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Prostheses in Classical Antiquity: A Taxonomy

Introduction

Curiously, classical prostheses have not received much in the way of attention from scholars, unlike those of later historical periods (Porter *et al.*, 2017; Withey, 2016; Kwass, 2006; Jones, 2017; Hasegawa, 2012; Neumann, 2010; Ott *et al.*, 2002; Smith and Morra, 2006). Despite the growing interest in the subject of impairment and disability in classical antiquity, discussions of prostheses, prosthesis use, and prosthesis users have so far played a relatively minor role in scholarship undertaken on it. The first monograph devoted to impairment and disability in classical antiquity, Robert Garland's *The Eye of the Beholder: Deformity and Disability in the Graeco-Roman World*, included a brief acknowledgement of the famous story of Hegesistratus of Elis and his wooden foot in a chapter focusing on medical diagnosis and treatment, but simply noted that it was possible for an ancient amputee to use a prosthesis (Garland, 1995 reissued 2010, p. 126; the story of Hegesistratus appears in Herodotus, *Histories* 9.36–37 and Plutarch, *On Brotherly Love* 3.1). The second, Martha L. Rose's *The Staff of Oedipus: Transforming Disability in Ancient Greece*, the first attempt to integrate the relatively new discipline of Disability Studies into Classics, devoted slightly more space to the subject in the opening chapter of the work, an effort to set the scene in advance of a series of studies focused on particular aspects of impairment and disability in the ancient Greek world (Rose, 2003 reissued 2013, pp. 26–27). However, Rose concluded that ancient prostheses would, in all likelihood, only have been cosmetic (Rose, 2003, p. 26); in the years since this work was first published, this notion has been comprehensively disproved through new research on old discoveries, and new discoveries (Finch, 2018; Li *et al.*, 2013). The third, Christian Laes' *Beperkt? Gehandicapt in het Romeinse Rijk (Restricted? The Handicapped in the Roman Empire)*, contains an entire chapter on mobility impairments but prostheses are mentioned only in passing, and the English translation, a slightly updated version of the original Dutch text, *Disabilities and the Disabled in the Roman World: A Social and Cultural History*, follows suit (Laes, 2014; Laes, 2018). Discussions of impairment and disability in the classical world are more frequently found in the form of edited volumes, and accordingly one might expect to find rather more discussion of prostheses here in the form of a focused individual chapter or two, but this has unfortunately not been the case; these likewise do not devote more than a sentence or two to the subject (Collard and Samama, 2010; Breitwieser, 2012; Laes, Goodey and Rose, 2013; Krötzl, Mustakallio and Kuuliala, 2015; Laes, 2017).

In 1996, Lawrence Bliquez published what was, even then, a cursory and incomplete survey in *Aufstieg und Niedergang der römischen Welt*, yet despite the increasing interest in the history and archaeology of medicine in the classical world over the last two decades, to date no more extensive study has appeared (Bliquez, 1996; this was inspired by a shorter piece of work, Bliquez, 1983). More recently, my research into ancient prostheses has resulted in the edited volume *Prostheses in Antiquity*, the proceedings of a workshop held in 2015 that was funded by the Wellcome Trust, published in 2018 (Draycott, 2018a).¹ This comprised eight chapters, each one dealing with a different type of prosthesis or an issue relevant to the subject. However, the subject has been far from comprehensively covered, and I am in the process of writing a monograph that aims to be the definitive treatment of prostheses, prosthesis use, and prosthesis users in classical antiquity (Draycott, in preparation).

The literary, documentary, archaeological, and bioarchaeological evidence that survives from classical antiquity attests that a variety of different types of prostheses were used by Greeks and Romans to replace various missing body parts, but the ways in which these prostheses were described and discussed by ancient authors likewise varied considerably, with some being viewed significantly more favourably than others by ancient commentators and thus, potentially, ancient society as a whole. So,

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in this chapter I shall use the literary references to classical prostheses in conjunction with other types of evidence to examine the discourses surrounding them in order to attempt to determine the place that each type had in ancient culture and society, and the ways in which the type of prosthesis used by an individual could consequently affect their life and lived experience.

Terminology and Definitions

First things first, we should define exactly what I mean by the term ‘prosthesis’. The term itself is a relatively modern one. Although it is a compound of the Greek terms *πρός* (‘on the side of’) and *θέσις* (‘setting’ or ‘placing’), it is not a term that was readily utilised by ancient authors, and it only entered the English language in 1533. It was initially used in a grammatical capacity to designate the addition of a syllable to the beginning of a word, then in 1704 that it began to be used in a medical capacity to refer to an artificial device that replaces or augments a missing or impaired part of the body, and it was only in the middle of the nineteenth century that it came to mean this almost exclusively (Wills, 1995, p. 218; Davis, 2013, p. 68).

