# A Gene's Eye View: W.D. Hamilton, the Science of Society, and the New Biology of Enlightened Self-Interest, 1950-1990

Sarah A. Swenson

Balliol College

Doctor of Philosophy

History of Science and Medicine

## Short Abstract

W.D. Hamilton has been celebrated as the twentieth-century Darwin. His extension of evolutionary theory to explain social behaviours has been extensively documented. Current accounts, however, have often overlooked the extent to which his early research goals were tied to his desire to see that a better world was created through a scientific understanding of society. In fact, when his interests in humans, and especially his eugenic concerns, have been acknowledged, they have been distanced from his scientific achievements and treated separately. Using new sources to reexamine the development of Hamilton's most famous idea, the theory of inclusive fitness, we may better understand how his perception of cultural upheaval shaped his reading of social behaviours as evolved characters following universal laws.

Understanding this, we may see that however successful Hamilton was, he never realized his original dream, which was to devise a theory that would inform the human world, replacing religious and ideological beliefs. As he sought to solidify his career in the 1970s, he moved away from publicly disclosing his more controversial ideas. This meant that by the time the science of social behaviour inspired heated debates, he was almost always absolved from political critiques. Many assumed that his theory was derived from observations of insects, and his eugenic ideas were forgotten, ignored, or not understood. He was therefore well positioned to become the objective figurehead of a new discipline, sociobiology. This does not mean that his desire to understand society as the result of genetic laws subsided, and by placing inclusive fitness against its social and political background, we might reimagine its trajectory and its impact in new ways. We might also begin to see Hamilton not as an isolated scholar unengaged with society but as an individualist whose extra-scientific beliefs paralleled his scientific theories in meaningful ways.

# Long Abstract

W.D. Hamilton has been heralded as the twentieth-century Darwin. His theory of inclusive fitness, for which he is most famous, remains a cornerstone in the field of evolutionary biology. The theory proposed an explanation for the evolution of altruism. To some, altruistic behaviours had seemed at odds with Darwin's theory of natural selection and its Malthusian factor, or the 'struggle for existence'. How could traits evolve if they not only decreased the likelihood that an individual would survive to reproduce but also increased the chance that its competitors would? As Hamilton saw it, the answer to this question was connected with rates of dispersal. If dispersal rates were low, individuals would be competing for resources with their close relatives, and all-out competition would be dramatically less advantageous. According to Hamilton, relatedness was the key factor in determining whether self-sacrifice would evolve. Ultimately, he claimed that behaviours that appeared altruistic were ultimately selfish when seen from the gene's eye view: they tended to benefit relatives and thus ensured that an individual's genes would survive to future generations, whether they were directly passed to progeny or indirectly transmitted through the reproduction of organisms that shared its genes, albeit in diluted form.

Previous accounts of Hamilton's place in the history of biology have almost unanimously adhered to a set of implicit assumptions concerning his ability to extend Darwinian theories of evolution into the realm of social behaviour. The first concerns Hamilton's reading of British statistician R.A. Fisher's *The Genetical Theory of Natural Selection* (1930) as an undergraduate student. Fisher's foundational text has often been divided into two parts, even though Fisher himself was adamant that the book should be read as a cohesive whole. Although the first part established the Mendelian basis of the theory of evolution by natural selection and continues to be admired today, the second is often understood to be an unfortunate consequence of Fisher's eugenic beliefs and thus rendered obsolete. Many scholars have seen Hamilton's early interest in Fisher's text to be an outcome of his precocious understanding of the mathematic argument made in the first part of the book, which proves largely impenetrable to this day, rather than an enthusiasm for Fisher's chapters on humans. Beyond this, it is assumed that Hamilton, a graduate student at the time he devised his theory, was an isolated and ideologically untouched scholar, more at home with insects than with people. Lastly, it continues to be taken as fact that his understanding of relatedness as an important factor in altruism was primarily tied to his in-depth knowledge of social insects and their unique breeding structures. With these features of the traditional narrative in mind, many believe that Hamilton despised prevalent and largely unquestioned conceptions of group selection and aimed to replace them with a gene's eye view of social behaviour. Through careful attention to Hamilton's personal archive, this thesis questions the historical accuracy of the above assumptions. What is more, it asks whether we can gain a more nuanced understanding of the theory of inclusive fitness if we see it as having emerged from a specific social and political world, and indeed a specific mind set, characterised by strongly held ideas about the limits of society.

The theory of inclusive fitness has been a topic of interest to scientists, historians, and sociologists because of its continued influence on a wide range of disciplines. It is also significant due to the role it played in influencing what may have been one of the most heated biological controversies in the second half of the twentieth century, namely the controversy over sociobiology.

Thus, this thesis investigates not only the development and early life of the theory, while it was yet unpopular, but also the public life of inclusive fitness from the late 1970s, after it became well established and widely cited. Inclusive fitness proves especially interesting because it formed the backbone of both the esteemed Harvard entomologist E.O. Wilson's controversial *Sociobiology: A New Synthesis* (1975) and the young Oxford biologist Richard Dawkins' *The Selfish Gene* (1976), and yet it has been largely absolved from the political critiques these books received. This is most likely because Hamilton's work was so associated with non-human animal societies, especially those of the social insects, whereas Wilson and Dawkins made explicit the relevance of the biology of social behaviour to human society. This misconception concerning Hamilton's work has been persistent, despite the fact that Hamilton combatted it throughout his life. In fact, he was adamant that he had always meant his theory to be universal. What is more, Hamilton himself was confident that his work would have meaning in the human world.

