

### Homo neanderthalensis (King 1864)

On an August day in 1856 the Neanderthals quite literally exploded onto the intellectual scene, and this year, we celebrate the 150<sup>th</sup> anniversary of their discovery. Little could the adult who lived and died some 40,000 years ago in the vicinity of the Düffel river have known that he would one day be critical to the definition of his own species, and little could the female who lived and died in the region of the rock of Gibraltar know how close she had come to that accolade. Huge intellectual advances separated the 1830s, when the Forbes' Quarry (Gibraltar) specimen was discovered, from the 1850s, and it is no coincidence that Darwin's and Wallace's theories of evolution by natural selection were forming and maturing over this period. Had the intellectual scene been primed for the reception of pre-modern human fossils in the 1830s we would be talking about *Homo calpicensis* (after the old name for Gibraltar, Calpe).

The discovery of Neanderthal 1 in 1856 came right in the centre of one of the most profound centuries of human technological and intellectual growth. From the start of the century the suggestion that species were not 'fixed' in the form that God created them and the question of the origins of humanity were firmly on the agenda. In 1844 Darwin had written his 'gleams of light' letter to Hooker, effectively announcing his own discovery – the theory of evolution by means of natural selection:

...At last gleams of light have come, & I am almost convinced (quite contrary to opinion I started with) that species are not (it is like confessing a murder) immutable. Heaven forbid me from Lamarck nonsense of a 'tendency to progression' 'adaptations from the slow willing of animals' &c – but the conclusions I am led to are not widely different from his – though the means of change are wholly so – I think I have found (here's presumption!) the simple way by which species become exquisitely adapted to various ends...'

C Darwin to JD Hooker, 11 January 1844 (quoted in Burkhardt 1996)

By the 1850s Darwin was working on what he referred to as his 'big species book' which, courtesy of the independent discovery of the same theory by Alfred Russell Wallace, was published in abridged form in 1859 as *On the Origin of Species by Means of Natural Selection*. Wallace had in 1855 published *On the Law Regulating the Introduction of New Species* which was circulated to Darwin, Huxley and Lyell among others. Around the time of the Neanderthal discovery, Wallace and Darwin were corresponding about the theory. Did it pertain to humans? The implications were that it did, but Darwin, famously, sidestepped the issue and it would not be until 1871 that he addressed the full implications of the theory head on: 'You ask whether I shall discuss 'Man' [in the *Origin*]. I think I shall avoid the whole issue' (Darwin to Wallace, 1857).

In 1858, papers by Darwin and Wallace on the theory were read out to the Linnaean Society in London. At the end of the decade the implications of these men's work was apparent: as Darwin famously wrote in the *Origin* 'light will be shed on the origin of Man'.

In fact it already had been. The Neanderthal discovery marked the emergence of the first recognised human fossils and the beginnings of palaeoanthropology. Given the intellectual context it is no surprise that to mid-century science the Neanderthal fossils 'stood out like a beacon' (Trinkaus & Shipman 1993:46). The story of the discovery in the detritus from the quarrying of the Feldhofer Grotte is well known. Quarrymen working in the Neander valley (thal) had been saving at least some of the better examples of 'diluvial' fossils for the frequent visits of a local schoolteacher, Johannes Fuhlrott who has been visiting the quarry and removing the bones of 'diluvial' animals such as bears, to educate his schoolchildren. To his everlasting credit Fuhlrott realised that the bones of Neanderthal 1 were not those of a cave bear but of a fossil human. He contacted a local academic, Hermann Schaaffhausen, Professor of Anatomy at the University of Bonn, and together the two studied and published the remains as those of a fossil human in 1857. Opposition to the notion that the remains were those of a genuine pre-modern human 'of a barbarous and savage race' (Schaaffhausen 1858) was quickly forthcoming. Rudolf Virchow, the eminent founder of modern pathology and a vociferous opponent of the notion of mutation, believed Neanderthal 1 to be simply

pathological. One of Schaaffhausen's colleagues at Bonn, August Franz Mayer, who was to become one of the most vocal opponents of the discovery, believed them to be the remains of a Cossack, given rickets by a lifetime in the saddle and dying as a consequence of Napoleon's actions in Germany in 1814. The French specialist, Franz Pruner-Bey believed the remains to be those of a micro-cephalic idiot, and the notion that it merely represented a pathological human was supported by Ernst Haeckel.