So, today, in the twenty-first century, a prosthesis is some sort of device that is used to replace a missing body part, and each one is designed and assembled according to an individual’s appearance and functional needs. A standard prosthesis is usually, but crucially not always, as unobtrusive and as useful as possible so as to maximise the chances of their acceptance of it, as the psychological aspects of coming to terms with needing to use a prosthesis are also important (Gallagher *et al.*, 2008). The missing body part might be missing due to a congenital or an acquired impairment. However, it is by no means certain that an individual missing a body part, whether that body part is missing due to a congenital or an acquired impairment, will accept a prosthesis as a substitute for it (Murray, 2005). Refusal of a prosthesis is particularly common in elderly amputees (Massey, personal communication). Embodiment, and the phenomenological embodiment of prosthesis use, is an important consideration, and studies have shown that if an individual both mentally and physically accepts their prosthesis and is satisfied with it, they will be more likely to use it, and it should not come as a surprise that users are more inclined to accept a prosthesis that is aesthetically pleasing to them (Mills, 2013; Murray, 2008). The reasons why individuals abandon their prostheses are complex and are as much to do with the individuals themselves (for example, age, sex, gender, ethnicity, level of education etc.) as the prostheses, but studies have made the importance of comfort and functionality in successful prosthesis use clear (Murray and Fox, 2002; Pezzin *et al.*, 2004; Biddiss and Chau, 2009). Consequently, considerable effort is expended by the prosthetist to match an individual’s skin tone, hair colour etc., or to design and create something unusual and truly unique if that is what the individual desires (Massey, personal communication). Users are also more inclined to accept a prosthesis that makes their life easier than one that makes their life harder, and the sooner after the amputation the prosthesis is fitted, the more likely the user is to accept the prosthesis and use it successfully (Pezzin *et al.*, 2004). So, we should consider each contemporary prosthesis as having something of a dual role, one aspect of this being its form and another being its function, although these aspects can also overlap. The nature of these forms and functions varies from prosthesis to prosthesis. An extremity prosthesis such as a finger, hand or arm not only resembles the missing finger, hand or arm but can also restore some but not all its functionality. A facial prosthesis such as an eye or a nose resembles the missing eye or nose and while it does not restore the lost sense of sight or smell, it does enable the user to ‘pass’ if that is what they wish to do; a recent study has shown that facial prosthesis users tend to prefer implanted prostheses over adhesive ones; the users of the latter type feel more self-conscious (Wondergem *et al.*, 2016). These are all useful starting points from which to consider classical prostheses.

When the word *πρόσθεσις* (‘application’) is used in Greek literature, it tends to indicate the application of an object to the body for a specific purpose, and when it comes to medical practice, this

includes the application of a medicinal remedy such as a pessary or a piece of medical equipment such as a cupping vessel (pessary: Hippocrates, *The Affections of Women* 1.11, and *On the Nature of Women* 11; ladder: Thucydides, *History of the Peloponnesian War* 4.135, see also Polybius, *Roman Histories* 5.60.7; cupping vessel: Aristotle, *Rhetoric* 1405b3). Despite this, no surviving ancient Greek or Latin medical treatise mentions prostheses; clearly the application of a prosthesis to the body for the purpose of replacing a missing body part was not considered a medical remedy. While this might seem strange to a contemporary reader, accustomed as we are to viewing prostheses and other types of assistive technology as objects that are thoroughly medicalised and provided by the British National Health Service, this makes sense when we consider the way that the author of the Hippocratic treatise *On Joints* feels that they have to explain and justify their decision to include recommendations regarding which type of crutch is best for rehabilitating different types of injuries that affect an individual's mobility:

One might say that such matters are outside the healing art. Why, forsooth, trouble one's mind further about cases which have become incurable? This is far from the right attitude. The investigation of these matters too belongs to the same science; it is impossible to separate them from one another. In curable cases we must contrive ways to prevent their becoming incurable, studying the best means for hindering their advance to incurability; while one must study incurable cases so as to avoid doing harm by useless efforts (Hippocratic Corpus, *Joints* 58, trans. E. T. Withington).

The irrevocable loss of a body part is the very definition of an incurable case and was recognised as such, hence, perhaps, why the provision of prostheses was not of interest to, or at least not considered relevant by, medical writers, even those who provided step-by-step guides to limb amputation such as Celsus, Heliodorus, Archigenes, or Leonidas. Aristotle differentiated between body parts that, once lost, would grow back and those that would not; he described individuals who experienced the latter type of loss as 'mutilated' (κολοβός) (Aristotle, *Metaphysics* 5.27.4).

Whereas in the twenty-first century we tend to refer to prostheses using the noun 'prosthesis' or the adjective 'prosthetic', and in the National Health Service, at least, one prosthetist will make any number of different types of prosthesis, in ancient literature, whatever the type of prosthesis under discussion, when prostheses are referred to, they are not described as 'prosthetic [body part]', they are described using the combination of the substitute body part and the substance from which it is made. Thus, Pelops has a shoulder of ivory (ἰώμος ἐλεφάντου or *umerus eburno*), Pythagoras has a thigh of gold (μηρός χρυσοῦν), Hegesistratus has a foot of wood (πούς ξυλίνου), Marcus Sergius Silus has a hand of iron (*manus ferream*), Statyllius has the hair belonging to another (ἀλλότριος πλόκαμος). This apparent lack of recognition of an overall category of object goes some way towards explaining what can appear to be a certain amount of cognitive dissonance on the part of ancient authors when it comes to their discourse, as we shall see shortly.

