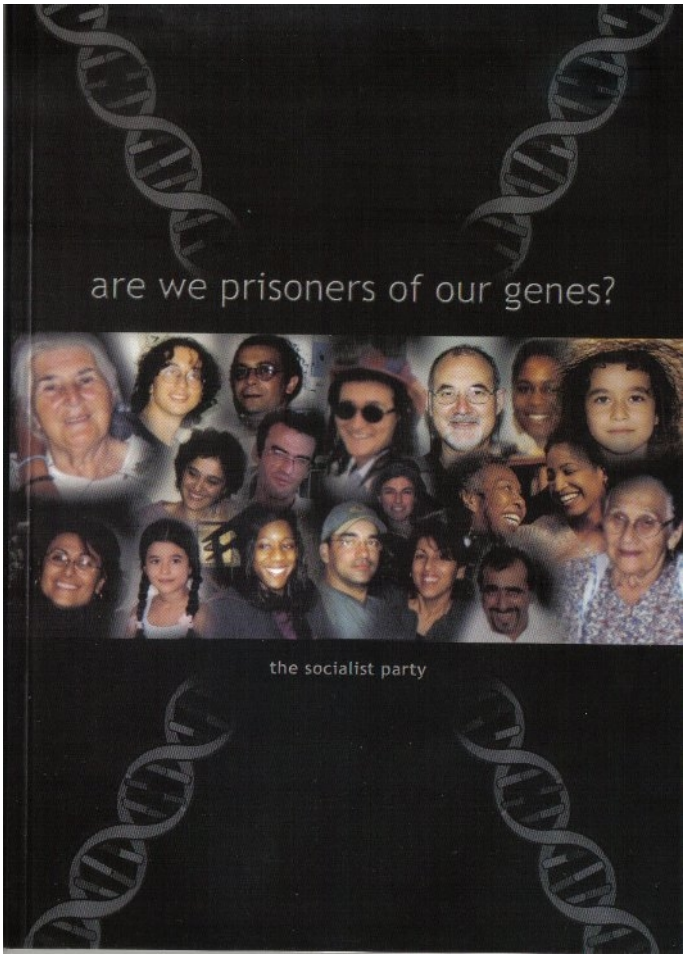

Are we prisoners of our genes?

Introduction

It may seem out of place that a political party should publish a pamphlet on an essentially scientific subject. What significance, it may be asked, have advances in our understanding of how heredity works got to do with a political programme aimed at changing the basis of society?

The answer is that it is not us socialists who have made genes a political issue. It is our opponents with their claim that the genetic make-up of humans would prevent the establishment of a co-operative, peaceful and non-hierarchical society based on the common ownership and democratic control of the means of wealth production.

Scientists had long posited that there had to exist some unit of heritable characteristics, which they called a “gene”, but it was only 50 years ago that Watson and Crick identified

what this precisely was and how it was structured. Before that very few had heard of DNA. Even now it is not known exactly how a gene functions though advances are being made in this direction every year.

Opponents of socialism have of course always claimed that "human nature" would be a barrier to a socialist society working, but in the past this was manifestly only an unsubstantiated assertion based on popular prejudice and religious dogma. So the identification of the gene came as a godsend to them. They could now give their prejudice a pseudo-scientific appearance by claiming that scientists were in the process of discovering genes for such behaviour traits as aggression, selfishness and domination that would make socialism impossible.

It is to refute such claims, which not only go well beyond the evidence but completely misunderstand the role of genes in biology, that we are publishing this pamphlet. It does not claim to be an original scientific study. Far from it. Socialists have no qualifications in the field of genetics and we would not want to claim that this pamphlet does any more than give a journalistic summary, informed by socialist understanding, of the current state of knowledge in this particular field of scientific study.

Because scientific knowledge in this field is still advancing it is entirely possible that some of the theories that the pamphlet discusses may subsequently be abandoned and replaced by new theories. That is the way science works. But we are confident that no advances in molecular genetics (the study of how genes work at a chemical level) or in neuroscience (the study of how the brain works) will back up the prejudice that humans are incapable of living in a socialist society.
The Socialist Party, April 2004

Chapter 1: What is human nature?

How often do we hear it said "It's only human nature", mostly about some gross piece of behaviour as if it couldn't be avoided? Curiously, it is not often said about the best things that people can do. On hearing that someone has risked their life to save another, for some reason we are not inclined to say "Yes, it's human nature". But then, none of these variations of good or bad behaviour are determined by our "nature". We behave differently in different social settings and this is evident from everyday experience.

Mostly, this idea of "human nature" is a reflection of a divisive society that is incapable of creating a decent life for all its members. This failure is then rationalised as a pessimistic view that all people (mainly other people) are inherently selfish, greedy, and lazy. In its nationalist or racist mode this idea of human nature attributes various characteristics to whole groups of people. This is thinking in stereotypes where some groups or classes are seen as culturally inferior or of lower intelligence. This becomes part of ideology used to justify domination and exploitation.

All this prejudice has been used politically to resist progress. It has been used as an objection to socialism (a system of society based on the common ownership and democratic control by all the people of productive resources, with production for use not profit and distribution on the principle of "from each according to their abilities, to each according to their needs"). In this argument all the bad examples of human behaviour which in the main are generated by capitalism are called upon to say that a society based on equality and voluntary co-operation is impossible.

This prejudice is also reinforced by arguments which assert that our behaviour and our relationships result from the way we are biologically or genetically programmed. Again these focus on competition, leadership, possessiveness, aggression, social and sexual inequality and an alleged drive to be territorial but, again, all these are behaviour patterns that reflect capitalism. Ever since capitalism became the dominant system its defenders have presented economic individualism and competition as an expression of our human nature and therefore the natural order of things. But if this were true, then throughout all history society would never have varied.

If our social arrangements were determined by our biology then there would never have been the great diversity of behaviour patterns, relationships and culture that is the real story of our past and which is evident even in the way we live now. The argument that our behaviour is determined by our physical inheritance may pose as science but in reality it is a socially determined prejudice used as part of crude political ideology.

Faced with such objections to socialism, the first thing that needs to be done is to clarify what is going to be meant by the term "human nature".

One approach would be to define human nature sociologically and say that it is how the typical human behaves in any particular society and at any point in history. One problem

with this approach is that it doesn't make it easy to decide what exactly human nature is or was at any time. On the other hand, even though this would be difficult, it would still be clear that human nature wasn't fixed but changed from society to society, indeed might even be constantly changing. On this definition, the answer to the human nature objection would be "oh yes, human nature can change, just look at history".

This was in fact the approach taken by the pioneer socialist Karl Marx. There's nothing wrong with it as long as it is made clear that by human nature you don't mean the biological make-up of humans but their typical behaviour in any society. However, these days you can't avoid dealing with what humans are biologically, so, in our view, it is better to make clear right from the start the distinction between biologically-determined human nature and socially-determined human behaviour.

In other words, to accept the objectors' view that there is such a thing as biological human nature but to show, on the basis of the findings of anthropology, biology, genetics and neuroscience, that there is nothing in the biological make-up of humans to prevent them living in a socialist society; that, on the contrary, it is part of humans' biological nature to be flexible and versatile in their behaviour and so to be able to adopt behaviours appropriate to the society in which they are brought up and live. On this definition, the answer to the human nature objection is "yes, OK, human nature is fixed and you can't change it, but this isn't a barrier to socialism; what would need to change is not human nature but human behaviour, and history shows that this is not fixed but can and does change".