Attention to Hamilton's rich and largely untapped archive highlights the extent to which Hamilton's interest in the biology of altruism was tied to his concerns, often eugenic, for the future of humankind. Although his eugenic beliefs are well known and widely acknowledged, they have been identified by at least one prominent biologist, Alan Grafen, as non-scientific and effectively distanced from Hamilton's biological work. Nevertheless, we may now understand more clearly the extent to which Hamilton saw a connection between his eugenic concerns and his interest in altruism. In fact, it was with human examples of altruism in mind, amidst concerns that Marxist ideologues were getting human nature all wrong, that he came to believe relatedness must be a factor in determining who will make sacrifices and for whom. Firmly convinced of this, he searched for non-human examples of altruism to support his intuition; throughout his research and his attempts to calculate an 'altruism equation', he remained hopeful that his work would shed light on the human condition. In fact, it is likely that this prospect sustained him when his ideas, and especially his uncompromising stand that inclusive fitness was relevant to discussions of human social behaviour, were repeatedly met with antagonism from other scholars.

Much of the current literature on Hamilton has drawn upon his autobiographical publications, dating from 1996. The memoirs of powerful and established figures, whether they are politicians or scholars, however, are of course limited by the fact that they are often purposely constructed with the idea that they will become part of the public record. Some may be concerned that Hamilton's archive, too, reflects this sort of bias, at least inasmuch as he saved materials with the idea that they would be conserved and studied after his death. Bill Hamilton's archive, somewhat surprisingly, proves to be remarkable in this respect. Although he certainly did not preserve everything, there is little indication that he tidied up his record to suit a particular agenda or reinforce his place in the history of science. He felt very deeply that his less palatable beliefs, especially his eugenic concerns, were arrived at not only through careful, rational, objective thought but also with a total disregard of what he and others would *like* to be the case. For this reason, he was seldom shy about declaring these provocative attitudes, even in his published memoirs.

A major difference between the materials in Hamilton's archive and his later recollections of his life and work is the vast discrepancy in his professional standing at the time each record was made. Thus, Hamilton's archive provides an astonishingly candid account from periods in his life when his place in the history of biology was less secure or altogether non-existent. This means that he had little to lose in honestly articulating his thoughts, fears, and concerns. Owing to this, Hamilton's record often provides great illumination into less desirable aspects of the world he inhabited. Thus, his archive is very much both a personal record and a social record. Beyond offering greater insights into the life of one of biology's most celebrated scholars, it also affords a remarkably unguarded account of a social and political world that was very much in flux. What is more, it sheds light on the attempts by experts in one discipline, biology, to find order in a disordered world.

Through Hamilton's archive, we see that although sociobiology became a topic of intense debate from the mid-1970s, the origins of the 'new synthesis' can be found in 1950s Britain. For this reason, an understanding of the assumptions Hamilton inherited as he began to study biology is the focus of Chapter One. It was amidst biologists advocating that their discipline would provide the basis for a new understanding of the human condition that the young Bill Hamilton decided to join the profession.

From the journal entries and letters he wrote in the 1950s, we can understand just what a career in biology meant to him at the time he made this decision, and this will be the focus of Chapter Two. Through a close biographical examination of Hamilton's student days, we will see that he was eager to follow the path set by Darwin. To him, this meant that his work would inevitably inspire great controversy: what Darwin's theory of natural selection had shown was that the myths and superstitions of British culture, and especially its Christian aspects, would necessarily collapse in the face of rational, scientific inquiry of what it means to be human. We also see that although many historians have recognized that Darwin never meant his theory to be coldly mechanical and brutal, producing as it did in the end humans with deeply established moral sentiments, Hamilton did not read Darwin so positively. When he copied out passages from Darwin's texts, he intended to etch in his mind those that emphasized competition as the predominant fact of nature.

Beyond Darwin, Hamilton was also following a more recent tradition of biologists such as Julian Huxley. Against the backdrop of biologists' hopes that their discipline, backed by advances in genetics, would inform a new and a better world, Hamilton began his research into the nature of altruism and selfishness. Initially, he aimed to produce a biological theory of ethics, and his desire to construct simplistic models of society was at least in part a reaction to his despair when faced with the idea that the real world was impossibly chaotic. His characteristic tendencies to opt for single explanations, even when comparing the breakdown of mechanical parts with the aging human body, and simple rationalisations, even when discussing complicated phenomena he had read relatively little about, such as the Russian revolution, will be detailed. These, combined with his faith in the power of his own intuition, would prove to be constant features in his methodology.

In Chapter Three, we follow Hamilton from 1963, the year he gained his first publication and made his first trip to Brazil. Although he had found few who were enthusiastic about his worldview to that point, he was confident that tides were beginning to turn in his favour. Owing to this reassurance, he continued to articulate his concerns for the future of humankind and his belief that only an evolutionary understanding of human

behaviour could meaningfully inform society. He published such concerns for the first time in a review article in 1965, but it is foremost through attention to a collection of unpublished records from this period that we may reassess the extent to which it was collectivist commitments in general, rather than group selection thinking in particular, that Hamilton was initially responding to as he inquired into the biology of social behaviour.

As Chapter One will have made clear, the limits of positive social behaviours, such as altruism and cooperation, were a pressing concern in the postwar decades. The desirability of international peace as well as the possibility of a global economy meant that the likelihood of disparate groups working together was often debated. What is more, the Labour Party ascended to power in 1945 after successfully campaigning on visions of a social safety net that would protect its citizens from cradle to grave. The viability of the welfare state it enacted was continuously called into question in the years that followed, especially amidst increased Commonwealth immigration in the 1950s. Politicians and members of the public alike worried that generous welfare provisions were luring the wrong groups of people to Britain. In articulating these concerns, they implied a sense of agreement that general sacrifices could be made on behalf of individuals in need, but with limits. If the individual in need was from a particular country or of a certain 'race', such sacrifice was suddenly felt to be untenable. These discussions as well as their relevance to Hamilton's theory will form the background to Chapter Four.

