The Beast Within: H.G. Wells, *The Island of Doctor Moreau*, and human evolution in the mid-1890s

JOHN MCNABB*

Department of Archaeology, University of Southampton, Southampton, UK

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* Correspondence to: J. McNabb, Faculty of Humanities, Department of Archaeology, University of Southampton, Avenue Campus, Southampton, SO17 1BF, UK. E-mail: J.McNabb@soton.ac.uk

ABSTRACT.

H.G. Wells' novels *The Time Machine* and *The Island of Doctor Moreau* were both concerned with the evolutionary destiny of mankind and what it meant to be human, both important areas of discussion for Victorian natural science in the 1890s. In this essay I set these two works in their broader scientific context and explore some of the then contemporary influences on them drawn from the emerging disciplines of archaeology and anthropology. Wells was a student of T.H. Huxley whose influence on his own emerging views on human evolution are clear. While most scientists and the lay-public accepted the reality of evolution by the 1890s, and the natural origins of the human species, fear of the implications of our 'primitive' heritage pervaded popular and scientific works. Wells bridged that gap with an uncompromising outlook delivered to the public as scientific truth delivered through short stories, novels and scientific journalism.

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1. INTRODUCTION

H.G. Wells (1866-1946) was an author of science fiction stories and polemical writings on the human condition who is perhaps best remembered today for the voluminous body of work that he produced in the late 1890s (Mackenzie and Mackenzie, 1987, McLean 2009), and in particular his masterpiece *The War of the Worlds*. Perhaps more than any other writer of this time he epitomised the spirit of his age, in no small part due to the scientific training he received at the Normal School of Science in South Kensington, London. Sadly, geology wasn't one of his strong points; he failed his third year geology exam and left in 1887 without taking his degree (Parrinder 2005). By the middle 1890s the natural sciences were increasingly becoming more specialised and professionalised, but the modern separation into distinct disciplines was still some way off – for example just before the First World

War the Keeper of the Department of Geology in the British Museum (Natural History: South Kensington) was a world class authority on fossil fish who felt qualified to publish on human evolution (*viz* Arthur Smith Woodward's involvement in Piltdown). It was still possible in the last decade of the Victorian era to consider oneself a student of natural science, and geology would have been a significant part of this. Wells' scientific writing reflects this broad-church view of research into the natural world. Modern emphasis on multi-disciplinarity is merely the rediscovery of what post-Edwardian science let slip through its fingers, as is our increasing need to justify the relevance of what we do to society as a whole. Victorian and Edwardian science was intimately imbedded in the social process and the relevance of research to society as a whole was never in any doubt. As a writer Wells' short stories, novels, and scientific journalism reflected these embedded perspectives. Geology, like any other scientific practice in the Victorian age was a part of how society understood its place in the world, and Wells' self-proclaimed mission was to ensure the public understood that relationship correctly.

Linking Wells' two great early novels *The Time Machine* (Wells, 1895) with *The Island of Doctor Moreau* (Wells, 1896) is a concern with what humanity actually is. The former is a critique on the popular Victorian belief that humans represent the top of the evolutionary tree, an inevitable consequence of our being a superior species. Wells set out to show that this was not a given – in evolution nothing is fixed. In the latter novel the human form, many of our treasured social institutions and even our hallowed capacity for speech, are reproduced in a laboratory and grafted onto vivisected animals – in evolution nothing is sacred.

Not surprisingly given Wells' fame, there is a large body of scholarship surrounding his work, as well as many of his individual writings (Bergonzi, 1961, Draper, 1987, Foot, 1995, Mackenzie and Mackenzie, 1987, McLean, 2009, Partington, 2008, Pearson, 2007, Philmus, 1993, Philmus and Hughes, 1975, Wagar, 1964) Philmus and Hughes, 1975; Draper, 1987; Mackenzie and Mackenzie, 1987; Philmus, 1993; Foot, 1995; Pearson, 2007; Partington, 2008; McLean, 2009). These references barely scratch the surface of Wellsian scholarship.

The plots of the two novels considered here are well known and do not need detailed retelling. In *The Time Machine,* the Time Traveller moves forward over 800,000 years in time. He encounters

the Eloi, a child-like race who are the heirs of a society that perfected total control of nature. With no more need to strive and compete, the Eloi have atrophied, both physically and mentally, and live lives of carefree inconsequentiality. However, the subterranean Morlocks are their opposite. They herd and nurture the Eloi for food. The Time Traveller only escapes the Morlocks by moving forward in time to witness the end of the world. In *The Island of Doctor Moreau* a shipwrecked man, Prendick, is saved and brought to a strange island. Here he meets a notorious vivisectionist who had fled England to continue his experiments. Believing that Moreau is operating on men and turning them into beasts, Prendick flees. In the jungle he meets the beast-men who are Moreau's victims. He hears the law, a set of rules they live by, injunctions on animalistic behaviour. Eventually, persuaded that these are not men reshaped into animals, but the opposite, he returns to Moreau's house. Moreau explains that his experiments are always unsuccessful and the beast within remerges to reclaim the animal. Eventually Moreau is killed and before Prendick escapes the island he spends time living almost as an animal himself, an experience from which he is not able to escape even after his return to civilization.

2. HUMAN EVOLUTION IN THE LATE VICTORIAN PERIOD - THE SCIENTIFIC CONTEXT OF *THE ISLAND OF DOCTOR MOREAU*

The 1890s and the end of the Victorian era are often described as the *fin de siècle* decade, literally meaning the end of an era. The Wikipedia entry (accurate on this occasion) describes it succinctly:

> "The 'spirit' of *fin de siècle* often refers to the cultural hallmarks that were recognized as prominent in the 1880s and 1890s, including boredom, cynicism, pessimism, and a widespread belief that civilization leads to decadence" (Wikipedia entry for *fin de siècle*).

An alternative interpretation:

> "In its widest sense *fin de siècle* was simply the expression of a prevalent mood: the feeling

> that the nineteenth century – which had contained more events, more history than any other – had gone on too long, and that sensitive souls were growing weary of it" (Bergonzi, 1961, p. 3).

As part of this, there was also an obsession with human origins, which outside of the disciplinary confines of archaeology and anthropology expressed itself in literature as a concern with primitiveness. Much of the science fiction written at that time had this theme at its core (McLean, 2009, McNabb, 2012) but it was by no means confined to this literary genre (Pearson, 2007). As Pearson defines it, there was an obsession with what it meant to be human.

Unlike today, Victorian publishing was not compartmentalized into niche markets. A wide variety of journals, magazines and periodicals published a range of scientific journalism as well as articles by scientists who reported their results and often engaged in heated debates with their detractors. It was an unparalleled time of access to primary and secondary information, and commentary upon the scientific questions and discoveries of the day. Only with the advent of the internet has this scale of access been revived. Anthropological research on what were then considered primitive people, discoveries in Palaeolithic archaeology, and advances in geological understanding of the Pleistocene and its climate all were widely debated. Heredity was a particularly hot topic. Most biologists by this time had accepted that inter-generational heredity lay at the root of the bigger phenomenon of species change and that the mechanisms were essentially the same. That heredity was based on the transfer of particles containing hereditary information was also widely held. Many accepted that these particles had something to do with the 'chromatin filaments' in the nucleus of cells, as promoted by the German researcher August Weismann (Bowler, 2003). Excellent introductions to the late Victorian study of genetics are provided by M.D. Hill and W. Turner (Hill, 1894a, Hill, 1894b, Turner, 1889). Debates about the origins of species, human origins and its links with concepts of the primitive were therefore widely accessible to an interested Victorian public. Origins debates were part of a broader *fin de siècle* project explored through science and literature.

