The Prehistory of Compassion

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Foreword

Compassion is key to what we feel makes us 'human'. Compassion binds us together, and acts of unselfish compassion inspire us and in troubled times give us hope for the world. Yet compassion is also remarkably fragile and elusive. As soon as we feel stressed or under pressure we can easily lose our sense of compassion for others (or indeed for ourselves), and as soon as we seek to understand or analyse our own sense of compassion we lose our feeling of this emotion. This apparent fragility of compassion makes addressing the evidence for its development in our most ancient ancestors a unique challenge, yet the archaeological record nonetheless has an important story to tell about the prehistory of compassion. In this volume we review the archaeological evidence for what can be seen as compassionate behaviour from our earliest ancestors to later archaic humans including the Neanderthals to modern humans like ourselves. Through discussing the evidence for a deep seated capacity to care in our ancient past we hope to begin to tell the story of the prehistory of compassion and perhaps to inspire further research.

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Chapter One: Mind, emotions and compassion

Traditional approaches to emotions

Science has been slow to address emotions, perhaps because they have been seen as something both 'woolly' and indefinable, and at the same time directly opposed to rational thought. Yet we know that emotions are central to human social relationships [1]. Emotions are intimately related to rationality, and form part of how we make all our key decisions [2]. They link us in a web of shared understanding and concern[3]. Indeed, the 'socio-moral' emotions such as compassion, love, remorse, empathy, and guilt have been seen as the key qualities making us 'human'. [4]

Our range of emotions moreover marks us out from our nearest relatives the other great apes. Even if other apes feel such emotions as compassion, guilt or remorse these feelings certainly don't structure their relationships and daily lives as they do our own. Yet archaeologists of early prehistory, who we might expect to be interested in how our uniquely 'human' feelings came about, have been typically wary of discussing emotions and their role in archaic human societies. Since emotions have been seen as difficult to define or understand [5] discussions of the development of emotions have been left to other disciplines and detached from the archaeological evidence for how archaic humans behaved. We have archaeological evidence for the activities of early humans from as far back as over two million years ago, but tend to prefer to focus on practical actions such as food procurement or butchery rather than the more challenging issue of how we might link behaviour, motivation and emotions[6]. Occasional finds of archaic humans with illnesses or disabilities who appear to have been 'cared for' [7] have sparked questions, though by and large we still see our early ancestors as obeying rational biological imperatives with little sense of any 'human' emotions or feeling for others, in turn giving us few clues as to how our own feelings evolved.

Broaching the question of the prehistory of emotions

Recently, various changes have made it possible to begin to open up the question of linking archaeological evidence to the development of emotions. New ground has been covered in appreciating the importance of more social areas of thought, or what has been termed 'the social brain' [8] and even in beginning to apply this to the archaeological record [9]. John McNabb for example has linked the production of Palaeolithic stone tools with a capacity to learn from others and share certain concepts[10]. Clive Gamble has illustrated how artefacts increasingly came to be important in forging long distance social bonds[11]. The link between emotion, motivation and behaviour is also increasingly understood[12] particularly through recent neuroimaging studies of modern humans today[13]. Moreover, the intimate link between biology and feelings, and the shared 'hard wired' human development of certain emotions is increasingly clear.

We now know that key emotional reactions follow universal patterns[14] which draw on common patterns in the brain[15]. Though there are cultural differences in how we show how we feel and how we recognise feelings in others, and also any one person's feeling of any emotion may be a little different from someone else's, it is increasingly clear that certain key emotions are found in all societies [16]. Brian Parkinson, Agneta Fischer and Tony Manstead [17]illustrate, for example, that shame is felt in all cultures, though in subtly different ways within 'individualistic' and 'collectivistic' cultures. Shame in a collectivistic culture (such as Spain or China where people are often discouraged from overly focusing on their own interests over that of others) is positive and understood to be an important emotion in

restoring social harmony. However in individualistic cultures (such as America or Britain where people are often encouraged to pursue more ego centred lives) shame is negative and often associated with personal failure. However, the emotion works in a similar way in each culture - putting a limit on anti-social behaviour[18]. This is a common pattern with other emotions being felt or considered in subtly different ways according to different cultures. Pride, for example, is seen as a positive emotion in American culture and a negative one in Japan [19]. In some cultures emotions may be repressed or so thoroughly discouraged culturally as to be hardly felt. In one especially clear case, Jean Briggs has documented how the Inuit view expressions of anger as unacceptable and 'squash down' this emotion, perhaps because they need to work so closely together in what is a difficult and constantly challenging arctic environment[20] (*figure 1*). In some cultures people even talk about feelings which seem to be unique to their society, such as the Japanese emotion of *amae* - a kind of sweet dependance on people close to you [21] - though these are nonetheless based on common roots found in all of us, in this case.

Figure 1. Jean Briggs in her ethnographic account 'Never in Anger' illustrated how expressing anger towards others is discouraged in close knit and deeply caring Inuit society
http://commons.wikimedia.org/wiki/File:Eskimo_Family_NGM-v31-p564.jpg

Emotions can clearly be felt and recognised in subtly different ways. Yet no matter how different our cultures, whether we grew up as an Inuit in the Artic, in a small community in Papua New Guinea or in the centre of London, we all recognise and experience key 'socio-moral' emotions such as love, compassion, remorse and guilt. Such emotions developed in an evolutionary context and play broadly similar social roles in cultures across the world from modern western societies to ethnographically documented ones[22]. Emotions may be challenging to address, but they are as much part of the human mind as is our ability to talk or to understand mathematical or spatial reasoning, and understanding the evolution of human emotions is as essential to comprehending the development of the human mind[23]. Moreover since certain emotions, in particular the 'socio-moral', appear to be particularly significant to our species, the way in which they work may even be one of the key elements to our particular success.

