs, fat over the buttocks and legs, and a disproportionate lower body to upper body ratio.³¹³ Hickmet and Régnault made the first medical observations of Ottoman eunuchs, noting gynecomastia (development of breast tissue) and atrophied prostates in the castrates, but did not record any measurements for any parts of the body.³¹⁴

5.1.2 Past Studies of Human Castrates

From the mid-19th to early 20th centuries A.D. there was an interest in studying castrate bodies scientifically. These studies attempted to quantify and anthropologically

³⁰⁶ (Kadish, 1969)

³⁰⁷ (Flood, 1899)

³⁰⁸ (Von Bayern, 1923)

³⁰⁹ (Teply, 1968)

³¹⁰ (Jay, 1993)

³¹¹ (Freitas, 2003; Krimmer, 2005; Potter, 2007)

³¹² (Jenkins, 2001, 1998)

³¹³ (Mukherjee, 1980)

³¹⁴ (Hickmet and Régnault, 1901)

understand individuals who were castrated in order to understand the endocrinological processes of the human gonads. These reports, while limited by the scientific knowledge of the time, include vital information on castrates that is no longer obtainable for ethical and other reasons. Therefore, these studies provide the largest and best dataset of castrate measurements currently available. Most of the studies were limited to anthropometric measurements and radiographs, as they were conducted on living individuals. There was a prevailing opinion that the *sella turcica* would be enlarged in castrates, as it was thought that the extra growth seen in castrates was caused by the pituitary gland, analogous to pituitary gigantism. However, most studies of castrates, either osteological or radiographic, failed to provide consistent indications that castrate *sellae turcicae* were enlarged.

5.1.2.1 Osteometric Studies

Three studies of the entire skeleton of a castrate and one study of the entire skeleton of a eunuchoid individual are available. They date from the last decade of the 19th century and the first decade of the 20th century, when castrates were prevalent in Europe, Turkey, and North Africa. The first was Lortet's study of a Cairene castrate (likely born in what is now Sudan), whose skeleton he donated to the Anatomical Museum of the University of Lyon.³¹⁵ This was followed by the unwrapping and examination of the mummy of Nekht-Ankh, a Middle Kingdom ancient Egyptian, at the University of Manchester, England.³¹⁶ Finally, Tandler and Grosz examined the body of a Zanzibar-born castrate who died in the Rudolfsspital in Vienna, Austria. Their work was part of a larger study to understand the endocrine system.³¹⁷ Subsequent to examining the Zanzibarian castrate, they examined the body of a eunuchoid individual in order to differentiate between the two body types.³¹⁸

Lortet's study of the skeleton of a Cairene castrate did not include much detail on the skeleton itself.³¹⁹ Osteometric examination was in its infancy, and he appears to have been more interested in the social side of castration as it was practiced in Egypt (especially Cairo) at the time. Lortet gives a very brief description of the physical appearance of the castrate before dissection: dark bronze-green skin and a small, well-

³¹⁵ (Lortet, 1896)

³¹⁶ (Cameron, 1910)

³¹⁷ (Tandler and Grosz, 1909)

³¹⁸ (Tandler and Grosz, 1910a)

³¹⁹ (Lortet, 1896)

formed skull with pronounced maxillary prognathism and dentition. He lists the lengths of the long bones and the stature calculated by Rollet's method.³²⁰ The castrate's calculated stature differs from the length of the skeleton as measured in the laboratory at Lyon by as much as 20 cm. Whether this measurement was taken when the skeleton was still fleshed or when it was completely defleshed, disarticulated, and rearticulated is not discussed. Lortet concluded that the difference between the calculated stature and the measured stature was due to an abnormal elongation of the limbs, especially the legs.³²¹ Lortet then discusses the disproportion caused by this elongation of the legs, stating that it was obvious when viewing living castrates.

Furthermore, Lortet observed that the dissected castrate skeleton had a short thorax in comparison to the abdominal area and the overall stature; the pelvic girdle was small and appeared atrophied; and the obturator foramina were very large, leaving a narrow pubic symphysis between them. He describes the long bones as extremely slender and feminine, without prominent muscle attachment sites. He thought that the humerus was relatively short, while the radius and ulna were long and gracile, and the metacarpals and phalanges were exceedingly elongated, causing the hand to appear "almost simian" in character.³²² Similarly, the femur was gracile, the tibia and fibula were slender with exaggerated lengths, and the metatarsals and phalanges were also very long and slender.

Lortet then discusses the elongation of the limbs of various animals, including rabbits, chickens, and cattle, after castration in order to explain the elongation of the human castrate's limbs, especially the legs. Lortet notes that in most animals, prepubertal castration causes the hind limbs to grow to great lengths. He explains the process of castration in Egypt, noting that Coptic monks normally performed it in order to gain large amounts of money by selling the castrated boys to the rich Muslim households of Cairo and Istanbul. He then describes two methods of castration performed in the monasteries, one the standard "Nubian" method of castration, which involved cutting off the testicles and penis, staunching the wound with hot oil or sand or a poker and burial in Nile mud for several days, and one a method by which the penis and testicles were severed from the body by crushing them between a string and solid boards. This caused less external bleeding, lessening the risk of haemorrhage, but as no anaesthesia was

³²⁰ (Rollet, 1889)

³²¹ (Lortet, 1896)

³²² (Lortet, 1896: 363)

applied, the children reportedly suffered greatly, and in both methods, as many as two-thirds of the boys died.

Lortet also mentions that the majority of these castrates always carried a lead nail in order to prevent the scar caused by the surgery from closing over their urethral canal. He finishes the article by drawing attention to surgeons' observations that the prostate in many castrates has been observed to have atrophied, possibly one of the effects of castration.³²³

Dr. John Cameron, the physician present at the unwrapping of Nekht-Ankh (the 12th Dynasty son of a noble's daughter), characterised the mummy as eunuchoid, citing the gracile, delicate nature of the mummy's skeleton and its faint muscle insertion points.³²⁴ It might be unusual to encounter a castrate in Egypt at this time (the Middle Kingdom, 1991-1783 B.C.), as it is currently unclear whether castrates existed in large numbers in dynastic Egypt. However, castration was used as a form of punishment for crimes in dynastic Egypt, so it is possible that isolated, individual castrates existed during this period.³²⁵ Alternatively, Nekht-Ankh might have been a eunuchoid individual. Cameron at first thought that Nekht-Ankh might be a female, but when he rearticulated the pelvic basin, he found that the subpubic angle and the dimensions of the pelvic inlet were definitely masculine. The skin of Nekht-Ankh's genital area was preserved, but it proved impossible to determine his status due to the desiccated nature of the tissue. Both Nekht-Ankh and his half-brother, Khnum-Nekht, were aged based on cranial suture closure, which gave an estimated age of sixty for Nekht-Ankh. The stature was estimated from the femur length using Thane's method.³²⁶ He discussed the shape of Nekht-Ankh's skull, especially in the area between the foramen magnum and the external occipital protuberance, but Cameron felt that there was no noticeable difference between Nekht-Ankh and Khnum-Nekht in this area of the skull.³²⁷ He does mention that Nekht-Ankh is markedly orthognathous, but this is in comparison to Khnum-Nekht, who is thought to be of Negroid descent. Cameron also describes Nekht-Ankh's zygomatic arches as slender, the temporal ridges as only lightly developed, and the mastoid processes as delicate and feminine in character. He compares Nekht-Ankh's skull to a female's, noting the sharp supraorbital margin and quoting from a description of a female skull by

³²³ (Lortet, 1896)

³²⁴ (Cameron, 1910: 33)

³²⁵ (Kadish, 1969)

³²⁶ (Quain and Godlee, 1894)

³²⁷ (Cameron, 1910)

Humphrys.³²⁸ He seems to conflate the sexually dimorphic and ethnic characteristics of the skull's development, noting that it has "a distinct racial character of its own. It is, however, much broader than the skull of a pure negro (sic)."³²⁹ Nekht-Ankh's teeth are described as being excessively worn (from chewing hard particles in food) with cup-shaped molar grinding surfaces with thin enamel edging. One of his molars was slightly decayed, and all of his teeth were present except his upper right lateral incisor, which had been removed while he was still alive.

In examining Nekht-Ankh, Cameron notes that all of Nekht-Ankh's long bones are approximately a centimetre longer than those of his brother. He attributed this to the delay of ossification due to castration, which allowed the long bones to elongate. In his description of all of the bones, Cameron emphasizes their slender, gracile, and smooth nature, with a definite lack of well-developed muscle attachment sites. He contrasts this lack of development in the muscle attachment sites with Khnum-Nekht, who had well-developed muscle attachment sites but who Cameron felt had not had a very active lifestyle due to very developed squatting facets on the bones of his ankles. There was some evidence for degenerative joint disease of the spine in Nekht-Ankh, as shown by the presence of small bony exostoses on the edges of his vertebral bodies. Cameron notes that Nekht-Ankh's sacrum appears more feminine in character, though he seems to be making this judgement based on index measurements rather than macroscopic observation. Nekht-Ankh's sacrum appeared to consist of six pieces rather than the normal five; however, Cameron states that there are in fact only five sacral vertebrae as the lowest limit of the auricular surface does not extend below the middle of the third sacral body. Cameron briefly discusses the entire pelvis of both brothers, stating that they are much smaller than European pelvises and that the pelvic inlet indices are much higher than European averages.³³⁰

The description of the femora is dominated by a discussion of the squatting facets on the anterior face of the femoral necks. Cameron uses the distinct difference of the facets in both men (Khnum-Nekht has more pronounced facets) to infer that Nekht-Ankh led a more active lifestyle, though his bones do not possess strong muscle attachment sites. Cameron does state that both brothers' femora do possess an increased curvature, which is associated with squatting. He also indicates that Nekht-Ankh's greater

