THE USES OF DARWINISM

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This paper considers the way a topic in the history of science can be used to illustrate various dimensions of the study of science. Darwinism provides a particularly good case study since the life and times of Darwin and his circle are especially well documented and there is an abundance of primary and secondary source material. Moreover, the theory is one of the profoundest in the whole of science, effectively providing an answer to the question "what is life?".

THE BIOGRAPHICAL APPROACH: A TALE OF PRIVILEGE AND COURAGE

Table 1
Significant Dates and Events in the Life of Darwin

1809 Born in Shrewsbury	Born same year as the publication of Lamarck's *Philosophie Zoologique*. Father Robert Darwin, a wealthy doctor. Mother a member of the Wedgwood family. Grandfather Erasmus Darwin, physician and scientist. Family were Whigs (liberal-minded), Unitarians (i.e. critical of the established Church of England). Freethinking atmosphere. The Darwins and the Wedgwoods abhorred slavery.

1818 Attends Boarding School in Shrewsbury	Curriculum dominated by the classics. Darwin fails to excel but shows an extra curricular interest in chemistry and shooting. His father despaired and noted that "You care for nothing but shooting, dogs and rat catching, and you will be a disgrace to yourself and all your family" (Desmond and Moore, 1991, p.20)
1825 Taken out of school (two years early) and sent to Edinburgh to study medicine	Edinburgh then the Athens of the north, a cosmopolitan city at the centre of the Scottish Enlightenment. During the summer of 1825 he reads Gilbert White's Natural History of Selbourne and his grandfather's *Zoonomia*.
1826 Disillusioned with medical studies he joins the Plinian Society	This was a radical group that criticised established religion. Meets Robert Grant- Francophile, radical, expert on marine life and sponges and follower of Lamarck. Such thoughts were dangerous in post Napoleonic Britain where the reaction against the French Revolution led to a long period of Tory dominance in politics. Yet Darwin moves in these circles, much talk of radicalism, materialism and transmutationism
1827 Darwin abandons his medical degree and enrols to take a BA degree at Cambridge to be followed by Holy Orders. Darwin destined for the Church.	Darwin at this stage still a firm believer in Christianity. Cambridge then very different to Edinburgh. It was centre of Anglicanism.
1828 Darwin meets the Rev John Henslow (Prof. of Botany).	Darwin acquired valuable skills from Henslow. At this time he displayed a mania for beetle collecting, having one of the best collections in England.
1828 - 1831 Darwin studies Paley's Evidences of Christianity.	Darwin impressed by the watchmaker analogy. A watch implies a watchmaker therefore the natural world, with its manifold evidences of purpose and design must imply a Creator. Therefore God exists.
1831 Obtains his BA Degree. Plans a trip to Tenerife	Darwin had read Humbolt's narratives of his voyages and becomes fired up with the prospect of travelling to Tenerife. Henslow introduces Darwin to the Rev. Adam Sedgwick to acquire some Geological knowledge in prep for voyage to Tenerife.
1831 Darwin and Sedgwick tour North Wales.	Darwin learns to become a geologist
1831-1836 Voyage of the Beagle	Darwin as FitzRoy's gentleman companion. Darwin himself reflected that "The voyage of the Beagle has been by far the most important event in my life". Darwin took with him the first vol. of Lyell's Principles of Geology and is converted to Uniformitarianism.
6 Jan 1832 The Beagle enters the port of Santa Cruz	News that the boat was to be quarantined for 12 days because of a cholera outbreak in England. FitzRoy does not wait and the boat sails away. Darwin deeply disappointed.
1836 Return to England.	By this time Darwin is already well known in scientific circles due to his collections sent back from South America. In July 1837 he opens the first of his many notebooks on transmutationism.

Oct. 1838 Reads Malthus	A decisive moment in the formation of Darwin' ideas. Darwin realises that the over-fecundity of nature leads to struggle and competition over scarce resources and that variations that help in this struggle would tend to be preserved.
1842 Moves to Down House in Kent	35 page sketch of his theory
1844 200 page sketch placed in care of his wife	So begins Darwin's delay. He probably wished to accumulate more facts but also realised that the theory would be controversial and offend many, including his wife. His inner doubts and anxieties probably responsible for his continuing ill health.
June 1858 Letter from Wallace arrives at Darwin's House	See the Summer of 1858. Darwin rushes out the Origin of Species in 1859
1871 The Descent of Man and Selection in Relation to Sex	Here Darwin outlines his other major contribution to understanding selection mechanisms: sexual selection. The theory of female choice was largely neglected over the next 100 years but has emerged triumphantly since 1970.
1872 Expression of the Emotions in Men and Animals	Here Darwin extends his belief in the continuity between animal and human minds.
1881 The Formation of Vegetable Mould through the action of Worms	This is Darwin's last work and typically rather than pontificating on grand themes he returns to a humble subject. He was always fascinated by the action of worms, whose tiny actions over long periods of time could bring about great changes
19th April 1882 Darwin dies. Buried in Westminster Abbey	Place of burial indicates his ideas now accepted by the establishment. It also points to the power of the merging scientific elite: Huxley and Hooker.

It is interesting to note that Darwin's appetite for a voyage around the world was initially stimulated by his reading of Humboldt's Travels and, as a result of this reading, his desire to visit Tenerife. On the voyage of the Beagle one of his earliest letters refers to the approach of the ship to the harbour of Santa Cruz, Tenerife:

> «On the 6th in the evening we sailed into the harbour of Santa Cruz.- I now first felt even moderately well, & I was picturing to myself all the delights of fresh fruit growing in beautiful, valleys, & reading Humboldt's descriptions of the Islands glorious views.- When perhaps you may nearly guess at our disappointment, when a small pale man informed us we must perform a strict quarantine of 12 days. There was a death like stillness in the ship; till the captain cried "Up Jib" and we left for this long wished for place.-

We were becalmed for a day between Tenerife and the grand Canary and here I first experienced any enjoyment: the view was glorious. The peak of Tenerife was seen amongst the clouds like another world».

Letter to R.W. Darwin, 8 Feb - 1March 1832

One can imagine Darwin's disappointment. The reason for the quarantine was an outbreak of cholera in England - one of the many outbreaks that plagued mid 19th century British cities.

Another important reference point in his life is the letter he received from Wallace in 1858. The extract below describes its effect :

The Summer of 1858

On the 18th June 1858 a letter was delivered to Darwin at his rural retreat in the parish of Down in Kent. The letter, which by then had travelled half way round the world, was written in February of that year by a young naturalist called Alfred Russel Wallace, then working on the island of Ternate in the Malay archipelago. When Darwin read its contents he felt his world fall apart. In the letter was a scientific paper in the form of a long essay entitled "On the Tendency of Varieties to depart indefinitely from the Original Type". Wallace, innocent of the irony, wondered if Darwin thought the paper important and "hoped the idea would be as new to him as it was to me, and that it would supply the missing factor to explain the origin of species" (Wallace, 1905, 361). The ideas were far from new to Darwin, they had been an obsession of his for half a lifetime. In contemplating the variety of species on earth , Wallace had independently arrived at the same conclusions Darwin that had reached at least 14 years earlier and the demonstration of which Darwin saw as his life's work. Darwin knew the essay must be published and in a miserable state, exacerbated his own illness and fever in the family, wrote to his geologist friend and scientific colleague Sir Charles Lyell that he "never saw a more striking coincidence" and lamented

that "all my originality, whatever it may amount to, will be smashed" (Darwin, 1858)

Fortunately for Darwin, his powerful friends arranged a compromise that would recognise the importance of Wallace's ideas and simultaneously acknowledge the previous work of Darwin on the same subject. A joint paper, by Wallace and Darwin, would be read out before the next gathering of the Linnean Society. So on 1st July 1858 extracts from Wallace's essay and unpublished work by Darwin were read out to a meeting of the Linnean Society in London. The reading was greeted by a muted response. The President walked out later complaining that the whole year had not "been marked by any of those striking discoveries which at once revolutionise, so to speak [our] department of science" (Desmond and Moore, 1991). At Down House Darwin remained in an abject state, coping with a mysterious physical illness that plagued him for the rest of his life and nursing a nagging fear that it might seem as if he had stolen credit from Wallace. He was also grieving: his young son Charles Waring had died a few days earlier. As the Linnean meeting proceeded Darwin stayed away and attended the funeral with his wife Emma. By the end of the day the theory of evolution by natural selection had received its first public announcement and Darwin had buried his child.