Research Methodology and Data

No uniform umbrella term, such as the adjectives 'prosthetic', 'artificial', or 'false' for example, was used by ancient authors to refer to ancient prostheses. Perhaps the closest ancient authors come to that is referring to prosthetic hair and teeth using the adjective 'purchased'. Consequently, what, exactly, we should include in the category of prosthesis is open for debate. In Lawrence Bliquez's initial study 'Prosthetics in Classical Antiquity: Greek, Etruscan, and Roman Prosthetics', he focussed his attention rather selectively:

The scope of this investigation was confined to those devices attached to the human body which had some practical as well as cosmetic purpose; that is to say, I was interested in dental

appliances and false limbs, as opposed to wigs and bodily padding of the sort detailed by comic poets and satirists (Bliquez, 1996, p. 2641).

I have discussed the issues with Bliquez's differentiation between what he perceived to be as practical and impractical prostheses elsewhere (Draycott, 2018b, pp. 71–72). Using this rationale, he collated fifteen ancient literary references to prostheses, comprising eleven dental prostheses and four extremity prostheses (three feet, one leg, one hand). To date, I have found 102, and these include references to prosthetic hands, shoulders, feet, legs, thighs, eyes, noses, teeth, and hair (see Table 1), and due to the nature of the search even this is not necessarily exhaustive. While these ancient literary references include both factual and fictitious prostheses, and both historical and mythological ones (see Table 2), to a degree, bioarchaeological and archaeological evidence supports their veracity, with examples of prosthetic toes, feet, legs, teeth, hair, and a hand having been recovered from tombs and graves around the ancient Mediterranean. Thus, this data set can be used to elucidate a substantial amount of information about prostheses in classical antiquity, and the ways in which they were viewed in ancient culture and society. This information includes the gender of the prosthesis user (see Table 3) and the material from which the prosthesis was made (see Table 4), and through using it I propose to advance a theoretical taxonomy of ancient prostheses.

Discussion

In the discussion that follows, I am going to focus on a representative selection of six specific examples from these works of ancient literature and demonstrate how they can be used to glean more information about prostheses in the classical world than the simple fact of their existence. I have selected these specific examples for several reasons. First, while they are a combination of factual and fictitious examples, they are to all intents and purposes historical rather than mythological examples (two are factual and involve real historical figures, four are may or may not be fictitious yet are very specifically grounded in space and time). Second, they are relatively detailed regarding the prosthesis, the prosthesis user, and their prosthesis use. Third, they can give insights into the lived experiences of the individuals in question, and by implication other ancient prosthesis users too. Fourth, they contain enough information to enable us to start to consider ancient prostheses in relation to each other rather than in isolation.

Case Study 1: Hegesistratus of Elis, Marcus Sergius Silus, and Lucian's 'Rich Man'

A) Hegesistratus of Elis was his diviner, the most notable of the sons of Tellias. This man had been put in prison and doomed to die by the Spartans for the much harm that he had done them. Being in this evil case, inasmuch as he was in peril of his life and like to be very grievously maltreated ere his death, he did a deed well nigh past believing: being made fast in iron-bound stocks, he got an iron weapon that was brought in some wise into his prison, and straightway conceived a plan of such hardihood as we have never known; reckoning how best the rest of it might get free, he cut off his own foot at the instep. This done, he burrowed through the wall out of the way of the guards that kept ward over him, and so escaped to Tegea; all night he journeyed and all day he hid and lay close in the woods, till on the third night he came to Tegea, while all the people of Lacedaemon sought him; and they were greatly amazed, seeing the half of his foot cut off and lying there, but not being able to find the man himself. Thus did he then escape from the Lacedaemonians and take refuge in Tegea, which at that time was unfriendly to Lacedaemon; and after he was healed and had made himself a foot of wood, he declared himself an open enemy of the Lacedaemonians. Yet the enmity that he bore them brought him no good at the last; for they caught him at his divinations in Zacynthus, and slew him (Herodotus, *Histories* 9.36–37, trans. A. D. Godley).

B) Nobody, in my judgement at all events, can rightly rank any human being above Marcus Sergius, albeit his great-grandson Catiline diminishes the credit of his name. Sergius in his second campaign lost his right hand; in two campaigns he was wounded twenty-three times, with the result that he was crippled in both hands and both feet, only his spirit being intact; yet although disabled, he served in numerous subsequent campaigns. He was twice taken prisoner by Hannibal (for it was with no ordinary foe that he was engaged), and twice escaped from Hannibal's fetters, although he was kept in chains or shackles on every single day for twenty months. He fought four times with only his left hand, having two horses he was riding stabbed under him. He had a right hand of iron made for him and going into action with it tied to his arm, raised the siege of Cremona, saved Piacenza, captured twelve enemy camps in Gaul: all of which exploits are testified by his speech delivered during his praetorship when his colleagues wanted to debar him from the sacrifices as infirm—a man who with a different foe would have accumulated what piles of wreaths! inasmuch as it makes the greatest difference with what period of history a particular man's valour happens to coincide. What civic wreaths were bestowed by Trebbia or Ticino or Trasimeno? What crown was won at Cannae, where successful flight was valour's highest exploit? All other victors truly have conquered men, but Sergius vanquished fortune also (Pliny the Elder, *Natural History* 7.29, trans. H. Rackham).