As this is our approach, this pamphlet will set out the evidence of genetics, biology and anthropology on which this conclusion is based. This will involve looking at Darwin's theory of evolution as updated in the light of later research as well as outlining what is known about the evolution of the animal species to which all living humans belong, *Homo sapiens*, before refuting the views of those biological determinists who have deliberately set out to try to show that socialism is biologically impossible: the Social Darwinists, the so-called "pop ethologists" of the 1960s, the Sociobiologists, and those who have hi-jacked the term "Evolutionary Psychology".

Chapter 2: The facts of life

Genes are always in the news these days. If it's not the genetic modification of crops, it's the human genome project. If it's not selfish genes, it's a gene for homosexuality. It wasn't always like this. Scientists have known for a long time that units of biological inheritance which they called "genes" existed but it is only comparatively recently that they have discovered that they are made of the chemical substance deoxyribonucleic acid, or DNA for short.

These advances in biology and genetics have had two consequences, one negative, the other positive. The negative consequence has been a revival of theories of biological determinism, the view that human behaviour patterns are more or less fixed and closely governed by our biological make-up. People who don't want to change society to try to make it better have long argued that you can't do this anyway as it would be "against human nature". In the past they didn't have any credible theory to back up this claim, just the Christian doctrine of "original sin" and the way that people did tend to behave. Now they can express their prejudice in a pseudo-scientific form by claiming that the various forms of human behaviour that they say are unchangeable are so because they are governed by our genes.

The positive consequence is that genetics has confirmed beyond any shadow of doubt that all living things had a common origin. This was obvious, as Darwin for instance had shown, on the basis of other features shared by all life-forms but it is now known that the genetic code of all life—bacteria and plants as well as animals—is expressed in the same language of DNA. It is often quoted that humans share 98.4 percent of the genes of chimpanzees, but we are also said to share 85 percent of the genes of dogs, 50 percent of those of fruit flies, 35 percent of those of daffodils, and 20 percent of those of yeast. This reflects the fact that all living organisms are composed of cells, some of which exist in all of them. Genes, in fact, essentially control the reproduction and maintenance of these cells.

Darwin's theory of the evolution of the various different species of life-forms was that they came about through a process of what he called "natural selection". Humans had created different varieties of plants and races of domesticated animals by selective planting and breeding, by taking plants or animals which had the characteristics they wanted and only propagating or breeding from them; they found that over generations this worked and new varieties of plants and races of animal were created by means of such "artificial selection". Darwin argued that natural processes had created the great variety of life-forms through a similar selection, only one that was not designed or intentional but which came about in an unplanned way, as the environments in which life-forms had to exist had changed over time.

Darwin realised that for natural selection to have operated two conditions had been required. First, plenty of time and, second, that the individual members of earlier species of life-forms were not exactly the same but that slight variations existed between them. It

was by working on these slight variations over generations and generations that the process of natural selection brought into being new species.

There was in principle no problem with the time factor. By the time Darwin was writing —the *Origin of Species* was first published in 1859—geologists had already proved that the Earth was very much older than the 6000 years calculated by Bishop Ussher in the 17th century on the basis of a literal interpretation of the bible.

When, however, it came to what caused variations within species and how these were inherited Darwin could not offer an explanation; he could only note these as facts, the reason for which had yet to be discovered. One theory, associated with the name of Lamarck, was that acquired characteristics could be inherited; thus, if the external environment brought some variation in an organism then this could be passed on to future generations. Although Darwin did not rule this out entirely he could see that it couldn't be generally true. Dog breeders, for instance, knew that, even if you cut off dogs' tails generation after generation, dogs would still be born with tails. Some other element was clearly at work, even if it wasn't known what.

Unbeknown to Darwin, at almost the same time as his own researches an Austrian monk, Gregor Mendel, was carrying out experiments which were to provide the basis for an answer. Mendel's experiments concerned peas and how various characteristics such as the colour of their flowers were inherited over more than one generation. When Mendel's work was rediscovered and analysed at the beginning of the last century it became clear that he had made an important discovery about inheritance: that an organism's inherited characteristics were governed by separate biological units for which names such as "chromosome", "germ plasm" and "gene" were coined.

It only remained to connect this discovery to the already established fact that heredity took place through cells (and not the blood, as once mistakenly believed). When a commonly accepted terminology had evolved, the theory was that inherited characteristics were governed by "genes" which were part of the "chromosomes" that were found in the nucleus of cells. At first the existence of genes too was just a theory but one that has been confirmed by later research.

The existence of genes provides an explanation as to how the variations that are essential to the theory of natural selection could have arisen. Normally, genes are inherited unchanged but occasionally this doesn't happen—DNA is a chemical combination that can be affected by radiation and by other chemicals—and a new gene is formed. If the organism inheriting the new gene survives and has offspring the gene will enter into the species' gene pool and can be worked on by either natural or artificial selection.

So, we now have a fairly complete picture of the origin of species: all the different life-forms that exist or have ever existed came about through the process of natural selection operating on genes as the units of heritable characteristics. This is now so well established that it is as unchallengeable as the fact that the Earth is spherical and not flat.

This does not mean that everything has been settled but there is no argument about the principle that genes govern the physical anatomy of an organism via the instructions they transmit to the cells of which all living things are composed. An organism's basic structure and the way it is maintained is inherited even if the precise way it is expressed can vary depending on the environment. For instance, if a plant gets more of what is required for growth it will grow bigger than one, other things being equal, that gets less.

All organisms react to stimuli they receive from their environment—this, in fact, is what "behaviour" means in the biological sense. This is not always an automatic, reflex or knee-jerk reaction. It is in plants, insects and bacteria and in some of the behaviour of all animals. However, those animals that have a more developed nervous system including a brain have the capacity to react—to behave—in the light of their previous experience. Such behaviour cannot be said to be governed by their genes; what is gene-governed in such cases is the capacity to react from previous experience, not the reaction itself.

The extent of such non-gene-governed behaviour in a particular species depends on the level of development of its nervous system and brain. The less developed this is, the less the scope that the organisms of the species have for such behaviour. On the other hand, the more developed the brain—the more space it has for storing and retrieving experiences as memory—the greater is the scope for non-gene governed, or "acquired", behaviour.

Of all animals humans have the most developed brains, which means that we have a greater capacity—a far greater capacity, in fact—for acquired behaviour than any other animal; which in turn means that human behaviour, as the reaction of members of our species to the environments in which they find themselves having to live, is able to be much more versatile than that of all other animals. This capacity of humans for adapting their behaviour to the environment that they happened to have been brought up in is what distinguishes us as an animal species—this biologically-inherited capacity must, in fact, be a key feature of any adequate definition of the term "human nature".

That members of our species are able to adapt to different environments does indeed have a biological basis, in our biologically evolved and inherited brains. What genes determine in humans are the physical characteristics and mode of functioning of this brain, but not the actual behaviour and behaviour patterns these brains enable us to engage in and which we actually do engage in. In other words, human nature is one thing, human behaviour another.

Chapter 3: How did we get here?

In 1936 the archeologist V Gordon Childe wrote a book entitled *Man Makes Himself*. Although today this would have to be justifiably changed to "Humans Make Themselves", the title well expressed a key feature of the evolution of the earlier forms of *Homo* into *Homo sapiens*: it wasn't purely biological in that the behaviours acquired by the earlier forms of *Homo*, and which were passed on from generation to generation by non-biological means, played a part in it.