To Darwin's relief, Wallace approved of the handling of the matter of priority and was gracious in acknowledging Darwin's previous work and prior claims. Thereafter, in corresponding with Wallace, Darwin always referred to "our theory", whereas Wallace consistently used the term Darwinism . History has endorsed the latter term. After the Linnean meeting, Darwin set to work on what he thought would be an abstract of the great volume he was working on. His publisher John Murray - once he was assured that the book would make no reference to the origin of man or Genesis -agreed to publish the work before reading the manuscript, despite a recommendation from one of his advisors that a work by Darwin on pigeons would sell better. The abstract grew to a full length book and Murray eventually persuaded Darwin to drop the term "abstract" from the title. After various corrections the title was pruned to *On the Origin of Species by Means of Natural Selection* and Murray planned a print run of 1250 copies.

Darwin, amid fits of vomiting, finished correcting the proofs on 1st October 1859. He then retired for treatment to the Ilkley Hydropathic Hotel in Yorkshire. In November Darwin sent advance copies to his friends and colleagues, confessing to Wallace his fears that "God knows what the public will think"(Darwin, 1859a). Many of Darwin's anxieties were unfounded. When the book went on sale to the trade on 22nd November it was already sold out. It was an instant sensation and a second edition was planned for January 1860.

The reception of the *Origin*, and the fact that its core idea was independently arrived at by Wallace, shows how well mid Victorian Britain was well prepared to appreciate evolutionary thinking. Darwin rode upon an intellectual tide that had been accumulating in Britain for at least 20 years. His singular contribution was to muster an overwhelming body of evidence and to have the vision and conviction to pursue selectionist thinking to its remorseless conclusion. The result was that the relationship between man and the natural world was swung to a new axis. Thereafter, man's place in nature was changed, and changed utterly.

Extract from CARTWRIGHT, J., *Evolution and Human Behaviour*, Macmillan, London 2000

- **Summary**

A study of the life of Darwin indicates the process of scientific creativity and some typical personal circumstances that go into the making of a scientist in the 19th century.

1. He was well placed financially, part of a wealthy family with important connections. Later in life he acquired a small fortune through inheritance and sound investments in land and the railways.

2. Stimulating intellectual background. His family was liberal and freethinking.

3. Serendipity: Darwin met the right people at the right time (Grant, Henslow, Sedgwick, and Lyell)

4. Courage and perseverance. It took great courage to circumnavigate the globe in the 1830s. Darwin was also not put off from pursuing his evolutionary ideas despite their heretical associations. He also struggled against physical illness, likely to have been brought on by anxiety.

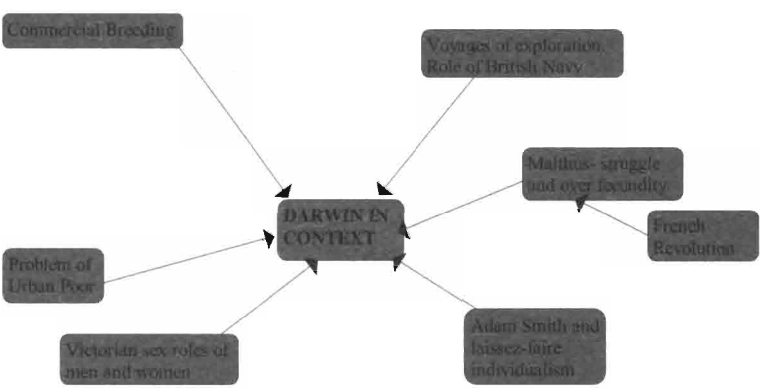
5. Tenacity in gathering facts. Darwin was dogged in his collection of an overwhelming body of evidence.

- **Educational value**

Students who find science remote abstract and devoid of human interest may be attracted to the study of the history of science through the drama of the lives of scientists.

The Social Construction of Scientific Knowledge

Darwinism provides a fine illustration of how scientific knowledge and discovery is influenced by the wider social context. The following diagram is an illustration of the main points:



Problem of the Urban Poor

Darwin lived through an industrial revolution. He watched on as the bulk of the British population moved from the countryside to cities.

The census of 1831 showed the population of Britain to be 24 million - it had doubled in thirty years. In bad winters one in ten existed on state handouts. Urban overcrowding and poverty brought about misery on a large scale and raised in people's minds the problem of what to do about the rising numbers of the poor and destitute. One solution proposed by Whig intellectuals and Malthusians like Harriet Martineu was to allow competition to weed out the weak and feckless. The State should not intervene but allow competition to run its course. So in 1831 the law allowing relief to the poor was repealed. The Whigs argued that that this would decrease labour costs.

Malthus and the French Revolution

The French Revolution struck fear into the heart of the English landed classes. What if it should spread to the shores of Britain? Partly as a response, Malthus published his Essay the Principle of Population in 1798 showing that social progress was impossible beyond a certain point and that the egalitarian ideals of the French were useless since human population growth will always outstrip resources leading to poverty and struggle.

It was the reading of Malthus that was decisive. It gave Darwin the crucial concepts of overproduction, struggle, competition and survival of the few. Malthusian ideas were openly debated in Darwin's circle in 1831. One of the most remarkable co incidences in the history of science is the simultaneous discovery of natural selection by Wallace and Darwin. Wallace himself noted:

> «The most interesting coincidence in the matter, I think, is, that I, as well as Darwin was led to the theory itself through Malthus...»
>
> Quoted in HUBBARD, 1979

Commercial Breeding

As well as an Industrial revolution Britain was passing through an Agrarian revolution. Farmers and commercial breeders were experimenting with new types and varieties of plants and animals. Darwin himself took up pigeon breeding and joined local societies. It was from animal husbandry that Darwin acquired his crucial metaphor

of selection. As a commercial breeder selects so too does nature. Note that Darwin himself published on the subject in *Variation of Animals and Plants under Domestication*, 1868.

Adam Smith and Laissez faire individualism.

In the *Wealth of Nations* (1776) Smith showed how the effect of the actions of numerous individuals each pursuing their own self-interested goals could lead to a general picture of harmony and stability. This laissez faire mentality probably influenced Darwin. Darwin was a Whig and his political allegiances lay with the emerging middle classes: the entrepreneurs, the professional and managerial classes. Darwinism provides a similar analysis of the natural world: the macroscopic is to be understood by examining the actions of atomistic individuals. What may appear as a picture of harmony and co-operation is in reality the combined effect of selfish intentions. Marx and Engels were aware of this congruence in ideas at the time. In 1862 Marx wrote to Engels:

> «It is remarkable how Darwin recognises among beasts and plants his English society with its division of labour, competition, opening up of new markets, "inventions" and the Malthusian "struggle for existence". It is Hobbes's "*bellum omnium contra omnes*" [*war of all against all*]...»
>
> Quoted in HUBBARD, 1979.