³²⁸ (Humphry, 1858)

³²⁹ (Cameron, 1910: 35)

³³⁰ (Cameron, 1910)

trochanter is not very prominent and is very smooth, in contrast to his brother's. Cameron discusses the tibiae mostly in terms of the evidence for squatting, though he does note that Nekht-Ankh's tibiae are only slightly longer than Khnum-Nekht's. Cameron argues that the slight difference in tibiae lengths indicates that Nekht-Ankh may not have been a castrate, as he expects most castrates' lower limbs to be very elongated. Both Nekht-Ankh and Khnum-Nekht had a great degree of platycnemia, meaning that their tibiae were very broad and flat anterior-posteriorly.³³¹

Cameron goes on to discuss the soft tissues of the mummies, including a brief discussion of the external genitals of Nekht-Ankh, in an attempt to determine whether Nekht-Ankh was in fact a castrate. His penis was found lying "loose" between his thighs, presumably detached from the underlying skeleton, after the mummy was unwrapped. Cameron describes the external genitals as a "triangular piece of hard, dried skin, dark brown in colour, from the apex of which there extends a peculiar open channelled structure, also quite firm, and guarded on each side by a well-marked flap."³³² He was able to place the piece back into anatomical position because of the impression of the pubic symphysis on the internal surface and found that the triangular piece represented part of the skin of the perineum. The channelled structure was most likely the remains of the penis, and he thought that the urethra had been open on the ventral aspect. He found no evidence of the presence of a scrotum or testes, which he felt confirmed the eunuchoid nature of the skeleton. He consulted another doctor, who felt that the two lateral flaps on the ventral side of the penis were probably the scrotum and who made the further point that the external genitals of mummies are often distorted, making it very difficult to definitely conclude the sex of an individual. Cameron states that the penis shows some evidence for subincision, a practice normally carried out by Australian aborigines. Included in the practice was the removal of an upper incisor, one of which Nekht-Ankh had lost during life. Cameron attempted to determine whether there was any evidence of the practice in ancient Egypt, but had no conclusive results by the time of the Murray publication.³³³

Tandler and Grosz's first published study involving castrates was the post-mortem study of a 28-year-old castrate from Zanzibar who had died of tuberculosis of

³³¹ (Cameron, 1910)

³³² (Cameron, 1910: 45)

³³³ (Murray, 1910)

the lungs and small intestine.³³⁴ He had been castrated in the “Nubian manner”, and he possessed a “delicate” skeletal construction with weak, emaciated musculature. His neck was long and narrow, topping a “wide and bulging” thorax.³³⁵ The larynx was small, with a barely noticeable Adam’s apple and no trace of ossification in the thyroid cartilage, making the castrate’s laryngeal cartilages more like the throat cartilage of a large child than an adult.

Once defleshed, the skeleton was found to be very delicate, without major bony projections or ridges at the muscle insertion points. The skeleton was 179 cm long, with an upper body (torso) length of 81.5 cm and a lower body length of 95.5 cm.³³⁶ No indication was given as to which landmarks were used for these measurements. This skeletal length varies from the non-dissected body length by five centimetres, which is too large a variation to be caused by the defleshing of the skeleton. It is not as large a difference as that of the Lyon castrate, and these measurements were taken on the cadaver and then (presumably) the articulated but defleshed skeleton, meaning that it should not be an artefact of stature regression. Tandler and Grosz did not account for this difference when discussing the skeleton, so it is unclear what may have caused it. The distance from the head of the humerus to the tip of the distal phalanx of the middle finger (arm length) was 83 cm and the distance from the iliac rim to the floor (iliocristale height) was 111 cm. Based on these measurements of the torso, arms, and legs, the lower and upper limbs were disproportionate to the torso.

The skull was small with a strongly developed mandible and maxilla. The superciliary (or supraorbital) ridges were “fairly strongly” arched forward and held a “relatively large” frontal sinus.³³⁷ The orbits were very small, with 3.9 cm between the two orbits (measured from their medial walls) and a “deeply saddled nasal root”.³³⁸ The nasal bones were narrow, slightly arched and short, forming a pointed nasal bridge, and the frontal processes of the maxilla were set forward, with flat canine fossae. The cribriform plate (lamina cribrosa) was deeply sunk between the two forward-arching orbital roofs and the hypophyseal fossa was wide, long, and deep in comparison with the rest of the small skull base. The palate was high and arched with a wide interior orbital fissure, though the openings to the base of the skull were small. The zygomatic arches

³³⁴ (Tandler and Grosz, 1909)

³³⁵ (Tandler and Grosz, 1909: 43)

³³⁶ (Tandler and Grosz, 1909)

³³⁷ (Tandler and Grosz, 1909: 43)

³³⁸ (Tandler and Grosz, 1909: 44)

were “coarse” and the mastoid processes were short and wide.³³⁹ The mandible had a weakly developed mental protuberance (chin) with a rounded-off, childlike mandibular angle. The mandibular ramus was very wide but short, with a shallow notch, and the mandibular body was significantly developed through the alveolar processes, minimising the width of the inner surface of the mandible. No strong muscle attachment sites were noted on the maxilla or mandible. The occipital dropped inferiorly very sharply, with a weakly expressed superior nuchal line, an absent external occipital protuberance, and obscured cerebellar fovea. The middle cranial fossa was short with a sharply laterally rising petrous pyramid. The posterior cranial fossa was “abnormally” short anterior-posteriorly. Most of the sutures were partially closed, with only the coronal and temporo-occipital sutures still completely open, though the spheno-occipital synchondrosis was completely missing.

The Tandler and Grosz castrate’s pelvic girdle was relatively small and “delicate”.³⁴⁰ The ilia descended “moderately steeply” and possessed thick, strongly developed crests on which the lines of epiphyseal fusion were clearly visible along the entire length.³⁴¹ The superior and inferior anterior spines were well developed. The sacrum had weakly developed alae, the 5th lumbar vertebra was sacralised, the epiphyses between sacral vertebrae were clearly visible anteriorly, and the auricular surface of the sacroiliac joint was bounded by open epiphyses. The medial sacral crest was well formed while the two lateral sacral crests were poorly developed, but showed a normal sacral hiatus. The iliopectineal line was barely visible and the horizontal, descending pubic bone was very delicate, measuring barely 10 mm in width below the symphysis, though the pubic tubercle was well developed. The ischium was also gracile, and the ischiopubic ramus clearly showed the inferior epiphyseal boundary, disappearing only in the area of the ischial tuberosity. The acetabulae were shallow with a wide lunate surface, but they had deep acetabular fossae with almost paper-thin bone. The subpubic angle was clearly male, forming a sharp V-shape, and the pelvic walls converged inferiorly, creating a narrow, heart-shaped, male pelvic outlet.

The spinal column showed no unusual features, and the sternum was slight with a strong crease in the sternal angle. The clavicles and the bones of the limbs were gracile and displayed little to no bone growth on the muscle attachment sites. The distal

³³⁹ (Tandler and Grosz, 1909: 44)

³⁴⁰ (Tandler and Grosz, 1909: 47)

³⁴¹ (Tandler and Grosz, 1909: 47)

epiphyses of the humeri were fused, but the epiphyses of the humeral heads and tubercles were only partially fused. The proximal epiphyses of the ulnae and radii were fully fused, but the distal ends still had clearly visible lines of fusion. The metacarpals and hand phalanges were very thin and long, though epiphyseal lines were not visible on either the metacarpals or the phalanges. The femurs were bowed anteriorly with short and sharply angled necks and lateral compression of the shaft. Both proximal and distal femoral epiphyses were fused. The tibiae and fibulae were delicate and straight with fused epiphyses, and the feet had slight, long metatarsals. Tandler and Grosz summarize the study of this castrate by saying that in addition to the elongated bones, the ensuing disproportion between the torso and extremities, and the unfused epiphyses, the features they observed in the skeleton were not a change from a masculine to a feminine character but rather an arrest at a certain developmental point, especially in the pelvis and skull, which appeared very immature.

Tandler and Grosz later studied the autopsied body of a 28-year-old eunuchoid man with small, underdeveloped testes whose overall body length was 181 cm, with a lower body length of 100 cm.³⁴² His Adam's apple was missing and there was no ossification of the laryngeal cartilage, which remained similar to a child's in size. The skeleton was delicate with long limb bones and open epiphyseal junctions at the sternal and acromial ends of the clavicle, the proximal ends of the humeri, the distal ends of the radii and ulnae, the distal ends of the femora, the proximal ends of the tibiae and fibulae, and the iliac crests and ischial tuberosities. The height of the skeleton was 175 cm, with a lower body length of 98 cm, and upper body length of 77 cm. The cranium was noted as being slightly asymmetrical with open sagittal, coronal, and lambdoid sutures. The *sella turcica* had a deepened pituitary fossa. The superciliary margin was well developed, the root of the nose was deeply saddled with wide nasal bones, and the thick mandible displayed a flat mental protuberance and large submaxillary angle. In this study, Tandler and Grosz wanted to highlight the two body types that they found prevalent among castrates: tall growth and fat growth. They noted that the two types were not mutually exclusive and that there was a range of variation between the two types in castrates. They also highlighted the disproportion between the torso and the limbs caused by the increased length of the arms and legs from delayed epiphyseal fusion, which often led to *genu valgum*. They noted that in the fat type, extreme elongation of the limbs did not

³⁴² (Tandler and Grosz, 1910a)

occur, but skeletal disproportion was still present, often detected in the measurement ratios. Prior to their work, theories for the disproportionate appearance of eunuchoid individuals were varied, but Tandler and Grosz's combination of the observable physical limitations and changes in these individuals and subsequent comparison to the changes observed in castrates led to the conclusion that the physical changes to the soft and hard tissues were related to the lack of testes.