Compassion in biological perspective

Were we to consider one feeling which we might ask to know if our earliest ancestors felt it would surely be compassion – this unique feeling is associated with love, commitment to others, willing self sacrifice and characteristics which we feel make us 'human'. However understanding the evolution and role of compassion in past human species demands seeing this emotion not only as part of our own personal experience but also in a wider analytical perspective as a biological response and 'motivation to act' whose roots lie in the hormonal and neuronal working of our mind. Alongside its poetic connections compassion can be scientifically understood. Compassion in its strict definition involves both feeling an emotion appropriate to another's emotion, empathising[24], and being motivated to help[25]. When we compassionately help others through a genuine motivation rather than obligation or for selfish gain (whether this be caring for someone who is hurt or responding to an infant[26], looking after pets [27] or even punishing cheats[28]) a flood of 'feel good' hormones is released into the brain[29]. So compassion, the emotional motivation to be altruistic, is not just about higher morality but also the biological evolution of a caring response which 'feels good'. Though in a competitive, individualistic, industrialised society it can be easy to see compassion as a weakness, or indeed for it to be rare, it is not difficult to see how mutual compassion forges strong bonds, deep seated collaboration, and a particularly unique strength. Are genuinely compassionate motivations purely within the realm of humans? It would appear not. Spontaneous and specific altruistic helping, motivated by compassion

rather than any instinctive behaviour, is recorded in dolphins (*figure 2*), elephants and higher primates[30]. Dolphins have been known to aid human swimmers in distress. Elephants have such close knit ties that they clearly suffer grief at the loss of a group member, they may spend much time handling the body of the diseased after death. Perhaps unsurprisingly given the significance in our own species, compassionate responses appear to be particularly important in our nearest relatives, orang-utans, gibbons, chimpanzees and gorillas. In these species successful relationships and an ability to get on with others are key features in their evolutionary success, both individually and as a group[31]. We can see how chimpanzees routinely 'hug' the loser of a fight[32] , *figure 3*, and orang-utans might move aside leaves to let another pass by more easily[33]. Acts of 'selfless courage' have also been recorded in chimpanzees, such as the case of an adult chimpanzee that died rescuing a drowning infant from the moat around a zoo enclosure[34]. Chimpanzees have even been recorded adopting unrelated infants whose parents have died[35].

Figure 2. Dolphins are very social animals and have been recorded helping human swimmers

http://commons.wikimedia.org/wiki/File:Parc_Asterix_20.jpg

Figure 3. Chimpanzee hug: A young chimp puts an arm around a screaming adult male who has just lost a fight. After De Waal 2008: figure 1. Photograph by Frans de Waal.

Caring for those who are not even directly related, or taking personal risks in acts of selfless courage might at first seem counter to the principles of evolution, or of what has been called the 'selfish gene'[36]. However in the context of the small, close-knit communities of our ancestors the development of compassionate motivations makes sense from an evolutionary view point. There are significant payoffs for mutual tendencies to help each other and an emotional motivation to help others is thus an advantage. In close relationships each benefits from a mutual capacity to go one step farther to help each other.

If compassion is such an advantage, why is it not everywhere? One reasons is that our compassionate motivations can leave us open to be exploited. In the past what would have stopped a few ruthlessly exploiting the many? It is not hard to imagine a caring majority being exploited by a few selfish people who in difficult times themselves 'win through'. Research suggests that it takes a certain social environment for compassionate motivations to flourish. Kevin Laland and Gillian Brown [37] have demonstrated the importance of a related tendency to 'police' cheats and those who exploit others. Across different cultures we are universally sensitive to detecting and punishing cheats and to maintaining fairness, even if it costs us to punish offenders. Take for example our attitude to politician's lack of integrity with their expenses, and our insistence that even relatively minor sums of money are fairly accounted for. Only where there is sufficient capacity to understand others' minds so that 'cheats' on collaboration (or people who ruthlessly take advantage) can be identified and punished, can strong altruistic motivations evolve which go well beyond kin and in situations where there can be no hope of payoff[38].

It is not difficult to see how in harsh savannah environments our small and vulnerable early human ancestors would have felt both the shared benefits of working together to find food, raise young and avoid predators and been keen to police any who acted purely out of self interest (*figure 4*). Furthermore it has been suggested that in these environments the benefits of 'co-breeding' as the length of human child dependency became increasingly great, are increasingly important going well beyond that of other apes[39]. Grandmothers, males, siblings or others compassionately motivated to help care for dependant offspring would make an important contribution to their survival and wellbeing[40]. For a small fragile

group of early humans, facing the predators and search for food in the African savannah, the benefits of a predisposition to work together and to 'care' for others are relatively clear.

Figure 4. Australopithecine reconstruction from Laetoli, It is hard to imagine how early humans such as these, between three and five feet high, could have survived the harsh environments they lived in without deep seated collaboration

http://commons.wikimedia.org/wiki/File:Laetoli_recreated.JPG

Compassion in Humans – the evolution of a uniquely significant emotion

A particularly unique and deep seated compassion in our species appears to have developed since our split with other apes as a result of around six million years of intense evolutionary pressure to work together. Human compassion seems to be qualitatively and quantitatively different than in other animals and far more integral to how all of society works. Compassion in other animals is comparatively fleeting, for example chimpanzees don't make allowances for individuals who are slow or who cannot keep up with the group, nor do they 'think through' how to help others in the long term[41]. Yet in contrast compassion is fundamental to human social life. Simon Baron-Cohen and Sally Wheelwright call it 'the glue that holds society together'[42] and it is fair to say that compassionate responses and reciprocal altruism forms the basis of all close human social relationships[43]. Through empathy (feeling an emotion appropriate to another's emotion) and compassion (being motivated to help) we extend ourselves into others[44]. In 'love' we become 'handcuffed' by our emotional commitment to others to act on their behalves and consciously willing to sacrifice our own interests by looking after them, taking risks for them or even giving up our own lives[45].