At a more general level we should note that evolution was in the air. Numerous thinkers were speculating in the 1840s and 1850s about organic and social evolution. It is noteworthy that the phrase "survival of the fittest" so often associated with Darwin came in fact from Herbert Spencer who used it in an essay written in 1851 referring to the growth of human populations. Just as Darwin took up ideas from the wider culture, moulded them and used them to good scientific effect, so too his ideas were readily reapplied in the form of Social Darwinism.

The Royal Navy and voyages of exploration

Britain in the 1830s was a powerful maritime nation. Her wealth depended on trade and exploration. It was such concerns that led to the mission of the Beagle: to survey the coast of South America. The ship

was also to carry on board a naturalist and some scientific equipment. Imperial expansion and the cataloguing of nature were part of a similar colonising mentality.

Victorian Sex Roles

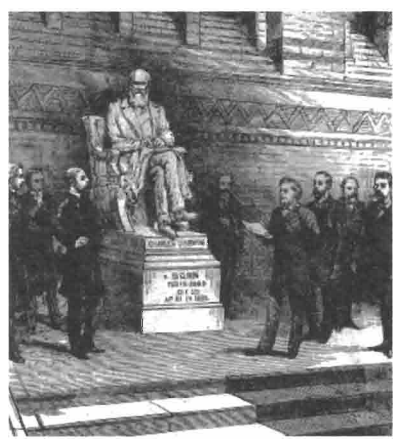
It is easy to see, especially in *The Descent of Man and Selection in Relation to Sex* (1871), that Darwin subscribed to a view that the sexual division of labour and abilities of Victorian men and women was somehow natural:

> «The chief distinction in the intellectual powers of the two sexes is shown by man's attaining to a higher eminence, in whatever he takes up, than can women -whether requiring deep thought, reason, or imagination, or merely the use of the senses and hands... the average mental power in man must be above that of women».

- **Educational Value**

Through this analysis students come to see that science does not take place in a cultural vacuum. Science is fostered by a wider culture; scientists use resources (intellectual and material) from the wider culture and contribute to that culture in turn.

Questions for discussion: Is the truth-value of a theory somehow brought into question by a demonstration of social influences?



DARWINISM AND THE PHILOSOPHY OF SCIENCE.

Science and Creationism.

In the USA religious fundamentalists have adopted at least 3 tactics:

1. Ban teaching of evolution, e.g. Tennessee (1925) – hence the Dayton trial-Mississippi (1926), Arkansas (1928) and Texas (1929).

2. Re-label Creationism as Creationist Science and demand that as a science it should be taught alongside Darwinism.

3. Declare evolution to be only a "controversial theory" (Alabama 1995 passed a law insisting that biology books should carry a sticker describing evolution as controversial)..

4. Remove evolution from state-wide exams (Kansas, 1999).

Response:

1. In 1968 the US Supreme Court invalidated the Arkansas statute on the grounds of the first amendment - law found to be unconstitutional since education should not be tailored to the needs of one specific religious group.

2. 1987 the US Supreme court held the Creationism Act of Louisiana unconstitutional since creation science endorsed religion.

- **Discussion Point.**

Is evolution bad science because no one actually observed the events? Is evolution a theory or fact?

The Evolution of Memes

Consider once again the four minimum conditions for natural selection to take place:

1. There exists in the world entities capable of self replication.

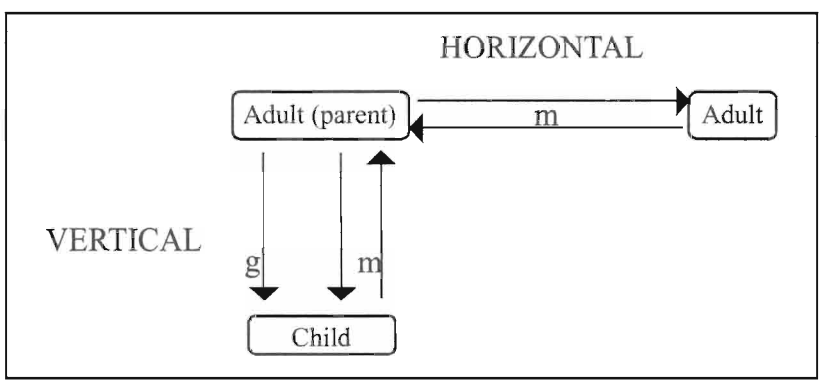
2. The process of replication is not perfect, errors are made and the next copy may not perfectly resemble its template.

3. The number of copies of entities that can be made depends on the structure of the entities in their interaction with the world outside such as the ability to sequester resources.

4. As a result of the finite nature of resources, operating spaces and so on these entities experience differential reproductive success, i.e. some have more favourable structures than others for the process of self replication

It is easy to appreciate that the entities above may not be strands of DNA. It is more of a shock to realise that the entities may not need to be physical at all; they may, in short, be ideas existing in and moving between brains. This concept has been developed by Richard Dawkins.

Dawkins was not the first to note the parallels between the natural selection of genes and the spread of units of culture but he articulated it forcefully in selectionist terms and coined the term "meme" to describe elements of thought or culture that replicate in human brains. As an analogy the meme idea works surprisingly well. Memes move from brain to brain like parasites from host to host. We can catch them vertically from our parents, as in the case of rules of behaviour inculcated in childhood, or horizontally from each other, as in the case of peer pressure or conformity to fashion (Box 1). Some memes are truly parasitic in the sense of damaging the survival chances of the host or the host's genes. Chastity, celibacy, self-sacrifice for noble ideals are all memes that damage their host's biological success. But this need not concern memes if memes survive: if self-sacrifice is held up (probably by a linked gene) as a laudable act then others will fall under the sway of the meme, and the meme will survive. Many memes, however, are mutualistic in that they assist their replication by ensuring the well-being of the host. Examples here include elementary rules of hygiene , methods of fashioning tools, avoiding disease and so on. The incest taboo may be a case of genes and memes directed to the same end if, as it seems, the



The Spread of Memes

Westermarck effect is based on a genetic developmental program. The taboo becomes the meme that reinforces the genetically-based mechanism of avoiding incest.

Memes (m) can be passed vertically in the case of parent to offspring or horizontally in the case of one organism to another.

Vertical. When passed vertically down the generations memes can accompany genes (g). In early traditional cultures there was probably a large degree of synergy between genes and memes. For example, the cultural meme that directs a male bias in inheritance in polygynous cultures could also enhance the genetic interests of those practising it. Similarly, the linked memes in Catholicism that restrict birth control and also insist that offspring are raised in the faith has the dual effect of increasing the spread of memes and the genes of those professing the memes. In these cases sociobiological and memetic explanations yield the same results.

Horizontal. In horizontal transmission genes do not accompany memes and memes may from a biological point of view be fitness reducing. The meme that suggests a career is more important than children reduces biological fitness but it may nevertheless spread through imitation. A fanatical devotion to chastity may be highly successful in that biological energies are diverted into meme replication (chastity) rather than gene replication.