If the fledgling science of genetics held the potential to explain how species originated, what was still missing was a clear understanding of why it happened. Here Victorian science was as much

in the dark as it had been in 1859. Darwin had proposed a mechanism called pangenesis (Darwin, 1871, Darwin, 1868), whereby different parts of the body created what amounted to the genetic information for that structure. It was then passed on to the sex cells. Nobody had ever found any of the hereditary particles he called gemmules and the theory itself found little support. Indeed, by the 1890s natural selection itself was in trouble (Bowler, 1983). Known as the selectionist theory, both natural and sexual selection (Darwin, 1871) received short shrift from both scientists and the public. Its contingent character and chanciness did not sit well with Victorian sensibilities. Figure 1 summarises some of the main movements in evolutionary biology before, during and after the *fin de siècle* decade. There was a strong presumption that the mechanism of inheritance would be proven via experiment and selection was not amenable to experimental approaches. One of its few adherents was Alfred Russel Wallace, but then he did not apply selectionist thinking to humans (Wallace, 1889).

Weismann (Weismann, 1891-1892, Weismann, 1893) coined the phrase germ-plasm to describe the hereditary information passed on to offspring through the sex cells in sexual reproduction. He described germ-plasm as immortal. It contained a portion of the individual's own unique genetic material, as well as discreet portions of the parents' genetic material, the grandparents and so on. All contributed something to the growing embryo and explained the appearance of recurrent features in families. Weismann also asserted that once the germ-plasm had released a proportion of its material to stimulate the growing embryo, it then sealed itself off. The body could not influence the germ-plasm and cells could not migrate back, so changes to the body could not be passed into future generations. This provided a strong argument against Lamarckist types of inheritance and was a fierce topic of debate in the 1890s. For Weismann, morphological variation (generated by changes within the germ-plasm) and natural selection on this, were the only mechanisms by which new species could form. Weismann's unpopular ideas, and his support of selection, ensured that Darwinism remained unpopular, too.

Lamarckism on the other hand witnessed a resurgence of popularity in the 1890s. Often characterised as use inheritance, or the theory of inherited acquired characteristics, its supporters believed that behavioural and physical changes to the body could be passed on and ultimately become fixed in succeeding generations. It was popular because it could be adapted to suit the needs of a

number of different disciplines, for example, cultural change in anthropology, or social and ethical improvement in sociology. A few years before *The Island of Doctor Moreau*, Lamarckism was the subject of a heated debate on heredity between the pro-Lamarckist sociologist Herbert Spencer, the less committed Lamarckist Georges Romanes and August Weismann, amongst others (see McNabb, 2012, for a summary). Elements of the debate are present in *The Time Machine* (McNabb, 2012)

Orthogenesis suggested that morphological variation, and therefore the character and scope of potential species change, was severely limited by constraints inherent within all animals. In other words evolutionary change had a fixed direction and species could vary only slightly within these imposed limits. On the other hand, saltationists believed that evolutionary change proceeded by dramatic leaps, radical departures from a norm. Occasionally, variation would produce an organism that differed markedly from its parents and forbears. These were the source of new lineages. Another theory popular at this time was recapitulation. Actually not a mechanism for evolutionary change, it was taken more as a powerful proof that development did occur and was sequential in character. First proposed by the German biologist and evolutionist Ernst Haeckel, the maxim that ontogeny recapitulated phylogeny implied that the embryo of an organism, as it grew, went through the adult stages of the preceding phases of its evolutionary development.

Perhaps slightly less prominent in the general scientific literature, but still holding a broad appeal, were developments in archaeology and anthropology. In the latter the imposing figure of E.B. Tylor dominated the discipline as the first Professor of Anthropology at Oxford University. He was also seen as a founding father of the discipline. The earliest theoretical framework for the subject was evolutionary anthropology as it later became known. Promoted and developed by Tylor (Tylor, 1865, Tylor, 1881), cultural evolution was seen to move forward through a series of unilinear developmental stages which all human societies would have passed through, though at different times in different places. The mechanisms by which cultures changed from one stage to the next were a little vague. Notably in the early 1890s, Tylor applied the evolutionary and developmental framework to the Aboriginal people of Tasmania (Tylor, 1894a, Tylor, 1894b, Tylor, 1895), concluding they were living fossils – a Palaeolithic or eolithic (see below) people in a stage of arrested development. Another variation on evolutionary anthropology was formulated by the archaeologist John Lubbock

(Lubbock, 1865).

The influence of evolutionary theory and concepts of sequential unilinear progress through stages is only too evident in such interpretations (Bowler, 2003, Bowler, 1983, Gould, 2002, McNabb, 2012). There was a strong synergy here between recapitulation and anthropology.

While a number of important discoveries were made in Palaeolithic archaeology in the 1890s, it was the eolith question that dominated Palaeolithic debates. In the late 1880s the celebrated geologist Joseph Prestwich had teamed up with a local amateur archaeologist called Benjamin Harrison from the Kentish village of Ightham (Harrison, 1928). Prestwich's early work on the Antiquity of Man debate in 1859 (Gamble and Kruszynski, 2009, Gamble and Moutsiou, 2011, van Ripper, 1993) made him a household name. He believed that the Pleistocene period comprised one monolithic ice age, with Palaeolithic humans restricted to the post-glacial period. This became the orthodox chronology for Palaeolithic man (McNabb, 2012, O'Connor, 2007). Harrison persuaded Prestwich to accept a class of stone tool that ultimately became known as eoliths – the dawn stones. These were very early and very crudely chipped stone tools. They presented their findings at the meetings of national societies (Prestwich, 1889, Prestwich, 1891, Prestwich, 1892). Over the first half of the decade Harrison chipped away at Prestwich and by the time of the great geologist's death in 1896, he had come to accept an intra-glacial, and possibly pre-glacial (but not pre-Pleistocene or pre-Palaeolithic) age for the palaeoliths and eoliths from the north Kent Plateau. He also accepted that within this framework the eoliths were earlier than the palaeoliths and made by a different 'race of men' (Prestwich, 1892, Prestwich, 1895). However Harrison, followed by others, considered the eoliths to be much older. They were evidence of Tertiary Man (Abbott, 1894, Bell, 1892, Harrison, 1892, Jones, 1894a). I have argued elsewhere that in the absence of skeletal data as present on the continent, the eoliths became a 'Second Antiquity of Man Debate', a proxy for a British origins dialogue (McNabb, 2012, McNabb, 2009).

The eolith question was debated through the 1890s as Wells was writing *Moreau*, and in journals like *Natural Science* that he was known to read and contribute to. I have no doubt that this debate, at times acrimonious, fuelled the broader interest in the primitive and in human origins. One last factor may contribute to understanding the context of the novel itself. Britain lacked a skeletal

collection of putative ancestors. However, the French, Germans and Belgians were awash with them. It was a matter of national disgrace. Adding injury to insult, a young Dutch doctor Eugene Dubois, inspired by Ernst Haeckel's descriptions of '*Pithecanthropus alalus'*, a potential missing link, went in search of it – and seemingly found it (Leakey and Slikkerveer, 1993, Shipman, 2001). As Wells was rewriting the first draft of *Moreau*, Dubois was touring the European capitals, lecturing in the national societies and attempting to persuade scholars he had discovered a creature that was genuinely part way between a man and the beasts from which he had evolved. The scientific literature of 1895 was inundated with discussions on *Pithecanthropus*. Again this would have served to maintain interest in the primitive and in the question of origins.