In other words, even the biologically inherited and gene-governed characteristics of our species were partly the product of our acquired, non-gene-governed behaviour. These behaviours were all concerned with how to use and fashion parts of the rest of nature so as to be better able to survive; in particular how to make and use tools and how to forage (hunt and scavenge for meat, and gather roots, plants, fruits and insects) collectively.

The first animals which anthropologists classify as being in the genus *Homo* are generally thought to have appeared some 2.5 million years ago on the savannah (open grasslands) of East Africa and are classified as such because of their larger brain capacity compared with those of the ape-like species from which they had evolved. This was also the time that the first stone tools began to be made. The evolution of the earliest forms of *Homo* into, first, the now extinct *Homo erectus* (something under 2 million years ago) and, then, *Homo sapiens* (between 200,000 and 100,000 years ago), also on the African savannah, is essentially the evolution, in animals which already walked on two feet, of a larger and larger brain but also of a vocal system more and more adapted to speaking and of a more prolonged period of growing to maturity.

All these biological features are linked. A more efficient vocal system permits a structured spoken language, which in turn implies abstract thinking, while a longer period of growing up means a longer period during which to acquire non-gene-governed behaviour. All presuppose a larger brain capacity. Humans have this larger capacity, compared to body size, than those of other animals because of the extra brainwork involved in the thinking, the learning, and the behaving in new ways, required of them.

What distinguishes humans from all other animals is not so much the greater proportion of their behaviour that is acquired, nor even the immensely greater recourse that humans have to fashioning other parts of nature to help them survive. These are quantitative differences, with humans doing more of what many other animals do. The qualitative difference between humans and other animals—and what lies behind the quantitative differences—is the one thing that only humans do and in fact that only humans are capable of doing: thinking abstractly, that is, thinking about things in the absence of physically sensing those things. This implies a capacity to represent a thing by a symbol and to think about that symbol instead. This is why abstract thinking is also known as "symbolic thinking", i. e., thinking with symbols. The symbols in question are words, the names humans give to things and which they use to think about things without having to

sense them at the same time. Thus, abstract thinking and a structured language are indissolubly linked. Without language there could be no abstract, or symbolic, thinking; language, by naming parts of our environment, supplies the symbols we think with.

Other animals do send signals to each other and this could be described as a sort of language, though a term such as proto-language or pre-language might be better, but the fundamental difference between this and human language is that it does not involve abstract thinking; the signals are always given in the physical presence of the thing or situation being signalled.

Humans have even been described as "the symbolic species" because we are the only species that uses abstract thinking with symbols. Such thinking requires a lot of brainpower, and a more powerful brain would only have been evolved, through the process of natural selection, if using abstract thinking with symbols as an aid to surviving in the rest of nature had some added survival value. It is not difficult to see what this might have been: exchanging experiences, passing on toolmaking skills and information about gathering, organising collective hunting, and generally teaching the behaviours of the group.

There is still controversy about how the biological capacity for abstract thinking and human language could have come to evolve—and probably there always will be, since the matter can never be settled by any direct evidence; all that anthropologists have to go on is the indirect evidence of fossils and artefacts, which is sometimes open to more than one interpretation—but both of the two main theories presuppose that this developed as a result of humans being social animals, i. e., animals that lived in groups and faced the rest of nature as a group to survive and so needed some means of communication amongst themselves to coordinate their activities. A brain capable of abstract thinking and communication by symbols is, and could only have been, a social product.

One theory is that the capacity for abstract thinking, and the bigger brain capacity needed for it, arose as a way to better master the complex social relationships—dominance, submission, rivalry, collaboration—within the sort of societies in which very early forms of *Homo* might be imagined to have lived. The other, perhaps more plausible, theory is that it was toolmaking that was the trigger. Above the level of simply taking a stone and knocking it into a rough shape, toolmaking involves design, i. e., the maker having a mental image of what was to be fashioned before they made it. This mental image would already be a symbol.

Being able to fashion special tools rather than simply using what was to hand would obviously have provided those able to do this with an added survival value; they would be able to obtain more effectively what they required from the rest of nature to survive. Individuals able to fashion tools from a mental image would have been favoured by the process of natural selection so that, over a million or more years, successive species of *Homo* would evolve with a gradually greater capacity to think with symbols. The end result, some 100,000 to 200,000 years ago, would be us, a species with a brain fully

capable of abstract thought and employing a language based on symbols.

Once animals of the genus *Homo* had developed even some capacity for abstract thought and speech this would have permitted the further development of toolmaking, "tool" being understood in the broadest sense of anything made to help groups of humans to survive in the rest of nature; not only stone axes and knives, but in time clothes and huts, and how to make fire and other knowledge about how to obtain what was needed from the rest of nature. Another name for "tools" in this broad sense has been "culture".

Culture, as a coherent body of human-made things and of the knowledge of how to use them, can be inherited in the sense of being passed down from one generation to the next but this inheritance is not biological. Its content is not part of the brains we are born with and is not passed down through our genes; the tools are inherited as physical objects, and the knowledge of how to use them by teaching and learning. In fact it is the culture of the society formed by the group that humans are brought up in, and which they acquire, that determines how they behave and not their genetic make-up. The great variety of ways in which different groups of humans have behaved in different places and at different times ought to be sufficient proof that our behaviour is governed by our culture not our genes.

Hence another definition of humans as "culture-bearing animals". Like "symbolic species", this underlines the fact that human behaviour is not genetically determined, but depends on non-biological factors. Of course this capacity for abstract thinking and creating cultures has a biological basis, in the capacity and structure of our brains and in the prolonged period of growing up compared with other animals during which the culture of the group—including its behaviours—can be acquired.

It is now clear what one of the things was that Childe had in mind when he chose that title "Man Makes Himself". The evolution of *Homo sapiens* was not just a purely biological process, but was a biological process influenced and even driven by the way earlier forms of *Homo* behaved and which depended on non-biological adaptations to their environment. The main such non-biological adaptation was the use of more, and of more complex, tools to act on the rest of nature to extract from it the resources needed to survive. Already in the 18th century Benjamin Franklin had defined humans as a "toolmaking animal", and Darwin himself had suggested that the use of language and tools by the species we are descended from would have affected their evolution into us. Since fashioning the parts of the rest of nature to procure means of subsistence is what Marxists mean by "labour" and "production", Engels was able to see the significance of this too, as early as 1876—in an essay published in 1896 after his death—under the evocative title *The Part Played by Labour in the Transition from Ape to Man* (even if he didn't get the mechanism of inheritance quite right, appearing to believe that acquired characteristics could be inherited).

Early forms of *Homo* worked and so changed nature including in the end, as a result of the workings of natural selection, the biological make-up of their descendants. Humans, in other words, made themselves or at least made us. Others have expressed this close

relationship between the development of toolmaking, language and culture, and the biological evolution of *Homo sapiens* as “co-evolution”. Which is another way of saying that we are the product not simply of biological evolution but of this interacting with these other, non-biological factors.

As evolved, or rather co-evolved along with toolmaking and language, *Homo sapiens* is an animal species with an upright stance, eyes capable of binocular three-dimensional colour vision, a vocal system capable of speech, hands capable of using and making tools, and a prolonged period of growing up during which human-created culture can be acquired, all capped by a brain capable of abstract symbolic thought and of transmitting social and practical knowledge from generation to generation by non-biological means. That’s our biological nature and it is indeed fixed to all intents and purposes (the timescale for evolutionary changes in the biological make-up of a species being measured in hundreds of thousands, if not millions, of years). But it’s not this “human nature” that we need to change if we want to move on to socialism. On the contrary, it suits us very well and will allow us to adapt to that society just as it has allowed us to adapt to the various other societies which members of our species have lived in up to now.