The important question to raise is whether the meme is an ingenious and amusing analogy or whether it provides a serious set of testable hypotheses that may really help us to understand the evolution of culture. In *The Selfish Gene*, Dawkins is in earnest when he explores the potential of memetics and uses the model to good (and characteristically provocative) effect in explaining the spread and maintenance of religious beliefs. To any secular rationalist there forever looms the formidable problem of explaining the fact through history the vast majority of people have subscribed to a set of religious ideas that are a) inconsistent with other equally fervently held systems, b) require believers to accept a suspension of the natural laws of the universe, c) place a great strain on their biological inclinations and drives, and, moreover c) are held to in spite of contradictory, little or at best ambiguous empirical support. To Dawkins such beliefs represent the invasion of minds by memes and people who are victims of these memes he calls "memeoids". Memes for some particularly unlikely tenet of belief may move around linked with other memes that help their survival such as the meme for the virtues of faith. If we define faith as 'belief

publisher and amateur naturalist Robert Chambers. The book was called *The Vestiges of Natural Creation* and was published anonymously in 1844. In fluent prose, mixing religious speculation and scientific facts, Chambers gave expression to the idea that life had evolved and that species were mutable. The Anglican Establishment came down hard on Chambers. Sedgewick, a Cambridge don and former tutor of Darwin, called it a "filthy abortion" that would sink man into a condition of depravity and poison the well springs of morality. One of the reasons why Darwin delayed publication until 1859, despite the fact that he had the essential mechanism of natural selection to hand by about 1838, was that as a respectable and prosperous middle class Whig he feared the use to which it would be put by radical agitators such as the atheists and chartists who were clamouring for reform. As Desmond and Moore (1991) remark in their masterly study of Darwin's life :

> «Anglican dons believed that God actively sustained the natural and social hierarchies from on high. Destroy this overruling Providence, deny this supernatural sanction of the status quo, introduce a levelling evolution, and civilisation would collapse».

When Darwin's *Origin* finally came out in 1859 there had been a sea change in British life. Despite his own anxieties on the eve of publication, wealthy entrepreneurial Britain received his ideas gladly. After the publication of the *Origin* there grew up a movement known as Social Darwinism. In fact much of the thinking contained in this movement can be found in the writings of Herbert Spencer before 1859 and the movement could more deservedly be called Social Spencerism, but the association with Darwin has stuck. It was in fact an assortment of ideas rather than a fully co ordinated political philosophy, but the basic premise was that evolutionary biology could teach a political lesson. Since, as biology has shown, struggle, competition and survival of the fittest are natural phenomena that have operated to shape well adapted and complex organisms such as ourselves, then this clearly is how the social world should be organised. The natural world had operated to weed out the weak and feeble, there had been no support from any central authority and yet naked competition between individuals pursuing their own ends had indubitably led to progress. To the Social Darwinists the political message was clear : colonialism, imperialism, laissez faire capitalism , disparities of wealth and social inequalities were all to be justified and encouraged. One of the leading Social Darwinists in

America was William Graham Sumner (1840 - 1910), a professor at Yale University. For Sumner, any redistribution of wealth from rich to poor favoured the survival of the unfittest and destroyed liberty :

> «Let it be understood that we cannot go outside this alternative: liberty, inequality, survival of the fittest; not liberty, equality, survival of the unfittest. The former carries society forward and favours all its best members; the latter carries society downwards and favours all its worst members».
>
> Quoted in OLDROYD, 1980, p. 215.

Darwin himself was not immune to the ever present temptation to mix social and biological concepts when he observed in a letter that "the more civilised so-called Caucasian races have beaten the Turkish hollow in the struggle for existence" (Darwin, 1881). But if capitalists and their apologists drew succour from Darwin then so did the communists. In a letter of 1861 Marx wrote that "Darwin's book is very important and it suits me well that it supports the class struggle in history from the point of view of natural science" (Quoted in Oldroyd, 1980, p. 233).

It is easy to see why Social Darwinists appealed to industrialists, entrepreneurs and those who had gained or stood to gain from the operation of the free market. Its additional appeal for Marx was that it eliminated teleology and design from nature. Marx saw that evolution could be used to undermine his ideological enemy, organised religion. Ironically for contemporary Marxists, Darwinism has proved to be a double edged sword. Marx's own views on human nature were ambiguous but most Marxists have adopted the view that human nature is plastic in the sense that "being determines consciousness". Modern Darwinsm shows that there is a universal human essence. It was the expression of this essence that brought about the downfall of the Soviet Bloc -Soviet man was never quite plastic enough.

The political affiliations of another group that drew inspiration from Darwinian ideas, the Eugenics movement, are harder to define. Eugenics is often treated as a subset of Social Darwinism but is in fact dissimilar in motivation and policies. The Eugenics movement in Britain began with the work of Francis Galton (1822-1911). Galton, who was Darwin's cousin, adopted a strong hereditarian position and argued that there was a correlation between a person's social standing and their genetic constitution. As early as 1865 Galton had tried to sway

public opinion to his view that upper classes should breed more and the lower classes less, but with little effect. The Eugenics movement flourished in Edwardian Britain however where the social strains between rich and poor and the effects of international competition were beginning to tell (MacKenzie, 1976). The general worry was that if the lower classes were breeding faster than the upper then a general lowering of the genetic stock of Britain would result.

On the eve of the first world war the eugenics movement flourished on both sides of the Atlantic. The first International Congress of Eugenics held in London in 1912 had Winston Churchill as the English vice president with Charles W. Eliot, the president of Harvard University, as the American vice president. Eugenics societies included some distinguished geneticists as well as the likes of socialists such as Beatrice and Sidney Webb. In Britain eugenics ideas appealed particularly to the professional middle classes. They preyed upon middle class fears of a rising working class population and a concern among the establishment over the poor medical condition of working class recruits for the Boer war. It was particularly attractive to the professional middle classes and intellectuals since it suggested that experts and meritocrats like themselves should play a role in an efficient state organised society. (McKenzie, 1976). In America, Galton's recommendations on selective breeding were not taken seriously until Lamarckism was discredited among biologists and social scientists (Degler, 1991). In a Lamarckian framework, if the environment worked upon individuals and modifications thereby induced could be inherited then the main hope for social progress lay in improvements to social conditions. Once the inheritance of acquired characters was removed as a scientific possibility then selective breeding becomes a serious option for improving the race.

One of the most prominent Eugenicists in America was Charles Davenport. Davenport held positions at the universities of Harvard and Chicago before becoming director of the Eugenics Record Office at Cold Spring Harbour. Davenport and his workers initially adopted the Mendelian assumption that each human trait was the work of one gene. They then traced the genealogical path of such traits as criminality, artistic skill and intellectual ability. Their warning to the nation about the effects of uncontrolled breeding is exemplified by their analysis of the Jukes family. Davenport examined the burden on society brought about by the offspring of one Margaret Jukes, a harlot and mother of criminals. He concluded that as a result of her protoplasm multiplying and spreading through the generations the State treasury was worse off

to the tune of one and a quarter million dollars in the seventy five years up to 1877 (Richards, 1987; Degler, 1991). One way to stem the march of degenerate protoplasm that occurred to the Eugenicists was to restrict immigration into the USA of those racial types who were expected to belong to inferior stock

In the UK the movement was attractive to Fabian socialists who believed in state intervention to cure the inefficiencies of an unplanned economy. For this reason it could be described better as Socialist Darwinism rather than Social Darwinism. The Eugenicists made, by today's standards, some outrageous proposals. There were suggestions for example that the long term unemployed should be discouraged from breeding since they obviously carried inferior genes. Major Leonard Darwin, fourth son of Charles Darwin, in his book *Eugenic Reform*, was strongly opposed to the advancement of scholarships to bright children from lower classes. His reasoning was that once such children were promoted by their educational attainments to the class above their fertility would decrease; whereas if they were left as they were they would probably have more children and so their gifted genes would be more likely to propagate. In addition, argued Major Darwin, the existence of scholarships would worry the parents of children already in the higher social classes since they would now face more competition and this would further reduce their already low fertility. Looking back these ideas appear comic, but in other countries they led to extreme and tragic consequences. In the 1920s twenty four American states has passed sterilisation laws, and by the mid 1930s about 20,000 American had been sterilised against their will in an effort to stamp out inferior genes.