3. H.G. WELLS AND THE BEAST WITHIN

I will begin with two variations on Wells and the beast within. A selection of Wells' writings, arranged chronologically, is presented in Table 1.

In the years preceding *The Time Machine* and *The Island of Doctor Moreau*, Wells' scientific journalism was strongly concerned with what he saw as the general public's arrogance and complacency regarding human evolution (Philmus and Hughes, 1975). For many, humans were a perfected species, for others they would soon be so. Very little in the Victorian world experience contradicted this, but Wells was keen to rectify this misconception.

A good example is Wells' *Zoological Retrogression* published in the September 1891 issue of the *Gentleman's Magazine* (Table 1). It was one of his first scientific articles. He countered the view that evolutionary change was always progressive with a very evocative metaphor in which the reality of evolutionary change was likened to a man walking around a city. He takes many side turns, parallels his original route, backtracks on himself, and takes the Underground or sometimes an overhead by-pass as he walks. The true character of evolutionary change is not linear; it is full of unexpected twists and turns.

A key concept in the article was plasticity which was Wells' expression for adaptability. The

fallacy of linear progression was shown by evolution sometimes reversing direction. This was when an organism seemed to de-evolve, and from a state of former structural and behavioural complexity revert to a much simpler and more primitive form. It was not the kind of change the public expected to find in the natural world, but Wells argued it was not uncommon. It was known as degeneration or retrogression and was an excellent example of the plastic nature of morphology. Wells gave a number of zoological examples to show that degeneration could be an evolutionary strategy that an organism adopted in order to cope with changing circumstances. Bluntly reinforcing his message, he reminded his readers that the reality of degeneration and adaptability meant that humans could not be assured of their continued dominance of the world. Mother Nature could already have fashioned a 'coming beast', even now waiting somewhere out there to replace modern man.

For our purposes the key concept here was Wells' demonstration that the beast within could actually be reinvented by adaptation. Evolution could potentially take any developed animal species, including ourselves, and return it to a more primitive state if appropriate.

The second perspective on the inner animal was that it was still with us. In this conception the beast took on a very particular character - it was our primitive and bestial ancestral heritage. Or in other words, the Palaeolithic savage. The Victorian public liked to think humanity had long since transcended its baser nature, but Wells, like many others, reminded them that this was not necessarily the case.

Not surprising for a writer interested in evolution and humanity's ultimate fate, Wells was also interested in our beginnings and followed evolutionary debates on human origins (Partington, 2008, Wagar, 1964). Wells was happy to follow the major discoveries in human palaeontology and archaeology, and the parallel changes in evolutionary theory, but reserved his opinions on them for what those changes meant in terms of the contemporary human condition. Across the middle 1890s, as he crafted the first drafts of *Time Machine* and *Moreau*, his views on heredity and biological species change underwent considerable development.

He wrote briefly on human evolution and Palaeolithic archaeology in the June issue of the *Gentleman's Magazine* for 1893. *Concerning our Pedigree* directly referenced the eolith debate and Joseph Prestwich's views on the age of the Kentish Plateau implements. The piece bemoaned the

dearth of skeletal material available to palaeontologists. For this reason other forms of evidence, such as the eoliths, could stand as proxies for skeletal remains.

The next best thing to a fossil ancestor might be a living fossil. Tylor's (1894a) paper presented another proxy for ancient bones with its claim that the Tasmanian Aboriginal people represented a Palaeolithic race whose material culture was the same as that of the eolith makers. The not-too-hidden agenda here was that the eolith makers of the North Downs would have been Tasmanian-like 'primitives'. For Tylor the primitiveness of the poor Tasmanians was not a result of adaptation or retrogression, but rather arrested development. These were a genuine eolithic people who had not evolved any further because there had been no need to – there had been no competitive race for precious resources so no need to adapt.

There is a nice link with the *Time Machine* here. The lack of competition in the Darwinian sense is one of the explanations for the effeteness of the Eloi, though in their case degeneration has also occurred (viz *Zoological Retrogression*). It is interesting to note that the Tasmanian people were obviously recognisably human, even if many Victorians were reluctant to acknowledge it. Most Victorians assumed that humans in the Palaeolithic would be more or less modern looking, although a bit more muscular and hirsute. A genuine missing link would be older and much more bestial – more ape-like. There was some debate as to whether *Pithecanthropus* was the maker of the eoliths.

So archaeology and anthropology combined to give an identity to the beast within, that of our remote ancestors. Modern indigenous people, as living fossils, were a powerful validation that the mark of Cain had not rubbed off because the beast had always been there.

Wells probably drew some of his information on prehistory from the monthly journal *Natural Science*. He is known to have read this journal and also to have contributed to it. A selection of its more relevant articles has been compiled in Table 2 and should be read in conjunction with Table 1. The journal occasionally ran articles on straight Palaeolithic archaeology, such as Worthington Smith describing his discoveries at Caddington (Smith, 1892). His classic book, *Man the Primeval Savage* (Smith, 1894), is now considered as a foundation text of Palaeolithic archaeology. The book was positively reviewed in April by *Natural Scienc*e (Table 2); the anonymous reviewer described Smith as having done 'yeoman's service' in bringing the lives of the Palaeolithic savages to light. Smith

accepted the traditional post-glacial date for the Palaeolithic. H.G. Wells also reviewed the book in April for the *Pall Mall Gazette*. In *Flint Implements Old and New*, he drew a vivid portrait of Palaeolithic Man directly from Smith's prose. The image of a red-headed, copper-skinned savage may have stayed with Wells over the years as he illustrated this very same creature in a plate in the much later *Outline of History* (Wells, 1920). Wells emphasised the primitiveness of these forebears by highlighting their lack of effective speech and their cannibalistic habits.

Undoubtedly inspired by *Man the Primeval Savage*, the following month Wells presented another piece of light scientific journalism focusing on the Palaeolithic (Table 1), once more in the *Pall Mall Gazette*. For the *Foundation Stone of Civilization*, Wells had a cyclist with a puncture stop at a wayside inn for a refreshing beer. He curses his luck to an older man sitting outside drinking a pint. A flint has cut a ragged hole in the cyclist's tyre and the frustrated traveller curses all flints everywhere. The old man reminds him that if it wasn't for the first sharp flints and then shaped flint tools, all of the other benefits of developing civilization would not have occurred. The pub philosopher waxes lyrical on all the subsequent inventions that have made human life easier and more pleasurable, all of which owe their origins to the very first stone tool technologies. Slightly mollified, the cyclist continues on his way.

Both of these pieces would have served as yet another reminder to readers of the long pedigree of human descent from the natural world. The picture painted of Palaeolithic life in all of these pieces was uncompromisingly brutish.