Chapter 4: Anti-Social Darwinism

Right from the start Socialists embraced Darwinism (as the theory of the evolution of species through natural selection came to be called, even though it was by no means the work of Darwin alone) as providing a credible materialist explanation of a natural phenomenon. The defenders of the status quo were divided. Some rejected Darwinism, preferring to rely on religion to provide an ideological defence of capitalist privilege. Others tried to co-opt Darwinism for this purpose.

Thomas Henry Huxley, the man who invented the term "agnostic" but who was also known as "Darwin's bulldog" for the determined way he defended Darwin's theory of evolution, against its religious and other detractors, wrote an article in 1888 entitled "Struggle for Existence and its Bearing on Man". In it he claimed that amongst early humans:

> "the weakest and the stupidest went to the wall, while the toughest and shrewdest, those who were best fitted to cope with their circumstances, but not the best in any other way, survived. Life was a continuous free fight, and beyond the limited and temporary relations of the family, the Hobbesian war of each against all was the normal state of existence" (*Nineteenth Century*, February 1888).

Thomas Hobbes was the 17th century writer whose book *Leviathan* was an attempt to justify the authoritarian rule of Charles II on other grounds than the discredited "divine right of kings". His argument was that before government had been set up by common agreement to submit to a ruler who would bring and maintain social peace, humans had existed in a "state of nature" in which everyone was in a perpetual state of war against everyone else so that life was "nasty, brutish and short". Even at the time there was enough evidence to show that this was not true, but Hobbes had to assume that it was in order to develop his argument. His aim was to justify authoritarian government by a single individual and he had to paint a bleak picture of life before government in order to make his point.

Huxley, though, was a scientist—a biologist in fact—and should have been informed enough (two centuries later) not to take Hobbes's philosophical speculations about what life was like in a "state of nature" at their face value. But Huxley could see no alternative to capitalism and uncritically accepted the view that, without the rule of a governing elite, humans would revert to behaving as he believed animals did in nature:

> "from the point of view of the moralist, the animal world is on about the same level as a gladiators' show. The creatures are fairly well treated, and set to fight; whereby the strongest, the swiftest, and the cunningest live to fight another day. The spectator has no need to turn his thumb down, as no quarter is given".

What Huxley had done was to give a scientific endorsement to Hobbes's philosophical justification of authoritarian rule; what is more, he gave this endorsement in the name of

the most renowned scientist of the epoch, Charles Darwin who had died in 1882.

Darwin himself did not actually believe that the natural state of humans was unbridled individualism. But he did say he had come to his theory by reflecting on the views of Malthus on overpopulation. According to Malthus, in his *An Essay on the Principle of Population* which went through many editions after it was first published in 1798, humanity was always on the brink of overpopulation in relation to food resources. This was because while food resources tended to increase only arithmetically (1, 2, 3, 4, 5) human population tended to increase geometrically (1, 2, 4, 8, 16) and was only held back from doing so by lack of food resources resulting in deaths from famine and disease.

Darwin saw this as applying in the natural world too. In nature, plants and animals tended to produce enough offspring to increase geometrically and this was only prevented from happening by lack of food resources reducing the number that actually survived. As a result, there was a continuous "struggle for existence" amongst the members of the same species to survive; and only the "fittest" did. Darwin meant by this the most capable of surviving and reproducing in the environment they found themselves having to live in. If the environment changed for some reason (climatic, geological, migration of other species), then, over a prolonged period of time, a new species would tend to evolve as those with characteristics best fitted for survival in this new environment survived in more numbers than those whose characteristics were not so well fitted. Such a view is central to Darwinism—indeed, this is his theory of the evolution of species through natural selection—but it by no means implies that every individual member of a species is therefore competing against every other member, with the best fitted seeking to eliminate the less fitted. It merely implies that those better fitted to survive will have more descendants than the others.

Darwin, however, must take some at least of the blame for the distortion of his theory by some of his followers. In writing, in the introductory summary of his chapter "Struggle for Existence", "Struggle for Life most severe between Individuals and Varieties of the same Species" and in borrowing the phrase "the survival of the fittest" from the individualist philosopher Herbert Spencer, he gave some credence to the view that his theory of the evolution of species was based on there being a struggle for existence between the members of the same species of which only the victorious survived.

Just as Malthus had opposed measures to improve the lot of the poor as counter-productive on the grounds that these would only encourage the poor to have more children, increasing the pressure on resources and making matters worse in the longer term, so those who transferred Darwin's views to human society used a similar argument. Called "Social Darwinists", they argued against helping the poor as this would make things worse by allowing the less fit to survive, so weakening the whole human race. Unlike in Malthus's time, by now socialism was on the agenda and the Social Darwinists consciously directed their theories against the possibility and desirability of socialism. Here's Herbert Spencer himself:

> "In the animal world the old, the weak and sick are ever rooted out and only the

> strong and healthy survive. The struggle for existence serves therefore as a purification of the race, protecting it from deterioration. This is the happy effect of this struggle, for if this struggle should cease and each one were sure of procuring its existence without any struggle whatsoever, the race would deteriorate. The support given to the sick, the weak and unfit causes a general race degeneration. If sympathy, finding its expressions in charity, goes beyond its reasonable bounds, it misses its object; instead of diminishing, it increases the suffering for the new generations. The good effect of the struggle for existence can best be seen in wild animals. They are strong and healthy because they had to undergo thousands of dangers wherein all those that were not qualified had to perish. Among men and domestic animals sickness and weakness are so general because the sick and weak are preserved. Socialism, having as its aim to abolish the struggle for existence in the human world, will necessarily bring about an ever growing mental and physical deterioration" (quoted in *Marxism and Darwinism* by A. Pannekoek, chapter 5, at http://csf.colorado.edu/mirrors/marxists.org/archive/pannekoe/).

In Germany the leading Darwinist was Ernst Haeckel, a biologist who made his own contribution to the theory of evolution. He was just as rabidly opposed to socialism as the philosopher Spencer:

> "Darwinism, or the theory of selection, is thoroughly aristocratic; it is based upon the survival of the best. The division of labour brought about by development causes an ever greater variation in character, an ever greater inequality among the individuals, in their activity, education and condition. The higher the advance of human culture, the greater the difference and gulf between the various classes existing. Communism and the demands put up by the Socialists in demanding an equality of conditions and activity is synonymous with going back to the primitive stages of barbarism" (*same source*).

The classic socialist responses to this obnoxious nonsense were given by Peter Kropotkin in his book *Mutual Aid As A Factor in Evolution* (published in 1902 but mostly written ten years earlier as articles in direct reply to Huxley) and by Anton Pannekoek in his short 1905 pamphlet *Marxism and Darwinism*. Both were scientists in their own right. In his youth in the 1860s Kropotkin had made an original contribution to an understanding of the geology of eastern Siberia. Pannekoek was to go on to become a leading astronomer.