Support, at least, was also forthcoming, particularly in England and France, and Darwin, Huxley, Lyell, Paul Broca and Gabriel de Mortillet all made fairly light work of the opposition. By the 1860s enough momentum had built up for the Irish anatomist, William King, formally to define the remains as *Homo neanderthalensis*. Although remains had been discovered previously that would in time be recognised as belonging to the same taxonomic group – Engis (1829), Forbes' Quarry, Gibraltar (1848), Feldhoffer Grotte, Neanderthal (1856) and La Naulette (1866), the Neanderthal 1 discovery was clearly the desired spark which set the flame for the acceptance of the notion of human evolution. The discovery of the Neanderthals can thus be seen as an integral part of the establishment of deep human time and the recognition that humans of both behaviourally and anatomically archaic forms had existed in antiquity.

A more mature consideration of the discoveries in the light of ethnographically derived models of social evolution can be observed from the 1870s onwards. Ironically, Neanderthal 1 does not feature much in Darwin's *Descent of Man* of 1871, save for the note that '...some skulls of very high antiquity, such as the famous one of Neanderthal, are well developed and capacious' (Darwin 1871i, 146) but this at least indicates the degree of acceptedness that had overcome initial opposition. By 1910, the status of *Homo neanderthalensis* had been combined into issues of human ancestry by Keith, Boule and others, and the *pre-sapiens* school of thought had come about. This advocated a long evolutionary line for our own species and therefore ruled Neanderthals out of this on the grounds that they were too geologically recent and too anatomically primitive. By the 1920s most scholars viewed Neanderthals as an evolutionary side branch. Clearly implicit in this school of thought was a replacement event which saw the establishment of modern humans in Europe and the extinction of the Neanderthals, and this notion remains at the heart of Neanderthal studies today. It is testimony to the severe limitations of the palaeontological and archaeological database and to the simplicity of explanatory models that there is still no agreement on the issue of this replacement today.

It is against the context of the *pre-sapiens* hypothesis that Marcellin Boule's famous reconstruction and interpretation of the first decently complete Neanderthal skeleton – La Chapelle-aux-Saints – must be seen. To Boule, significant anatomical differences between the observable Neanderthal material and that of *Homo sapiens* supported the notion that Neanderthals had no place in human ancestry. The *pre-sapiens* school came under increasing criticism with the emergence of the 'pre-neanderthal' school from the late 1930s, in which fossil discoveries of the new decades of the twentieth century (e.g. Swanscombe, Saccopastore, Mauer) were seen by scholars such as Kleinschmidt, Coon, Weidenreich and Von Koenigswald as plausible ancestors to the Neanderthals as opposed to modern humans. The net result of this was to bring the Neanderthals closer to modern humans phylogenetically, if still denying a direct ancestry. From this time, reconsiderations of Boule's anatomical reconstruction began appearing, and Coon forwarded his famous reconstruction of a clothed Neanderthal, all of which served to emphasise similarities between the two taxa, to the extent that some scholars now defined Neanderthals as *Homo sapiens neanderthalensis*. The uncomfortable feeling that arose from having a relatively primitive hominid as a close phylogenetic relative could be alleviated by explaining many Neanderthal traits away as specific biological responses to cold environments or stresses due to the use of the anterior dentition as tools due to the simplicity of their toolkits, notions which remain at the heart of archaeological interpretations of the European Middle Palaeolithic.