A key year for the eolith debate was 1894 (McNabb, 2012). The British Association for the Advancement of Science, the 'British Parliament of Science', met that year in Oxford. Eoliths were the subject of a special joint session between sections H, anthropology, and C, geology. The session was widely reviewed in the scientific press and a detailed report appeared in *The Times* on the 11th August (McNabb, 2012). The overall conclusion was somewhat indecisive as A.M. Bell, an eophile, reported to Benjamin Harrison in a letter dated 10/8/94 (Harrison, 1928). That a joint discussion took place at all, involving some of Britain's most senior archaeologists and geologists, showed how seriously the whole question of Tertiary Man was taken. Rupert Jones, professor of geology at the Royal Military College Sandhurst, and an avid eophile, spoke eloquently at the meeting (Jones, 1894a,

Jones, 1894b). He also wrote his lecture up in detail for the October issue of *Natural Science* (Jones, 1894c) and was extending his views to argue that Tertiary Man was present in the Indian Miocene in the November issue (Jones, 1894d). An equally strident case for the eoliths had been made by the redoubtable J. Lewis Abbott in the April number (Abbott, 1894).

Turning now to Wells' opinions on the consequences of evolution for modern society, we can ask the following - what was the relationship between the beast within and its descendants? In this respect an important benchmark in the development of Wells' thinking on human evolution was T.H. Huxley's *Evolution and Ethics*, which was given as the prestigious Romanes lecture for 1893 (Huxley, 1894a). Huxley's influence on Wells has been acknowledged by many scholars (Mackenzie and Mackenzie, 1987, Philmus and Hughes, 1975). Wells would later describe him as the greatest man he would ever know. The lecture was published the same month as it was delivered (May) and reprinted a further four times that year. The lecture has some interesting points in regard to *The Island of Doctor Moreau*. Part of Huxley's argument is as follows. The cosmic process, evolution, created mankind and equipped the fledgling race with sufficient savagery to survive in a harsh primeval world. However, civilization developed and with it the ethical process – the recognition that doing good was better than doing evil. We have not lost our primal instincts and feelings, nor will we ever (they are the root cause of sin and pain – the reason why we still have crime), but our ability to recognize the benefits of doing good and living in an ethical society, will overcome our baser nature. Both man and his nature are malleable (the plasticity of *Zoological Retrogression*) and can be changed – at least to the extent that the beast within is contained by society.

In the notes to the lecture there was a strong nod to Weismann's views on the immortality of the germ plasm and in the belief that character traits were heritable; I suggest an equally strong nod to Lamarckism as well. Many of the themes in the lecture appear as sub-texts within the plot development of *The Island of Doctor Moreau.* Ultimately Huxley's message was a positive one; even if we can't overcome our inner nature, we can learn to control it and fashion societies that will be the better off for that control and the knowledge of why it is important. For Huxley the Palaeolithic savage was definitely still with us.

Late in 1894 and against this general background, Wells began writing the first draft of

Moreau, probably in October or just before (Philmus, 1993). The middle years of the 1890s were a phenomenally productive time for him and not all of his novels or short stories reflected evolutionary themes. *In the Avu Observatory* (*Pall Mall Budget*, 9th August 1894) sees an astronomer attacked at night by a creature unknown to science, but which is part of local Bornean legend, while *The Flowering of the Strange Orchid* (*Pall Mall Budget* 2nd August 1894) has a new species of orchid attack an unsuspecting gardener. Both of these short stories highlight our imperfect knowledge of the natural world, and imply that evolution may yet have a few unsuspected tricks up its sleeve – the basic theme from *Zoological Regression*. In *Aepyornis Island* (*Pall Mall Budget* 13th December 1894) a shipwrecked sailor nurses a large extinct flightless bird of the kind found as fossils on Madagascar. As it matures it turns on him and he is forced to kill it. The lesson here is that nature will always reassert itself and, despite the closeness of the hatchling and the man in the beginning, it reverted to its true character once instinct took over. *Natural Science* had an article on *Aepyornis* in March (Table 2).

This theme is further played out in one of Wells' most unsettling tales, *The Lord of the Dynamos* (*Pall Mall Budget* 6th September 1894). In this story a native from what is today Malaysia works at an electricity generating station for London Underground. He is uneducated and unable to transcend his tribal beliefs despite having lived in London for a long time. He comes to see a large dynamo as a god. He murders his white overseer as a sacrifice to the dynamo god. The overseer was a cruel man who had brutalised the Malayan. Neither of these two men, despite quite different backgrounds, was able to transcend their own 'primitive' nature. After the murder head office sends a 'scientific overseer', an educated and intelligent man, whom the Malayan also tries to sacrifice. Failing in this, he gives himself to his god. Despite being of a 'better sort' the scientific overseer is wholly uninterested in anything other than the continued running of the machines, and it is his indifference to others that affords the Malayan an opportunity to try and kill him. Here Wells juxtaposes the callous indifference of civilised nature with the two variations on primitive nature represented by the Malayan native and the brutal white. Neither side comes out very well.

It is perhaps no surprise that all of these stories appeared in print either at the time of, or after, the re-publication of T. H. Huxley's Romanes lecture from 1893 in volume nine of his *Collected Essays* published in July or August of 1894. In it Huxley included a specially written introduction, the

prolegomena (Huxley, 1894b), which laid out his background opinions on social evolution in more detail than in the Romanes. The fixed character of our ancestral nature was very much in evidence. As societies evolved, the social bonds increased and the need for respect from one's peers, and in particular the fear of shame, was responsible for people wanting to live in an ethical way. Humans were never going to overcome the tension between selfishness and the ethical process, but the ability to understand the overall benefits of collective responsibility and restraint would override natural instincts; education and ever closer social bonds should sustain and enhance the ethical process. Interestingly for Huxley it was the fear of social shame that policed the process. Inevitably human society will fall into decay, but in the meantime societies ought to be governed by a meritocracy because the personality traits that make someone a social success in an ethical society are the very same qualities needed to run such a society.

For me, the key concept is that a perfect society is impossible because of two irreconcilable conditions (i.e., human nature and human nurture); however, given the benefits of society and ethically informed leadership, a compromise can be achieved whose benefits become apparent to all through education. Wells' own position, ultimately spelled out in *Human Evolution an Artificial Process* in 1896 (see below), was similar to Huxley's expressed in the Romanes lecture and in the prolegomena.

The *Time Machine* as a novel was first published in Britain in May of 1895 and was Wells' first real critical success, as well as the work that launched his career (Wells, 1895). It went through a number of significant revisions over the years prior to the novelization. The last two were as magazine serializations (Table 1). That in 1894, published in the *National Observer*, was written at the time Wells would have been reading *Man the Primeval Savage* and thinking about the transmutation of species. This version contains references to Palaeolithic man. In terms of mind and body we are today, essentially, what we were in the Palaeolithic. Natural selection has maintained our physique and strength in the face of continued competitive necessity; but our minds remain essentially the same. The power to reason has not evolved since the Palaeolithic, we have simply cluttered our minds with more facts. Once more, I see a strong synergy between this and Huxley's Romanes lecture. It is interesting that in the lecture Huxley used the analogy of a newly founded colony's struggle to

succeed in an alien land. He described a series of ever more severe social controls that build a society from which competition is wholly removed. In fact Huxley was describing the world of the Eloi.

(Further Huxley influences on Wells may be suggested by the comparison of the following. A phrase from the prolegomena is very similar to one from the *War of the Worlds.* Compare "Let us now imagine that some administrative authority, as far superior in power and intelligence to men, as men are to their cattle …" (On-line edition, opening lines to section VI of Huxley's prolegomena), with "Yet across the gulf of space, minds that are to our minds as ours are to those of the beasts that perish …" (*War of the Worlds*, p. 9).