5.1.2.2 Anthropometric Studies

The use of anthropometry for the study of castrates is very well established.³⁴³ The last anthropometric examinations of castrates were also the last true scholarly investigation of castration and its physical effects on the skeleton before World War II and the subsequent scientific distancing from both anthropometric and castrate studies. The benefit of anthropometric measurements is that there is a long and fairly detailed history of standardisation,³⁴⁴ and that the major measurements have not changed very much since they were first introduced, making it possible both to replicate them with modern populations and to understand a report that is over a century old. As a number of previous anthropometric measurements of castrates include useful information such as stature, arm length, and floor-to-pubic symphysis height, there is a strong argument for creating methods that will allow these useful anthropometric measurements to be converted to modern osteometric measurements; see discussion in Chapters Six and Seven.

The first available anthropometric study of castrates is that of Tandler and Grosz,³⁴⁵ who studied five Skoptsy men in Bucharest, taking anthropometric measurements and observing disproportional limb-to-torso length and 'knock-knees' (*genu valgum*) on most of the castrates, open epiphyses on radiographs (as well as an enlarged *sella turcica* on one individual who had been castrated at age ten), and 'deeply saddled' noses and prominent supraorbital margins. They were unsure if the 'saddled' noses were the result of castration or if they were a genetic anomaly of the population. They spend most of the article describing the social and physical situation of the Skoptsy, as well as their deep distrust of strangers and medical examinations, due to their history of persecution at the hands of government authorities. This may explain why they are

³⁴³ (Koch, 1921; Pittard, 1934; Tandler and Grosz, 1910b; Wagenseil, 1933a, 1927)

³⁴⁴ (Dupertuis and Tanner, 1950; Kron, 2005; Martin, 1928, 1914; Wang et al., 2000)

³⁴⁵ (Tandler and Grosz, 1910b)

only able to give a limited number of measurements for the five men they examined (mostly stature, arm span, lower limb length, and skull dimensions) and some physical and social descriptions.

During the German occupation of Romania in World War I, Walter Koch³⁴⁶ took anthropometric measurements and a few skull radiographs of thirteen Skoptsy men who had been born in Russia but had emigrated to Romania. He observed that the pituitary glands were enlarged in some of the men, especially those who had been castrated before eleven years of age, with some erosion of the *dorsa sellae* in those who had very enlarged pituitary glands as well as a general thinning of the bones of the skull and kyphosis of the spine. He noted axial to appendicular skeletal disproportion and concluded that the constitution of these castrates confirmed the observations of previous investigations, stating that there was a clear relationship between the physical appearance of the Skoptsy and the age at which they were castrated. He was able to take a wider range of measurements than Tandler and Grosz, including height, leg length, arm span, the lengths of individual arm and leg elements, and head measurements, though not all of these measurements are listed for each individual. He performed physical examinations of all of the men, including their scars, and took biographical information. There is some indication that the Skoptsy were not completely honest with him, however, as individuals one and two, a pair of brothers, gave two different stories related to the timing and circumstances of their castration.

Ferdinand Wagenseil examined eleven Ottoman palace eunuchs of Sudanese and Abyssinian descent and one eunuchoid palace servant of Turkish descent in Istanbul following World War I.³⁴⁷ He also examined one uncastrated Sudanese male as a comparison for the proportions and growth of the castrates. One of the Africans and the Turkish individual had died in hospital, and were subsequently dissected. During the autopsy it was discovered that the Turkish individual was a cryptorchid with hypoplastic genitals rather than a surgical eunuch. Wagenseil took a wide range of measurements, helpfully compiled into a table, using Martin's anthropometric standards³⁴⁸ and photographs of the individuals. He recognized the similarity of his results to those of Tandler and Grosz and Koch, noting the tall, relatively thin body type and the fat body type. He also noticed that consequences of castration can be very varied, even within the

³⁴⁶ (Koch, 1921)

³⁴⁷ (Wagenseil, 1927)

³⁴⁸ (Martin, 1914)

narrow range of castration age (6-12 years) and closely related ancestry of the castrates. He established a series of nine body index ratios based upon the large range of measurements he had taken that compared specific absolute measurements. The comparative Sudanese male had either much higher or lower ratios than all of the castrates. He found that the castrates tended to fall into two major types: fat and only slightly taller than average males and very tall and thin. He also discovered that the castrates' ratio of the length of the lower limbs to the torso length was much greater than that of uncastrated males, indicating that their torsos were either slightly shorter than an intact male's torso or that they merely appeared to be shorter than an intact male's torso due to the castrates' elongated limbs. A number of effects of castration were confirmed in the castrates: the extremities, especially the lower limbs, were lengthened, width measurements, especially those of the pelvis, increased, the head became longer, and the face and nose became taller. The eunuchoid Turk showed the same lengthening of the extremities as the other subjects but retained a brachycephalic skull.

Wagenseil also took radiographs of four of the individuals, which revealed that two of the castrates had enlarged pituitaries and thinned *dorsa sellae*. Wagenseil did not report kyphosis in these castrates, perhaps due to the relatively young age of all the castrates at the time of examination, or perhaps because all but one came from Africa and might have had a higher bone mineral density before castration.³⁴⁹ As there was little indication of kyphosis, his stature measurements should reflect actual stature achieved by castrates due to prepubertal castration.

Wagenseil later examined thirty-one Chinese palace eunuchs, measuring height, weight, and a variety of dimensions.³⁵⁰ These measurements again followed Martin's standards, but he lists fewer measurements in these tables than in the 1927 Turkish eunuch article,³⁵¹ making them more difficult to use. He also took radiographs of the skulls and descriptions of skin and body hair. The individuals were 45-57 years old and had been castrated before, during, and after puberty. Twenty-one individuals were kyphotic (approximately two-thirds of the sample size), potentially affecting their statures. Though these individuals were castrated at an average age of eighteen (with nine castrated before or at the age of fourteen), the skull radiographs revealed no enlargement of the *sellae turcicae*. He again divided the castrates into groups based upon

³⁴⁹ (Wilson and Roehrborn, 1999)

³⁵⁰ (Wagenseil, 1933b)

³⁵¹ (Wagenseil, 1927)

body types by index, with the overall fat type and tall, thin type being the largest groups found. The tallest individuals were prepubertal castrates, but not all prepubertal castrates were excessively tall. Torso height was shorter than intact Chinese males, and was more noticeable in prepubertal rather than postpubertal castrates. Pelves were clearly enlarged, a factor which was not dependent on age of castration. Both the upper and lower extremities were elongated, the lower more strongly than the upper, and *genu valgum* was prevalent. The faces and noses of the castrates were taller and narrower than the comparative Chinese population Wagenseil examined. Their head hair was well developed, but the beard and body hair were reduced. The characteristics of castration that Wagenseil noted for the Chinese castrates were the reduced torso length, the enlarged pelvic width, the length of the extremities, the size of the larynx, the stature, the length and breadth of the face and nose, and the joint deformities of the lower extremities.

Working in Romania before and after World War I, Eugène Pittard took the measurements of thirty Skoptsy men from one village on the Black Sea coast, noting that they were taller than their uncastrated peers, with disproportionately long limbs compared to torso length.³⁵² While he took detailed measurements of all the Skoptsy he studied, he did not chart his data in a format that allows them to be analysed as individuals. However, one of the points he most strongly emphasized was the extreme disproportion of castrate torso to limb measurements, caused by the elongation of the limbs after castration. He, like Wagenseil, found that not all the castrates who had been castrated before puberty were very tall, but that all those castrates who were extremely tall had been castrated at a young age, often well before puberty might have been expected to begin.

Data from Koch, Tandler and Grosz, and Wagenseil has been used in the statistical analyses discussed in Chapter Six. While this data is a century old, most of the measurements are well documented and were taken following widely known, popular standard anthropometric measurements,³⁵³ which has been discussed in Chapter Three and will also be discussed in Chapter Six. Some of the studies provided more types of measurements than others, but all studies used provided at least basic information on stature and arm and leg lengths, allowing for statistical analysis to be carried out.

³⁵² (Pittard, 1934)

³⁵³ (Martin, 1914)

5.1.3 Medical Literature

The birth of endocrinology and the study of castration were closely intertwined. Medical doctors like Tandler, Grosz, and Koch studied castrates in an effort to understand the processes, including biochemical and biosynthetic, behind the physical changes in castrates' bodies and how those changes were effected. Expansion of their studies to the general population and to animals contributed to the birth of the discipline of endocrinology. The use of castrates as study subjects became increasingly difficult during the two World Wars. After the Second World War, castrates were not generally available to Western doctors in large numbers. Endocrinology and Medicine continued to study the hormonal processes driving abnormal development in humans, but tended to use individuals with genetic or endocrinological disorders as case studies. The increased ability to develop and breed strains of lab animals, especially mice, with particular characteristics allowed endocrinology to continue to develop, despite the small number of human case studies and increased ethical awareness of the study of human beings. This knowledge allows new, interesting information to be gained from the study of castrates, and a better understanding of the hormonal processes driving castrate body development and maintenance.