C) Not long ago there was a rich man in Asia, both of whose feet had been amputated in consequence of an accident; they were frozen, I gather, when he had to make a journey through snow. Well, this of course was pitiable, and to remedy the mischance he had had wooden feet made for him, which he used to lace on, and in that way made shift to walk, leaning upon his servants as he did so. But he did one thing that was ridiculous: he used always to buy very handsome sandals of the latest cut and went to the utmost trouble in regard to them, in order that his timber toes might be adorned with the most beautiful footwear! Now are not you doing just the same thing? Is it not true that although you have a crippled, fig-wood understanding, you are buying gilt buskins which even a normal man could hardly get about in? (Lucian, *The Ignorant Book-Collector* 6, trans. A. M. Harmon).

Hegesistratus of Elis and Marcus Sergius Silus were, as far as we can tell, real historical figures, while Lucian's rich man is likely a fictional character created by Lucian to make his point although aspects of his portrayal may have been based upon one or more real individuals that Lucian had encountered in the mid to late second century CE. The story of Hegesistratus of Elis comes from Herodotus' *Histories*, and can be dated to 479 BCE, but it seems to have been reasonably well-known as over five centuries later as Plutarch refers to it (Plutarch, *Moralia: On Brotherly Love* 3.1). The story of Marcus Sergius Silus is only known from this entry in book 7 of Pliny the Elder's *Natural History*, in which he is presented as an example to follow and a paragon of virtue (Beagon, 2002; Beagon, 2005, pp. 293–298). Its basic tenets are, however, supported by a reference to his quaestorship by Livy which can be dated to 197 BCE, and a coin issued by one of his descendants who bore the same name in either 116 or 115 BCE that depicts him on horseback holding his sword and the severed head of an defeated enemy in his left hand rather than his right (Livy 32. 27. 7, 32. 31. 6, 33. 21. 9, 33. 24. 4; Crawford 286/1). It would appear that both Hegesistratus of Elis and Marcus Sergius Silus conform to the 'super crip' stereotype, the 'super crip' being an impaired person who 'triumph[s] over the tragedy of their condition ... who, through astounding personal endeavour overcomes their disability ... dramatically, this image is useful to script writers for whom a disabled person's triumph over their impairment is a metaphor for the more general human struggle to overcome life's obstacles' (Harnett,

2000, p. 21; however, see also Schalk, 2016). Other individuals from the classical world can be said to conform to this ‘supercrip’ stereotype too (Garland, 1995, 2010, pp. 31–32). They triumph over several different types of adversity: first, the actual loss of their extremities; second, their imprisonment by their enemies; third, in the case of Marcus Sergius Silus, attempts made by his peers to marginalise him because of his impairment (Beagon, 2002). Thus, both could be said to be setting positive examples and potential sources of inspiration for amputees regarding the possibilities of prostheses; the ancient equivalent of the contemporary ‘inspiration porn’ (Grue, 2016). Additionally, for those aware of both of these individuals, the rich man, or any real individual that resembled him, would be compared to them and found wanting in the way that they used their prostheses (both human and extremity). Elsewhere, Dio Chrysostom, writing in the late first century CE, makes the point that ‘as if there were any use in a man having a golden or ivory hand or eyes of diamond or malachite; but the kind of soul he had men did not notice’, so perhaps we can take from this that there was a tendency for some individuals to use overly elaborate prostheses, or to make their usage performative, much to the chagrin of onlookers (Dio Chrysostom, *Eighth Discourse: On Virtue* 28, trans. J. W. Cohoon).

Also, notable here is the role that other people played in the daily life of an amputee. The rich man requires the assistance of other people, the enslaved members of his household, to assist him in using his wooden feet to restore his physical mobility, so we might consider such individuals as ‘human prostheses’ (van Schaik, 2018; see Blake, 2012 and 2016 on the role that the enslaved played in the lives of their enslavers generally). It is likely that Marcus Sergius Silus also utilised the enslaved, and that they assisted him in arming himself and helping him onto his horse, at the very least. Animals of various sorts seem to have been utilised as assistants as well (Draycott, in preparation).

Finally, although certain aspects of these ancient literary accounts might seem highly questionable, there is archaeological and bioarchaeological evidence that supports all three. Regarding the use of wooden feet in classical antiquity, a wooden prosthetic toe, the ‘Cairo Toe’, from Egypt has been dated to either the 21st or 22nd Dynasty (*circa* 1065–740 BCE) (Finch, 2018). Regarding the feasibility of using a prosthetic hand in an historical battle, a weaponised prosthetic hand with a knife attachment from Italy has been dated to the period of the sixth to the eighth centuries CE (Micarelli *et al.*, 2018), and this perhaps offered its wearer a degree of functional advantage in certain situations such as physical combat.

Case Study 2: Galla, Statyllius, and Giton

A) You are at home yourself, Galla, but you are made up in the middle of Subura. Your hair is manufactured in your absence. You lay your teeth aside at night as you do your silks, and lie stored in a hundred caskets. Your face does not sleep with you. Yet you ogle with an eyebrow that is brought out for you every morning and have no respect for your hoary cunt, which you can now number among your ancestors. However, you promise the earth; but my cock is deaf, and though it be one-eyed, it sees you (Martial, *Epigrams* 9.38, trans. D. Shackleton Bailey).

B) When Time was about to drag down to Hades pathic Statyllius, the effeminate old stump of Aphrodite, he dedicated in the porch of Priapus his light summer dresses dyed in scarlet and crimson, his false hair greasy with spikenard, his white shoes that shone on his shapely ankles, the chest in which reposed his bombasine frippery, and his flute that breathed sweet music in the revels of the harlot tribe (Myrinus, *Greek Anthology* 6.254, trans. W. R. Paton and M. A. Tueller).