Over the next few months Wells rewrote *The Time Machine* and a new version of the story was partially published in the *New Review* in early 1895 (Table 1). In the meantime, he was also working on the first draft of *The Island of Doctor Moreau* (as well as other novels, short stories and scientific journalism). Whereas the Time Traveller is content to merely describe evolutionary consequences as an unengaged observer, Moreau is willing to do something about them. Through his vivisection he is actively attempting to change the cosmic process by exploring the potential for change itself (adaptability/plasticity) in our species.

The insoluble primal nature of the beast within is very much the subject of the first draft of *The Island of Doctor Moreau*, written over the last quarter of 1894. The original manuscript and several subsequent redrafts exist in the H.G. Wells archive at the University of Illinois (Philmus, 1993). Unusually for the time it was not serialised and the final novel did not appear until April 1896, with further editing taking place across much of 1895. In this first draft, as in the final novel, Moreau's attempts to vivisect animals into men always fail as gradually the beast within reasserts itself, forcing Moreau to abandon his creations into the forest and begin anew. In particular, he has trouble with the intelligence of his creations, which is always low. So, like so many of his short stories described above, nature is fixed and cannot be changed. One important departure between the draft and the final novel is in the community of the beast men. In the draft they live in a small village of built houses. Their society is a pale reflection of men's, mirroring the rudiments of an ethical society in Huxley's sense. In the final book version their hovels are more like a Palaeolithic encampment, and their laws and society are restraints against animalistic reversion (see below).

In the December 29 issue of *Saturday Review* for 1894, Wells accused Weismann of putting a modern spin on the old theory of preformation, where a complete copy of the parent organism was considered to be present in the egg. In the article, *The Biological Problem of Today*, Wells asserted that 'Weismannism' did not conform to the latest research on cell division. This showed that cells divided equally, halving their nuclear components (where heritable material was located), the opposite of what Weismann was saying. Weismann's views, claimed Wells, were too close to the old doctrine of preformation to be scientific. Amongst other articles on cell division and heredity, *Natural Science* ran three pieces describing the work of the great German zoologist Oscar Hertwig (Table 2). Philmus and Hughes (1975) suggested these were the source of Wells' own criticism of Weismann. Earlier in the same month (on the 8th; Table 1) Wells had made his views on heredity clear in the pages of the *Saturday Review* in a piece entitled *Fallacies of Heredity*. He cleverly argued that studies on heredity had missed a big trick when they had tried to understand why the children of gifted parents did not always inherit their parents' abilities (a gentle dig at Francis Galton, perhaps?). He argued it would have been more enlightening to ask why the siblings of gifted people did not inherit the same abilities. For Wells, what little data was then available, suggested that inheritance was a blending of the characteristics of the parents, as the skin colour of the children of mixed race parents showed. Blending inheritance is clearly referred to in discussion of skin colour in the West Indies in the second chapter of the first draft of *Moreau*.

Why was heredity important to Wells, other than as part of his general interest in zoology and biology? I would suggest the following explanation. For Wells, species change was linked to culture change and cultural development was the mechanism by which the Palaeolithic savage became the moral citizen. Since he accepted recapitulation he would have had a sense of sequential development, both in the biological and in the anthropological record (as did most of his contemporaries). Here Wells was taking a very rounded perspective, and thinking of evolutionary change from both a physical and a social perspective. Since the character of species evolution influenced the character of social evolution, Wells needed a mechanism that explained both together, and Lamarckism provided this. Philmus and Hughes (1975) asserted that *Incidental Thoughts on a Bald Head* (*Pall Mall Gazette*, March1st 1895) is the earliest public expression of Wells' doubt concerning Lamarckism in the face of

Weismann's work. My own candidate for this is actually *The Limits of Individual Plasticity* from the January 19th edition of *Saturday Review*. This was actually the sixth chapter from Wells' first draft of *Moreau* in which the doctor explains his actions. Wells abandoned the manuscript in December 1894 (Table 1), but rewrote the chapter as a short article defending the proposition that almost every aspect of animal biology, whether it be physical, behavioural or chemical, could be manipulated and altered out of all previous recognition. Unlike *Incidental Thoughts*, *Limits* is not ambiguous in its anti-Lamarckist statement. It is likely, then, that the abandonment of the first draft of the novel in December coincided with his own rejection of use inheritance.

I suggest that Wells had also comprehensively rejected saltation by this time as well. What else is Moreau's vivisection other than an attempt to create new species in a few quick steps? Saltation had received a powerful boost early in 1894 with the publication of William Bateson's *Materials for the Study of Variation* (Bateson, 1894). Huxley wrote to him in February 1894 to thank him for a copy of the book (Huxley, 1894c) and reminded the younger scientist that he, too, was a saltationist. I suspect that saltation was unacceptable for Wells because of the discordance between biological and cultural jumps. That offspring did radically differ from their parents on occasion was a well-known phenomenon. However cultural evolution did not work that way, it was a slower process of gradual adaptation.

The only alternative then was Darwinian selection. That brand of it being promoted by Alfred Russell Wallace (Wallace, 1889) was too teleological for Wells, and many aspects of Weismann's selectionist interpretations (above) did not sit well with him.

I suspect that Wells had always been sympathetic to Darwinian selection and the role of variation and natural selection (*sensu* Darwin), but had felt that it did not answer every question. I will speculate that by the time *The Time Machine* appeared in the *New Review*, and he was at work on the second draft of *Moreau*, Wells had come to broadly accept the central role of selection in explaining species change, even if it did not cover every eventuality. About this time he wrote a number of scientific articles which defended Darwinian perspectives, which at the same time showed an acute grasp of how selection worked.

This is certainly the gist of *The Darwinian Theory* (*Pall Mall Gazette*, January 1st 1895), and

Discoveries in Variation (*The Saturday Review*, 9th March 1895). The latter is particularly important. Acknowledging that embryology and studies of morphology had gone as far as they could for the moment, Wells described a meeting at the Royal Society in which the nature and character of variation itself was being discussed. At this time Professor Walter Weldon was spearheading a new approach to the species question – by studying the variation present in different aspects of physical form and organization. Crucially, these researchers were quantifying variations, and then using statistics and the normal distribution to present their data and explain their results. This became known as the biometric school. For Weldon and his colleague, the brilliant mathematician Karl Pearson, species change was a gradual shift in the distribution of continuous variation along the horizontal axis of a graph. The continuity was best explained via natural selection working on the generation of random continuous variation. Weldon was leading a committee specially set up by the Royal Society to study variation and Wells was reporting on one of their meetings. *Discoveries in Variation* was a vote for straightforward Darwinian selection.

Another pro-Darwinian piece was *Bye-products in Evolution* from the February 2nd edition of *The Saturday Review* (Table 1). The significance of this was Wells defending a Darwinian explanation for an aspect of behaviour that many said could not be explained through the selectionist project. In this case it was the range of senses and emotions responsible for the arts and music. Many non-Darwinian evolutionists believed that every aspect of an organism had to confer a direct adaptive advantage, something Darwin himself never said. Of what adaptive use in the struggle for survival was a sense of the aesthetic? Wells suggested such things could be explained by reference to what Darwin had called the correlation of growth (later the correlation of variability). Darwin had asserted that if one part of an organism adapted under natural selection, there would be knock on effects on others parts, but they would not necessarily be adaptive or of benefit to the organism. Structures changed because every part of the body was interconnected. For many, this disproved natural selection because every change/structure had to have a benefit. Darwin, aware of this problem, had argued that later on, such structures could acquire a new and beneficial use. Wells posited that from a primordial need for security and the 'pleasurable emotions' that developed from this, other emotions were changed and then evolved, some of which fortuitously developed into our capacity for artistic

sensibility – a mental by-product of cognitive evolution.