The naturally occurring condition that best simulates prepubertal castration is anorchia (also called vanishing testes syndrome or testicular regression syndrome) in which chromosomally and (often) phenotypically male individuals display a unilateral or bilateral lack of testes well in advance of puberty.³⁵⁴ As this condition naturally mimics surgical castration, individuals with this syndrome, though rare, would form the best study group on which to base a comparison of castrate skeletal development. However, as this condition is mostly noticed at or shortly after birth, individuals are usually treated with the appropriate hormones to induce growth and virilisation at puberty.³⁵⁵ Modern medicine likens castration to primary hypogonadism (an inherent defect within the gonad, usually due to genetic factors) because both conditions express similar effects, caused by the loss of the sex hormones produced by the testes.³⁵⁶ Individuals with primary hypogonadism, especially as a result of testicular failure, present what are called 'eunuchoidal' characteristics, such as extreme stature, decreased muscle mass, failure of the voice to deepen, impaired body hair growth, impaired penis and testicular growth,

³⁵⁴ (Hegarty et al., 2007; Vinci et al., 2004)

³⁵⁵ (Kenny and Raisz, 2003; Plymate, 2003; Winters and Clark, 2003)

³⁵⁶ (Jay, 1993; Plymate, 2003)

and gynecomastia.³⁵⁷ In primary hypogonadism, the length ratio between crown-to-pubis and pubis-to-floor is skewed so that the extremities display exaggerated growth, although in true eunuchoid proportions the arm span is often at least six centimetres greater than the height and not all individuals with primary hypogonadism attain this.³⁵⁸ Similar effects could also be seen in those individuals who have congenital hypogonadotropic eunuchoidism (of which primary hypogonadism is a subtype), testicular trauma destructive to the gonads before puberty, or androgen or oestrogen insensitivity syndromes, but these individuals are also regularly treated with hormones to promote typical male growth patterns once the condition becomes apparent.³⁵⁹

Androgenic steroids, especially testosterone (ninety-five percent of which is secreted by the testes), are necessary for the development of normal male sexually dimorphic characteristics, especially skeletal development and maintenance.³⁶⁰ Androgens may affect bone metabolism directly or indirectly through stimulation of either the androgen receptor or conversion into oestrogen and stimulation of the oestrogen receptor.³⁶¹ The gonadal production of testosterone is extremely important as the majority of endogenous oestrogen in men derives from gonadal testosterone³⁶² through the action of aromatase, the key enzyme in oestrogen biosynthesis,³⁶³ and which may account for at least one-fourth of a normal male's oestradiol production.³⁶⁴ Oestradiol, the major oestrogen, plays a significant role in preventing bone loss in aging individuals, while both oestrogen and testosterone maintain bone formation.³⁶⁵

Oestrogens are just as important as androgens for normal male development, modulating skeletal maturation and regulating bone structure, size, and the production of trabecular bone,³⁶⁶ as well as causing normal epiphyseal maturation and being responsible for the pubertal growth spurt.³⁶⁷ There is evidence that without this oestrogen-induced growth spurt and subsequent bone fusion, males experience a steady, slow rate of bone growth throughout adolescence and later decades, resulting in

³⁵⁷ (Marshall, 1977; Plymate, 2003)

³⁵⁸ (Plymate, 2003)

³⁵⁹ (Plymate, 2003; Quigley et al., 1995; Winters and Clark, 2003)

³⁶⁰ (Hiort, 2002; Vanderschueren et al., 1998; Winters and Clark, 2003)

³⁶¹ (Vanderschueren et al., 1998)

³⁶² (Kenny and Raisz, 2003)

³⁶³ (Stratakis et al., 1998)

³⁶⁴ (Kelch et al., 1972; Weinstein et al., 1974)

³⁶⁵ (Frank, 2003)

³⁶⁶ (Grumbach, 2004; Vanderschueren et al., 1998)

³⁶⁷ (Bilezikian, 2001; Cutler Jr, 1997; Frank, 2003, 1995; Grumbach and Auchus, 1999; Juul, 2001)

‘eunuchoid’ proportions.³⁶⁸ In addition, the testicular hormones strongly influence the development of the tubular and flat bones of the skeleton.³⁶⁹ Oestrogen is the main hormone involved in the building and maintenance of bone mass, while testosterone seems to play a small role, mainly helping to maintain bone formation and serve as a base for aromatisation to oestrogen.³⁷⁰ However, a study of the effect of sex steroids on somatic growth in childhood in agonadal individuals found that growth through childhood and the prepubertal years was not dependent on gonadal steroids,³⁷¹ perhaps giving some explanation for why certain normal growth patterns persist in castrates, including the definitively male shape of the castrate subpubic angle and sciatic notch. The loss of the testes through castration therefore deprives the developing male body of the necessary hormones for sexual dimorphism and skeletal development, causing a shift in development and maintenance from that of an intact male.

Osteoporosis appears to be a problem that castrates regularly face, as evidenced by the extreme kyphosis seen in the spines of the living individuals studied in the early 1900s and modern medical studies of hypogonadal individuals.³⁷² In those individuals without gonadal steroids, severe osteoporosis is common, while hypogonadism caused by aging also causes bone loss.³⁷³ Studies of bone mineral density in men who experienced constitutionally delayed puberty showed that in their mid-twenties, these men had significantly lower spinal and radial bone density than normal men. It was thought that this might be due to incomplete bone development, but when the men were re-examined two years later, it was found that they had not gained any bone mineral density, indicating that low bone mineral pickup due to delayed or absent puberty leaves men at a greater risk of osteopenia and osteoporosis later in life.³⁷⁴ For those individuals who begin with lighter bone mineral densities and even for those who begin life with normal bone mineral density, sex hormone deficiency in later life can cause bone loss.³⁷⁵

³⁶⁸ (Frank, 2003; Grumbach and Auchus, 1999; Juul, 2001)

³⁶⁹ (Eng et al., 2010)

³⁷⁰ (Bilezikian, 2001; Frank, 2003; Grumbach, 2004)

³⁷¹ (Campos SP, 1989)

³⁷² (Pittard, 1934; Vered et al., 1997; Wagenseil, 1933a, 1927)

³⁷³ (Finkelstein et al., 1992, 1987; Frank, 1995)

³⁷⁴ (Finkelstein et al., 1996)

³⁷⁵ (Vered et al., 1997)

5.1.4 Palaeopathological Literature

5.1.4.1 Modern Studies of Castrate Skeletons

While castration has not been an area of study for many years, in the last decade, two studies of castrate remains have been published which corroborate the results of the early 20th century studies. They also provide some new, useful information for the detection and classification of castrate skeletal remains both in the field and in existing skeletal collections.

Jacqueline Eng examined the skeletons of two Ming Dynasty eunuchs after their excavation from a Beijing cemetery.³⁷⁶ The analysis was carried out in one day, so it was necessary to measure the skeletons by photograph rather than osteometric board. The individuals were well preserved with intact crania, but some postcranial elements had not been recovered. Eng examined both skeletons for age, sex, pathological conditions and activity-related skeletal changes. While time to assess the skeletons was limited, the information this examination offers is invaluable to the study of castrates as it was produced using modern osteological standards and techniques.

The first skeleton, M1, had some post-mortem damage and was missing the right humerus, radius, ulna, hand and foot bones, and several vertebrae. He appeared to be in his late thirties at the time of death according to changes to the pelvic morphology, a determination which is supported by cranial suture closure, tooth wear, and epiphyseal fusion of all the long bones. The skull and pelvis were clearly male, and the bones showed some signs of slight pathology, including degenerative changes in the left shoulder, left elbow, left hip, and left knee, as well as some osteophytic growth on the body margins of all the preserved vertebrae. The two preserved lumbar vertebrae both exhibited Schmorl's nodes on their superior surfaces, and the left tibia had a healed fracture distal to midshaft which shortened the bone about six millimetres relative to the right tibia. The teeth displayed some enamel hypoplasia, most likely from the same event, as the line was approximately level across all teeth. The skeletons of M1 and M2 had come from a section of a cemetery that contained what were specifically designated as eunuch burials, and M1's long bones were longer than those of comparative groups of Chinese males. These factors, in combination with his overall developmental state, the solidly male characteristics of the skeleton, and his fairly robust bones, led Eng to conclude that M1 was most likely a postpubertal castrate. This conclusion appears to be

³⁷⁶ (Eng et al., 2010)

based most heavily on the burial location and the length of the individual's long bones. As there is no associated tomb structure naming M1 as a eunuch, it could be argued that location and bone length difference is insufficient evidence to name M1 as a eunuch, given that he may have been buried near the eunuch section of the cemetery and naturally been unusually tall for a male of his time, which Eng acknowledges. However, as M1's skeleton also showed signs of osteoporosis as well as degenerative joint disease, the location of the skeleton's burial and the extra length of the limbs do give credence to the idea that M1 was a postpubertal castrate.

The second eunuch skeleton, M2, had a gravestone giving his name as 'Huang Zhong' and was also fairly complete, missing the hand and foot bones, most vertebrae, the clavicles, and ribs. Several ages were suggested by age assessment criteria, as the epiphyses of many of the long bones were only partially fused or were completely unfused, which normally indicates an age at death in the mid-to-late teens. However, M2's third molars were fully erupted and showed signs of slight wear, though his auricular surfaces retained transverse ridges, a sign of a younger skeleton. Based on these indicators, Eng felt that M2, 'Huang Zhong', was likely a young adult about twenty to twenty-four years of age at death. The cranium displayed mostly ambiguous sexually dimorphic features, but the mandible, subpubic region, and greater sciatic notch showed male morphology. Two linear enamel hypoplasia lesions were present on the lower right canine, and the lower left central and lateral incisors had fused crowns and roots. The skeleton was relatively gracile, but there were no marked pathologies on the postcranial elements and no skeletal indication of the cause of death. In Eng's opinion, all the macroscopic features of M2's skeleton were consistent with prepubertal castration.

Individual M2 had longer long bones than M1, giving him a much greater estimated stature than M1 (M1 – 179 cm, M2 – 188 cm). Eng examined whether the body size and long bone lengths were affected by the hormonal effects of castration by comparing the long bone lengths of M1 and M2 to other archaeological skeletal samples, transforming all measurements to z-scores and comparing them. Both castrates had longer long bones than any of the comparative groups, although M1 was closer to the Northwestern Chinese sample of individuals, leading Eng to conclude that both were, in fact, castrates.