By the 1930s natural scientists in Britain and America were realising that the early deliberations of the eugenicists were based on faulty assumptions about the nature of inheritance. Most traits were simply not the product of single genes as had been supposed. Features such as intelligence, moral rectitude, personality were, if they had any genetic basis, the consequence of the action of many genes in concert with environmental influences. Consequently, it was extremely difficult to predict the outcome of any given union of parents. Even enthusiasts for negative eugenics realised there were formidable problems. If a genetic abnormality caused an abnormality in the homozygous condition then heterozygous carriers could go undetected. It was not at all clear to the eugenicists what could be done about carriers.

By the late 1930s scepticism over the viability of eugenic principles among Western biologists and social scientists turned to revulsion as it

became clear to what depths the Nazis had sunk in their application of eugenic ideas. It is known that whilst in prison Hitler imbibed the ideas of eugenics from *The Principles of Heredity and Race Hygiene* by Eugene Fisher. In the hands of Hitler the eugenic ideal of improving the national stock had become twisted to a concern with racial purity, viz. : the enhancement of the Aryan race and the outlawing of mixed race marriages between Aryans and the supposedly inferior Jews, Eastern Europeans and blacks. When the Nazis came to power in 1933 they set about the systematic forced sterilisation of schizophrenics, epileptics and the congenitally feebleminded. Deformed or retarded children were sent to killing facilities, an estimated 5000 died in this way. 70,000 mentally ill adults were also targeted and put to death (Steen, 1996). The horrific culmination of this reasoning was the holocaust and the extermination of about 6 million Jews, homosexuals and others deemed unfit.

Social Darwinism and Eugenics: the issues.

✓ Social Darwinism.

Nowadays, the term Social Darwinist is one of abuse. Denouncing someone as a Social Darwinist is often thought to be a sufficiently crushing argument in itself. But why exactly is Social Darwinism an untenable exercise ? Spencer's phrase "survival of the fittest" has become a catch phrase for those who advocate the virtues of free competition. There may indeed be virtues, but Darwinism, to the disappointment of any contemporary would-be Social Darwinists, must remain silent on the issue. At one level it is not at all clear that nature runs strictly along red in tooth and claw lines anyway : animal groups show plenty of signs of co-operation and even vampire bats share a meal with their needy brethren. If we look at some taxa, such as the ants, then competition between individuals seems entirely suspended in favour of caring and sharing for the common good. If we wish to model human society on the natural world then it is difficult to know which group of organisms we should look at. The message from, say, ants, bats and dandelions would be entirely different.

It could be retorted that genetic self interest lies at the heart of all these manifestations of altruism, and that we must allow this as a scientific statement. Perhaps we should. We could also allow the fact that nature is not regulated by some external conscious agency (as far as we can tell) and that indeed the purposeless process of natural and

sexual selection has led to such complex organisms as ourselves. But does it follow that society should also be left to the unregulated outcome of the effects of individuals all pursuing their selfish ends ? The answer is no. To believe otherwise is to make a huge and invalid leap of logic. The Scottish philosopher David Hume is credited with first exposing this fallacy. In his *Treatise on Human Nature* Hume pointed out that the "is" does not imply the "ought". The way humans want their social world to operate is a matter of values, biology is no more a reliable guide to what values we should hold than say chemistry or astronomy. The suggestion, contra Hume, that one can infer values from descriptive facts is now known as the naturalistic fallacy.

The invocation of Hume's Law - the impossibility of deriving the "ought" from the "is" - is often thought to be sufficient to deal the death blow to Social Darwinist reasoning. But we should be careful here that we do not shoot ourselves in the feet. As some stage the Darwinian will want to give a naturalistic account of value and morality and this - in the absence of any transcendental notions of goodness - will presumably have to be based on a factual account of the natural world.

Midgley (1978) who is certainly no Social Darwinist and is even sceptical about the full potential of the Darwinian paradigm, makes the point that values must at some level be related to facts. It is the factual nature of the human condition that enables us to express what are human wants and what are good things for humans. We value a society that allows couples to have children, for example, because this is allowing freedom of expression to our biological nature. We need to think carefully therefore about the reasoning underlying Social Darwinism and the reasoning used to dismiss it.

We must be aware in fact of at least two layers to morality. One is the phenomenon of moral behaviour, which a good Darwinian may be able to give a plausible account of. In other words, why people erect rules and choose to live by them and how such rules relate (or not) to fitness gains in any given environment. Another layer is the question of whether such codes and rules are right. A large number of people from T. H. Huxley onwards have argued passionately that ethics transcends nature and have despaired at any attempt to draw ethical premises from evolutionary thought. A modern exponent of this view is the Harvard biologist Steven Jay Gould. Gould, who has done much to expose the sexist and racist bias in some attempts to capture human nature, is of the opinion that "evolution in general (and the theory of natural selection in particular) cannot legitimately buttress any particular moral or social philosophy" (Gould, 1998).

Returning to the logic of Social Darwinism we can show that the reasoning is fallacious but we need to do better that to simply wave Hume's Law. What the Social Darwinist does is to confuse the consequences with the value of natural processes. If fierce unbridled competition got us to our present state there is no obvious reason why it should still serve our ends. Suppose for example that it could be demonstrated that periodic famines on a global scale or massive doses of gamma rays from solar flares were instrumental in the course of evolution that led us to *Homo sapiens*. I doubt if even the more ardent Social Darwinist would suggest that famine and ionising radiation are to be welcomed as means by why we can improve the human stock.

The Social Darwinist is also guilty of smuggling teleology in through the back door. Another reason why Social Darwinism should be called Social Spencerism is that it was Herbert Spencer not Darwin who kept ideas of progression in his system of thought. The abyss into which Darwin stared was always too much for Spencer who clung to a belief in steady evolution towards perfection. The key point here is that it is the very purposelessness of the natural world that makes it a doubly unreliable guide. Natural selection does not make organisms better in any absolute way, it merely rewards reproductive success. There is no progress measured on an absolute scale but merely change. The whole thing is not going anywhere.

✓ Eugenics.

Eugenics represents the other side of the coin to Social Darwinism. Rather than let nature take its course the eugenicist wanted to intervene to put it right. Eugenicists were concerned that the processes operating in urban societies were such that people producing the most offspring resided in lower socio-economic groups and were therefore genetically inferior to those in the higher strata of society. Needless to say, those promulgating the idea regarded themselves as genetically superior. The remedy for the eugenicist lay not in competition and laissez faire - since civilisation for ethical reasons had already accepted the burden of helping the weak - but in active measures to encourage the spread of good genes (positive eugenics) and discourage the spread of weak genes (negative eugenics). The whole eugenics programme was so fraught with scientific, ethical and practical difficulties that no one today would seriously advocate the sort of measures proposed earlier this century. In fact any hint of sympathy for Eugenics ideas in the UK is regarded as a blight on the career of a politician.