Kropotkin accepted that there was of course a struggle for existence in nature in the sense that each individual of every species strove to survive. He also accepted that "the fittest" were the ones that did survive. What he did not accept was that the struggle for existence was a struggle for superiority between the members of the same species or that the fittest who survived were those who came out on top in such a struggle. Basing himself on observations of the animal world, he pointed out that in the vast majority of species the struggle for existence was a collective effort, with the members of the same species living in groups whose members co-operated with—mutually aided—each other to survive. The fittest were those whose biological characteristics were best suited for survival in the

particular environment that their group found themselves in, and they—or rather those of their type—survived, not by exterminating the less fit but by relatively more of their descendants surviving than those of the less fitted. Today, this can be said to be the mainstream Darwinian view.

Turning to humans, Kropotkin pointed out that neither did early human societies conform to the picture painted by the Social Darwinists. Early humans were not isolated individual(ist)s waging a struggle to the death against each other. On the contrary, as surviving primitive societies testified, they lived in societies (tribes and clans) the members of which co-operated with each other to survive:

> "The very persistence of the clan organization shows how utterly false it is to represent primitive mankind as a disorderly agglomeration of individuals, who only obey their individual passions, and take advantage of their personal force and cunningness against all other representatives of the species" (*Mutual Aid*, Penguin, 1939, p. 82).

To Huxley's claim that "the first men who substituted mutual peace for mutual war—whatever the motive that impelled them to take that step—created society", Kropotkin replied pertinently: "society has not been created by man; it is anterior to man".

Pannekoek attacked on another front. He pointed out that it was not an accident that defenders of capitalist rule jumped at the idea that nature was a struggle for survival amongst ruthless individualists; this was a reflection of capitalist society and of the competition that went on amongst capitalists. What they were doing was reading features of capitalist society back into nature so as to give the impression that competitive capitalism was somehow natural—and that socialism wasn't. But Pannekoek's comments were not confined to analysing the capitalist ideology that Social Darwinism represented. Like Kropotkin, he too pointed out that the theory was factually wrong.

Human evolution, Pannekoek replied, had become different from biological evolution. Once humans had evolved as a biological species with specific biological features their evolution ceased to be biological in the sense of an adaptation of their biological characteristics; in fact it was their very biological characteristics that brought this about: a brain capable of abstract thought, a vocal system capable of speech, and hands capable of using and making tools. This biological heritage made humans into toolmaking animals, the tools they made becoming non-biological extensions of their bodies.

Whereas other animal species could only adapt to a changed environment through evolution (as a result of natural selection over immensely long periods of time) of different biological features, humans could adapt by developing their tools. So human evolution ceased to be biological and became technological. In addition, since humans were social animals living in societies, and since technology played a decisive role in shaping the features of these societies, human evolution was social evolution. The societies in which they lived also evolved, but on quite different principles from those of biological evolution. The Darwinian theory of biological evolution did not apply to

human societies, nor to the struggles that went on within them.

There was indeed, said Pannekoek, a sort of Social Darwinian struggle for existence going on within capitalist society but it was not between humans as individual biological units, with the most intelligent and the healthiest ending up on top and the weakest and the stupidest going to the wall. It was a struggle between owners of tools (by now in the form of factories and machines) amongst themselves, in which the winners were not those with the best brains or bodies but those who owned the best machines. The failures were those with the least performant machines and their fate was to be condemned to join the great majority of humans who didn't own any machines—the working class.

The working class too, said Pannekoek, was engaged in a struggle, not with tools since they owned none, but a collective struggle "for the possession of tools, a struggle for the right to direct industry", i. e., a struggle for socialism as the social ownership and democratic control of the means of production, the great collection of tools humanity had built up.

Chapter 5: Genes for everything?

When the Nazis came to power in Germany in 1933 biological determinism became a state ideology. This was to be its undoing, at least temporarily, as with the defeat of Germany more accurate views on human biology and behaviour came to the fore. Racism and eugenics were repudiated and it came to be recognised that human behaviour was socially and culturally, not biologically, determined. This was based on solid scientific research and was well expressed (apart from the then prevailing confusion of "human" and "man") by Kenneth Boulding in 1966:

> "It is the great peculiarity of man, however, differentiating him from all the other animals, that what his genes endow him with is an enormous nervous system of some 10 billion components, the informational content of which is derived almost wholly from the environment, that is, from inputs into the organism from outside. The genetic contribution to man's nervous system is virtually complete at birth. Almost everything that happens thereafter is learned. It is this consideration which inspires the modern anthropologist to declare that man has virtually no instincts and that virtually everything he knows has to be learned from his environment, which consists both of the physical world in which he lives and moves and the social world into which he is born" (in *Man and Aggression*, edited by MF Ashley Montagu, OUP, 1968, pp 86-87) .

And by the anthropologist Alexander Allard in 1972:

> "Anthropologists realized long ago that purely biological explanations of human behavior are inadequate. Our behavior is based on customs which develop in the context of specific social and environmental conditions. While they do reflect the fact that man like all other animals must adjust to the environment to survive, attempts to link human behavioral systems to simple geographic or genetic factors have always failed. This is because man's major behavioral adaptation is culture.
>
> "Culture is learned and shared. It is rooted in biology. But although this is true (the capacity for culture is part of a normal human's brain structure), culture frees man to an unprecedented degree from strictly biological controls over the development and maintenance of behavioral systems. Culture is biologically adaptive. That is, human populations imbedded, like all animal populations, in specific environments adjust to these environments largely through culture.
>
> "Man is born with a capacity to learn culture, not with culture. This does not mean that all human behavior is freed of biological programming. Individuals are born different. The outcome of heredity and experience will lead to differences in temperament and ability which make it possible for the human group to function as a social entity.

> "The human being has been shaped by evolution. His size, the fact that he walks on two feet, his relative lack of body hair, and the fact that he can and does talk are all products of the evolutionary process. What man does and also what he believes are also products of evolution. *But* those elements which depend upon culture are not inherited biologically. In part, man adapts biologically to his environment in a non-biological way—through culture.
>
> "Since man is one of the most widely distributed of species occupying a vast array of environments ranging from deserts to swampland, from plains to mountains, from inland to the sea, and because his social and technological environment varies as widely, we should not be surprised to find a range of behavioral variation adjusted to specific environments" (*The Human Imperative*, Columbia University Press, 1972, pp. 21-22).

This finding was never popular with those who supported class rule and capitalist privilege. It had implications which were too democratic, let alone too socialist, for them. In fact, it confirmed that the so-called “human nature objection” to socialism was completely unfounded: people could adapt to living in socialism, just as they had adapted to living in primitive tribal communism, ancient slave society, feudalism and capitalism.

So, after leaving a respectable time for people’s memories of Nazism to dim a little, the defenders of a muscular biological determinism began to make a reappearance. One of the first was the Austrian naturalist Konrad Lorenz,. A book he had written in German in 1963 was translated into English and published in 1966 under the title *On Aggression*. In it he argued that humans were naturally aggressive, or, as he put it, that they were “phylogenetically programmed” for aggressive behaviour.

In a chapter entitled "The Spontaneity of Aggression", Lorenz claimed that aggression in humans was an internally-generated "drive" that was part of their genetically-inherited physiology:

> "Knowing of the fact that the aggression drive is a true, primarily species-preserving instinct enables us to recognise its full danger: it is the spontaneity of the instinct that makes it so dangerous. If it were merely a reaction to certain external factors, as many sociologists and psychologists maintain, the state of mankind would not be so perilous as it really is, for, in that case, the reaction-eliciting factors could be eliminated with some hope of success" (*On Aggression*, Methuen, 1969, p. 40).