Farinelli (A.D. 1705-1782), born Carlo Broschi to an affluent family, was a famous castrato singer who was exhumed in Bologna in A.D. 2006 in order to better understand how the process of prepubertal castration and subsequent growth affected his

musical ability.³⁷⁷ The poor preservation conditions within his final tomb meant that his bones were very fragmentary and fragile, with only facial fragments and an incomplete frontal bone preserved from the cranium, and only fragmentary pieces of the postcranial skeleton were preserved. The only long bone whose complete length was preserved was the right ulna. Due to the fragmentary nature of the skeleton, the only available indicators of sex were a narrow sciatic notch and the absence of the preauricular sulcus, both indicators of male sex. The preserved sections of the cranial sutures were all completely fused and the auricular surface was irregular and porous, both indicators of advanced age. The bones were fragile and light, with trabecular thinning and wide marrow spaces, which, together with a compression fracture in a lumbar vertebra suggest osteoporosis. Degenerative joint disease was indicated by marginal lipping and surface porosity in those articulations available, especially the vertebral column. Epiphyseal lines were still visible on the medial border of the left scapula and the left iliac crest, both of which normally fuse by twenty-three years of age. Farinelli's teeth were preserved and were in good condition, with only two decayed.

Farinelli's frontal bone was strongly affected by a bony thickening which covered the endocranial surface bilaterally, was deposited on the surface, and which did not affect the groove for the superior sagittal sinus. There was no diploic thickening, and the bony growth had an irregular, lobular appearance with clearly demarcated borders.³⁷⁸ The authors felt that this indicated the most severe category (of four categories) of *Hyperostosis Frontalis Interna* (HFI) as established by Hershkovitz *et al.*³⁷⁹ HFI is a condition of uncertain clinical aetiology but is believed to be related to disturbance of the gonads, as it is seen most often clinically in postmenopausal women and chemically castrated prostate cancer patients.³⁸⁰ It has also been found to be an age-related condition, as its prevalence and severity increases with age.³⁸¹ The prevalence of HFI in modern populations has increased and the age at which it is clinically visible has decreased in industrial populations in the last century.³⁸² This condition affects the internal table of the frontal bone of the skull, beginning in small, discrete nodules of bone that begin to build up and join together over time, creating a large, thick bony formation on the inner

³⁷⁷ (Belcastro *et al.*, 2011)

³⁷⁸ (Belcastro *et al.*, 2011)

³⁷⁹ (Hershkovitz *et al.*, 1999)

³⁸⁰ (Hershkovitz *et al.*, 1999; May *et al.*, 2011, 2010)

³⁸¹ (May *et al.*, 2011)

³⁸² (May *et al.*, 2011)

surface of the frontal bone. It is not clearly distinguishable on radiographs until it is in the later, more advanced stages, making it difficult to detect in living individuals.³⁸³

5.1.4.2 Palaeopathological Observations

In order to understand and recognize the changes to the skeleton caused by prepubertal castration, an understanding of normal skeletal development in maturing males is necessary. Epiphyseal fusion in mammals follows a general order-pattern that appears to be consistent (barring a few species-specific deviations) in the progression of skeletal development, if not chronological time.³⁸⁴ The specific endochondral bone growth processes of epiphyseal fusion have been covered in great detail elsewhere.³⁸⁵ Therefore, only those aspects of epiphyseal fusion which are relevant to castration, such as timing, will be discussed here. In this context, epiphyseal fusion means the stage of bone growth and maturation at which the cartilage between epiphysis and diaphysis ossifies and unites into a single element, ending linear elongation. Radiographic versus dry bone estimations have given a wide range of ages at which epiphyseal fusion occurs in developing human skeletons.³⁸⁶ The radiographic ages are based upon the disappearance of a radio-opaque line of dense, active bone adjacent to the epiphyseal plate in the fusion zone, and are normally a year or two in advance of those ages given in dry bone studies, in which the lines of fusion between the element and epiphysis must be totally or nearly totally obliterated.³⁸⁷

As mentioned previously, male and female skeletal development tends to be similar for most of early childhood, as the same hormones drive it. There are a few slight differences, most obviously the earlier development of girls.³⁸⁸ Castration was normally performed on boys between the ages of six to ten (with only a few earlier ages recorded),³⁸⁹ so it is likely that any differences in skeletal development or maturation will only be visible past these ages. **Figure 5.1** diagrams the widely accepted times for fusion of the major epiphyses which fuse later than six to ten years of age and therefore

³⁸³ (Hershkovitz et al., 1999)

³⁸⁴ (Todd, 1930)

³⁸⁵ (Frank, 1995; Stevenson, 1924; Todd, 1930)

³⁸⁶ (McKern and Stewart, 1957; Scheuer and Black, 2000; Todd, 1930)

³⁸⁷ (Moran and O'Connor, 1994; Stewart, 1979; Ubelaker, 1989)

³⁸⁸ (Scheuer and Black, 2000)

³⁸⁹ (Barbier, 1998; Nachtigal, 1881; Rosselli, 1988; Wilson and Roehrborn, 1999)

indicates which ones would contribute to unusual maturation, elongation and disproportion in the skeleton.

Modern, Western, industrialized age estimations for the beginning and end of puberty are used here: individuals thirteen years and under are classified as prepubertal, individuals from fourteen to eighteen are classified as midpubertal, and individuals nineteen and older are classified as postpubertal. While the onset of puberty is dependent on heredity, environment, nutrition, and hormonal changes, all of which may have been very different for various groups of people throughout time, the use of the modern, Western, industrialized age estimations provides a common baseline against which all individuals examined in this study can be measured.

The development of the cranial area is greatly influenced by the anatomical function it serves, so cranial development is first driven by the development of the nervous system, then the nasal passages, and finally the masticatory system, which means that each stage must be able to adapt to preceding skeletal changes.³⁹⁰ From the ages of six to twelve years, the facial skull, the transverse portion of which has already reached a large percentage of its adult size, grows to its completely adult form as the craniofacial sutures fuse and the permanent dentition erupts. This includes an increase in size of both the mandible and maxilla, caused by the formation of the adult alveolar processes and maxillary sinuses.³⁹¹ The growth of the upper face (the area from the base of the nasal cavity to the frontal-nasal joint, including the orbits and maxillary-frontal processes) is closely linked to the expansion of the cranium, which grows rapidly soon after birth and then slowly begins to ossify around age twelve.³⁹² The mid-cranial base tends to finish its growth by age ten, but the posterior cranial base develops considerably during puberty, which has been linked to changes in the sphenoid-synchondrosis.³⁹³ The growth of the middle face (the maxilla, nasal area, and zygomas) is controlled by the craniofacial and maxillary suture systems, synchondroses, and cartilaginous nasal septum up to age seven. After this, periosteal bone growth dominates, with the majority of vertical growth due to the development of the nasal region.³⁹⁴ The nasal bones extend in length from age three to puberty, ascending with the frontal bone

³⁹⁰ (Kean and Houghton, 1987)

³⁹¹ (Schumacher, 1997; Snodell et al., 1993)

³⁹² (Bastir et al., 2006; Schumacher, 1997; Trenouth and Joshi, 2006)

³⁹³ (Arat et al., 2001)

³⁹⁴ (Arat et al., 2001; Schumacher, 1997)

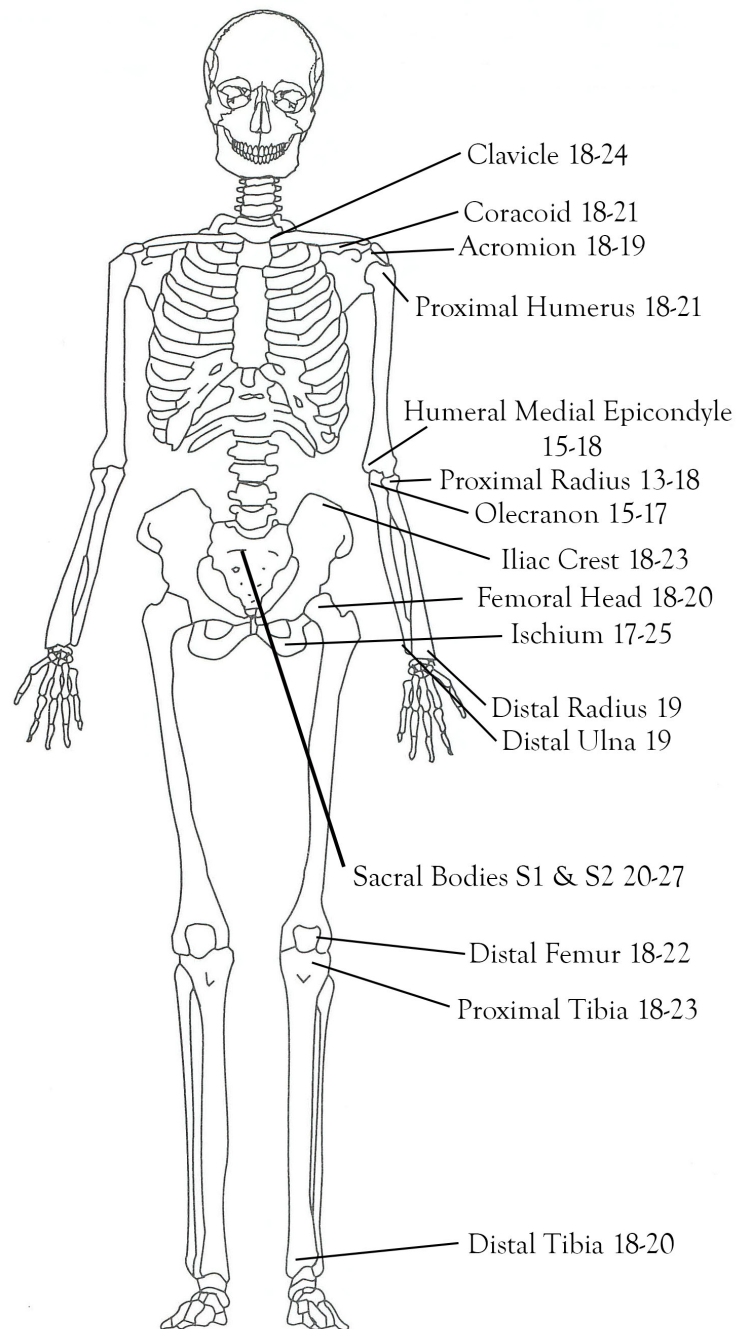


Figure 5.1: Normal range of fusion times for the major long bone epiphyses and late-fusing epiphyses of the male skeleton (sources noted in text). Skeleton base from (Buikstra and Ubelaker, 1994), timings added by author.