The fertility of different social groups is of course an empirical matter and could be settled by statistical means. It is also possible of course that certain genes are more frequently found in certain social groups than others. Problems start hereafter. For who is to define what genes are desirable and worth increasing in frequency? At this point we need to import an ethical system to help our judgements and fortunately for our sanity there is no general consensus on what qualities made up desirable human beings and what standards there are shift with time and vary across cultures. Nor, I think, would most people wish to see any committee pronounce on this subject. If this were not enough, there is then the practical problem of how the state could alter gene frequencies without an unacceptable infringement of other human values, or whether even the state has responsibility to its gene pool that overrides its responsibility to the welfare of individuals and the preservation of individual freedoms.

In a profound sense though, the eugenics programme is unrelated to the evolutionists paradigm. From an evolutionary perspective successful genes are simply successful genes. An ardent evolutionist desperate for meaning might be tempted to encourage the proliferation of fecund genes rather that any other qualities. Even this mad speculation is cut short however by the constant reminder (that we need in this territory) that evolution involves no sense of progress. Successful genes are not better on any absolute scale of values and certainly not on any human scale - we do not admire aphids because of their fecundity.

We must be alert to eugenics issues since gene technologies are increasingly delivering into our hands powerful tools to screen individuals for genetic defects. Prenatal screening enables doctors to assess if the foetus is genetically defective for a wide range of conditions. If, for example, parents choose to terminate a pregnancy because of the condition of cystic fibrosis, this involves the judgement that a child with cystic fibrosis is too great a burden to justify its birth. Some have argued that this is a form of eugenics through the back door. The comparison with eugenics thinking is not strictly accurate however in these cases. Certainly the motivation of the parents is not to eliminate the genes from the human population, their concerns are about the suffering of the child and the burden to the family. In fact, by such procedures it is extremely difficult to alter gene frequencies. A child with cystic fibrosis is born when the relevant genes are homozygous in the recessive state , that is it has two copies of the defective gene, one from each parent . If it has only one copy then it is said to be a carrier. People who are carriers live perfectly

normal and health lives never realising they are carriers until they mate with another carrier. About 1 in 25 Caucasians are thought to be "carriers" of the recessive allele for cystic fibrosis. The chances of two carriers meeting is thus about $(^1/_{25})^2 = 1$ in 625 or 0.0016. The chance of a child from a union of these parents having both recessive alleles and hence displaying the condition is one quarter of 0.0016 = 0.0004, or 1 in 2500. Hence about 1 in 2500 of Caucasian children are born with cystic fibrosis. Simply removing those affected by cystic fibrosis, i.e. those who are homozygous will not remove the allele itself. In fact the heterozygous condition only needs to carry a 2.3 % advantage compared to non-carriers for the recessive allele to persist indefinitely (see Strachan and Read, 1996). The only way for a true eugenics programme to work in this context would be to screen for carriers and discourage carriers from breeding with anyone. Such a programme would of course be impractical and ethically unacceptable

Evolutionary Biology and Sexism

When sociobiology emerged in the 1970s it was quickly denounced as sexist. Sexism is in fact quite a complex term that needs to be unpacked carefully to examine this accusation. Evolutionary thinking could be sexist in the sense that concepts from socially constructed gender roles are transported into the natural world and have a distorting effect. To speak of the "queen bee" for example is really a metaphor which if taken too literally could give a very misleading effect of what actually happens in the hive, where, if anything, the queen seems controlled by her "workers". There are particular problems here in describing the sexual behaviour of animals where it is only too easy to transpose concepts from the social world to the biological and then back again. What may seem to be a dominant and resourceful male reigning over his harem could be a group of females with their own social bonds clubbing together to choose the best looking male. Another example concerns the way in which we give an account of the way in which some species of ants make "slaves" of others. In human slavery members of the same species are violently coerced into labouring for others. Yet the application of the word slave to ants may be misleading. When ants make "slaves" they capture immature members of a different species. The captured individuals then mature in the nest of their captors and perform housekeeping tasks apparently without co-ercion. Perhaps a better metaphor here would be domestication.

The reception of scientific ideas can also be influenced by views on the social roles of males and females. It has been noted, for example, that in the patriarchal climate of Victorian Britain, where women were denied effective political power, that Darwin's view that the female could through her power of choice exert an effect on the male was received with much scepticism (Cronin, 1991). One might postulate then that ideas from evolutionary thinking are accepted by the scientific community if they conform to contemporary social expectations.

Both these points have epistemological and political dimensions and need to be considered carefully. There seems no doubt that in constructing knowledge of the world scientists employ metaphors that betray a social origin, and that therefore such metaphors may condition a particular image of reality. Knowledge is rarely, if ever, value neutral. It is produced by people with specific social, personal or professional interests. Even in the most abstruse field someone decides that something is worth knowing about and that invokes a value commitment. The important question here has to be whether or not our view of external reality is so distorted by this process that our image of the world is entirely a social construction. The answer we think has to be no. Unless one is a thoroughgoing relativist with respect to scientific knowledge, it has to be acknowledged that the world is not plastic enough to sustain any interpretation. Moreover, the checks and balances built into the methodology of modern science ensure that false images will eventually be exposed. The very fact that we realise that analogies such as queen or harem or slave making are simply that, i.e. imprecise metaphors, shows that we are not imprisoned by them. More generally, the very phrase natural selection is a metaphorical extension of the way humans select, but no respectable biologist really believes some conscious agency is at work doing the selecting.

One has to concede of course that particular lines of inquiry may be socially conditioned. At a trivial level the funding arrangements of science will always ensure that social priorities enter into the direction of scientific research for example. There are deeper ways too. The fact that in his scientific speculations Aristotle advocated the view that some men are fit for slavery, or that in sexual reproduction the male supplies the important organising form and the female supplies only the matter, no doubt reflects the sexist and slave-owning culture in which Aristotle lived. In recent years there has been a great deal of work on female choice in the process of mate selection. One could speculate that this reflects the increase in social power of women in western societies. This may be the

case, and sociologists of science could be gainfully employed in establishing this. The crucial point however is that the results of the enquiry process are scrutinised by standard scientific procedures. In short the outcome of the research is not logically predetermined by the motivating factors. To suppose that it is, entails committing what Popper called the "genetic fallacy" (nothing this time to do with genes) : the belief that the origin of ideas impacts on their truth value.

Another line of attack on evolutionary accounts of human nature is that it is sexist because it points to innate differences between the sexes. The concern here stems from the belief that to suggest differences in gender-specific behavioural dispositions means, a) these dispositions are fixed and are therefore incapable of moderation, and b) the genetic basis of behaviour can be used to legitimate social roles. The first point to note here is that there are obvious physical differences between men and women that have a strong genetic basis. Men cannot bear babies or lactate. In relation to height and musculature there are of course environmental influences, and girls that are well fed and nourished may grow to be larger than boys who are malnourished, but on average, when raised under similar conditions, men are slightly taller and more muscular that women. Girls on the other hand mature physically and emotionally faster than boys. These are not sexist statements in the sense of denigrating one sex or the other, neither are they sexist in that they entail distortions, deliberate or otherwise, of the world. They are descriptive statements about human development. If they are sexist then so too must be large portions of the sciences of anatomy and physiology . The facts could be used for sexist purposes but that needs to be tackled on a different level and in no way challenges the data itself.