This assertion was based on his own studies of non-human animals, mainly birds and fishes, and on his personal belief in Freud's view that "we are still driven by the same instincts as our prehuman ancestors" (p. 193).

His fellow scientists were highly critical of the book. They pointed out that in talking about “instincts” in humans he was having recourse to a notion long since discarded as

unhelpful; that his view about their being "phylogenetically evolved patterns of social behaviour" in humans went against the evidence of anthropology and history; that it by no means followed that what applied to other animals therefore applied to humans; that in any event the behaviour he described as aggressive didn't apply to all animals; that even in those to which it did apply it was not always clear that it might not be learned.

On the key issue of whether aggressive behaviour in humans was triggered in response to external factors or, as Lorenz asserted, in response to some internal "drive" that had to be "discharged", opinion (apart from a few die-hard Freudians) was unanimous: Lorenz had drawn the wrong conclusions from the facts. There was no "fighting instinct" or "aggression drive" in humans; aggressive behaviour in humans was triggered by external causes. This being so, the situation was not as dangerous as Lorenz had imagined since, on his own admission, this meant that these external aggression-eliciting factors could be eliminated "with some hope of success".

Another pioneer of this revival of Social Darwinism was the playwright and Hollywood scriptwriter Robert Ardrey whose *The Territorial Imperative* also appeared in 1966. He was followed by Desmond Morris in 1967 with his *The Naked Ape*. Ardrey was writing explicitly as an anti-socialist, subtitling his book "A Personal Inquiry into the Animal Origins of Property and Nations". His argument was that private property and the division of the world into competing states was natural. "The territorial nature of man is genetic and ineradicable", he wrote. The level of his argumentation can be judged from the following reply to those who said he was wrong about humans' being genetically territorial:

> "Either fence-lizards, Canadian beavers, prairie dogs, three-spined stickleback fish, howling monkeys, defiant wildebeest bulls, intolerant female cameleons, warblers in variety, and gulls in variety were wrong—or Karl Marx was wrong" (*The Hunting Hypothesis*, Collins, 1976, p. 111).

He just took it for granted that what might be valid for the animals he trotted out to support his contention must therefore automatically be valid for humans too. In fact, it wasn't, as a key distinguishing factor of humans is that virtually all our behaviour is acquired and not governed by our genes. So, if humans did sometimes behave in a possessive or territorial or aggressive way—as undeniably they did and do—this was not because this was in their genes but because they had acquired it from the society in which they lived and its culture. In a different society, with a different culture, humans could adapt to behaving in non-possessive, non-territorial and non-aggressive ways.

Ardrey had already written a book *African Genesis* in 1961 in which he publicised the views of the anthropologist Raymond Dart, who had argued that humans were descended from a species of ape which, unlike apes up till then and unlike today's surviving apes, hunted other animals for meat in order to survive. Although Dart overstated his case, this view is now widely accepted. Ardrey returned to this theme in another book *The Hunting Hypothesis* and proclaimed not only that we were descended from "killer apes" but that

this was basically what we still were.

This was based on another fallacy. Just because we had evolved from animals which had been hunters didn't mean that this had become embedded in our genes; the end result of the evolution through such animals was another animal, one with a brain capable of allowing it, through abstract thinking and culture-acquisition, to adopt new behaviours and so to adapt its behaviour to a great variety of different ways of surviving. We may well have first been hunters (as well of course as gatherers) but later were able to adapt to becoming farmers and herders and, today, to living and working in a society relying on industrial methods of production.

In describing humans as "naked apes" Desmond Morris completely missed the point. The first thing any zoologist studying us from the outside as just another animal (which was Morris's starting point) would have noticed is that most of the time we were not naked but clothed. The zoologist would then have had to investigate why, and would have discovered that we were an "ape" (or a "third chimpanzee" as another writer has put it) that was capable of fashioning parts of the rest of nature to provide an artificial substitute for the fur and hairs that nature had left us without. Once started down this road, the zoologist would have discovered that it wasn't just clothes that we were able to produce, but also most of the other things we needed, by having recourse to tools we had made to substitute for other biological features nature had left us without. The zoologist would have had to conclude that we were "clothed, toolmaking apes" and that this made such a difference that maybe we shouldn't be classified as apes at all but as an animal in our own right. This wasn't Morris's conclusion of course. His was that we were genetically still primitive hunters ill-adapted for living in modern society. *The Naked Ape* was a huge commercial success selling over 8 million copies and launched Morris on a long and financially rewarding career as a purveyor of unscientific notions about humans to the general public.

Morris's method was to seek out a constant behaviour pattern or psychological trait ("assembled by simple, direct observation of the most basic and widely shared behaviour patterns of the successful mainstream specimens from the major contemporary cultures") and to declare this to be part of humans' inherited biological nature. However, just because one particular behaviour pattern could be identified as a constant of human behaviour in different times and places does not mean that it is therefore biologically determined. It could equally be the result of similar environmental conditions producing similar learned behaviours as a response. Not that it was easy for Morris to find behaviours that have been common to all humans at all times, so great has been the variety of human behaviour at different times and in different places. In the event, he had to resort to dismissing some forms of behaviour—such as the non-aggressive or non-possessive behaviour or equality between the sexes practised by some tribal societies—as eccentric or that of losers whose societies were failures. As he put it, such societies were "cultural backwaters" which "revealed just how far from the normal our behaviour can stray without a complete social collapse". Talk about assuming what you are setting out to try to prove.

Once started, this pandering to the popular prejudices reflected by the likes of Ardrey and Morris began to infect scientists too, and what can only be described as a regression in the understanding of many of them occurred. In 1971 a specialist in the study of ants, E. O. Wilson, outlined a grandiose scheme called “sociobiology” whose objective was to attempt to explain human social behaviour in terms of the influence of our genes, to reduce sociology to biology. In a later book, *On Human Nature* that first came out in 1978, he declared that socialists had misunderstood human nature:

> "The perception of history as an inevitable class struggle proceeding to the emergence of a lightly governed egalitarian society with production in control of the workers is (. . .) based on an inaccurate interpretation of human nature" (*On Human Nature*, Penguin, 1995, p. 190).

Wilson denied that the human brain that had evolved through natural selection was "an all-purpose device, adaptable through learning to any mode of social existence", and asserted that, on the contrary, genes inherited from the time humans first evolved, and adapted for life in that environment, strongly predisposed humans to behave in society in particular ways.

The technique was easy: you examined human behaviour to try and find something constant; you then assumed that this was determined by biology, by the genetic make-up of humans; the final step was to work out a more or less plausible theory as to why and how this might have become fixed in our genes during the period when anthropoid apes and earlier forms of *Homo* were evolving into *Homo sapiens*.

Thus, for instance, religion might be identified as a constant of human behaviour and a gene for a belief in religion assumed and a theory developed as to how a gene for believing in something greater than the individual might have had a survival value for the ancestors of *Homo sapiens*, which the working of Darwinian natural selection would have incorporated into our genetic make-up. Or, the dependence of women on men; this would be said to have become genetically determined because during the period we evolved men went off hunting while the women stayed at home looking after the children, etc, etc, etc. It was a game anyone could play, and which feature writers and TV producers played to the full. Amusing perhaps, but totally unscientific.