and moving closer to the upper orbital margins.³⁹⁵ The growth of the nasal septum moves the maxilla inferiorly and anteriorly in the first decade and vertically in the second, with cartilaginous expansion up to age seven followed by appositional growth.³⁹⁶ The

³⁹⁵ (Scheuer and Black, 2000)

³⁹⁶ (Enlow and Bang, 1965; Scheuer and Black, 2000)

expansion of the maxillary sinus enlarges the maxilla, adding to the height and breadth of the face.³⁹⁷ Alveolar growth due to permanent dental eruption also increases the vertical growth of the middle facial region³⁹⁸ and delayed ossification of the cranial synchondroses can lead to a lengthening of the base of the skull, while the mastoid process extends in length from ages eleven to nineteen in males.³⁹⁹ Craniofacial growth in males can continue past age eighteen for all elements except maxillary width.⁴⁰⁰ Girls with Turner Syndrome (a genetic disorder caused by aberrations of the X chromosome) demonstrated smaller calvaria and faces than normal girls, with flattened cranial bases, reduced posterior cranial base lengths, facial retrognathism, and short, posteriorly rotated jaws.⁴⁰¹

The majority of postcranial epiphyses begin fusion during or after puberty, with only seven epiphyses (the sacral hiatus, the third and fourth sternbrae, the ischiopubic rami, the dens and the spinous process of the second cervical vertebra, and the second sternbra) fusing before age twelve. From twelve to sixteen, the distal humerus,⁴⁰² the radial tuberosity,⁴⁰³ the proximal ulna,⁴⁰⁴ the proximal first metacarpal,⁴⁰⁵ the proximal middle phalanges of the hand and foot,⁴⁰⁶ the proximal ends of the distal phalanges of the hand and foot,⁴⁰⁷ the tibial tuberosity,⁴⁰⁸ and the distal epiphyses of the second through fifth metatarsals⁴⁰⁹ can all fuse. From twelve to twenty, the spheno-occipital synchondrosis,⁴¹⁰ the medial humeral epicondyle,⁴¹¹ the proximal radius,⁴¹² the

³⁹⁷ (Lang, 1989; Maresh, 1940; Peter, 1938; Schaeffer, 1910; Van Alyea, 1936; Wolf et al., 1993)

³⁹⁸ (Arat et al., 2001)

³⁹⁹ (Bastir et al., 2006; Schumacher, 1997)

⁴⁰⁰ (Snodell et al., 1993)

⁴⁰¹ (Midtbø et al., 1996)

⁴⁰² (Brodeur et al., 1981; Haraldsson, 1959; Silberstein et al., 1982, 1981a, 1979)

⁴⁰³ (Scheuer and Black, 2000)

⁴⁰⁴ (Cohn, 1921; Davies and Parsons, 1927; Hansman, 1962; Paterson, 1929; Silberstein et al., 1981b)

⁴⁰⁵ (Garn and McCreery, 1970; Garn et al., 1967; Greulich and Pyle, 1959; Joseph, 1951; Moss and Noback, 1958; Pyle et al., 1971; Stuart et al., 1962, 1962)

⁴⁰⁶ (Garn and McCreery, 1970; Garn et al., 1967; Greulich and Pyle, 1959; Hansman, 1962; Joseph, 1951; Moss and Noback, 1958; Pyle et al., 1971; Stuart et al., 1962)

⁴⁰⁷ (Garn and McCreery, 1970; Garn et al., 1967; Greulich and Pyle, 1959; Hansman, 1962; Joseph, 1951; Moss and Noback, 1958; Noback et al., 1960; Pyle et al., 1971; Sidhom and Derry, 1931; Stuart et al., 1962)

⁴⁰⁸ (Bloom et al., 1993; Ehrenborg and Engfeldt, 1961; Hughes and Sunderland, 1946; Lewis, 1958; Ogden, 1984a; Ogden et al., 1975; Ogden and Southwick, 1976; Pyle and Hoerr, 1955; Smith, 1962)

⁴⁰⁹ (Garn et al., 1967; Hansman, 1962; Hoerr et al., 1962)

⁴¹⁰ (Bassed et al., 2010; Ford, 1958; Ingervall and Thilander, 1972; Irwin, 1960; Konie, 1964; Melsen, 1969; Powell and Brodie, 1963; Sahni et al., 1998; Scott, 1958)

⁴¹¹ (Brodeur et al., 1981; Flecker, 1942, 1932; Hansman, 1962; Paterson, 1929)

⁴¹² (Brodeur et al., 1981; McKern and Stewart, 1957)

sternoclavicular and chondrosternal joints,⁴¹³ the rib tubercles,⁴¹⁴ the acetabular triradiate cartilage,⁴¹⁵ the anterior acetabular epiphysis,⁴¹⁶ the superior posterior marginal acetabular epiphysis,⁴¹⁷ the femoral head,⁴¹⁸ and the distal tibia⁴¹⁹ can fuse.

From sixteen to thirty, the greater and lesser horns of the hyoid,⁴²⁰ the vertebral annular rings,⁴²¹ the auricular epiphyses for the sacro-iliac joint,⁴²² the lateral margins inferior to the sacro-iliac joint,⁴²³ the medial clavicle,⁴²⁴ the rib heads,⁴²⁵ and the proximal fibula⁴²⁶ can all fuse. From twenty to thirty years, the perpendicular plate of the ethmoid,⁴²⁷ the vomer,⁴²⁸ the sacral annular rings,⁴²⁹ the entire sternal body,⁴³⁰ the medial scapular border,⁴³¹ the inferior angle of the scapula,⁴³² the ischial ramal epiphysis,⁴³³ and the pubic tubercle fuse.⁴³⁴ The progression of these changes is displayed in **Figure 5.2**.

After puberty the majority of epiphyses have fused, with only a few, late-fusing epiphyses, which normally close between twenty and thirty years of age, remaining.⁴³⁵ As almost every epiphysis in the body begins to fuse after the standard age of prepubertal castration (six to ten years of age), almost every epiphysis has the potential

⁴¹³ (McKern and Stewart, 1957; Stewart, 1954)

⁴¹⁴ (McKern and Stewart, 1957; Scheuer and Black, 2000; Stevenson, 1924)

⁴¹⁵ (Cardoso, 2007; Flecker, 1932; Freedman, 1934; Johnston, 1961; Laurensen, 1964; Ponseti, 1978; Stevenson, 1924; Walker, 1981)

⁴¹⁶ (Ponseti, 1978; Scheuer and Black, 2000; Zander, 1943)

⁴¹⁷ (Cardoso, 2007; Freedman, 1934; Johnstone et al., 1982; Ponseti, 1978; Zander, 1943)

⁴¹⁸ (Cardoso, 2007; Flecker, 1932; Hansman, 1962; McKern and Stewart, 1957; Paterson, 1929; Stevenson, 1924)

⁴¹⁹ (Cardoso, 2007; Crowder and Austin, 2005; Hansman, 1962; Hoerr et al., 1962; McKern and Stewart, 1957; Ogden and McCarthy, 1983)

⁴²⁰ (Evans and Knight, 1986; O'Halloran and Lundy, 1987; Reed, 1993)

⁴²¹ (Albert and Maples, 1995; Bick and Copel, 1951, 1950; Birkner, 1978; Gooding and Neuhauser, 1965; Haas, 1939; Hindman and Poole, 1970; McKern and Stewart, 1957; Taylor, 1975)

⁴²² (Fawcett, 1907; Götz et al., 1993; Rogers and Cleaves, 1935)

⁴²³ (Fawcett, 1907)

⁴²⁴ (Black and Scheuer, 1996; Jit and Kulkarni, 1976; McKern and Stewart, 1957; Meijerman et al., 2007; Schmeling et al., 2004; Stevenson, 1924; Szilvássy, 1980; Webb and Suchey, 1985)

⁴²⁵ (McKern and Stewart, 1957; Stevenson, 1924)

⁴²⁶ (Ellis and Joseph, 1954; Flecker, 1932; Hansman, 1962; McKern and Stewart, 1957; Ogden, 1984b)

⁴²⁷ (Cleland, 1862; Verwoerd et al., 1989)

⁴²⁸ (Cleland, 1862; Scott, 1953; Takahashi, 1987; Verwoerd et al., 1989)

⁴²⁹ (Fawcett, 1907; Johnston, 1961; McKern and Stewart, 1957; Scheuer and Black, 2000)

⁴³⁰ (Scheuer and Black, 2000)

⁴³¹ (Birkner, 1978; Grant et al., 1989; McKern and Stewart, 1957; Stevenson, 1924)

⁴³² (Birkner, 1978; Flecker, 1932; Grant et al., 1989; McKern and Stewart, 1957; Stevenson, 1924)

⁴³³ (Davies and Parsons, 1927; Flecker, 1932; Garn et al., 1967; Johnston, 1961; Laurensen, 1964; McKern and Stewart, 1957; Stevenson, 1924)