C) One of Tryphaena's maids took Giton below decks, and ornamented the boy's head with some of her mistress's clustered curls. Further, she also took some eyebrows out of a box, and by cunningly following the lines where he was defaced she restored his proper beauty complete. Tryphaena recognized the true Giton, there was a storm of tears, and she then for the first time gave the boy a kiss with real affection. Of course, I was glad to see him clothed again in his former loveliness, but still I kept hiding my own face continually, for I realized that I was marked with no common ugliness, since not even Lichas considered me fit to speak to. But the same maid came and rescued me from gloom, called me aside, and decked me with equally becoming curls. Indeed, my face shone with a greater glory. My curls were golden! (Petronius, *Satyricon* 110, trans. M. Heseltine, W. H. D. Rouse, and E. H. Warmington).

It is possible that Gallus and Statyllius were real historical figures whose likenesses were captured in Martial's and Myrinus' satirical epigrams during the late first century CE, while Giton and Encolpius are both characters in Petronius' satirical novel *Satyricon*, which dates to the middle of the first century CE. In all three examples, we see individuals, both male and female, wearing wigs, and this seems to have been reflective of a reality in which both men and women wore wigs and hair pieces in ancient Roman society (Draycott, 2018b). However, the differences in the ways that works of ancient literature describe men and women wearing wigs and hair pieces are clear. Most men described as wearing wigs do so in order to disguise themselves, usually before doing something nefarious, with only a few described as wearing wigs to cover a deficiency such as premature or temporary hair loss (wigs used as disguise: Ovid, *Metamorphoses* 14.654–660; Suetonius, *Caligula* 11; Suetonius, *Nero* 26; Josephus, *Life of Josephus* 47; Dio Cassius, *Roman History* 80.2; Polybius, *Histories* 3.78. Wigs used to cover hair loss: Suetonius, *Otho* 12; Martial, *Epigrams* 12.45; Avienus, *Fables* 11.7–12). With women, the situation is reversed (wigs used to cover hair loss: Horace, *Satires* 1.8.47–50; Martial, *Epigrams* 6.12, 9.38, 12.23; Macedonius the Consul, *Greek Anthology* 11.374; Lucillius, *Greek Anthology* 11.68, 11.310; Lucian, *Dialogues of the Courtesans* 11.4. Wigs used as disguise: Juvenal, *Satires* 6.120–122). The criticisms Martial directs at Galla are typical, and there are traces of these in Myrinus' account of Statyllius, whom he describes as effeminate, too: prosthetic hair is inherently false and its usage is designed to deceive; it is viewed as a type of luxury like silk and perfume; it is essentially a type of cosmetic. In Petronius' *Satyricon*, we see prosthetic hair and eyebrows belonging to a woman repurposed by two men, and presumably this idea of two men wearing prosthetic hair in a feminine hairstyle was intended to be comedic, part of the joke being that the men themselves did not understand this.

Just as Lucian's rich man required the assistance of enslaved individuals to use his prosthetic feet effectively, so too do Giton and Encolpius require the assistance of an enslaved individual to apply their prosthetic hair and eyebrows effectively, and there are numerous ancient literary references to and artistic depictions of attendants dressing their mistress' hair.

There is also archaeological and bioarchaeological evidence that supports all three literary accounts, as numerous examples of wigs and hair pieces have been recovered from tombs and graves dating to the Roman period from sites around the empire (Draycott, 2018b). These range from hair extensions in the form of braids that could be used to supplement existing hair and elaborate upon hair styles to full wigs (for braids, see discoveries from France and Britain, at Audollent, 1921, p. 163; Audollent, 1923, pp. 311–312, pl. 8, nn. 3–6; Wood, 1883, pp. 108; Black, 1986, p. 225. For a full wig that was found in conjunction with a gold hair net and belonged to a woman named Aebutia Quarta, see Legrottaglie, 2005 and Benecchi, 2005).