Wilson was a biologist but the game was so easy that others wanted to get in on the act. So was born “Evolutionary Psychology”, whose slogan is "our modern skulls house a stone age mind", which allowed psychologists to play the game too, choosing some psychological trait and subjecting it to the same treatment. Like Ardrey and Wilson, one of their leading lights, American university professor Steven Pinker, wrote as an explicit critic of socialist ideas:

> "One of the fondest beliefs of many intellectuals is that there are cultures out there where everyone shares freely. Marx and Engels thought that preliterate peoples

> represented a first stage in the evolution of civilization called primitive communism, whose maxim was 'From each according to his abilities, to each according to his needs'" (*How the Mind Works*, Penguin, 1998, p. 504).
>
> "Those who believe that communism or socialism is the most rational form of social organisation are aghast at the suggestion that they run against our selfish natures" (*The Blank State*, Allen Lane, 2002, p. 161).

For him as for Wilson, this would not have been biologically possible because such free sharing would not have had any survival value and so brains capable of practising it would not have evolved. It followed that such a society is still biologically impossible today, as we still have the brains appropriate to the hunting and gathering life we led on the African savannah during the period when our genetic make-up was fixed:

> "For ninety-nine percent of human existence, people lived as foragers in small nomadic bands. Our brains are adapted to that long-vanished way of life, not to brand-new agricultural and industrial civilizations. They are not wired to cope with anonymous crowds, schooling, written language, government, police, courts, formal social institutions, high technology, and other newcomers to the human experience" (*How the Mind Works*, p. 42).

Pinker argued that the human mind is a "neural computer" that was "designed" by natural selection acting as a "blind programmer". This is perhaps one way of putting it, but "designed" for what? Pinker jumped from the assumption that the human mind must be "wired" for symbolic language and stereoscopic vision (a not unreasonable conclusion since, as we have seen, these are two features of human biological nature) to the highly dubious proposition that it must be similarly "wired" for reacting to conditions as they were during the Stone Age.

This argument that we still have a "stone age mind" cuts both ways. Another evolutionary psychologist, Andrew Whiten, professor of evolutionary and developmental psychology at the University of St. Andrews in Scotland, has pointed out that for Pinker's "ninety-nine percent of human existence" people lived in a state of "primitive communism":

> "Humans are the most social species on Earth and our ancestors formed hunter-gatherer groups which pulled together to adapt to their new lifestyle. Unlike every other species, they had an egalitarian culture where everything was shared out equally: no other animal does that. There was also no hierarchy in the society or tribal chiefs, as anyone who tried to lead was pushed back down by the others. Everyone was considered to be equal and they lived in a culture of primitive communism. We might expect as the products of evolution our ancestors would be selfish, but it was their ability to work together and support each other which made them more successful than any other. This supportive culture allowed technology and skills to be passed down and improved with each generation. Although this egalitarian lifestyle is not present in most of the world today, it may

> be resting dormant within us waiting to be reawakened" (Paper delivered to the Royal Society of Edinburgh, see *The Times*, 19 August 2000).

In other words, if we really were "hard wired" or "designed" by natural selection for living in any particular kind of society it would be for socialism rather than capitalism!

Much as we would like to believe that humans are genetically programmed for living in a non-hierarchical, sharing, co-operative society, there is no evidence that *any* of our social behaviour patterns are genetically programmed or could be. What our genes govern is how our bodies function and how they renew themselves, not the sort of complex behaviour patterns that the biological determinists have in mind.

The first analyses of the Human Genome Project, published in February 2001, confirm that we are not "hard wired" by our genes to behave in society in any particular way, but that how we behave depends crucially on what we have learned from our environment rather than on what we have inherited from our genes. In the words of Craig Venter, head of one of the two teams working on the project, "the wonderful diversity of the human species is not hard-wired in our genetic code. Our environments are crucial" (*Observer*, 11 February).

Venter explained the more of the science behind this conclusion in the official press release issued by the journal *Science* which published his team's results in its 16 February issue:

> "There are many surprises from this first look at our genetic code that have important implications for humanity. Since the June 26, 2000 announcement our understanding of the human genome has changed in the most fundamental ways. The small number of genes—30,000 instead of 140,000—supports the notion that we are not hard wired. We now know that the notion that one gene leads to one protein and perhaps one disease is false. One gene leads to many different products and those products—proteins—can change dramatically after they are produced. We know that regions of the genome that are not genes may be the key to the complexity we see in humans. We now know that the environment acting on these biological steps may be key in making us what we are. Likewise the remarkably small number of genetic variations that occur in genes again suggest a significant role for environmental influences in developing each of our uniqueness".

Ironically, but fittingly, it is the science of genetics itself that is undermining the speculations and prejudices of the biological determinists. Its advances are discovering that the parts of the brain involved in human social behaviour are "wired" after birth, depending on the social environment in which the human child grows up. It is this biological capacity to get wired after birth that is gene-governed, not the content of the wiring. In other words, the findings of genetics are confirming those of anthropology that the main biological characteristic of humans that distinguishes us from non-human

animals is the capacity, as a species, to engage in a great variety of social behaviours.

Chapter 6: Behaviour and socialism

The argument between biological determinists (who say that human behaviour is governed by our genes) and those, including socialists, who say that, on the contrary, human behaviour is acquired from our social environment is not about the facts of how humans do behave. Aggressive behaviour, acquisitiveness and male dominance are features of life today. The question is not whether they exist or not but what causes them.

In one of his books Ardrey wrote that "there is no great difference between a mode of action learned from social tradition and another directed by innate compulsion" (*The Hunting Hypothesis*, p. 132). As far as the action itself is concerned this is true. Aggressive behaviour is aggressive behaviour whatever its cause. But when it comes to what might be done about it there's all the difference in the world. If it is "directed by innate compulsion", then that's it, there's not much that can be done about it; we'll just have to live with it. If, on the other hand, it is "learned from social tradition" then we can do something about it; we can change the social tradition. This may be slow and may not be able to be done immediately, but it is certainly possible.

The socialist objection to biological determinism is not that it is determinist. As materialists we agree that everything, including human behaviour, has a material cause; our quarrel with the biological determinists is that they have misidentified the determining cause of human behaviour—it's society not biology. In fact some of them such as TH Huxley and Haeckel, and today EO Wilson and Richard Dawkins, have been valuable allies in the ideological battle against religion, in particular against its present dogma that, though it might be evolution through natural selection that created our bodies it was a supernatural being that gave us reason and a free-floating "free will".

Socialists defend the finding that human behaviour is acquired and not innate, because this is what the accumulated evidence shows. Human behaviour throughout the ages has been so diverse that it is not possible to conclude that, to continue with our examples, aggression, acquisitiveness and male domination, are universal; and not just throughout the ages, such behaviour is not even exhibited by all people today. What this suggests is that humans as a species possess the capacity to engage in a great variety of behaviours and that it is this behavioural flexibility and versatility that is "human nature".

This is confirmed by the study of the genetic make-up of humans. Our brains are adapted for acquiring new behaviours and for thinking abstractly and communicating by means of a structured language based on abstract symbols, and we have a biologically-governed prolonged period of growing up during which we learn the most intensively, in particular language and social skills. Neuroscience is making advances in our understanding of how the brain works but it is not uncovering anything to suggest that complex behaviour patterns such as aggression or possessiveness are, or even could be, innate. Quite the contrary, what neuroscientists are trying to discover is what it is in the make-up and functioning of our brains that allows humans to have a repertoire of many more behaviours than any other animal.