It is also in Chapter Four that we will see Hamilton begin his explicit attack on group selection ideas within biology. As earlier chapters will have made clear, the concept of the 'group' within scientific discourse was impacted by the rhetoric surrounding the Cold War conflict between capitalism and socialism. At the time, 'socialism' was understood by many to be the mirror opposite of capitalism, and this was certainly how Hamilton saw it. Furthermore, 'socialism' was almost always identified in connection with the economies modelled by the Soviet Union, which Hamilton had rejected from his early years. He believed both the ideas that humans could exist without property and that they could unite in some form of global brotherhood contradicted the laws of nature. In fact, we will see that Hamilton was above all committed to promoting individual freedom, and he was neither isolated nor unengaged. In fact, he was very much attuned to prominent social and political questions. His archive demonstrates the extent to which he was an individualist, and in this way, his personal values were well aligned with his perception of a natural social order that emphasized individuals and families over larger groups.

Beyond an enduring concern that nuclear war could break out at any moment, the postwar decades had been marked by unprecedented social transformation, and with it, a certain shared optimism that change was possible. From the early 1960s, however, Hamilton rejected such optimism not only as it was communicated through Christian or Marxist doctrines of sociability but also as it was articulated through social scientists' 'blank slate' interpretations of human nature. The 'truth' he offered was much more pessimistic: nepotism, racism, and tribalism were persistent features of the human world because they were natural and evolved. Positive social behaviours could be selected, but only in populations with low migration rates, that is to say, in communities where individuals would share a large proportion of their genes. This 'fact' of nature, as Hamilton saw it, could meaningfully inform a wide range of social and political issues.

Still, Hamilton's vision of human nature and a natural social order was not immediately taken up. Chapter Five explores Hamilton's attempts to gain relevance in the

early 1970s. While some scholars, including E.O. Wilson, G.C. Williams, Robert Trivers, and George R. Price, were already committed to Hamilton's theory and eager to build a research agenda upon it, Hamilton struggled professionally. As a lecturer at Imperial College, he would go over ten years without promotion, and this was one reason that by the mid-1970s, he was ready to leave Britain for career opportunities in the United States.

From the outset, Hamilton's theory had been received much more enthusiastically in the U.S. than it had been in Britain. Hamilton's move, however, which forms the basis of Chapter Six, was certainly facilitated by the controversy surrounding the publication of Wilson's *Sociobiology* in 1975. He was offered a visiting professorship at Harvard University, the centre of the sociobiology debates, but the offer he accepted for a permanent position came from the University of Michigan, which also hosted an active group of scientists committed to attacking the research agenda Hamilton had in large part inspired.

Although it definitely had its opponents, both within and outside of biology, sociobiology also had a growing number of advocates across disciplines. Still, Hamilton's theory of inclusive fitness was only seen to be intuitive after cultural tides shifted away from the collective and towards the individual in the 1970s. Amidst such change, the previously shared faith in the possibility of global harmony, which Hamilton had always questioned, appeared deeply flawed and overly idealistic. A retreat from the social transformations of earlier years began to take place, and sometimes this was explicitly or implicitly tied to the idea that man was rational and calculating. In fact, man was sometimes seen to be little more than a vehicle for his selfish genes, and this 'scientific' conclusion would certainly have ramifications in the world of policy.

Despite having been suddenly thrown into the spotlight, Hamilton was not eager to involve himself in controversy. Having only so recently become an established figure in biology, he was for a time reluctant to publicly discuss the biology of social behaviour in relation to man. Since the early 1970s, he had turned his professional career toward a number of topics that were further removed from his concerns regarding human evolution, and his later publications seem to have reinforced existing presumptions that he had been interested in insects, not humans, all along. With few exceptions, he was therefore able to comment on controversies surrounding sociobiology, especially through his 1977 reviews of Wilson's and Dawkins' books, from the position of a disinterested and apolitical naturalist. This certainly does not mean that Hamilton had suddenly become less interested in the bearing evolution had on the human condition. In Chapter Seven, we see through his participation in the Human Behavior and Evolution Society that his concerns for the future of humankind were lasting.

While the focus of this thesis may at first sight appear somewhat narrow, emphasizing as it does the work of a single biologist and only one of his many theories, it nevertheless reveals a number of themes that speak to wider issues, both scientific and social, in the second half of the twentieth century. Through close attention to Hamilton's records, we are able to gain a more nuanced understanding of the widely celebrated theory of inclusive fitness. Rather than a scientific theory that was ahead of its time or, indeed, timeless, we may see the many ways in which inclusive fitness, as well as the meaning Hamilton intended it to have for the human world, is illuminated by an understanding of the social and political background against which and within which it was formulated.

With this in mind, we can see the extent to which Hamilton was caught up in the spirit of postwar social engineering that surrounded him, but rather than government

administrators, he believed that scientific experts should inform policy considerations. When we understand the wide range of questions Hamilton hoped his research agenda would inform, we may also begin to consider the collectivist culture he was eager to combat, and this certainly extended far beyond the reach of group selection thinking within biology. Ultimately, he aimed to establish the primacy of a scientific understanding of human nature over competing types. The reconstruction of Hamilton, consciously or unconsciously, as 'nature's oracle' seeks to secure the superior position of biology in relation to other disciplines that hope to shed light on what it means to be human. In doing so, however, such accounts ignore the lasting and significant relationship between science and society that historians have effectively documented in so many cases. What is more, they fail to take into account how Hamilton himself hoped his work would contribute to the construction of a new and better world, one in which his worldview, and the biological truths he associated with it, would overcome both myth and superstition. Thus, although Hamilton achieved his early dreams of becoming a great scientist, he nevertheless failed to realize his original goal, which was to use evolution to undermine religious and ideological conceptions of sociability and codify a new, biological understanding of society.