Gender

As we have seen in Table 3, both men and women are presented as having used prostheses in classical antiquity through ancient literature. However, there are significant differences not only in the types of prosthesis that they are presented as using, but in the ways in which these stories are told. Broadly speaking, there are significantly more examples of men using prostheses than women. Why might this be? Is it simply a result of the generally gendered nature of ancient literary sources? Very possibly, for while it is notable that the references are found in both prose and poetry across a range of genres, certain types of references are found in specific genres. The references to men using prostheses are found in all literary genres, while the references to women using prostheses are concentrated in satirical poetry and prose such as the works of Horace, Juvenal, Martial, Lucilius, Mardonius, and Lucian (Horace, *Satires* 1.8.47–50; Juvenal, *Satires* 6.120–122; Martial, *Epigrams* 1.72, 5.43, 9.38, 12.23, 12.45, 14.56, Lucilius, *Greek Anthology* 11.68, 11.310; Macedonius, *Greek Anthology* 11.374; Lucian, *Professor of Public Speaking* 24). Men are presented as using extremity prostheses (feet, legs, hands), while women are presented as using facial prostheses (teeth, hair). Why might this be? Is this indicative of a reality in which men were more likely to lose limbs while women were more likely to lose facial features? This is possible, since ancient literature attests that there was a considerable range of ways in which an individual could lose a body part. An individual might be born without a body part: phocomelia, the absence of the proximal part of a limb which causes the hands or feet to be directly attached to the torso; meromelia, the congenital absence of specific parts of a limb; hemimelia, the partial absence of terminal parts of the limb; or amelia, the complete absence of the limb. However, this congenital absence of a body part is extremely rare, and relatively few examples survive in the skeletal record from any period of history (Mann *et al.*, 1998, p. 295). Much more common was an individual experiencing the loss of a body part during life, and this acquired loss of a body part could occur through a variety of different circumstances: traumatic amputation; surgical amputation; martial amputation; judicial amputation; extra-judicial amputation; self-mutilation or mutilation; and the natural aging process (Draycott, in preparation). Although realistically it is likely that both genders could lose any number of body parts in any number of ways, in literature we do seem to see a focus on men losing their body parts through military or agricultural activity, and women losing their body parts through mutilation or aging. For men undertaking military activity, the loss of the right hand (the sword hand) and one or both eyes (due to lack of appropriate protective gear) seem to have been particularly common, while for men undertaking agricultural activity, the feet or legs were at risk from accidents with agricultural tools or bites from venomous creatures (loss of the right hand in the course of military activity: Pliny the Elder, *Natural History* 7.29; Plutarch, *Camillus* 142; Lucian, *Friendship* 10, 62; Ammianus Marcellinus, *Roman History* 17.10; Nonnus, *Dionysiaca* 2.427–435, 22.196–202. Loss of one or both eyes through military activity: Dionysius of Halicarnassus, *Roman Antiquities* 5.23.2–25; Plutarch, *Sertorius* 4.2; Caesar, *Civil Wars* 3.53.4; Suetonius, *Caesar* 68.4; Lucan, *Pharsalia* 6.213–216. Loss of the foot or the leg through agricultural activity: Erycius, *Greek Anthology* 9.233). Women seem to have been at risk from facial mutilation that occurred as the result of interpersonal violence and was carried out so as to purposefully spoil their beauty and so make them less attractive to men and therefore less valuable, and the female natural aging process that resulted in the loss of teeth and hair receives much more commentary from ancient writers than the male one, again because of the effect that this had on a woman's beauty, her attractiveness to men, and her intrinsic value (loss of facial features through mutilation: Plautus, *Pot of Gold* 188–189; Diodorus Siculus, *Library of History* 1.78.4–5; Hermesianax, *Fragments (Leontion)* 2.4. Loss of teeth and hair through the natural aging process: Cokayne, 2003; Parkin, 2003). In ancient Jewish literature, facial prostheses are recommended specifically to restore a woman's physical attractiveness and make her a more desirable potential bride (Palestinian Talmud, tractate Nedarim 9.41c; Babylonian Talmud, Nedarim 66b; for discussion, see Lehman, 2018, pp. 112–113). But

perhaps there was some sort of visible imbalance in ancient society and this fed into existing stereotypes and bolstered them.

Archaeological and bioarchaeological evidence supports these demarcations. Of the extremity prostheses that have survived from classical antiquity, all those found in situ were found in the tombs and graves of men. These include the third century BCE ‘Capua Limb’ and the sixth century CE ‘Hemmaberg Limb’. Of the facial prostheses that have survived from classical antiquity, all of those found in situ were found in the tombs and graves of women, and the size of those that are unprovenanced indicates that they belonged to women too (Becker and Turfa, 2017, pp. 113–114).

Material

As we have seen in Table 4, the materials utilised to make prostheses varied considerably and included gold, silver, iron, wood, ivory, bone, horn, diamond, malachite, leather, hair, and other types of textiles such as linen and plant fibres. Thus, it is not surprising that the technical sophistication and complexity of prostheses should vary too. After all, a prosthesis composed of one material only required one type of artisan, yet a prosthesis composed of two or more types of material required multiple artisans working in collaboration at all stages of the manufacturing process so was exponentially more complicated. Why are the literary references so variable? Is this indicative of reality? Were some prostheses simple and others complex? And if so, why was this? Was it simply a matter of utilising whatever material one had to hand? Were some materials considered more suitable to certain types of prostheses than others? Were the wealthy elite more likely to invest in a technically sophisticated and complex prosthesis? Perhaps, but if so, why? Practicality? Usability? Not necessarily.

Contemporary prostheses can be problematic for their users, and it is debateable how practical or usable any ancient prosthesis was. We need to consider what a prosthetic limb could offer its user that an alternative type of assistive technology such as a staff, a walking stick, or a crutch could not (Draycott, in preparation 2020). Perhaps we should consider prostheses ‘bodywear’ and include them in our discussions of dress and clothing, imagining wealthy and high-status individuals using their prostheses to make specific statements about themselves, just as individuals in subsequent periods of history have done. The ancient Jewish religious teachings debate whether a prosthetic leg or foot should be considered a shoe or a tool, and individual rabbis have different opinions on this. If one’s prosthetic leg or foot was classed as a shoe, it did not affect their ability to access the temple or even leave their house on the Shabbat, but if one’s prosthetic leg or foot was classed as a tool, one was subject to the same restrictions about using it as any other piece of equipment, no matter how crucial it was to one’s day to day life. It would certainly appear that wigs, hair pieces, eyebrows, and teeth were considered to be cosmetic and as a result part of the broader category of dress and clothing and, on occasion, even costume. Thus, we can see how, like expensive and beautiful jewellery, for example, a prosthesis might be utilised by its wearer as a means of communicating not just wealth, status, and prestige but also good taste and even fashion sense, just as bespoke prostheses, such as the ones created by companies like the Alternative Limb Project, do today.