Our mental ability to feel and use compassion for others is clearly different from other animals. Most particularly we notice that unlike in other primates, compassionate motivations in humans extend into the long term. We can both feel compassion and be motivated to help someone, and at the same time 'think through' what to do. That is, we are able to 'regulate' compassion, to talk about how we feel, and to bring compassionate motivations to help others into rational thought and plan ahead for the long term good of someone we care for[46]. We may occasionally do 'good deeds' because we want to be seen as a good person but genuine selfless compassionate motivations such as a willingness (and planning) to care long term for loved ones or elderly relatives are commonplace[47] and human societies depend on such a willingness. Our sense of emotional commitment to others can be profoundly in contrast even to other primates. In baboon troops when a new alpha male kills the infants of a previous male the mothers pragmatically swap their allegiance and mate with the newcomer[48]. Chimpanzees may abandon infants who cannot keep up. For most humans our emotional sense of commitment to our loved ones means that such acts would be unthinkable. This capacity differs in degree rather than presence or absence.

Our capacity for compassion is also remarkably different to other primates in other respects. We extend caring and commitment way beyond close relationships and kin and towards strangers[49]. The remarkable 'kindness of strangers' is legendary, and something alien to other animals. We also 'care for' animals, pets[50] and even abstract concepts (such as 'liberty' or 'justice') and all kinds of objects[51] (*figure 5*). Perhaps most unusually, in a way that is totally unlike other animals we 'care for', make a commitment to and protect things as diverse as photographs and gardens, and such objects can in turn provide 'comfort'[52].

Figure 5. Antique teddy bears. For humans many objects can appear to have personalities and be able to 'give back' compassion, providing us with a sense of warmth and comfort.
http://commons.wikimedia.org/wiki/File:Ours_en_peluche.jpg

Managing our complex sense of compassion for others is far from straightforward. Caring for the objects, animals or people to whom we have made a commitment can generate conflicts, and our capacity for self sacrifice presents a risk of being exploited. In response we develop various mechanisms to protect ourselves. Close social ties based on genuine altruism are typically combined with wider social links which work based on 'tit for tat' relationships[53] and in some contexts social relationships become competitive or defensive rather than caring of others[54]. We are not all compassionate, and none of us are compassionate all of the time. Depression or anxiety, for example, can easily block the capacity for compassion. Indeed the capacity for compassion, far from being found in all situations, is particularly 'squashed' in those who have grown up in 'tough' environments[55]. Paul Gilbert explains how easily oxytocin, the soothing 'feel good' hormone which is produced in our brains when we feel compassion and care for others and are cared for by them, can be displaced in favour of achievement and stress related serotonin in such situations. He suggests that our different emotional reactions to our social surroundings may have been an evolutionary adaptation to help potentially caring early humans survive in harsh contexts where compassionate motivations might be exploited[56]. Research has shown that some of us (up to 30% in modern western society[57]) are predominantly self-focused in our motivations in close personal relationships even though the majority of us are predominantly other focused[58].

So our astounding capacity for compassion is not always found everywhere, or in everyone. Across human societies from those in the West to ethnographically documented hunter-gatherers we see a constant dynamic between competitive self interest and a drive for collaboration and helping others. Much as though we tend to idealise simple societies, markedly self interested individuals are as equally found in ethnographically documented small scale societies, such as the Inuit recorded by Jean Briggs or the Mbuti recorded by Colin Turnbull[59] as they are in the modern industrialised world. Jean Briggs documents that amongst the Inuit the harsh life of orphans who knew little comfort would lead to their particular drive to achieve and reach a position of status as adults, often becoming excellent hunters. Sometimes it can be an advantage to put the energies which might have been spent in caring for others into particular pursuits or achievements and people who do so take up certain roles in society[60]. Equally certain genetic conditions which emphasise specific talents at the expense of connections to others, such as Asperger's Syndrome[61] or Schizophrenia[62], appear to have been maintained in human populations due to their unique advantages. Natural selection gave us a capacity for self interested competition as much as for compassion, but perhaps in response to such unique complexity we also have an ability to make a conscious choice about how we behave.

Chapter Two: Compassion in the archaeological record.

How can archaeology tell us about compassionate feelings in ancient humans or how compassion came to be so important to us as a species? The archaeological record provides us with only the most fragile of glimpses of behaviour in the past. However within this there are several areas where behaviour motivated by compassion for others, a drive to put the wellbeing of others before ourselves, is demonstrated. Perhaps the most obvious is that of an increasing care for ill or infirm individuals, sometimes over long periods.

Evidence for long term care of others

For some time the concept of compassionate care of others in early species of human was largely a contentious one. Finds of early humans who survived disabilities or illnesses and appear to have been looked after by others prompted some early discussions about compassion in archaic humans [1]. However such ideas were initially met by some negativity and an unwillingness to accord archaic humans with motivations which were seen as uniquely human. It was suggested that we might be implying our own 'moral rightness' on the past[2] or misrepresenting the level of disability which might truly demand care from others[3], or failing to appreciate the potential calculated 'selfish' motivations for caring for other people[4]. However over recent years, as evidence has mounted for both altruism in other great apes[5] and widescale evidence for 'care' of incapacitated archaic humans in the past[6] the question of whether archaic humans showed compassion to others has become much clearer[7]. The question of the capacity for compassion becomes instead one of how that compassion 'works' cognitively, what stages there may have been in the evolution of compassion and how the emotion is played out in social relationships.

The evidence for 'care' of others in archaic humans shows a particularly interesting pattern. The most well known early example of long term support for someone who couldn't look after themselves comes from from a site in Kenya where KNM-ER 1808, a female Homo ergaster dated to around 1.5 million years ago, was discovered[8]. Examinations of the skeletal remains of this early woman have led to suggestions that she was suffering from hypervitaminosis A, a disease caused by excessive intake of vitamin A (perhaps due to eating excessive quantities of liver or bee larvae[9]). Symptoms of hypervitaminosis A include a reduction in bone density and the development of coarse bone growths, both of which are present in KNM-ER 1808's skeleton[10]. The pathology present would have taken weeks or even months to develop, accompanied by symptoms such as abdominal pain, nausea, headaches, dizziness, blurred vision, lethargy, loss of muscular coordination and impaired consciousness. Symptoms of this type would have greatly hindered her capacity for independent survival, yet she survived long enough for the disease to be identifiable in her skeletal pathology, something which only occurs in the advanced stages of hypervitaminosis A. Alan Walker and Pat Shipman suggest "someone else took care of her"[11], and David Cameron and Colin Groves add:

"There is no way she could have survived alone for long in the African savannah…someone must have been feeding her, protecting her from carnivores…The group dynamics of early Homo must have been based on some form of mutual support"[12].