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## Contents

# Introduction

'Happy is the Man that Findeth Wisdom' was a hymn written for Charles Darwin's funeral. It was again performed, many believed for the first time since 1882, after the unexpected death of William Donald Hamilton in 2000. Already, parallels were being drawn between the life of Darwin and that of Hamilton. Many centred on the idea that both scientists had published natural truths, however distasteful.

The theory for which Hamilton is most famous, inclusive fitness, stated that apparent altruism in nature is ultimately selfish when seen from the gene's eye view: by benefiting related individuals, such behaviour ultimately ensured that genes shared between relatives would pass to the next generation. Through his deterministic conception of behaviour, Bill Hamilton and his theory of inclusive fitness challenged ideas that individuals and societies could be perfected, at least inasmuch as they could be made more cohesive. In many ways, such determinism was believed to explain if not justify the current world order.

Reflecting upon his work in 1996, Hamilton reaffirmed his adversarial stance against a public who seemed to him to prefer myth and superstition to biological fact. Expressing a frustration he had maintained since his youth, he remained convinced that the tenets of evolution were "very intuitive […] The problem is rather that of thinking the socially unthinkable." In this way, Hamilton saw his position as rational and objective, as opposed to traditional or ideological, and to him this meant that his science was placed undeservedly on the chopping block. Accordingly, he wrote that his theories, like Darwin's, "cannot fail to direct at deeply entrenched and perhaps almost essential human myths". Thus, the truths he

proposed were not only unpalatable, they were threatening. When his genetical theories mathematically confirmed the 'true' nature of man as social in only a very limited sense, he claimed that they "have, or are perceived to have, the unfortunate property of being solvents of a vital societal glue".[1] Although Hamilton's world never entirely consisted of enemies, he and other biologists of his time were keen to make it appear as if the debates that did occur were between science and superstition. The resounding nature of these claims, as recorded in the articles, correspondence, and lectures of geneticists and evolutionary biologists in the second half of the twentieth century, deserves careful study, without which it is impossible to understand the recurring political nature of debates surrounding the biology of social behaviour or the vehemence with which these debates were recorded.

In the last forty years, Hamilton has become a key figure in the history of biology. In fact, he has been heralded as evolutionary biology's "greatest practitioner since Charles Darwin",[2] and his life and theories have already attracted attention.[3] In reaffirming a common tale of scientific heroism through Hamilton's story, scholars have often been preoccupied with his supposed tendency to be more interested in insects than humans as well as his divergence from benefit-of-the-species thinking, a step that is showcased as an example of his exceptionalism even when it left him feeling isolated and his ideas underappreciated. It is in part because of the pervasiveness of these beliefs that I have chosen to place Hamilton at the centre of this thesis, but this choice was also based on his

[1] W.D. Hamilton, *Narrow Roads of Gene Land*, i, (Oxford: Freeman, 1996), 14-15.
[2] S.T. Emlen, 'Introduction to William D. Hamilton Symposium', *Behavioral Ecology*, 12 (2001), p. 261.
[3] See, for example, U. Segerstrale, *Nature's Oracle: The Life and Work of W.D. Hamilton*, (Oxford: Oxford University Press, 2013); L.A. Dugatkin, *The Altruism Equation: Seven Scientists Search for the Origins of Goodness*, (Princeton and Oxford: Princeton University Press, 2006); M. Kohn, *A Reason for Everything: Natural Selection and the English Imagination*, (London: Faber and Faber, 2005); A. Grafen, 'William Donald Hamilton 1 August 1936-7 March 2000', *Biographical Memoirs of Fellows of the Royal Society*, 50 (2004), pp. 109-132; D. Hughes, 'The Value of a Broad Mind: Some Natural History Meanderings of Bill Hamilton', *Ethology Ecology & Evolution*, 14 (2002), pp. 83-89.

rich personal archive, only recently made fully accessible at the British Library. Using this material as a guide, I hope to recreate through Hamilton's own eyes the social and political world that provided the background to his work and in doing so, contribute to a more nuanced understanding of the context in which he saw his ideas, and his theory of inclusive fitness especially, to have meaning.

Above all, what follows will show that Hamilton's readings of nature relied on his own intuition, which was necessarily tied to his class, race, gender, and nationality. Although before World War II, the presumed authority of these categories was seldom undermined, Hamilton would see them each questioned throughout his lifetime. Thus, although he identified with liberal causes from his youth and later would see his work as largely apolitical, the biological meanings of inclusive fitness must be understood to operate within a particular context. The extent to which Hamilton's science of society was in dialogue with other social trends is confirmed by the peculiar commonalities between contemporary debates surrounding the evolution of social behaviour within biological circles and larger discussions concerning what we owe to others. While Hamilton was certainly no political ideologue, he nevertheless had in mind a specific, biologically informed agenda that he regretted was never seriously considered. Consequently, even when his standing as a scientist was secure, he continued to feel himself an outsider in a world in which reason had never fully prevailed.

**The Significance of Inclusive Fitness**

Even among professional biologists, Hamilton's "most glorious ideas" are recognized to be his earliest, namely the theory of inclusive fitness.[4] In light of its position as a cornerstone in evolutionary biology, the theory of inclusive fitness is the main focus of my attempt to understand Bill Hamilton and the research agenda he set in motion. Through close attention to Hamilton's early work and influence as well as to other actors within his social and intellectual space, we may come to better understand the intricate relationships between the practice of science and the values of a given culture, thus blurring the lines that have historically separated social construction from natural fact.