It should be noted that a number of ancient literary references to prostheses state that the individual acquired their prosthesis ‘themselves’, so we can infer that some individuals made their own prostheses, and so presumably these were absolutely reflective of that individual’s taste, but it is important to bear in mind that the process of designing, commissioning, and manufacturing any object is frequently elided in ancient literature. Something that is apparent in the discussions of prosthetic teeth and hair that is not mentioned in discussions of other types is the frequency with which the fact that these items are purchased; apparently, in the city of Rome wigs could be purchased near the Porticus Philippi, in front of the temple of Hercules and the Muses (Ovid, *Art of Love* 3.167–168).

This implies that there was enough trade in prosthetic teeth and hair, at least, to allow makers to specialise and potentially even provide ready-made versions rather than made to measure ones.

Again, archaeological and bioarchaeological evidence supports these demarcations. Judging from the other grave goods found in the inhumations, cremations, and mummifications that contain prostheses, sophisticated prostheses have been found in the tombs and graves of high-status individuals, both male and female. But it needs to be born in mind that the metal survives where the organic materials such as wood and leather do not, and the prostheses of the poor were not necessarily any less technically sophisticated, for all that they may have been made from less prestigious materials (Li *et al.*, 2013).

The most commonly cited material used in the production of prostheses is gold, and there are several reasons why this might have been the case. Gold is, due to its colour and shine, instantly recognisable, and an indicator of wealth, status, prestige, and luxury. Thus, for members of the social elite it would be a suitable material for a prosthesis, particularly one that was small yet highly visible, such as an eye, a nose, or a tooth (*Laws of the Twelve Tables* 10.8–9; Hippocratic Corpus, *Joints* 33.9–10; Celsus, *On Medicine* 6.12; Lucian, *The Professor of Public Speaking* 24; Palestinian Talmud, Shabbat 6.5; Babylonian Talmud, Shabbat 65a; Palestinian Talmud, Yerushalmi Nedarim 9.8, 41c; Babylonian Talmud, Nedarim 66a–b). In turn, individuals who were elite in some way, or who wished to be perceived to be elite in some way, such as Pythagoras and his imitator Alexander the False Prophet, might be expected to have a golden prosthesis as an indicator of that special quality that set them apart from others. There are also practical reasons why gold was a suitable choice for prostheses, particularly those that came into contact with the interior of the body such as the eye socket or the mouth, and that is its purity and resultant harmlessness (Becker and Turfa, 2017, p. 101). It is also a malleable metal, which would make beating or engraving it relatively easy and straightforward.

Also commonly cited are ivory, bone, and horn, and these were likely used in the production of prostheses for similar reasons to gold. There was a mythological antecedent in the tale of Pelops and his ivory shoulder, so ivory had divine connotations, and since it was most often associated with exotic creatures such as elephants, it was itself seen as exotic and luxurious, and imported from far away territories such as Africa and India. Thus, it was a prestige material, and this prestige is reflected in its use for cult objects such as chryselephantine statues. However, like gold, ivory's qualities also made it suitable for prostheses, particularly false teeth. It came in the right sort of sizes and shapes, it had the right sort of appearance, and it could be worked with relative ease. However, an additional aspect of using materials such as ivory, bone, and horn to consider is that, unlike metals, they had once belonged to living creatures. In the case of dental appliances, an individual might utilise their own extracted teeth, but if the reason that their teeth had been extracted in the first place was that they were in some way damaged or defective, as the discarded teeth found in during archaeological excavation of facilities such as ancient dental surgeries and bathhouses tend to be (Becker, 2014), they would need to repurpose someone or something else's. For example, one ancient Etruscan dental appliance incorporates an animal rather than a human tooth (Becker and Turfa, 2017, p. 110, p. 209). What might these teeth, tusks, bones, or horns have signified, not only to their users but also others who witnessed them being used in this way? What qualities might they have been thought to impart? Might the user have been considered, for better or for worse, a human-animal hybrid (Hughes, 2010)? By way of comparison, one ancient prosthetic leg recently recovered from a grave at Turfan in China that has been dated to approximately 300-200 BCE makes its hybridity explicit: it was made from leather, sheep or goat horn, and the hoof of either a horse or an Asiatic ass, and consisted of a plate that was fastened to the left thigh by leather straps and which tapered into a peg-leg (Li *et al.*, 2012, p. 339). No attempt was made to carve the peg-leg to resemble the human limb that it was supplementing; on the contrary, the peg-leg terminated in a hoof which may, in fact, have rendered the prosthesis easier to use. While the materials that the prosthesis comprised and the form that the prosthesis took can be seen as entirely practical, even utilitarian, a means of stabilising its user as he

moved around, it is also possible that his choice of an animalistic rather than humanoid limb was influenced by his Subeixi culture's interaction with the Pazyryk culture of the Scythian communities in the nearby Altai mountains. While there is no evidence that any Greek or Roman prosthesis user was inspired to model their prosthesis after an animal this explicitly, they may have done so implicitly, by exercising their ability to choose materials for their own specific reasons. Alternatively, they may simply have considered using animal products in their prostheses as being akin to using animal products in their cosmetics, jewellery, or clothing, and not given it a second thought, which brings us back to the idea of prostheses as 'bodywear'.