A capacity for compassionate support by providing food for several weeks in early hominins is confirmed by similar evidence elsewhere. An even earlier example of long term care comes from Dmanisi in Georgia, 1.77 million years ago[13]. One of the Dmanisi hominins had lost all but one tooth several years before death, with all the sockets except for the canine teeth having been re-absorbed. This person could only have consumed soft plant or animal

foods, thus probably necessitating support from others. At Bau de l'Aubesier in France, a similar lower jaw, dated somewhat later at around 180,000 years ago, was found with similiar substantial dental disease and reabsorption of the teeth, which would have made chewing painfull and ineffective. The excavator Serge Lebel[14] is confident that this person must have been kept alive by others preparing soft food for them, although some critics have pointed out that chimpanzees can sometimes survive loss of teeth and manage to find sufficient food for some time[15].

Though debate over the level of independence of toothless archaic humans continues, and how much help a tootless human might have needed, a review of more than twenty records of lesions and non trivial pathologies in Lower and Middle Palaeolithic early humans by Hong Shang and Erik Trinkaus[16] produced evidence for at least some degree of survival from severe injuries in all cases, across different parts of the skeleton, supporting the argument for some level of care from a relatively early date.

Recent evidence from Sima de los Huesos in Spain has been particularly influential. Studies of a young Homo heidelbergensis child recovered at this site suggest that by 530,000 years ago long term care was not limited to those people who were old enough to have already made a contribution to a society. Ana Garcia[17] and her team have published evidence from Cranium 14, a child mostly likely aged between 5 and 8 years old at death, who suffered from lambdoid single suture craniosynostosis (SSC), a premature closing of some or all of the separate bony elements of the skull (*figure 6*). This would have caused an increase in pressure within the brain in this child, which would have impacted upon their brain growth and also potentially on their mental capacity, as well as their facial appearance. However, despite this, they survived for at least 5 years, prompting Ana Garcia to note that "her/his pathological condition was not an impediment to receive the same attention as any other Middle Pleistocene *Homo* child"[18]. A Middle Palaeolithic woman from Salé, Morocco, also suffered from debilitating cranial distortion and muscular trauma related to a pre-birth physical deformity (congenital torticollis). She reached adulthood despite such obvious physical deformities[19].

Figure 6. Cranium 14 from Sima de los Huesos. (A) Frontal view, showing the left glenoid and mastoid regions wel below those of the right side. (B). Left lateral view. Note the rounded profile, and the vertical forehead. (C) Superior view. The projection of the torus supraorbitus can be clearly seen. (D). Inferior view, revealing the characteristic deformities of this craniosyntosis: The posterior part of the cranium is twisted to the left with respect to the sagittal place; the left glenoid cavity is more anteriorly placed than the right one. Photograph – Ana Gracia.

At a later date, evidence for widespread care for others comes from Neanderthals. Shanidar 1, the 'Old Man of Shanidar' found at Shanidar Cave in Iraq (*figure 7*) is perhaps one of the best known examples of apparent compassionate care. This man suffered multiple fractures across his body, with the right side being particularly badly affected; the right arm has been described as completely "withered"[20], with the forearm lost before death[21], and with degenerative deformities in both legs which is likely to have caused him a painful limp[22]. He had also received a 'crushing' injury to his cranium, possibly causing blindness in his left eye due to the deformity of the skull[23], and some have even hypothesised that there may have been some brain damage as a result of this injury[24]. Studies of Shanidar 1's injuries have suggested that the majority occurred in adolescence[25], yet were largely healed, with little sign of infection, by the time of his death, some 20-35 years later, at the relatively advanced Neanderthal age of between 35-50 years old[26].

The 'Old Man' of Shanidar was not only looked after despite his injuries, but we might assume, given that he was 'elderly' in Neanderthal terms, by several different people if not

as a shared commitment to 'care' from the whole group. The others in his group must not only have felt compassion for his vulnerability, but also been able to talk about how they felt, and how to plan for his care. As with some other Neanderthals, when he died the 'Old Man' appears to have been carefully buried in a small grave.

Injuries were astoundingly common in Neanderthal times, most probably due to the way in which they appear to have hunted large game, using spears designed to be employed at close quarters[27]. Most remarkable though is the extent of healed injuries, and long term survival despite these injuries. Other Shanidar Neanderthals were also cared for during a considerable time after injury or illness, including Shanidar 3 who had debilitating arthritis of the left ankle and foot joints[28], Shanidar 4 who had a healed wound to his rib, and Shanidar 5 with a large scar on the left side of his face[29]. Another famous Neanderthal, the first ever Neanderthal burial found in 1908 at La Chapelle aux Saints in France, also survived until he was around forty (a considerable age for a Neanderthal) despite tooth disease and the loss of many teeth, and arthritis or a similar joint disease severely affecting his jaw, spine, hip and foot[30].

Figure 7. View of Shanidar Cave, Iraq.

http://en.wikipedia.org/wiki/File:Erbil_governorate_shanidar_cave.jpg

Figure 8. Crania of the La Chapelle aux Saints Neanderthal. (2004) Neandertals Likely Kept Their Genes to Themselves. PLoS Biol 2(3): e80. doi:10.1371/journal.pbio.0020080

Other examples of injuries from across the Neanderthal record help to demonstrate the prevalence of injuries that would have required long term care of individuals from the rest of the group. For example, from Saint Cesaire, France, an individual with a fully healed fractured cranium[31]. Such an injury would have been incredibly debilitating, with immediate effects such heavy bleeding and possible unconsciousness, as well as possible long-term effects, including the possibility of brain damage.