Since the 1970s Neanderthal studies have been in an essentially modern paradigm, which can be characterised by the exploration of the functional significance of anatomical autapomorphies, the evaluation of Neanderthal palaeoecology, an increasing integration of physical anthropology (especially biomechanics) with Palaeolithic archaeology, and initial exploitation of sophisticated biomolecular analyses of Neanderthal remains (stable isotope dietary analysis, ancient DNA). We now know that the Neanderthal 1 remains are about 40,000 (<sup>14</sup>C) years old, on the basis of AMS radiocarbon dates on the Neanderthal 1 material as well as refitting material newly discovered from the spoil of the 1850s.

Here, *Before Farming* marks the 150<sup>th</sup> anniversary of the Neanderthal discovery with three papers that reflect major current concerns with Neanderthal palaeoecology and biogeography. Verpoorte draws on the relatively large

energetic requirements of the Neanderthal body to make some speculative but elegant predictions about how their biology affects their land-use patterns. Using a central-place foraging model he demonstrates that in comparison to *Homo sapiens*, Neanderthals paradoxically would have made relatively more residential moves but covered less annual ground, and from this, he suggests, it is understandable that they invested less effort into constructing and modifying their campsites or to having carried their lithic raw materials over long distances. The attractiveness of his model lies in its holistic integration of the biological and behavioural.

In recent years, the stable isotope analysis of Neanderthal bones has supported faunally-derived notions that Neanderthals were efficient hunters, and these studies generally agree that Neanderthals obtained 80–90% of their dietary protein from meat. Today, few people perpetuate the notion that Neanderthals were primarily scavengers, and a number of specialists such as Sabine Gaudzinski and Mary Stiner are refining reconstructions of the Neanderthal hunting niche. An important contributor to such work is John Speth, whose characteristically rigorous paper (with JL Clark) develops his notion that at Kebara Cave, Israel, Neanderthals were actually over-hunting large herbivores such as aurochs and red deer and increasingly taking smaller animals such as gazelle and extinct roe deer, females and juveniles, to compensate. The gradual shift in emphasis on hunted resources occurred irrespective of major climatic oscillations, and it is tempting to view these as an early move towards the intensified use of smaller game resources that has hitherto only been identified later in the Palaeolithic.

The extinction of the Neanderthals is one of the most vexed questions in Palaeoanthropology at present, and a number of scholars have attempted to reconstruct the broad biogeographic pattern of Neanderthal fracturing and retraction. The notion that late Neanderthals were in some regions of Europe ‘contemporary’ with dispersing *Homo sapiens* populations has achieved almost axiomatic status, yet real demonstration of this contemporaneity – let alone any concomitant ‘interaction and acculturation’ remain notoriously elusive. The Iberian peninsula has in particular been central to arguments of contemporaneity, particularly in the light of the notion of a biogeographic ‘frontier’ centred on the Ebro river. Recently, some scholars have argued from ongoing excavations on Gibraltar, that Neanderthals persisted very late in the south of the peninsula. In our final paper, Joao Zilhão and I raise some issues with such suggestions, which I hope is reflective to a large extent of current debates over the all-critical use of radiocarbon dates in the period 30–50,000 BP. Much of what we do depends upon the validity of our dating evidence, and the slow emergence of ‘correction’ curves for radiocarbon dates and refinement of non-radiocarbon dating methods is slowly placing our understanding of the timing of Neanderthal extinction and modern human expansion onto a firmer footing.

So I hope that, 150 years on, Fuhrott and Schaaffhausen would find that although we have little idea of what finally happened to the Neanderthals, we have come a very long way towards understanding these iconic but enigmatic peoples. We should not underestimate the significance of the Neanderthals. They played a critical role in the demonstration that humanity evolved. Their acceptance immediately required the acceptance that there has been more than one species of human. The demonstration that they had lived through the rigours of several glacial periods stressed the role of climate in human evolution. And finally, they remind most of us of the most profound lesson of all, that human species can become extinct.

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## References

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