Although not very many of the ancient literary references to prosthetic hair specifically state that these items were made from human hair, other literary evidence for the hair trade in classical antiquity and archaeological evidence in the form of wigs and hair pieces that survive from classical antiquity indicates that this was, in fact, that case. Again, the reasoning that lay behind this was likely due to the nature of the material itself. Since human hair comes in a variety of colours and textures, one can choose: it would appear that blonde hair was particularly popular in imperial Rome, for example (Ovid, *Amores* 1.14.45–46, *Art of Love* 3.163–168, 3.242–250; Martial, *Epigrams* 14.26 refers to 'Teutonic locks' (*teutonicos capillos*); Draycott, 2018b). Although wigs and hair pieces made from other types of textile such as leather and plant fibres are attested, these would have been in one fixed style. Wigs and hair pieces made from human hair, on the other hand, had the advantage of being able to be arranged into different styles.

Finally, it is perhaps surprising that so few ancient literary references are to prostheses made of wood, especially considering the archaeological evidence not just from classical antiquity, but from all historical periods up to the twentieth century, indicates that that was the material most commonly utilised for them, particularly extremity prostheses. The ancient references that do refer to wooden prostheses – and all of these refer to legs and feet rather than arms and hands – do align with this. One possible explanation is that wood was the material most commonly used for functional prostheses like extremity prostheses just as it was used for other types of assistive technology such as staffs, sticks, canes, and crutches, and being so common did not necessarily rate a mention, unlike the more unusual gold or ivory. After all, with the exception of certain types of rare imported wood such as ebony or citrus, wood was not a prestigious material in the ancient Mediterranean: in the only instance in which the type of wood is specified in a reference to a prosthesis, the wood is olive which was readily available and a popular material for tools. Wood would have been a good choice of material for an ancient prosthesis: it is readily accessible in most places, as a result it is cheap or perhaps even free to acquire, it is relatively easy to work even for someone with rudimentary carpentry skills, and it is strong enough to bear the weight of the prosthesis user while being lighter and more manoeuvrable than metal. Associated with this is another possible explanation, which is related to the people that, in all likelihood, would have been using wooden prostheses, rather than the wooden prostheses themselves. Individuals situated lower down the social hierarchy with less recourse to expensive and luxurious materials with which to fashion prestigious statement prostheses were much less likely to rate a mention by the sorts of ancient authors who record cases of prosthesis use – after all, in a society where impairment and disability were common, what was noteworthy about an ordinary person using an ordinary prosthesis?

Conclusion

It is clear from the literary, documentary, archaeological, and bioarchaeological evidence that classical prostheses were, if not rare, certainly not common. More significantly, it is clear that they were certainly not standardised in any way, even those that sought to replace the same parts of the body, such as the 'Greville Chester Toe' and the 'Cairo Toe', and the 'Capua Limb' and the 'Hemmaberg Limb'. This is to be expected in items that were in all likelihood designed,

commissioned, and manufactured entirely at an individual's direction and discretion. Yet there does seem to have been some sort of consensus, at least in the literature that survives, regarding the relative merits of different types of prosthesis in ancient society and culture, and this literature allows a partial reconstruction of a taxonomy, and a tentative reconstruction of the lived experience of the classical prosthesis user.

Extremity prostheses seem to have been viewed relatively positively, at least in situations where it is clear that they were being utilised as necessities rather than luxuries. They were practical, useful, they empowered their users and facilitated their return to some semblance of normality. There are broad similarities with the way that extremity prostheses were used by veterans in the US Civil War, and the First and Second World Wars, although the restorative effects of these on the individuals themselves and on their societies more broadly were made much more explicit in the way that the prostheses were marketed and advertised (Figg and Farrell-Beck, 1993; Hermes, 2002; Neumann, 2010; Hasegawa, 2012). However, facial prostheses seem to have been viewed relatively negatively. While they may have been, in reality, just as practical, useful, and empowering for their users as extremity prostheses were for theirs, they were dismissed by the individuals writing about them as ridiculous, vainglorious, and fundamentally dishonest and deceptive in a way that extremity prostheses were not. They seem to have been classed as a type of cosmetic rather than a type of assistive technology.

Why the difference? It is possible that these differences are due to the nature of the surviving evidence, coupled with the fact that the individuals recording these examples for posterity were working within pre-existing literary traditions and conventions. However, we should also consider the nature of the prostheses themselves: no matter how technologically sophisticated they could be, an extremity prosthesis was unlikely to be mistaken for the limb that it sought to replace, whereas prosthetic teeth and hair feasibly could be, or at least that seems to be the fear that is expressed by ancient authors in their writings. This leads us to wonder what the purpose of a prosthesis in the classical world was, and how far it differed from the purpose (or purposes) of a prosthesis in the contemporary world. There is far more evidence of all kinds for individuals using other forms of assistive technology, that would have been potentially much more effective than a prosthesis, to compensate for some sort of physical deficiency, so prosthesis use was a deliberate and definitive choice, the motivations for which are up to us to continue to try and interpret.

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