Christoph Zollikofer "The immediate effects of the trauma were probably serious, implying heavy bleeding, cerebral commotion, and temporary impairment. Although it is possible that the individual sustained these adverse effects autonomously, it can be assumed that it had benefited at least to some extent from initial intragroup assistance." [32]

Neanderthal 1, from the Neander Valley in Germany, the individual who gave the species their name, again shows the presence of injuries which would have necessitated care in order to recover. The Neanderthal 1 individual suffered from a fractured ulna, one of the lower arm bones. This in itself would have been a painful injury, which probably would have taken some weeks to heal and recover from, however the healed bone ultimately showed signs of severe deformity, which could have resulted in this injury effecting the individual for the remained of their life. It is interesting, with this in mind, that, like Shanidar 1, it is suggested that Neanderthal 1 received this injury to his arm at a fairly young age yet survived to an estimated age of 50. While Neanderthal 1's injury was not as extensive as those of 'the Old Man', it could still be that it resulted in several people, or indeed the whole group, feeling compassion for him and planning his care[33].

Krapina Cave, in Croatia, where some 900 bone fragments of Neanderthals were discovered, and is amongst the most important sites in discussions of the species, also throws up evidence of injuries requiring care amongst its bones. 5 fragments have been reported to show evidence of injuries, and although given the nature of the fragments it is not possible

to identify whether all of these injuries were fully healed at time of death, it is possible to identify that this was the case in at least 2 of the fragments, both of which show fractures to the cranium[34]. Again, as with Saint Cesaire 1 and as is indeed evident from modern skull fractures, for these injuries to have completed healed and the individuals to have survived them allows us an important insight into the workings of Neanderthal society and the emotional lives of individuals.

One of the most debilitating injuries to have been survived by an individual is a broken femur suffered by La Ferrassie 1, an individual from the La Ferrassie cave site in France. The femur, or thigh bone, is tremendously strong and so the force required to break it huge; this would suggest quite a spectacular event, possibly with other minor injuries being inflicted alongside the main one. Given the large amount of blood vessels within the area of the femur, it's also highly possible that a fracture of the femur could result in a large level of blood loss. Due to both of these factors, the femur is a very pain and dangerous bone to break, while it's large size and density means it has a long healing time, approximately 6 to 8 weeks. In modern medicine, broken femurs often require pining to ensure the correct healing with no deformity. So, for La Ferrassie 1 to survive this injury, with no deformity and to, once again as with so many of these individuals, a relatively advantaged age, again is highly evocative of a Neanderthal society based upon the ability and desire to care long term for its members[35].

Many other Neanderthal individuals also show evidence for long term care, dating back as early as 190-160 thousand years ago. Indeed, research into the population distribution of evidence for care of the ill or wounded in Neanderthals supports the notion of widespread long term care (table 1). In research from a sample of 19 individuals, representing the majority of Neanderthal remains recovered to date, with some 23 different traumatic injuries, there was some level of healing to the injuries of 11 of these individuals, representing 60% of the total[36]. Partial healing was also present in 2 of the individuals, suggesting that the healing process had at least enough time to begin. It is also interesting to note the low rate of infection which seems to be present in the sample of Neanderthal trauma, the severity of many of the injuries and their long approximate healing times. There is only evidence of infection in 2 individuals from the sample of 19 (only 11%), and from these cases, only Shanidar 1's pattern of infection seems to indicate secondary infection due to trauma[37] and this was largely healed at death. The second case, La Ferrassie 1, is not what would be expected if caused by a post-traumatic reaction; instead it has been suggested that the infection pattern present is more likely due to a systemic skeletal disorder[38]. That the low rate of infection occurs in parallel with the high incidence of healing seems to further support interpretations of care-giving. The approximate healing times for the injuries within the sample are also informative. While these are very much approximations, based upon modern medical advice, they still provide another avenue of evidence to suggest care-giving in Neanderthals; the fact that the minimum healing time for any injury in the sample is 4-6 weeks suggests quite a prolonged period when an individual would have needed care and support. These injuries were therefore anything but short-term incidences; even after an individual trauma had healed, it would not be unreasonable to suggest, as in modern examples, that someone would have reduced capabilities in many areas of life and would still require support for possibly much longer after this.

Table 1. Healing times and implications for the care of Neanderthals

[1] No infection to trauma, although there is some infection present in dental abscesses.

[2] No infection to trauma, although infection is present in the individual. This infection is bilateral and symmetrical and therefore more likely represents a systemic disorder such as hypertrophic pulmonary osteoarthropathy (HPO) than post-traumatic reaction[39]

[3] Healed at time of death [40]

It seems that neither age nor the type of affliction, whether it be injury or genetic defect, recoverable or life-long, detracted from the care given by these archaic humans. This is perhaps all the more remarkable since life was hard in such times, the risk of serious injury was high and records from teeth show that periods of food shortages were common[41].

Figure 9. Reconstruction of a Neanderthal man (Neander museum, Germany)
http://commons.wikimedia.org/wiki/File:Neandertaler_reconst.jpg

Figure 10. Reconstruction of a Neanderthal child (based on the infant from Devil's Tower, Gibralter) Made by research team from Anthropological Institute, University of Zürich, image: Christoph P.E. Zollikofer.
http://commons.wikimedia.org/wiki/File:Neanderthal_child.jpg

Life for the latest humans in our story, the early modern humans of the Upper Palaeolithic appears to have been somewhat easier. Modern humans, that is, people genetically and physically the same as ourselves, first arose in Africa around 150,000 years ago, arriving in Europe around 40,000 years ago. These people lived longer and perhaps slightly less harsh lives than the Neanderthals[42]. The fundamental differences between ourselves and earlier human species, and reasons for our particular success and their decline remain something of a mystery. That our own species included within it a range of different people with different minds who worked together in a unique way may have been one part of the story[43], but changes in our emotional construction and the way in which compassionate relationships work between people might also have played a role.