For the fields of evolutionary biology and genetics, growing up in the wake of the age of physics and surrounded by the great achievements of molecular biology, the relationship between science and society was particularly important. While in some ways, the molecular perspective of genetics conflicted with the organismic approach of evolutionary biologists such as Ernst Mayr, practitioners in both fields felt their work was immensely important for human society. According to historian Erika Milam, "Whereas molecular biologists worked valiantly to find practical applications of their research for human medical conditions, organismic biologists [...] suggested that organismic biology could shed light on the human condition, through an evolutionary lens."[5] Central to both of these claims was the implicit promise that science would create a better world.

Although Mayr disagreed, many biologists saw at least one place where the laws of genetics and evolutionary theory overlapped in meaningful ways, theoretical population

[4] D.C. Queller, 'W.D. Hamilton and the Evolution of Sociality', *Behavioral Ecology*, 12 (2001), p. 262.
[5] E.L. Milam, 'The Equally Wonderful Field: Ernst Mayr and Organismic Biology', *Historical Studies in the Natural Sciences*, 40 (2010), p. 282.

genetics. E.B. Ford, for one, supported the view that in 1927 British statistician Ronald Aylmer Fisher had successfully provided evolutionary biology with a mathematical basis.[6] Such mathematical proof of natural selection, combined with an unbound faith in the potentially revolutionary understanding of society that could be found in genetics, made the possible achievements of scientific thinking appear endless to many of its practitioners.[7] For them, the line was drawn between what we know and what we could know through a dedicated application of the scientific method rather than between what could and could not be understood given the limits of the human mind. Thus, with faith in science and certainty in mathematics, biologists interested in genetical models of social behaviour as well as those involved in more qualitative studies of behaviour, such as the ethologists,[8] saw the nature of aggression and the realistic limits of altruism to be fundamental to an accurate understanding of which kinds of societies were possible. The resulting theories cannot be described as essentially conservative, supporting as they often did increased access to reliable birth control methods as well as the legalisation of abortion[9] and homosexuality. In fact, biologists such as Julian Huxley, who was one of the evolutionary thinkers most admired by Hamilton in his youth, corresponded frequently with politicians in the American Democratic

[6] Milam, 'The Equally Wonderful Field', p. 308. Ford was referring to R.A. Fisher, 'On Some Objections to Mimicry Theory—Statistical and Genetic', *Transactions of the Royal Entomological Society of London*, 75 (1927), pp. 269-78.

[7] Nathaniel Comfort recently argued that scientists' decisions to view 'human nature' as heritable was often accompanied by a eugenic desire to control and improve it. What is more, their emphasis on genetics caused them to neglect possible non-technical interventions (N. Comfort, *The Science of Human Perfection: How Genes Became the Heart of American Medicine*, New Haven: Yale University Press, 2012).

[8] For a classic text on the history of ethology, see R.W. Burkhardt, Jr., *Patterns of Behavior: Konrad Lorenz, Niko Tinbergen, and the Founding of Ethology*, (Chicago: University of Chicago Press, 2005).

[9] Both conservative and liberal politicians supported legalized abortion in this period. Even in 1970, then Republican congressman, George H.W. Bush, chaired a committee that recommended improved access to safe abortions (*U.S. Congressional Record*, 8 July 1970). The tone was discernably eugenic, emphasizing that abortions should be made available to individuals belonging to lower socioeconomic groups. The call to action was tied to concerns of overpopulation (see also, Bush, 'Control of Population', *U.S. Congressional Record*, 4 March 1970, pp. 6073-6).

and British Labour parties throughout the 1950s. In contrast, others, and particularly C.D. Darlington, were more fanatically anti-left, relating ideology on that side of the spectrum with the post-modern relativism that dominated the social sciences. Likewise, they contrasted the romanticism of other disciplines with the rationality of science. What is more, romantic views of human nature were seen to serve as a signpost for communist leanings.

Across this spectrum of viewpoints within the British biological community, however, were common themes. British biologists repeatedly emphasised the individual and aimed to protect individual freedom, as they saw it. Their biological theories concerning human societies were therefore often explicitly anti-communist and, to varying degrees, implicitly anti-collectivist, especially as the political tides shifted increasingly towards an emphasis on self-reliance and individual responsibility in the 1970s.

Hamilton developed his theory of inclusive fitness while he was a doctoral student, jointly enrolled at the London School of Economics and the University of London. He published a summary of inclusive fitness in 1963[10] and explained it fully in a two-part paper in 1964.[11] The popularity of the theory, however, would not materialize for at least a decade after its initial publication, indicating, some have argued, the reality of Kuhnian paradigms and the delays inherent to scientific revolutions.[12] Rather than a symptom of the slowness with which truly original scientific thinking can be incorporated into academic disciplines, however, I argue that the delayed popularity of inclusive fitness may have had more to do with shifts toward an acknowledgement and, increasingly, a large-scale acceptance of the nature of selfishness in the late-1970s. Noting the atmosphere in which they were developed

[10] W.D. Hamilton, 'The Evolution of Altruistic Behaviour', *The American Naturalist*, 97 (1963), pp. 354-6.
[11] W.D. Hamilton, 'The Genetical Evolution of Social Behaviour, I' and 'The Genetical Evolution of Social Behaviour, II', *Journal of Theoretical Biology*, 7 (1964), pp. 1-16; 17-52.
[12] E.O. Wilson, *Naturalist*, [1994], (London: Allen Lane, 1996), p. 320.

and perhaps more importantly the culture in which they gained exponentially in popularity, we may consider the political and social significance, beyond the biological significance, of the budding science of social behaviour from its beginnings in the 1950s and 1960s through to the popularity of the 'selfish gene' in the 1980s.