⁴³⁴ (Parsons, 1903; Scheuer and Black, 2000)

⁴³⁵ (Eby and Nadol, 1986)

to be affected by castration. This means that castration before thirteen can lead to extra growth time for the base of the cranium, all of the long bones, the connections of the ribs to the sternum and the vertebrae, the sternum, the vertebrae, and the bones of the pelvis. The late fusion of a number of pelvic epiphyses means that the ilium is free to grow out and up and the ischium is free to grow down and out. The femoral head, given the ability to grow longer, may allow the angle of the femoral neck to alter, changing the positioning of the femur in relation to the pelvis. Most notably, all elements that create

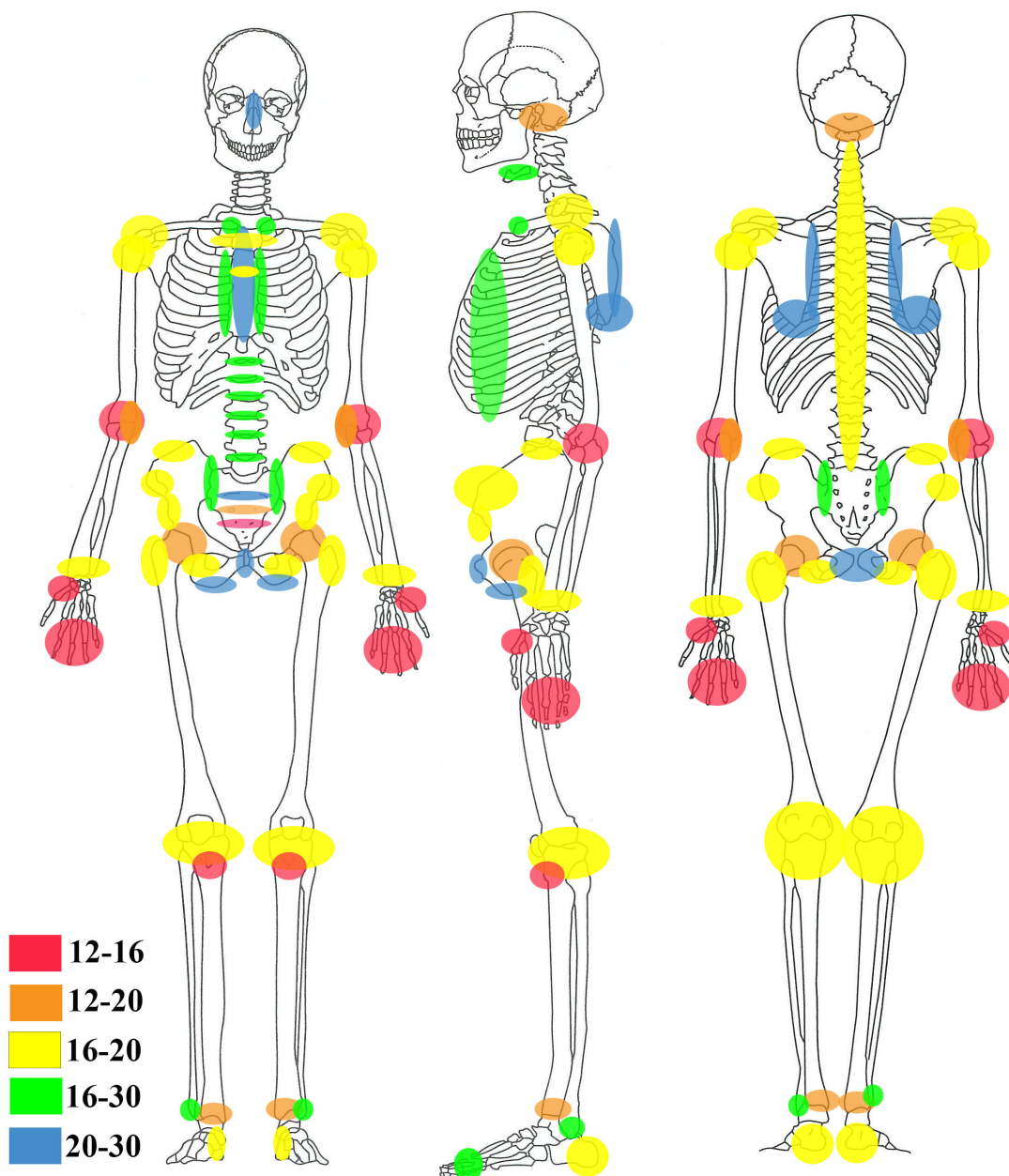


Figure 5.2: Age categories of pubertal and postpubertal epiphyseal fusion, showing the progression of skeletal changes. Coloration to skeletal diagrams (Buikstra and Ubelaker, 1994) added by author.

longitude in the body (the long bones, the vertebral annular rings, the sacrum, and parts of the pelvis) begin to fuse well after the standard age of prepubertal castration, and even many recorded ages for midpubertal castration.⁴³⁶ Castration during the pubertal period, such as is recorded for a number of Chinese eunuchs and Skoptsy, may lead to changes in some bones but not others, depending on the age of castration. Post-pubertal castration, here assumed to be any castration taking place after age nineteen, may still affect the fusion of some bones, depending on the age at which it is performed and the general nutritional and developmental state of the individual. In addition, several other factors can affect skeletal growth,⁴³⁷ such as genetic potential (if an individual comes from a generally shorter or taller population),⁴³⁸ severe or chronic illness during the growth period (illness can cause stunting or bone malformation),⁴³⁹ nutrition (malnutrition can cause stunted growth),⁴⁴⁰ and exercise (exercise builds bone mass and muscle attachment sites, creating more robust skeletons).⁴⁴¹

5.2 Physical Changes Expected In Animals

5.2.1 Zooarchaeological Literature

Castration is most often associated with animal husbandry. In general, the motivations for the castration of domestic animals are as follows: to reduce aggression and the risk of undesirable mating, to improve meat quality and enhance fat content, to improve the fleece in sheep and other wool-bearing animals, and to create tractable draught animals.⁴⁴² In zooarchaeological practice, if the statistical examination of a collection of adult animal bones displays three groups (one female, one male, and one indeterminate), it is usually agreed that the indeterminate group, which normally rests between the male and female groups but is a definite group in its own right, is a group of castrates.⁴⁴³ While this generalization can be useful, it is not very exact. However, there are few studies of the skeletons of castrates from modern animal populations that would provide a solid reference sample on which to base archaeological analyses, making this

⁴³⁶ (Koch, 1921; Pittard, 1934; Wagenseil, 1933a)

⁴³⁷ (Vercellotti et al., 2011)

⁴³⁸ (Duyar and Pelin, 2003; Trotter and Gleser, 1952)

⁴³⁹ (Trowbridge et al., 1987)

⁴⁴⁰ (Dahinten and Pucciarelli, 1986; Nussbaum et al., 1985)

⁴⁴¹ (Bass et al., 2000; Horcajada et al., 1997; Wallace et al., 2012)

⁴⁴² (Davis, 2000; De Cupere et al., 2000)

⁴⁴³ (Davis, 2000)

the best method to determine castrate presence in zooarchaeological samples.⁴⁴⁴ Despite how little is currently understood about animal castration, it is still possible to infer some knowledge about human castration from the study of animal castrates.

Sheep are the domestic animal group for which there is the most information, as much effort has been put into differentiating sheep and goat skeletons and determining when sheep were domesticated, as discussed in Chapter 2. Studies were performed on a population of feral Soay sheep on the island of Hirta, St. Kilda, Outer Hebrides, Scotland. Several males were castrated, and as a result some failed to grow horns and some grew small, crumpled horns or horns that resembled female horns. They were larger (taller) than the ewes and were less stocky, with longer limbs than the rams.⁴⁴⁵ Castration also inhibited horn growth in Herdwick sheep, either stopping or slowing it considerably from the time of castration.⁴⁴⁶

Castration seemed to advance dental eruption in the St. Hirta population of Soay sheep.⁴⁴⁷ Castrates reached dental maturity as much as one year in advance of intact males, and a similar effect has been observed in Gotland sheep.⁴⁴⁸ However, this might have been because both groups were island populations with closed genetic pools and particular diets that affected maturation, as advanced dental eruption has not been noted in other studies.⁴⁴⁹ Moran and O'Connor studied dental eruption and epiphyseal closure in museum collections of sheep skeletons from a range of breeds, including Soay, Gotland, and Shetland sheep.⁴⁵⁰ They discovered that tooth eruption did not seem to be advanced in castrated sheep, and that, as in human osteology, there is some discrepancy in the ages for epiphyseal fusion, as radiological and dry bone studies gave differing ages for fusion. The few sex-based studies of epiphyseal fusion which exist in the zoological literature indicate that female bones tend to fuse earlier than male bones, though, as in humans, growth is a complex combination of factors such as genetics, nutrition, metabolism, and hormones.⁴⁵¹

⁴⁴⁴ (Armitage and Clutton-Brock, 1976)

⁴⁴⁵ (Clutton-Brock et al., 1990; Jewell, 1997)

⁴⁴⁶ (Marshall and Hammond, 1914)

⁴⁴⁷ (Clutton-Brock et al., 1990)

⁴⁴⁸ (Hatting, 1983)

⁴⁴⁹ (Davis, 2000; Moran and O'Connor, 1994)

⁴⁵⁰ (Moran and O'Connor, 1994)

⁴⁵¹ (Moran and O'Connor, 1994)