The counter-arguments put by biological determinists against social determinism are not very impressive. One is that social determinists are preaching that human nature is good, the myth of the "noble savage". “Good” and “bad” are not concepts that science employs but, insofar as Christianity preaches the “innate depravity” of humans, then in rejecting this socialists are indeed saying that human nature is not “bad”. But this is not the same as saying that it is therefore “good”, that humans are some sort of angels who only think of the good of others. In fact humans as a species are neither “good” nor “bad”.

The second accusation is that social determinists believe that you can take any human being and mould them to be anything. It is true that some materialists such as the pioneer socialist Robert Owen and the American behaviorists JB Watson and BF Skinner unwisely came very near to taking this position. It is also true that some social determinists have used words such as "malleable", "educable" and "plastic" which could suggest that the acquisition of behaviours by humans is a passive conditioning, which it isn't. Marxists, however, can plead not guilty here as Marx, as early as the 1840s, had pointed out that humans played an active role in the relationship between them and their environment and had criticised other materialists for not taking this into account.

People do have different biologically-inherited learning capacities (even if most people today could have learned a lot more than present social conditions have allowed them). Individual humans are each unique and every one of us has inherited, through our genes, not just different physical features but also different learning capacities. The so-called “nurture/nature” argument (to the extent that it has any sense) applies to individual humans, not to the whole species. Virtually all human behaviour is acquired, but some humans can learn more or different things better than others. This fact of biology in no way undermines the socialist case since the aim of socialism is not to make everybody exactly equal but to allow everybody the full chance to develop their abilities. In fact, even if racists were to be shown to be right that one group of humans were less able to learn than other humans (which of course they haven't been, just the opposite in fact) this would still not invalidate the case for socialism. The long-standing socialist principle of “from each according to their abilities, to each according to their needs” is based on people having different abilities and everyone, whatever their abilities, having the same right to satisfy their needs.

But how, if people have learned to behave in ways that fit in with capitalist society, can their behaviour change to what would be appropriate in a socialist society? Robert Owen thought he had the answer; an enlightened minority should work to change the conditions under which the majority lived; once these conditions had been changed, then so in response (thought Owen) would their behaviour. Lenin held a basically similar position: workers under capitalism were incapable of acquiring a socialist consciousness; only a minority could; this minority should work to seize political power from the capitalists and then use it to educate the majority into socialist ideas and behaviour patterns. Both Owen and Lenin were advocating what today would be called “social engineering”.

This is not what we in the Socialist Party are advocating. We agree with the criticism Marx made of Owen's views in 1845 that they were both inadequate and elitist:

> “The materialist doctrine concerning the changing of circumstances and education forgets that circumstances are changed by men and that the educator himself must be educated. This doctrine has therefore to divide society into two parts, one of which is superior to society".

And with his way out of the dilemma:

> “The coincidence of the changing of circumstances and of human activity or self-changing can only be comprehended and rationally understood as revolutionary practice” ("Theses on Feuerbach", translation in *Karl Marx, Selected Writings in Sociology and Social Philosophy*, ed. TB Bottomore and M. Rubel, Pelican, 1963, pp. 82-83).

In other words, people brought up under capitalism can change both circumstances and themselves at the same time. The revolutionary change of circumstances from capitalism to socialism cannot be brought about by an educated elite, however well-meaning; it can only be brought about by the majority themselves once they have learned, from living under capitalism, that if they are to better their lives they must establish socialism as a system of society based on the common ownership and democratic control by all the people of society’s productive resources.

Once socialism has been established social conditions will have changed, most notably in two respects. First, individual humans will no longer have any problem of material provision. Everybody will have free access to the things they need to live and enjoy life, such as food, clothing, housing, health care, transport and entertainment. Considering what a constant worry this is for all but the very rich today and how much of our time and energy it takes up, this will represent a great change in the conditions in which we live.

Second, with the abolition of the division of society into two classes with antagonistic interests, with the one trying to exploit the labour of the other as much as possible and with the other resisting, there will be, for the first time since the break-up of the primitive tribal communism in which humans lived for tens of thousands of years, a genuine community with a genuinely common social interest. This, too, will represent a great change of social conditions compared with today.

Humans are not "naturally lazy". Quite the opposite. We need to exercise our physical and mental energies but, quite naturally, want to do this in a creative, pleasurable or at least meaningful way. What people object to is work that is boring, over-tiring or meaningless, but this is the only kind that capitalism has to offer most people in return for selling their mental and physical energies to an employer for a wage or salary. It is such work for an employer that people seek to avoid and which gives rise to the "humans are naturally lazy" argument. Yet even under capitalism, if people think work is creative or

useful they will undertake it, even without requiring payment as witness the time and energy that many people put into voluntary work and into their hobbies and pastimes. In a socialist society, freed from exploitation and working for wages, work will of course still have to be performed to produce the goods and services to which people will have free access, but this will be a question of organisation, of fitting together the work that needs to be done and the people willing to do it in the quite different working conditions that will then prevail.

The coming of socialism will not require great changes in the way we behave, essentially only the accentuation of some of the behaviours which people exhibit today (friendliness, helpfulness, cooperation) at the expense of others which capitalism encourages. Capitalism has an all-pervading culture of violence, competitiveness and acquisitiveness, and people are under pressure to adapt their behaviour to this. In socialism this culture will disappear and people's behaviour will no longer be shaped by it.

Of course, sometimes people will get frustrated and annoyed and this will occasionally find expression in an act of aggression, but this would be the isolated act of an individual. Social acts of violence such as war, training for war, terrorism, violent crime, vandalism and the like will disappear, as the social conditions that generated and sustained them will have disappeared.

Nor does socialism require us all to suddenly become altruists, putting the interests of others above our own. In fact socialism doesn't require people to be any more altruistic than they are today (a behaviour which is greater than biological determinists like to admit and which presents them with the insoluble theoretical problem of how a gene for such behaviour, which they have obliged themselves to believe in, could have evolved). We will still be concerned primarily with ourselves, with satisfying our needs, our need to be well considered by others as well as our material and sexual needs. No doubt too, we will want to "possess" our toothbrush, our clothes and other things of personal use, and to feel secure in our physical occupation of the house or flat we live in, but this will be just that—our home and not a financial asset.

Such "selfish" behaviour will still exist in socialism but the acquisitiveness encouraged by capitalism will no longer exist. Under capitalism we have to seek to accumulate money since the more money you have the better you can satisfy your material needs, and as an insurance against something going wrong (like losing your job) or as something to hand on to your children or grandchildren. People are therefore obliged by their material circumstances to seek to acquire money, by fair means or foul and if need be, when push comes to shove, at the expense of others. This is why capitalism has earned the name of "the acquisitive society".

Socialism won't be an "acquisitive society" and won't need to be, as everybody will be able to satisfy their material requirements as of right and without needing to pay money. In fact, because productive resources and the social product will be owned in common there won't be any need for money; just products—useful goods and services—ready to

be distributed for people to take and use. And, because people could always be sure that the stores will always be stocked with the things they need, there would be no incentive to grab and hoard; that would be an irrational and pointless behaviour in the new social conditions.

The scientist and visionary Carl Sagan once put it rather well:

> "Humans have evolved gregariously. We delight in each other's company; we care for one another. Altruism is built into us. We have brilliantly deciphered some of the patterns of Nature. We have sufficient motivation to work together and the ability to figure out how to do it. If we are willing to contemplate nuclear war and the wholesale destruction of our emerging global society, should we not also be willing to contemplate a wholesale restructuring of our societies?" (*Cosmos*, Futura, 1987, p. 358)