So in the opening months of 1895, as he was revising the *Moreau* manuscript, Wells was thinking about species change, and its relationship with social and mental evolution. He needed a mechanism that would explain the development of all three at the same time. He couldn't find one. The best bet seemed to be natural selection, but it didn't answer all his doubts. For example, in *Incidental Thoughts on a Bald Head* he questioned what the adaptive value was in humans losing their body hair.

Wells' answer to this dilemma was to develop a different perspective on human evolution and its relationship with cultural evolution. He drew on two ideas already prevalent within the archaeological and biological communities. The first was that the physical form of humans had not changed since the Palaeolithic. This had been mooted by a number of scholars for many years (Wallace, 1889, Huxley, 1890). Secondly, that the main thrust of evolution in man had shifted from the physical to the mental (Wallace, 1889, Morris, 1890).

That he was aware of these concepts is clear from his engagement with them in the *National Observer* version of *The Time Machine* and he went on to build his own interpretation around them. The idea was presented to the public in October 1896 in the *Fortnightly Review*, six months after the *The Island of Doctor Moreau* was published. However, the manuscript, minus a few alterations, was written in the first six months of 1895 (Philmus, 1993). In *Human Evolution, an Artificial Process*, Wells argued that because human reproduction rates were so slow compared to other mammals, there has not been enough time for natural selection to work on our physical or mental evolution. Effectively, both remain as they were in the Palaeolithic. He then restated Huxley's old paradox that ethical social behaviour conflicted with the selfish and primitive instincts we still retain, but nevertheless there had been changes since the Palaeolithic. What, then, were these differences and how did they develop?

The differences lay in the ideational realm, in thought. Crucially, he asserted these differences could not occur through use inheritance or via natural selection. Wells' mechanism for the evolution of the social mind was speech. Evermore complicated social institutions and traditions were made possible as the capacity for speech increased. Complex language allowed for complex thought. Wells

described the ‘culminating ape’, the unchanged and largely unchangeable natural (Palaeolithic) man. This beast within was kept in check by an ‘acquired factor’ which is culture - the enormous power of ethically informed social traditions. This was ‘artificial’ man, in a sense the realisation of Huxley’s ethical process.

Only one short story across this period is relevant to our subject. *Our Little Neighbour* published in April 1895 in the *New Budget* was an unsympathetic tale of atavism. This concept was important to Victorian science as it was seen as a direct throwback to earlier states of evolutionary development and, therefore, by implication proof of their reality (Huxley, 1894a). A young couple move into a new house, but their neighbour’s brother is seriously atavistic. Unable to keep his sexual and violent emotions under control he is killed while attempting to harm the couple. The timing of publication is interesting (Table 1), as this was exactly the time Wells was revising *Moreau*. Effectively the hapless atavar is ruled by his primordial emotions, the very same ones that rise to draw the beast-men back to the animal world in *Moreau*. There is an interesting comparison here between the young wife whose loathing of the poor creature is not dissimilar to the insensitivity of the scientific overseer in the *Lord of the Dynamos*. The artificial man does not necessarily cover himself in glory. Underlying this, and a few other non-evolutionary tales from this period, is a real sense that nature is fixed and cannot be changed.

How much of the new perspective from *Human Evolution* was introduced into the final version of *Moreau*? At first glance, very little. The novel was still a rejection of all the main mechanisms of physical transmutation and there was no overt nod to natural selection either. In that sense it could be argued that the novel reflects Wells’ new perspective in that man’s innate primordial nature cannot in reality be changed, whether by physical manipulation or by hypnotism; the beast within can’t be exorcised.

Where I sense the new perspective may have informed his rewriting, rather than directly reflect it, is in the culture of the beast-men. As noted above there is a subtle difference in the character of the two societies when the draft is compared to the final text. The well built houses are replaced by ‘dens’, described by their owners as huts which were situated in a fetid ravine, the floor of which is scattered with food remains. The primitiveness of it all could have been directly drawn from E.B.

Tylor's (1894a, b, 1895) descriptions of the Tasmanians. The socially organised and class-driven society of the beast-men in the draft, with its aristocratic justice system and police force, is replaced by a tribal set up in which the 'Sayer of the Law' holds a loose authority. The articulate, almost educated, demeanour of the beast men, with their reverence for books, is replaced in the novel by a vacuous bestiality. The impression from the draft is that of a society struggling with itself to rise above animal instincts, using education to fight the good fight. When caught by the beast-men in the draft, Prendick requests he be educated in order to better comprehend their laws and so avoid acting like a wild animal. Not so in the novel. There is no sense of a society trying to improve, rather the impression is of a society trying to stave off the inevitable – retrogression. Interesting in this context is the clear difference between the more articulate beast-men of the draft, and the much less articulate creatures of the novel, since it will be remembered that it was speech that frame-worked the capacity for cognitive sophistication. The reiteration of the law in the novel is more by rote than by conviction and comprehension. There is an ape-man in the novel whose capacity for speech is relatively well developed; however, what he says is meaningless. McLean (2009, p. 48) puts it nicely: "The Ape man's 'big thinks' are nothing but signifiers that have become dislodged from their concepts or that have been conjured up from nothing."

Here, I think, is the key to how the new perspective did influence Wells' text. In explaining his actions to Prendick, Moreau bemoans that he has never been able to increase the intelligence of the beast-men, and that some indefinable quality that sits at the root of the emotions still defeats him. Novel and draft both reflect Moreau's inability to change the Palaeolithic beast within. Not even the rudiments of culture, speech and intelligence can affect a permanent change (*viz* Huxley in the Romanes lectures and the stability of human form since the Palaeolithic in *Human Evolution*). It is education that makes the real difference and without it the ethical process is impossible. It is one thing to create a set of rules to stop you doing something because you have been told it is wrong and then to repeat them out loud parrot-fashion. It is quite another to have sufficient intelligence to understand why it is wrong and why it is better not to do it. Lacking ethically informed social traditions, fully articulate speech within which complex thoughts can be explored and sufficient education to recognise their relevance, the society of the beast-men failed and the beast within reasserted itself.

4. CONCLUSION

In the 1890s H.G. Wells was part of the second Victorian publishing boom (Moskowitz, 1974a, Moskowitz, 1974b) which, through magazines, journals and periodicals brought science and fiction to much larger audiences than in previous decades. Wells' reputation as a writer ensured his informed polemical views gained wide attention. His novels, short stories and scientific journalism reflected the concerns of the time. Human evolution and what it really meant to be human were widely debated, and archaeology and anthropology contributed to these dialogues. *The Time Machine* and *The Island of Doctor Moreau* were also contributions to this debate and not just because they were scientifically informed. They articulated the anxieties that many people had about the questions that science was throwing up. Victorian science seemed determined to take the Victorian man in the street and strip him of everything that made him feel secure. By the publication of *Moreau* Wells had come to believe that the physical nature of man had crystallised, and could no longer be changed without drastic adaptation by natural selection. That this could happen in the future was possible, it depended on our own actions. Our cognitive mechanisms had also reached their apogee during the Palaeolithic. Subsequent evolution had mainly occurred in the socio-cultural realm and its links with cognition whose increasing complexity was facilitated through the evolution of speech. This allowed for true education and so the ability to comprehend we are all better off in an ethical society. The notion resonates with us today and the enduring power of Wells' work may lie in the fact that many of the issues he challenged through his writings, are still with us.