Noddle studied the post-cranial bones and mandibles of domestic and feral goats in order to determine ages of epiphyseal closure and dental eruption.⁴⁵² Epiphyseal closure varied by age, sex and breed, but castrates' bones showed a delay in fusion of several months longer than the other domesticated goats. Comparison of the lengths of the castrated goats' bones against the male and female bones of the same age showed that castrate bones are considerably longer than both male and female bones, perhaps caused by the delay seen in the epiphyseal fusion of the castrated goats.⁴⁵³

Some of the early-noted effects of castration in cattle included the observation that oxen tended to grow larger and taller than bulls, with thinner necks and forequarters, and that their horns became thicker and longer than those of bulls.⁴⁵⁴ This effect has been somewhat debated, as work carried out on archaeological cattle horn-cores has suggested castrate horn-cores are closer in cross-section to that of females than those of males but longer than both with a greater basal circumference.⁴⁵⁵ However, horn-cores thought to be from castrates from Roman Chelmsford, Essex, possess a more masculine cross-section than feminine.⁴⁵⁶ It has also been noted that castrate horn-cores may have a thinner bone wall than either male or female horn-cores.⁴⁵⁷ Other work on cattle has suggested that castrate proportions should fall between male and female measurements, castrates being larger and more robust than cows, and longer-limbed and more gracile than bulls.⁴⁵⁸ The effects of castration on cattle are more pronounced the earlier the animal is castrated, as those that have been castrated in the first few weeks after birth display fewer sexually dimorphic characteristics than those castrated at an older age.⁴⁵⁹

5.2.2 Veterinary Literature

Most veterinary literature that focuses on castrated animals tends to discuss soft tissue changes, though some work has been performed on both the skeletal and hormonal effects. In addition, medical work on how hormonal changes affect bone growth in lab animals, especially rats, has been used to better understand both castrated animals and humans with congenital syndromes that mimic castration.

⁴⁵² (Noddle, 1974)

⁴⁵³ (Noddle, 1974)

⁴⁵⁴ (Flood, 1899)

⁴⁵⁵ (Armitage and Clutton-Brock, 1976)

⁴⁵⁶ (Luff, 1994)

⁴⁵⁷ (Armitage and Clutton-Brock, 1976)

⁴⁵⁸ (Grigson, 1982; Luff, 1994)

⁴⁵⁹ (Armitage and Clutton-Brock, 1976; Luff, 1994)

Some early veterinary literature discussing the effects of castration on animal skeletons includes the observations that if gelded horses are castrated at a young age, they will grow larger than intact males without changes to the bridle teeth. Another important observation was that castrated cats grow larger than intact males and are fonder of petting.⁴⁶⁰ A few veterinary articles have discussed the delay in fusion seen in prepubertally castrated dogs and cats, noting that radiographically defined complete fusion occurs later than anatomical fusion and that the delay in fusion leads to statistically significant but not readily visible or clinically important lengthening of long bones.⁴⁶¹ Closure times vary, and no specific sequence of closure has been established, but a general pattern has been laid out, with individual epiphyses being placed into one of three groups (first, middle and last) according to its approximate time of closure. In cats, fusion begins around the fourth month with the distal and middle phalanges, the scapular tuberosity, accessory carpal bone, distal humerus, and, in some cats, the proximal radius. The middle group of epiphyses, which fuses between eight and fourteen months, includes the epiphyses of the proximal femur, the metacarpal epiphyses, the metatarsal epiphyses, the proximal ulna, fibular tarsal, distal tarsal, and distal fibula. The last group, which includes the proximal tibia, proximal fibula, distal femur, distal radius, distal ulna, and proximal humerus, has generally finished fusing (along with the other two groups) by fourteen to twenty-four months of age. Cartilage can remain in any of these epiphyses and is particularly likely to remain in the last group, delaying the upper fusion time limit. It has, however, been confirmed that prepubertally castrated male cats have delayed epiphyseal closure relative to intact male cats and both intact and neutered female cats.⁴⁶² There is some evidence that castration and obesity are linked in cats and possibly in dogs, but not that it is necessarily a mandatory consequence of castration, as it can be controlled in cats and dogs through diet, feeding, and exercise regimens.⁴⁶³ Due to concerns over the effects these skeletal changes and soft tissue changes may have on animals, there is some debate within veterinarian circles as to what the appropriate age to castrate dogs and cats is, with two preferred options: seven weeks and seven months.⁴⁶⁴

Ovariectomized female rats were given exogenous oestrogens in order to prevent cancellous osteopenia in an experiment to clarify the effects of oestrogen on cancellous

⁴⁶⁰ (Flood, 1899)

⁴⁶¹ (Kustritz, 2007; May et al., 1991)

⁴⁶² (May et al., 1991)

⁴⁶³ (Kustritz, 2007)

⁴⁶⁴ (Kustritz, 2007; Spain et al., 2004a, 2004b)

bone turnover. It was found that administration of exogenous oestrogen reduced mineral apposition rate, osteoblast number, and osteoclast number, which was taken to mean that the hormone inhibited both bone formation and resorption.⁴⁶⁵ In another experiment relating to osteoporosis, castrated and uncastrated male rats were divided into two groups, one of which was sedentary and the other of which ran on a treadmill for an hour a day, six days a week, for fifteen weeks. After the rats were killed, it was found that running had no significant effect on the femoral mechanical properties of either the castrated or uncastrated rats, that castrated rats had a lower femoral bone mineral density than uncastrated rats, but that those castrated rats who had been exercised had a higher femoral bone density than those castrated rats who had remained sedentary.⁴⁶⁶

In an experiment on the effects of castration and malnutrition on cranial sexual dimorphism in the rat (*Rattus norvegicus*), castration decreased sexual dimorphism by 16% in male rats.⁴⁶⁷ Tests performed on laboratory-raised and genetically altered rodents support the conclusion that oestrogen modulates skeletal maturation and regulates bone structure and size,⁴⁶⁸ and early hormone tests discovered that canine and simian testes also secrete oestradiol, a major oestrogen which affects bone growth.⁴⁶⁹

Growth hormone and thyroid hormone control prepubertal growth in both male and female mammals, but sex steroids, especially androgens, control most pubertal growth and skeletal development through the regulation of the adolescent growth spurt and the termination of epiphyseal closure.⁴⁷⁰ Leydig cells in the testes produce the majority of androgens in males, while the ovaries produce small amounts in females, but the majority of female androgens are produced by the adrenal cortices.⁴⁷¹ Testosterone converts to oestrogen, which accelerates growth and epiphyseal maturation; increases production of growth hormone and insulin-like growth factor (IGF-1), which stimulate proliferation of chondrocytes in the growth plate; and stimulates proliferation of chondrocytes by upregulating IGF-1 receptor gene expression.⁴⁷²

⁴⁶⁵ (Turner et al., 1993)

⁴⁶⁶ (Horcajada et al., 1997)

⁴⁶⁷ (Dahinten and Pucciarelli, 1986)

⁴⁶⁸ (Kenny and Raisz, 2003; Vanderschueren et al., 1998)

⁴⁶⁹ (Kelch et al., 1972)

⁴⁷⁰ (Kustritz, 2007; May et al., 1991)

⁴⁷¹ (May et al., 1991)

⁴⁷² (Irie et al., 2005)

5.3 Expected Features of Castrate Skeletons

From the various strands of historical literature, previous examinations of castrate bodies, medicine, endocrinology, osteology, zooarchaeology, and veterinary studies, a general picture of human castrate physicality can be created. Castrates generally fall into either fat or thin soft tissue groups and range from the average height of a given population to extremely tall. Fatty soft tissue tends to collect in more female patterns (on the hips, thighs, buttocks, breasts, and stomach), and body hair tends to conform to a more female shape as well, only forming on the underarms and above the pubis. The head is consistently described as small, with a childlike face, and the hips, probably due to the fat pads over the buttocks and thighs and the elongation of the femoral neck, are described as feminine in character. *Genu valgum* is often seen in living castrates, also likely due to the elongated femoral neck, which would exaggerate the width of the hips and angle the distal ends of the femora medially. A number of older castrates showed signs of osteopenia and osteoporosis, including extreme kyphosis. Prepubertal castrate skeletons tend to show extreme disproportion in axial versus appendicular ratios, with the bones of the appendicular skeleton often noticeably longer than in normal individuals. This is demonstrable in both living and deceased individuals through anthropometric and osteometric measurements.

The extra growth time for the epiphyses of the ribs may have led to larger, broader rib cages in castrates, especially singers, who often practiced for many hours a day.⁴⁷³ The majority of epiphyses in prepubertal castrates will remain open (in the osteological sense) long after puberty or the time the bones should have fused, in some cases as long as the eighth decade of life. Prepubertal castration, especially very young prepubertal castration (mid to late first decade), does not always lead to extremely tall individuals, but all extremely tall castrates who have been examined were castrated prepubertally. Prepubertal castrates examined osteologically will give varied age ranges based on modern ageing techniques due to delayed epiphyseal fusion. Osteological examinations of prepubertal castrate skulls and ossa coxae will likely find mostly indeterminate features, though the mandible, subpubic angle, and sciatic notch appear to achieve masculine form, perhaps due to somatic growth in early childhood.

It has been noted that those individuals castrated later in puberty or after puberty will not manifest the same effects as those castrated very early in life or before

⁴⁷³ (Rosselli, 1988)

puberty.⁴⁷⁴ This means that there is a sliding scale of effects created by castration, based upon previous levels of maturation and sexual dimorphism. Once certain levels of sexual dimorphism have been obtained, removing testosterone from the developmental process does not make those changes disappear, it merely stops the addition of new features of sexual dimorphism. A better understanding of the processes of growth and sexual dimorphism will therefore help us to understand the changes brought about by castration at certain ages and what to expect in the skeletons of prepubertal, midpubertal and postpubertal castrates.

⁴⁷⁴ (Dahinten and Pucciarelli, 1986; De Cupere et al., 2000; Flood, 1899; Pittard, 1934)