As with earlier species there were also people in the Upper Palaeolithic who were injured or suffered diseases which made it difficult to look after themselves or 'pull their weight' in society. As with Neanderthals we can also see evidence for cases of extensive care of such injured or incapacitated people. A man buried at Chancelade in France who survived for some time with a skull fracture, dislocated shoulder and bent right big toe is perhaps reminiscent of the famous Neanderthal man of Shanidar[44]. At Romito II in Italy, an Upper Paleaeolithic child had a genetic dwarfism (acromesomelic dysplasia) and according to the excavators must have been cared for by the whole group until his death at around 17 years of age[45]. This 'dwarf' ate the same foods as other members of his group so we can assume that he was not disadvantaged because of his deformity[46]. At Sunghir in Russia an elaborate triple burial containing the remains of a mid-Upper Palaeolithic child with bowed long bones was discovered [47] and at Dolní Věstonice a probable female was found with shortening of the limbs probably caused by chondrodysplasia calcificans punctata (CCP) complicated by trauma and early fractures of the upper limbs[48]. Care in early modern humans even involved the practice of operations such as trepanation (incisions in the crania) which by the Neolithic had extended into successful . Unfortunately in the case of a Late Upper Palaeolithic child at Rochereil, France with a bulging forehead and excess of fluid within the skull (hydrocephaly) this operation, though intended to release the potentially fatal pressure, was probably the cause of death[49]. Medical procedures later in the Neolithic had nonetheless reached the point of successful amputations[50].

Figure 11. Upper Palaeolithic Burials from Sunghir, Dolni Vestonice and Romito

However one element marks a rather unique change with the 'care' of modern humans. In many of the burials of individuals who appear to have been cared for we see many grave goods. At Sunghir for example, alongside other grave goods many thousands of ivory beads accompanied the skeleton of the girl with bowed long bones, 5270 in total, more than the other individuals buried at the site. Though archaeological interpretation often focus on the idea of 'status' of these unique individuals, an understanding of compassion might suggest that others felt that they needed more 'comfort' than the norm.

Other expressions of compassion

Taking risks on behalf of others

Compassionately helping others is not limited to caring for those who are ill. Another reliable sign of compassionate motivations is a willingness to take risks or suffer pain on another's behalf[51]. Evidence for such risk taking in archaic humans also supports the picture of a progressive expansion of an emotional investment in others integrated with a rational ability to plan ahead through early prehistory. Competing with predators for carcasses and at a later date hunting large mammals would have been very risky for soft bodied archaic humans[52], yet highly successful as a strategy if all were prepared to take risks and to protect each other rather than individualistically avoiding danger[53]. It has been suggested that as groups worked together more and more effectively, provisioning pregnant females and young and increasingly sharing the care of infants, it became possible for early humans to become larger bodied and to mature more slowly[54]. Certainly we see much larger body sizes, as large as modern humans today and slower maturation rates at the time of Homo erectus (around 1.8 million bp). Shared risk taking in hunting (or protecting young) shows that archaic humans not only took risks on behalf of the group, but were able to trust others to do so equally.

By around 500,000 years ago, evidence from the British site of Boxgrove shows that people were collaborating very effectively in the hunting of large and potentially dangerous animals, and were consciously subjecting themselves to risk in the process[55]. Puncture wounds on a horse scapula at area GTP17 at this site have been interpreted to suggest the use of projectile weapons which would have been prepared before the hunt, and carcass butchery techniques illustrate very early access to carcasses i.e. that at this time, Homo heidelbergensis were either actively hunting large mammals or actively competing with large carnivores for carcasses. In whatever case any early human, sorely unsuited to defence from predators or from large mammals, might place themselves at considerable risk, and given evidence for weapons preparation prior to foraging, clearly planned to do so.

By the Middle Palaeolithic, Neanderthals were perhaps the most extreme of 'risk takers'. Though they clearly planned ahead as shown from evidence for deliberate 'drives' such as at La Cotte de St Brelade in Jersey[56], or food 'caching'[57], hunting was nonetheless a dangerous activity demanding a great deal of courage. Many Neanderthals show upper body injuries apparently from confronting large game, which are similar to those suffered by modern rodeo riders[58]. Such dangerous hunting techniques confronting animals such as bison would not work unless all were prepared to risk injury or even death for the sake of providing food to share.

Figure 12 La Cotte de Brelade. Jersey, site of a Neanderthal mammoth 'drive'

Compassion and bereavement

The archaeological evidence also gives us a glimpse of a developing desire to soothe others distress in bereavement. A remarkable sense of grief has been noted in chimpanzees at the

death of those they are close to. In fact chimpanzee mothers have been known to be so attached to their infants as to carry the bodies of their babies around for several weeks after they die[59] (*figure 13*). However there is little evidence for a compassionate soothing of those who are bereaved by other chimpanzees. In humans however we see gradually increasing evidence for a sharing in grief in shared rituals - perhaps an ability to articulate shared wishes and feelings, to want to find ways to soothe a sense of loss in others and also an extended sense of group rather than individual identity.

Figure 13. An adult female chimpanzee, Jire, carries the mummified remains of her infant, Jimato, who died in a respiratory disease epidemic at Bossou, Guinea, 17 days earlier. The body is carried dorsally, with Jimato's arm gripped between Jire's shoulder and neck. Jire continued to carry the corpse for a further 51 days, before abandoning it. (Image byDora Biro.)

The deliberate placing of the bones of about thirty individuals into a pit at Sima de los Huesos, Atapuerca, Spain at around 400 thousand years ago[60] suggests grief, in its joint expression in shared ritual, was shared at this early date. Somewhat later, formal burials are recorded for Neanderthals[61] with the earliest at Tabun, in the Near East at 112-143kbp[62]. Over thirty Neanderthal burials, from areas as far apart as Kiik Koba in the Crimea, Mezmaiskaya Cave in Russia, Tabun and Amud in Israel, Le Moustier and la Quina in France and Teshnik-Tash in Uzbekistan are recorded,[63]. At La Ferrassie in France eight burials, two adults and six children, were recovered in the low overhanging rockshelter. Whether or not Neanderthals could conceive of a spiritual being or afterlife as Robin Dunbar suggests[64], explicit burials shows both sharing of how people felt and the 'regulation' or shared sense of understanding and communication of their feelings through the material world. Shared 'caring' about the body at death may also reflect similar motivations to those of caring for the living.