5. POSTSCRIPT

This paper is presented as a tribute to Andy Currant. I can't remember the first time I met him. It was probably at Boxgrove in the 1980s. He was already a legend even then. We heard he'd joined the

Museum as a cleaner and worked his way up to the offer of a Keepership, which he turned down (we all believed this); he'd been found as a baby floating in a basket in bulrushes (possible); he'd grown up in Carshalton (plainly ridiculous); he could only be killed by a silver vole canine on a moonlit night (popular theory after pub closing time); and the list went on.

Andy's colleagues and long-time collaborators will write erudite and scholastic articles about his great passion, animals. Sadly I can't, as apart from a much loved cat, I don't know a thing about them. All I can say is that I have enjoyed every minute I ever spent in Andy's company. It usually takes much less than a minute for him to reduced me to hysterical laughter. He has a wicked sense of humour, and his stories, often told at his own expense, ought to be preserved as part of the national heritage. It's always been a pleasure to be in his company.

I deliberately wrote an essay that I thought Andy might enjoy and which had some relevance to his life's passion – but is there any link between the archaeology of the Palaeolithic and the ideas presented above. Well, there may be. Figure 2 is the Löwenmensch, the lion headed figure from Stadel-im-Hohlenstein, now in the Ulm city museum in Germany and dating to more than thirty thousand years in age. The artisan who carved this astonishing figure envisaged a creature that was neither human nor animal - a world-view that did not see humanity as something distinct from the natural world. Rather, the Löwenmensch is a glimpse into a psyche that saw itself as one shade within an endless spectrum of diversity stretching across our world and into others. Whatever story this creature inhabited, it had to come from somewhere – was it out there, or was it already sitting beside the fire?

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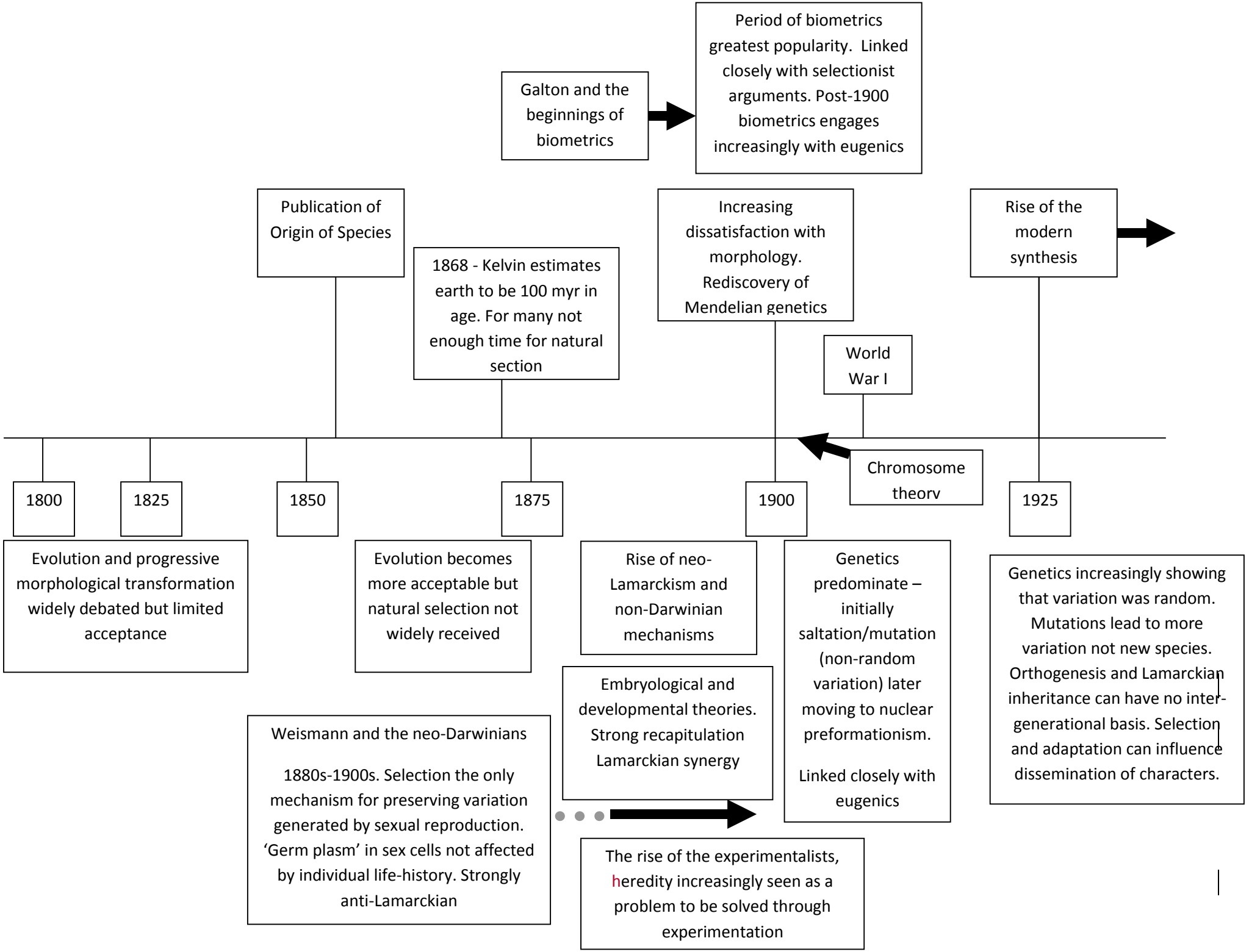
FIGURE AND TABLE CAPTIONS

Figure 1. The main shifts in biological interpretations and schools of analysis across the late Victorian period and into the Twentieth Century (after Bowler, 2003; McNabb 2012).

Figure 2. The Löwenmensch, the lion headed figure from Stadel-im-Hohlenstein. Original in Ulm city museum. Drawn by Penny Copeland.

Table 1. A selection of novels, short stories and scientific journalism written by H.G. Wells across the period he was writing and revising drafts of *The Time Machine* and *The Island of Doctor Moreau*.

Table 2. A selection of articles from the journal *Natural Science* published across the period H.G. Wells was writing and revising drafts of *The Time Machine* and *The Island of Doctor Moreau*.