While Hamilton's theory of inclusive fitness was by no means an immediate success, it provided the basis for two major tomes on the new biology of social behaviour, E.O. Wilson's *Sociobiology* (1975) and Richard Dawkins's *The Selfish Gene* (1976). Although these texts proved controversial, the theory of inclusive fitness that they built upon was seldom questioned. This is because the theory was seen to have arisen primarily through observations of social insects, an assumption that I believe has been insufficiently discussed to this point.[13] Its objectivity assumed, the theory of inclusive fitness has been incorporated into studies in psychology, sociology, and anthropology.[14] Its rise to fame after such a shaky start has engendered the construction of a story that has been well celebrated as an example of scientific genius. The problem with the current narrative is that it presumes a overly simplistic, linear trajectory from the genius of Darwin to that of Fisher and, through an extraordinary understanding of Fisher's frequently overlooked and complicated

[13] Segerstrale, for example, admitted that Hamilton used Hymenoptera as a "mere example" to illustrate the strength of his theory (*Nature's Oracle*, p. 92). Still, while she maintained that Hamilton was not strictly "a wasp or insect man", her discussion of his "profound empathy with all living things" excludes explicit reference to his lasting interest in man (p. 3).

[14] See, for example, in anthropology L. Cronk, N. Chagnon, and W. Irons, (eds.), *Adaptation and Human Behavior: An Anthropological Perspective*, (New York: Allen de Gruyter, 2000); in psychology, D.P. Barash, *Natural Selections: Selfish Altruists, Honest Liars, and Other Realities of Evolution*, (New York: Bellevue Literary Press, 2008); in sociology, S.A. Boorman and P.R. Levitt, *The Genetics of Altruism* (New York: Academic Press, 1980). The biology of selfish genes has also featured in philosophy (J.L. Mackie, 'The Law of the Jungle', *Philosophy*, 53 (October 1978), pp. 455-64).

mathematical equations, to the young, ideologically untouched Cambridge undergraduate student, Bill Hamilton.[15]

This history has been oft repeated, especially among biologists. Nevertheless, individuals who knew the players well, such as A.W.F. Edwards, a Cambridge biologist and statistician who was a student of Fisher's, were sometimes forthcoming about the exaggerations present in this dramatized story of scientific victory over superstition, especially over the ideologically charged concept of group selection.[16] Still, in the recent biography of Hamilton written by sociologist Ullica Segerstrale the story has remained one of an initially unrecognised genius, of a young man so much like Charles Darwin, a scientist who would change our understanding of the world if only we would listen.[17]

As the title of her book, *Nature's Oracle*, suggests, Segerstrale not only sees Hamilton as an isolated individual of genius with unique, remarkable divinations; she also interprets his achievements as quite above and beyond his time owing to his intense focus on nature. It is thanks to this single-mindedness that he was supposedly able to derive natural laws applicable to all organisms, whether plant, animal, or human. Close attention to the rich archive that Hamilton left behind, however, reveals a different image. Imitating the approach taken by historians Janet Browne, Adrian Desmond, and Jim Moore in their impressive and extensive research on the ways in which Darwin's ideas both impacted and were impacted by their particular social and political world,[18] I aim to similarly provide a more nuanced understanding of the private development of a scientific theory as well as the public roles it

[15] See, for example, Grafen, 'William Donald Hamilton 1 August 1936 - 7 March 2000'.
[16] A.W.F. Edwards, 'W.D. Hamilton's Darwinian Precursors', Letters to the Editor, *Times Literary Supplement*, (6 December 1996), p. 17.
[17] See, for example, Segerstrale, *Nature's Oracle*, pp. 1-5.
[18] E.J. Browne, *Charles Darwin*, (London: Pimlico, 2003), 2 vols.; A. Desmond and J. Moore, *Darwin: The Life of a Tormented Evolutionist*, (New York and London: W. W. Norton, 1991).

came to play without detracting from its success. In doing so, I hope to shed light on the larger question of how scientific and extra-scientific factors come together in the lives of individuals and groups of individuals to affect not only the questions scientists ask but also the solutions they find and agree upon.

Combining a new resource with an alternative methodology, we may understand inclusive fitness as, at least in part, the product of a particular worldview, namely, that of a young man coming of age amidst meaningful and profound social and political change. We see that Hamilton was deeply attuned to the sense of chaos he and others perceived in the world as they were thrust, it was thought, to the brink of annihilation. It was Hamilton's fears for the future, anxieties that were in fact shared by both members of academia and the public, that fuelled what would become a lifelong commitment to biology. What is more, it influenced his dedication to promoting what he believed were those hard to bear truths that would, if indeed anything could, save society from its own self-destruction.

In fact, through a new understanding of Hamilton, we might now see him as a notable personality whose fatal flaw was his unyielding obsession with evolutionary thinking, and thus, his desire to apply it without restraint or remorse. As I will document, in the 1950s Hamilton's commitment to natural selection was combined with a visceral hatred of socialism. Thereafter, he became caught in the spirit of postwar planning but acutely feared that without a biological understanding of the true nature of society, government planners were getting it all wrong. It is in this light that we should understand both his Darwin mania and his desire to turn to simplified scientific models as a way of coping with the high level of complexities inherent to the real world. What is just as significant, however, is the fact that the simplistic theories of complicated social phenomena that

Hamilton produced gave others solace as well. While this is not surprising given the social and geopolitical turbulence of the postwar decades, it is nevertheless important in fully understanding both why Hamilton tackled the topics he did and why his theories became so popular, not initially, but as political tides shifted towards the atomistic individual in the late-1970s.

**Seeing Hamilton in Context**

Through Hamilton's archive, we may gain insight into the world of Bill Hamilton as he saw it when it still appeared uncertain rather than as he and others have remembered it after his place in scientific history was well cemented. It is nevertheless important that the narrative is not strictly centred on the life and work of Hamilton. The archives of other major actors concerned with the relationship of biology and society in the postwar world as well as the public record, as embodied in scientific journals, books, magazines, and newspapers from the 1950s through the 1980s, will allow us to understand the extent to which biological theories of social behaviour were seen to have serious social and political relevance.