Shanidar cave, excavated by Solecki between 1951-1960 and dating to *c.* 45-100, 000 years ago[65] presents a clear case of burial practiced over a long period of time[66]. There were, until recently, nine Neanderthals known from the cave but a new discovery has increased this to ten, of which at least five represent clear burials[67]. The table[68] details the age, sex and position of the skeletons[69].

Table 2 Details of Neanderthals buried at Shanidar Cave

The great number of burials in this cave over an extended period suggests a possible use of group memory to recall significant mortuary sites, aided in this case by limestone blocks which may mark the burials[70]

Compassion and the comfort of 'things'

In much the same way that the body of someone deceased cannot reciprocate emotionally in the way that the living may do, yet nonetheless inspires a motivation to care and protect, other objects can, from relatively recently in evolutionary history inspire similar feelings. Meaningful things can also spark memories of people who care for us, and provide us with comfort.

Widespread 'caring' for things that become immersed in emotional relationships with people only seems to develop remarkably late in evolutionary history. Personal ornaments are

known amongst Neanderthals[71] but it is only with modern humans that such objects become widespread and fundamental to society[72]. 'Caring' for objects (and in turn feeling 'cared for' and 'comforted' by objects) appears to be essential to modern human society. Though we know that 'gifts' form part of networks of obligation[73] or display status[74], amongst close relationships they also form networks of genuine selfless 'giving' to provide comfort for another[75]. Though we may give gifts because we feel we should or because it is expected of us, we also often give things 'out of the kindness of our hearts' and such gifts given from others make us feel more secure and comforted.

Certainly ethnographic studies support the important emotional role of 'precious' objects that form an emotional relationship with people 'as if' they were a person, seen as 'part' of people[76], tying in with studies of how objects such as photographs function psychologically today in 'standing for' someone who makes us feel comforted and secure[77]. Daniella Bar-Yosef Mayer and Naomi Porat describe ethnographic studies showing that in widespread contexts personal ornaments help people feel more open and confident as they 'counteract or divert the effects of supernatural powers and...bring luck and strength' [78]. Other studies also illustrate the importance of an attachment, and willingness to care for objects that 'stand for' people or important social memories in small scale societies.

Annette Weiner comments *'small wonder that the attainment of these most coveted shells, encrusted as they are with histories of people's successes, fills a person with emotional feeling for the shell itself'* [79]

And *'Bambi Schieffelin tells of how the egalitarian Kaluli deeply treasure bits of cloth or tiny pieces of shell that once belonged to a deceased kin, carrying it with them wherever they go. The Trobrianders enlarge upon these feelings, ritually carrying a dead person's hair or fingernails that have been inserted into shell necklaces*'[80]

It is perhaps not surprising that several of the people who were 'cared for' in early modern human societies, such as the children buried at Sunghir and Romito, or the adult at Dolní Věstonice are often found buried with a wealth of beads and ornaments, more so than in other graves, perhaps illustrating that others felt that they needed more than usual comfort.

Figure 14 Upper Palaeolithic infant burials: Decorations on the bodies of newborns indicate that they were probably important in their community.

The rise of our own species heralds an apparent revolution in the making, wearing and use of things which have no obvious practical function. We see early evidence of beads in the Near East at the time of arrival of modern humans in the form of two perforated marine shells at Skhul in Isreal, dated to 100-135 thousand years ago[81], and the selection of shells with natural perforations at nearby Quafzeh, dated to 100kbp[82] . Early beads accompany the evidence for art and other signs of 'modern human behaviour' at Blombos Cave in South Africa at around 75,000 thousand years ago[83] (*figure 15*) and beads later become widespread in the European Aurignacian[84]. In many cases necklaces or bracelets of marine shells would have been worn for considerable periods of time, very possibly for over a year[85]. A particularly evocative reminder of a relationship with another is found in the form of a human molar from Aurignacian levels at Isturitz which has clearly been suspended and much worn[86]. Other items also seem to have had a personal meaning and perhaps were comforting. At Dolní Věstonice both an engraved ivory plaque and clay head show the same torsioning of the face as a woman with deformed facial joints and probable facial paralysis who is buried nearby, and have been suggested to be the earliest evidence of a portrait[87]. Many Upper Palaeolithic burials are associated with beads or other personal objects.

Figure 15. Nassarius kraussianus shell beads from Blombos Cave: evidence for symbolic behaviour in the Middle Stone Age

Figure 16. Sunghir male burial with many thousands of shell beads

The more secure and comfortable we feel the more confident we are to explore. 'Comforting things' may have been an important part of the large scale dynamics of our species. It is perhaps not surprising that the rise of 'personal' objects is associated with a wave of exploration and expansion into new areas by our own species, as well as extensive networks of connections with people many thousands of miles apart. Clive Gamble[88] and Fiona Coward[89] show how socially important objects allowed relationships to be maintained over long distances. Indeed the transport of non functional marine shells and other exotic items up 1500 km[90] in Upper Palaeolithic Europe certainly illustrates that things 'mattered' to people in highly significant ways.

Extending our capacity to 'care' beyond other people and to objects appears to also be related to a mental ability to extend our capacity to care to other areas. We might include a capacity to care for pets with this extended 'compassion' and equally capacities to care for and make a commitment to intangible concepts such as 'freedom of speech', 'liberty' or 'justice'. Robin Dunbar suggests that the prefrontal cortex region of the brain reaches an appropriate size to allow us to conceive of an abstract concept, such as a god or spirits, at 200-100,000 years ago, tying in with evidence for 'caring' for commonly recognised symbolic objects. Indeed not only objects but any concept which 'means something' to a group of people can also be 'cared about' and investments made in its protection, or risks taken for its defence. Many have chosen to 'die for one's country' showing an emotional commitment to sacrifice for concepts which goes way beyond self interest or simply complying with social norms.