I suspect that more concern is expressed over the supposed sexist implication of evolutionary accounts of behaviour rather than physique because behaviour is what defines us as human. In bodies (apart from our extra large brains) we are very similar to the great apes, but in behavioural terms we have a sophisticated culture which apes lack. The fear that a biology of mind destroys our humanity runs deep. For many, a belief in the autonomy of the mind and its susceptibility to beneficial moulding by culture represents the last raft of refuge from scientific attacks on the uniqueness of the human species. Copernicus and Darwin (and some would say Freud) effectively sank any claims that humans are the chosen species occupying a special place in creation. Those who have such worries should take heart : in a meaningful sense evolutionary theory confirms that we are unique, it just adds the timely reminder that all species are unique.

That there are fundamental differences in the behavioural characteristics of human males and females should not concern us; rather we should celebrate and take delight in the fact. Aristotle Onassis spoke up for about half of the human species when he said that "If women didn't exist, all the money in the world would have no meaning". It would be surprising in the extreme if genes conditioned our physique and the structure of our brains but stopped short at wiring us up for behaviour and handed it entirely over to culture. But we are not hard-wired, our genes long ago handed to us considerable autonomy. The sex drive, for example, is fundamental and strongly ingrained, but we can choose to override it or sublimate it. Chastity is a viable option for humans. Evolutionary reasoning may tell us that it could be a difficult option or that it is unlikely to have any strong genetic basis (we exclude here any accounts of the genetic basis of homosexuality) but ultimately evolutionary thinking makes no value judgement about chastity.

Evolutionary biology has of course been used to provide corroborating evidence in the legitimisation of the social roles of men and women. The arguments usually amount to the idea that certain contemporary roles are more suited to one sex or the other because of the ancestral division of labour that became encoded in our genes. It might be thought that this approach could provide valuable information in say job selection, but in fact beyond surrogate motherhood or wet nursing , for which we could reasonably rule out men, any information we have on the evolutionary basis for sex differences is useless in this respect. In height and physique for example men and women are not strongly dimorphic. To use sex as a guide to these qualities would be useless given the overlap of the spread of values in male and female populations. Even strength is a quality increasingly less useful in a society where muscle power is increasingly displaced by mental agility. The fact remains that virtually all modern social roles can be performed by both men and women, sex alone is not a reliable criterion for assessing suitability for a particular role.

Other such extrapolations often fall prey to the naturalistic fallacy. To say for example that women or men <u>should</u> perform some tasks because they <u>did so</u> in the hunter-gather stage of evolution is a leap from facts to values. Fortunately Western society has seen the sense of all this and discrimination on the basis of sex is largely outlawed.

If anything evolutionary accounts of human sexuality provide a strong antidote to sexism. There is no room in biology for the suggestion that one sex is in some way superior, the concept simply has no meaning. In sexual reproduction each sex inherits half its genome from its mother

and half from its father. Whatever we think of the genes that meiotic shuffling has given us we must give blame and thanks equally.

Evolutionary Biology and Race

Racists have often turned to biology for support. Even before the evolutionary thinking of the 19th century, racists, particularly in the USA, used a mixture of biology and religion to justify the exploitation of African natives. It was both bad theology and bad biology. Following the advent of Darwinian thinking the exponents of racism had to shift their ground, but unsurprisingly came to similar conclusions to before: that some races were higher or more developed than others. The view crept into medicine. Down's syndrome, a problem caused by an error in the chromosomal inheritance of a child, was called "mongolism" by its Victorian discoverer, John Langdon-Down. To him it seemed an appropriate term; sufferers from this condition had slipped a few places in the evolutionary hierarchy to resemble a race lower than the Europeans, the Mongols.

By and large, modern evolutionary thought and the science of genetics is destructive of racist ideas. It turns out that the concept of race is not a particularly useful one for the biologist. It was realised long ago that all races belong to the same species, *Homo sapiens*. (given the fact that racism is a problem in our culture one can only shudder at what the world would be like had another *Homo* species survived into the present epoch). If we start with say skin colour as a criterion for dividing people into groups, it transpires that only about 10 genes out of a total of at least 50,000 on the human genome are responsible for skin colour. We might then look for correlations between skin colour genes and others. When we do, patterns in the distribution of one set of genes are not matched by distributions in others. The human races are remarkably heterogeneous possibly because of our relatively recent origins. Most of the genetic diversity between individuals is due to the fact that they are individuals and not members of the same race. Put another way, most of the world's genetic diversity is found in any one race you choose. On the whole the evolutionary approach to human behaviour is concerned with human universals- cross-cultural features that unite the different groups of the world and reveal our common evolutionary ancestry. The mental modules or Darwinian algorithms that evolutionary psychologists refer to were laid down before races differentiated.

It follows that the concerns of the eugenicists over the heritability of various traits is not of particular concern to the evolutionary theorist.

The concept of heritability describes the percentage of variation between individuals that is due to inheritance. Assuming for the moment that IQ has some validity, the heritability of this features is a measure of the extent to which differences between individuals are attributable to genetics or environment. If we say IQ has a heritability of 50% this means that half of the variation in IQ between say two people is due to genetic influences and half due to environment. A heritability of 100% would imply that all the difference between individuals is due to genes, and 0 % would imply that any difference is entirely due to upbringing. Now in studying human nature from a Darwinian angle we are dealing with low hereditabilities. The premise is that all humans have mental hardware that predispose them to behave in ways that are adaptively similar. This mental hardware is laid down by the genes but the variance is small. As an analogy, consider the number of lungs (two) possessed by most people. The heritability of this is near zero: nearly all people are born with two lungs. If we examine people who have only one lung it will usually be found to be a product of the environment - usually a surgeon's knife. The possession of two lungs is an inherited trait (very adaptive) but with low heritability. A feature such as eye colour will have nearly 100% heritability, differences between people will be almost entirely the result of genetic influences. The environment does not shape eye colour. This raises another point: features with low heritability tend to be more interesting. Heritability itself is not a good guide to establish if something is under genetic control. We need say no more about the IQ heritability debate ; it is not a part of the evolutionary paradigm applied to humans.

The Perfectibility of Man

There is an age old philosophical debate that goes back to the time of the Greeks concerning the origin of human vices and virtues. In the modern period the debate was sharply defined by Hobbes and Rousseau. Hobbes, writing in England in the 1650's after the chaos of a civil war, argued that in the natural state the life of man was "nasty brutish and short". Left to his own devices man would live in a squalid state of perpetual struggle and conflict. The solution for Hobbes was for the State to impose order from above to curb the excesses of human nature. At the other end of the debating spectrum lies Jean -Jacque Rousseau. In his *Discourse on Inequality*, published in 1755, Rousseau argued that humans are by nature basically virtuous but are everywhere corrupted by civilisation. Rousseau gave Europeans the image of the

noble savage living in a state of bliss before the arrival of civilisation. Rousseau's arguments were in part polemical and designed to expose the decadence in French culture, but his picture of the noble savage stuck and was profoundly influential. Ever since the time of Rousseau, weary Europeans have sought examples of the blissful and guiltless lives that Rousseau described.