Period of biometrics greatest popularity. Linked closely with selectionist arguments. Post-1900 biometrics engages increasingly with eugenics
Galton and the beginnings of biometrics
Publication of Origin of Species
1868 - Kelvin estimates earth to be 100 myr in age. For many not enough time for natural section
Increasing dissatisfaction with morphology. Rediscovery of Mendelian genetics
Rise of the modern synthesis
World War I
Chromosome theorv
1800
1825
1850
1875
1900
1925
Evolution and progressive morphological transformation widely debated but limited acceptance
Evolution becomes more acceptable but natural selection not widely received
Rise of neo-Lamarckism and non-Darwinian mechanisms
Genetics predominate – initially saltation/mutation (non-random variation) later moving to nuclear preformationism.
Linked closely with eugenics
Genetics increasingly showing that variation was random. Mutations lead to more variation not new species. Orthogenesis and Lamarckian inheritance can have no inter-generational basis. Selection and adaptation can influence dissemination of characters.
Embryological and developmental theories. Strong recapitulation Lamarckian synergy
Weismann and the neo-Darwinians
1880s-1900s. Selection the only mechanism for preserving variation generated by sexual reproduction. 'Germ plasm' in sex cells not affected by individual life-history. Strongly anti-Lamarckian
The rise of the experimentalists, heredity increasingly seen as a problem to be solved through experimentation

Year	Month	H.G.W. and human origins or Palaeolithic link	H.G.W. and evolutionary theme	Selected novels and stories of H.G.W.	Other debates and relevant items
1891	September		*Zoological Retrogression*		
1893	March				Feb. – December Spencer, Romanes and Weismann, among others, debate Lamarckism in *Contemporary Review* / E.B. Tylor reads paper on Tasmanians to *Anthropological Institute*
	May				Huxley gives Romanes lecture
	June	*Concerning our Pedigree*			
1894	January				Bateson's *Materials* probably published
	February				
	March			*Time Machine* in the *National Observer*	
	April	*Flint Implements Old and New*			
	May	*The Foundation Stone of Civilization*			Weismann gives Romanes lecture
	June				
	July				Huxley's Collected Essays vol. 9 published with prolegomena (possibly August)
	August			*In the Avu Observatory* *The Flowering of a Strange Orchid*	BAAS at Oxford joint anthropology/geology session on Eoliths. *Pithecanthropus* monograph published in Batavia – sent to leading European figures
	September		*Extinction of Man*	*The Lord of the Dynamos*	
	October			Begins 1st draft *The Island of Doctor Moreau* before this month	
	November				
	December		*Fallacies of Heredity* *The Biological Problem of Today* – initial objection to Weismann	1st Draft of *The Island of Doctor Moreau* finished and abandoned *Aepyornis Island*	E.B. Tylor second paper on Tasmanians to *Anthropological Institute*
1895	J		*Limits of Individual Plasticity* *Darwinian Theory*	Begins redrafting of *The Island of Doctor Moreau*	Notice of *Pithecanthropus* in *Academy*. Review of Dubois monograph *Nature*. Cunningham lecture in Dublin on *Pith.*.
	F		*Bye-products in Evolution*		Short notice of *Pithecanthropus Nature* Meeting on, and notice of, Keith discussion on *Pith.*in Proc. of *Anatomical Soc.* *Natural Science* – note on *Pithecanthropus*
	M	*Incidental Thoughts on a Bald Head* - 1st public doubt on Lamarck	*Discoveries in Variation*	*The Moth*	

	A			*Our Little Neighbour*	*Time Machine* in the *New Review*	Turner in *J. Anat. & Physiol.* on *Pithecanthropus* Prestwich in *Nineteenth Century*
	M			*The Time Machine - novel*		
	J			Next draft of *The Island of Doctor Moreau* complete. Anti-Lamarck comment now inserted		
	J					Article on human evolution including *Pithecanthropus* by Arthur Keith in *Science Progress*
	A		*Bio-optimism*			Short notice of Keith article in *Academy*
	S					*Pithecanthropus* unveiled at 3rd Int. Congress Zoology, Leiden
	O					
	N					Dubois and *Pithecanthropus* remains in Edinburgh and Dublin. Notices of Pithecanthropus in *Academy* and *Athenaeum*
	D					
1896	J					
	F					Abstract of Dubois's Dublin lecture published in RAI journal
	M					Kropotkin in *Nineteenth Century*
	A			*The Island of Doctor Moreau* published as a novel		

Year	Month	Volume	Page number	Selection of articles or short reports on human evolution, Palaeolithic archaeology, or any other topic relevant to heredity from *Natural Science*
1892	April	1	P85	Pre-glacial man
	May	1	P171-184	Weismann's theory applied to plants
	June	1	P248-249 P272-278	The glacial period Fossil men of Mentone
	August	1	P427-433	Glacial climate in Europe
	September	1	P487-488 P489-490 P541-548	Age of the Earth Evolution of Man Review of Romanes' *Darwin and after Darwin*
	October	1	P578-587	Evolution of heredity
	November	1	P648-649 P659-663 P664-670	Antivivisection Evolution of consciousness Worthington Smith P*rimaeval Man*
	December	1	P749-750	Alfred R. Wallace on sexual selection
1893	February	2	P81-82	Age of the Earth
	March	2	P195-200	Recapitulation
	April	2	P275-281	Recapitulation
	May	2	P364-369	Recapitulation
	June	2	P428-432 P461-463	Naegeli's research on living cells Review of Weismann's *The Germ Plasm* in translation
	July	3	P62-66	Review of Huxley's Romanes lecture *Evolution and Ethics*
	August	3	P138-139	Recapitulation
	October	3	P261-266 P282-287	Effects of glacial climate on UK flora and fauna The problem of variation
	November	3	P324-325 P389-391	Prestwich's final submergence of Europe Review of Romanes' *An Examination of Weismannism*
	December	3	P408-409	The inheritance of acquired characters
1894	January	4	P4-6 P38-49	Vivisection Cell division
	February	4	P91-97	Lamarckism in insect heredity
	March	4	P176	Aepyornis
	April	4	P257-266 P281-289 P303-305	Lewis Abbott on Plateau Man in Kent (i.e. Tertiary Man) Darwinism and insect heredity Review of Worthington Smith's *Man the Primeval Savage*
	May	4	P371-376	Review of Bateson's *Materials*
	June	4	P417-426	Cell division
	July	5	P2-3	Critique of Weismann
	August	5	P132-134	Overview of Hertwig's cell and embryology research part1
	September	5	P161-163 P177-183	Life on Mars Herwig's cell and embryology research part 2 A.R. Wallace critiquing Rev. Henslow's critique of natural selection
	October	5	P257-264 P269-275 P292-297	Henslow's reply to Wallace – denying natural selection Geology of the plateau implements (i.e. eoliths) Hertwig;s cell and embryology research part 3
	November	5	P345-349 P376-377	Miocene Man in India Review of lecture by Weismann

1895	February	6	P79-80	Note on *Pithecanthropus*
	March	6	P204-205	Review of A.M. Marshall's *Lectures on the Darwinian Theory*
	April	6	P217-220 P269-272	Reports on Royal Society's committees on variation Review of *Degeneration* by M. Nordau (2nd edit)
	May	6	P298-299 P305-312 P330-332 P341-342	Note by A.R. Wallace on Bateson and Galton's interpretations Descent and biogenetics Lewis Abbot on cave at Oban Review of E. Clodd's *A Primer of Evolution*
	June	6	P367-368 P384-390	Latest discoveries in Early Man studies Discussion on Variation
	August	7	P103-106 P159 P159-160 P193-200 P201-202	Evolution and speciation in plants Comment on anti-Darwinian sentiments Comment on Grant Allen's criticism of Weismann Sexual reproduction part 1 More doubts on Miocene man in India
	September	7	P233-234 P245-250	More on Weismann Sexual reproduction part 2
	November	7	P326-332	Darwinian sexual selection part 1
	December	7	P372-379 P398-406	Short articles on cells Darwinian sexual selection part 2
1896	January	8	P1-3 P11-13	Dubois at the Anthropological Institute Short articles on cell theory
	February	8	P89-93 P200-201 P201-203	Lamarckism Review of Romanes *Darwin and After Darwin* Review of anti-Darwinian book on plants by Henslow
	May	8	P321-325 P326-331	Karl Pearson on biometrics Lamarckism