I aim to place Hamilton back into the social and political context in which his ideas developed and in which he intended them to operate in a meaningful way. To accomplish this, I will first look at the changing place of biology in the postwar world and especially the role genetics was promised to play in providing potentially revolutionary insights into the social and political problems plaguing man. Chapter Two will focus upon Hamilton's life from 1954 in an attempt to reimagine both his commitment to Darwinian natural selection and his view of the world that drew upon his understanding of evolution. As he passed

through the National Service and into undergraduate study at Cambridge, we see major social issues, including discussions of the genetic ramifications of the recently established welfare state and increased Commonwealth immigration, and political events, such as the Suez Crisis, the failed revolt in Hungary, and nuclear proliferation, through the eyes of a dedicated Darwinian. We then follow Hamilton's entrance into the London School of Economics under the supervision of social scientists. Through his work there, we witness how Hamilton's theory of inclusive fitness developed in close association with his genetic concerns for the future of mankind.

In Chapter Three, I will examine the context in which Hamilton made his first trip to Brazil. While he had gone to observe wasps, he continued to observe society with, he would argue, the same objectivity. Indeed, he viewed both wasps and men to be in a moral dilemma of how to act. Having rejected the idealism of leftist ideologies or religion, he believed that only science could predict the extent to which the 'decisions' of various organisms would be social or selfish, and as he transitioned into a life as a lecturer upon his return to England, we see him articulate his views on humans with greater force.

Chapter Four will begin to explore the increasing relevance of evolutionary theory and genetics to human nature in the public sphere, especially as it related to the subjects of race and reproduction. The bearing of inclusive fitness on these subjects allows us to examine first, the unprecedented and global postwar population increase and second, increased immigration and the resulting strain this was perceived to have on social cohesion. In light of this strain, in 1969 the Smithsonian Institution considered it important to bring together scientists, politicians, and philanthropists to discuss what advances in animal behaviour might mean for society, and Hamilton was drawn into the whirl of interest

surrounding the biological background against which social problems, especially the perceived inevitability of racial conflict, were being discussed.

In Chapter Five, I will further demonstrate the extent to which inclusive fitness appeared relevant to human issues through an examination of the 1960s projects of two of Hamilton's early colleagues, George R. Price and Robert Trivers. Chapter Five also brings us to the start of Hamilton's life as an established and increasingly well regarded biologist, especially after E.O. Wilson and Richard Dawkins increased the publicity surrounding inclusive fitness. While the first half of the thesis looks at the extent to which Hamilton was responding to and in dialogue with a particular environment, this chapter begins to explore how he set in motion major discussions surrounding biological theories of social behaviour and at the same time created a new legacy for students interested in this topic through his lectures at Imperial College and elsewhere.

In Chapter Six, we examine Hamilton's 1977 decision to move to the United States, where the reception of his ideas so greatly overshadowed the response in Britain. The major question asked is whether the differential reception of his ideas reflected the historic cultural emphasis on individualism in America. However celebrated his ideas were, Hamilton nevertheless ran up against the local branch of Science for the People soon after he began work at the University of Michigan. In light of this, Chapter Six also examines the varied responses to Hamilton's work in different circles.

While there were certainly scientists and social scientists who opposed sociobiology, believing it to have extra-scientific motivations, there were also many anthropologists, psychologists, and even psychiatrists who by the late-1970s were eager to incorporate sociobiological theory into their work. With optimism that human sociobiology could

provide meaningful insights into the social world, these scholars came together to create a new academic society in the mid-1980s, the Human Behavior and Evolution Society, with Hamilton strategically positioned as its figurehead. While the social and political world had changed a great deal by the 1980s, those interested in the biologically informed understanding of human interactions continued to see themselves as combatting the idealism of what people liked to think was possible. Rather than Marxists and liberal ideologues, however, they were now more actively combatting the creationism of religious conservatives, whose irreverence towards evolutionary theory made its potential contributions a hard sell. These will be the major topics discussed in Chapter Seven.

In conclusion, I will reflect upon the meaning that inclusive fitness originally held for Hamilton as well as the meaning it held for others as it garnered increasing attention in the decades after it was published. In doing so, I will examine more generally the question of what authority biology held in the increasingly globalized postwar world and offer some remarks as to why a reconstructed image of Bill Hamilton and his theory of inclusive fitness has been so predominantly perpetuated among biologists and historians of science to date.

# CHAPTER ONE

## A Vindication: The Changing Place of Biology in the Postwar World

Since the publication of Charles Darwin's *On the Origin of Species* in 1859, the relationship between the natural sciences and society has been probed through various scientific attempts to understand both humans and their social lives. A rich body of historical texts have revealed how biology was often used, implicitly or explicitly, to justify politics and ideology. Historians of phrenology, biometry, and eugenics, for example, have argued that biologists who investigated the constitution of the so-called nature of man were influenced by and provided support for cultural biases that ultimately legitimised the political status quo.[19]

As theories of evolution were buttressed by advances in genetics and celebrated as a unified theory in the modern evolutionary synthesis of the 1930s and 1940s, there came again the idea that scientists could authoritatively speak to political and social issues: indeed, many hoped that the second half of the twentieth century would be the age of biology. It is with this expectation that the biology of social behaviour in the 1950s and 1960s, and particularly theories of altruism and aggression as well as their implications for society, were reassessed. Through this work, biologists sought to unearth rational and purportedly unbiased solutions to problems plaguing humankind on both a national and an international scale: how could society best be organized, and could a political body that went

[19] For classic texts on the relationship between biology and society since Darwin, see R. Hofstadter, *Social Darwinism in American Thought, 1860-1915*, (Philadelphia: University of Pennsylvania Press, 1945); D. Kevles, *In the Name of Eugenics*, (New York: Knopf, 1985); M. Hawkins, *Social Darwinism in European and American Thought, 1860-1945*, (Cambridge: Cambridge University Press, 1997).

beyond the scope of any nation be used to fend off another world war? Understanding this, we may flag a number of themes that will set the stage for future chapters. These include the perceived conflicts between science and ideology and between science and social science in the decades following World War II, especially as they related to discussions of race, class, and reproduction as well as perceptions of a natural social order.