The reality however has never really matched up with the expectations but on one occasion it looked as though Rousseau's vision had been found. In 1925 Margaret Mead went to the Polynesian island of Samoa to study the life of the islanders. Mead spent just 5 months amongst the islanders before returning to New York. Her subsequent accounts in *Coming of Age in Samoa* published in 1928, were seminal works. Mead claimed to have discovered a culture living in a state of grace, free from sexual jealousy or adolescent angst. Violence was extremely rare and young people enjoyed a guilt free, promiscuous lifestyle. Mead became a major celebrity, her books were best sellers and became required reading for generations of undergraduates. She even had a crater on the planet Venus named after her.Unfortunately Mead was duped. At the onset of her career she was strongly influenced by the anthropologist Franz Boas, who, appalled at the eugenic thinking he encountered in his native Germany, propounded a culturalist view of human nature. Mead imbibed this and her work was a product of her own expectations coupled with faulty data collection. Her errors were exposed by Derek Freeman, who, like Mead, spent time among the Samoans (5 years) but came to an entirely different conclusion. Mead had constructed her account of the carefree love lives of the Samoans from reports of just two adolescent girls, Fa'apua'a and Fofoa. When Freeman interviewed the girls, by then old ladies, he heard how in a state of embarrassment about Mead's questioning of their sex lives they had made up fantastical stories of free love. So it was that a whole view of human nature in social anthropology was based on a prank by two young women. (Freeman, 1996).

✓ Fine Intentions.

It is easy to see why the left and the liberal intelligentia should be so attracted to environmentalist conceptions of human nature. For a start, right of centre ideologies have often looked to a static human nature to support their claims. But at a deeper level there lies the often unquestioned assumption that if human vices are the product of social circumstances then by changing the circumstances we can change human nature - for the

better of course- and the perfectibility of man is at hand. Likewise, feminists have often argued that the unequal distribution of power between the sexes, the differences in historic cultural achievements between men and women, gender stereotypes and the "glass ceiling" are not products of biological differences between the sexes but products of socialisation in a patriarchal society. Change the society and we can change the roles.

Such thinking seems to have lain at the heart of the environmentalist programme of Boas. As a Jew, Boas found the anti-Semitism in Germany in the 1870s and 1880s discouraging and alarming. He foresaw a career path strewn with obstacles and disappointments merely as a result of his own racial identity. In contrast, Boas saw an America (before the proliferation of eugenic ideas and restrictive immigration policies) beckoning with an outlook that stressed equality of opportunity and intellectual freedom.

Boas almost single handedly swung American anthropology away from explanations based on inherited mental traits towards cultural relativism. The transformation in anthropology was mirrored in the lives of individual social scientists. Carl Kelsey, who was a sociologist at the University of Pennsylvania, is a particularly interesting example. In his early career Kelsey embraced Lamarckism and regarded the race problem in America as a product of inherent differences between blacks and whites brought about the exposure of thousands of generations to radically different environments. The downfall of Lamarckism that led some scientists to turn to eugenics as a method of effecting national improvement led others such as Kelsey to move in the opposite direction. If, as Boas had shown, nurture was instrumental in shaping character, then Kelsey reasoned that social progress could be achieved by improving environmental conditions. Such a procedure had the additional merit of being faster than either selective breeding or waiting for the inheritance of acquired characteristics. Within this framework Darwinism was an irrelevance. Some psychologists were quite open in their commitment to a science that was in keeping with liberal values. One was Thomas Garth of the University of Texas who in 1921 laid down a rule for students who were set upon examining racial differences :

> «In no case may we interpret an action as the outcome of the exercise of an inferior psychical faculty if it can be interpreted as the outcome of he exercise of one which stands higher on the psychological scale, but is hindered by lack of training».
>
> Quoted in DEGLER, 1991, p. 190.

The rule is of course an amusing and ironic allusion to the canon laid down by Morgan 26 years earlier.

✓ Retrieving our Humanity.

The history of ideas tells us that Darwinism is not the property of any single political ideology. It is a scientific view of nature that can be used to inform political discussions but one that doesn't translate easily into simple political remedies. It is simply misguided to imagine that the scientific enterprise of examining the evolutionary roots of human behaviour is somehow impugned by the errors of the past. In the coming years skill will needed to sift the legitimate from the spurious applications of Darwinism. We already factor knowledge of human nature into our social systems in a myriad of ways. Consider the undeniable and biological propensity for humans to fall asleep. This is not something we learn, we are born with this tendency. But modern society relies upon the ability and willingness of some individuals to work through the night. A knowledge of biology tells us that there is a price to pay in terms of performance and fatigue, and elementary psychology tells us that we may need inducements to persuade people to work through "unnatural" hours. But it can be done. Biology is not destiny but it can provide a useful contour map.

This is the approach taken by the Australian philosopher Peter Singer who argues that "it is time to develop a Darwinian left" (Singer, 1998). For Singer, Darwinism informs us of the price we may have to pay to achieve desirable social goals. Uninformed state attempts to make socialist man have failed because they ignored human nature. For Singer, some aspects of human nature show little or no variation across culture and consequently must be taken account of in any social engineering. Singer's list includes concern for kin, ability to enter into reciprocal relationships with non-kin, hierarchy and rank, and some traditional gender differences. To ignore these is, according to Singer, to risk disaster. The abolition of hierarchy in the name of equality, as attempted in the French and Russian revolutions for example, has all too often simply led to a new hierarchy. This, for Singer, is not an argument in favour of the status quo. The political reformer, like a good craftsman should have a knowledge of the material which he or she works. The trick is to work with the grain rather than against it.

There is a set of deeper problems with the view that the promise of a humane society lies only within an acceptance of the view that our humanity is culturally determined and defined. Supposing we could structure a society to shape people the way we desire. Who draws up the

blueprint for *Homo perfectus* ? Where do we draw our notions from as to what constitutes ideal man ? Reason by itself is not enough. Reason needs motives to act, it needs the will, beliefs, goals, ideals, something to serve, in other words human nature. Reason cannot lift itself up by its own bootlaces. Perfectly rational man would be a monster.

The blank slate approach to human nature that is still unquestioned in some branches of the social sciences would, if it were taken seriously, be a tyrants license to manipulate. Liberals would have to stand back powerless and impotent as a tyrannical state moulded its people into instruments of whatever crazy ideology was in fashion. There would be no basis for any objection since this would have been jettisoned when biology was thrown out, if human nature is anything that a society structures it to be, there is nothing to be abused.

Associated with the view that human nature is culturally determined, is the philosophy of cultural relativism. If there is no fixed nature there can be no single way of life conducive to its expression or fulfilment. Consequently, there is no judgmental moral high ground. Cultures where the limbs of criminal offenders are severed, where mixed-race marriages are forbidden, where females undergo genital mutilation, must be looked on in silence. As the French philosopher Finkielkraut said "God is dead but the Volksgeist is strong" (Finkielkraut, 1988).

We should remember that the Enlightenment project of progress through reason, science and the intellectual challenging of authority, delivered human freedoms precisely at the expense of culture. To resurrect culture as the new authority risks all we have gained and threatens to tip us into a state of intellectual bankruptcy and moral free fall. Fortunately, for anyone so inflicted, Darwinism is the best antidote around to the fashionable fallacies of post modernism.

Looking back over the 20th century, historians will probably see a struggle for the ownership of human nature. They will note how many scientists and intellectuals, sometimes for the best of motives, allowed it to be snatched away by the social sciences and cultural relativists. It is time for an evolutionary understanding to reassert itself and there are ample signs that this is just what is happening. For as Blaise Pascal noted «If the earth moves, a decree from Rome cannot stop it».

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A humane work that shows the folly of politically motivated science, in this case craniology and IQ measurements

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WEB SITES

→ http://www.ucmp.berkeley.edu/history/evolution.html
Good material on history of evol thought with biographies.

→ http://157.242.64.83/HBES/websites.htm
Plenty of links here, part of the Human Behaviour and Evolution Society Website.

→ http://www.world-of-dawkins.com/headlines.htm
The unofficial Dawkins Web site but well constructed with masses of links to useful sites and recent developments.