Such a widespread willingness to act against one's own self-interest for the apparent good of the 'group' can of course easily be exploited and Dylan Evans[91] shows how a commitment to the wellbeing of others, 'love', is also the basis for long-standing feuds and vendettas where each is prepared to risk death to 'protect' their group. It may be no coincidence that with the arrival of modern humans with our fully modern sense of commitment to others, concepts, groups or ideas that we also see the first evidence for what we might term 'warfare' in the Upper Palaeolithic 'cemetery' at Jebel Sahaba in Sudan. At this site of fifty-nine burials almost half had severe unhealed injuries or stone points embedded in their bodies which appear to have been the cause of death.

From a simple motivation to provide food for an incapacitated individual in early humans, compassion became a reason for living, or for dying, and a structural fundamental to human social life.

Chapter Three: A model for the development of human compassion

A brief review of the archaeological evidence for emotional investments in the wellbeing of others allows us to propose four key levels of a capacity for compassion (*figure 17, figure 18*).

Level One: At approximately 6 - 1.8 million years ago we might expect to see compassion in archaic humans as a fleeting response to another's distress. In common with other higher primates the common ancestor between humans and chimpanzees (at about 6 million years ago) for example would have been likely to have been able to conceive of another's intentions, empathise with another's feelings and be motivated to help them[1]. This 'helping' might have taken the form of an immediate gesture of comfort (eg 'hug') to one in distress, or a very limited 'thinking through' of an immediate problem such as moving obstacles in an individual's path. By the time of species such as *Homo habilis (2.3-1.6 mill years)* or *Homo rudolfensis (1.9 mill years)* transport of carcasses is likely to have been a group activity[2] as well as collaborative defence against predators[3]. Though it is difficult to judge we might assume that a propensity towards collaboration in food procurement and defence begins to be crucially important for early humans to survive in relatively open savannah environments.

Level Two: Emerging from 1.8 million years compassion begins to be 'regulated' as an emotion which is integrated with rational thought. Within *Homo erectus (1.9-1.6 mill years),* and later *Homo heidelbergensis* in Europe the acquisition of meaty carcasses and body size energetics suggests that meat was shared extensively, with pregnant females and those with young infants likely to have been provisioned with food[4]. 'Helpers' with the care of offspring, whether these be males[5], siblings or grandmothers[6] may have played an important role in evolutionary success[7]. Compassion thus gradually became extended widely into non-kin and in potentially extensive investments in caring for offspring and equally for ill individuals. Those who were incapacitated might be provisioned with food for at least several weeks if not longer. By around 500,000 bp with the emergence of mortuary treatment such compassion, and grief at the loss of someone cared for, emotions which bind us to others might be able to be symbolised in communication and recognisable as something akin to 'love'. Such emotional commitment to others may have made abandonment of the disabled child at Sima de los Huesos[8] 'unthinkable' for them. One might speculate that other social emotions such as shame began to also structure archaic human social relationships within such collaborative contexts, and it may be at this stage that difficult to mimic physical signs of genuine emotions such as crying and blushing develop to foster trusting relationships[9].

Level Three: (300,000-50,000 in Europe) By the time of the Neanderthals in Europe, the regulation of compassion extends into deep seated commitments to the welfare of others. With a long period of adolescence and a dependence on collaborative hunting, Neanderthal society depended on deep seated emotional investments beyond the self. Mental capacities to think through others feelings and intentions allowed the rise of the shared beliefs[10] and effective long term planning capacities[11], which appear to have supported routine care of the injured or infirm over extended periods. Much of the sustained care such as of the Shanidar Neanderthal must have involved not a single individual but at least several over his lifespan if not the whole group, and in these cases suggests a shared emotional motivation to help, shared 'socio-moral' emotions which perhaps suggest that other such emotions, remorse, shame, empathy were also in evidence. Neanderthal language, judging by their sharing of the FOXP2 gene associated with language development, was at least complex enough to deal with communication of emotions[12]. Though 'compassionate', Neanderthal

society appears to have been very different from that of modern humans, with for example little contact between groups or with strangers as illustrated by their limited mobility[13]. Neanderthals seem to have been no strangers to 'love' but it may not have been as we would know it.

Level Four: Within Modern humans (from 120,000 in Africa, 40,000 in Europe) the capacity for compassion extends into strangers, animals, objects and abstract concepts, and becomes flexible to context. These developments, shown as a 'branch' in the model, are perhaps best seen as a difference in the expression of compassion, rather than a progressive extension. Objects become 'cared for', particularly as symbols of supportive human relationships and in turn can provide comfort. Abstract concepts, illustrated by the emergence of symbolic art, can also be 'cared about' and protected or sacrificed for. Widespread connections across large areas, as shown by the movement of marine shells, show an ability to relate to strangers in an open and potentially 'caring' way and develop relationships based on trust in non exploitative motivations. However in the new hurly-burly of widespread social connections, the complex range of different social contexts may also have provided the contexts and pressures for different and less compassionate minds to emerge to take on different roles.

From 'homininity' to 'humanity'

The first steps in a prehistoric archaeology of compassion must necessarily be tentative. New archaeological evidence for care of archaic humans and for altruism in great apes plus a greater understanding of how emotions 'work' has allowed us to begin to bring what were once intangible concepts of the 'feelings' of ancient humans into the area of scientific explanation. It becomes feasible to discuss the development of compassion, that apparently most 'human' of feelings, in the past and in the process we move from a purely scientific and rational construction of archaic humans into one in which our earliest ancestors become far more familiar. Though we approach it scientifically, the development of compassion in archaic humans tells us an important and also perhaps a moving story. One cannot help but feel a deep sense of admiration for the kindness and courage of ancient humans and our earliest ancestors. We have traditionally paid a great deal of attention to the mental capacities of early humans and to how they found food, but it may well be time to pay rather more attention to whether or not they 'cared'.

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