If we are to understand Bill Hamilton's choice of both subject and methodology, we must recognize that the changing place of biology in these years did not escape his attention. In fact, Hamilton's personal development as a biologist and his adoption of various sociopolitical agendas promoted by postwar academics coincided with this period in which biologists once again probed their relationships with both government agencies and the public.[20] Before looking at Hamilton's student days, it is therefore important to highlight several issues that occupied biologists in the late-1950s and early 1960s as well as the competing claims they denied. Turning our attention to questions surrounding the possibility of lasting international peace, we may examine the one point of contention between scholars within the biological sciences and those in the social sciences.

**The Defence of Science and the Formation of a Disciplinary Identity**

In the years following World War II, leaders flirted with the idea that some form of global government was not only a real possibility but also a necessity, especially if nuclear war was to be avoided. This sincere desire to create a peaceful world contributed to the establishment of the United Nations in 1945. Such institutional efforts to prioritize

[20] See D. Edgerton, 'C.P. Snow as Anti-Historian of British Science: Revisiting the Technocratic Moment, 1959-1964', *History of Science*, 43 (2005), pp. 187-208; A. Jones, 'Elite Science and the BBC: A 1950s Contest of Ownership', *British Journal for the History of Science*, 47 (2014), pp. 701-23.

international cooperation were understood to necessarily undermine nationalism,[21] but the success of the organisation would also rely on breaking down antagonisms between groups that went beyond loyalty to any particular country. As Clement Attlee would say in 1954, the unique situation of the postwar world meant that "everything depends on acceptance of the need for toleration and upon the renunciation of all attempts to force particular creeds on other people". For this reason, he endorsed a "gradual renunciation of the idea of absolute sovereignty and the building up of international organisations".[22] Bertrand Russell agreed: human society must submit itself to an international authority if total war was to be averted.[23]

Beyond the United Nations itself, a document meant to present a unified statement on behalf of social scientists and biologists, the UNESCO Statement on Race, addressed widespread hopes for a longstanding global peace inasmuch as it sought to disavow prevailing notions that group conflict was inevitable. The document was nevertheless loudly contested by a biologist with an eye for genetics, C.D. Darlington. Far from being an isolated scientist operating along the margins of the biological community, from 1948 Darlington had been a distinguished scholar often featured in BBC broadcasts on genetics,[24] and he would go on to become the chair of botany at the University of Oxford in 1953.

[21] The priority of the international over the national was consistently debated in British newspapers throughout the 1950s. In BBC's *The Listener* alone, see, for example, A. Eden, 'The International Outlook in 1954', (14 January 1954), pp. 43-4; V. Bartlett, 'McCarthyism: A Cause of Anxiety in Europe', *The Listener*, (11 March 1954), pp. 409-10; J.B. Slade-Baker, 'Can the Anglo-Egyptian Gulf Be Bridged?', *The Listener*, (18 March 1954), pp. 461-2.
[22] C. Attlee, 'The Political Problem', *The Listener*, (17 June 1954), pp. 1035-6.
[23] B. Russell, 'The Hydrogen Bomb and World Government', *The Listener*, (22 July 1954), pp. 133-4.
[24] See, for example, C.D. Darlington, 'The Coming of Heredity', *The Listener*, (3 January 1952), pp. 15-7. His opinion was also featured with those of S.C. Harland, R.A. Fisher, and J.B.S. Haldane in 'The Lysenko Controversy', *The Listener*, (9 December 1948), pp. 873-5.

Using the notes, letters, and publications of Darlington and others who hoped genetics would play an important role in both understanding society and organizing it in a way that was in tune with natural fact rather than ideological opinion,[25] the first section of my thesis will focus on the creation of identity among biologists in this period, especially in relation to social scientists who seemed to prioritize the role of the environment in shaping social order. Darlington saw religious, liberal, and Marxist views of man as out of touch with biological reality, and his association of these competing views of man with ideological doctrines served not only to label them unscientific but also to relate them to the perceived communist threat to Western democracies during the Cold War.

But geneticists such as Darlington had to combat more than the agenda of social scientists and other liberal thinkers in the postwar decades; they had to defend science against the public image that it was dangerous and perhaps even immoral. As much as the potential for international cooperation was lauded in the years following World War II, the use of atomic weapons in Japan seemed to show that it was impossible for national governments to promote the general welfare of humankind without favouring their own citizens over outsiders. Moreover, scientists in the atomic age were in some ways seen to be as culpable as governments were, despite having previously celebrated the democratic nature of their methodology as well as the universality of their claims. Science had tasted sin in developing the atomic bomb, and whether scientific research would be used to create a better world or to destroy it entirely remained an open question that was actively discussed in both scholarly and more public mediums.

[25] See C.D. Darlington, *The Facts of Life*, (London: G. Allen & Unwin, 1953). The wide-ranging impact of this book can be judged from the number and variety of journals that reviewed it as well as the fact that it was reprinted in several languages from 1953 to 1962.

Physiologist Freeman H. Quimby, for example wrote in 1954 of what he perceived to be the "growing distrust of science and scientists". He cited an abundance of phrases used in recent months which indicated increasing scepticism, including the ideas that "science is in conflict with society", "science is charged with some, if not most, of the failures, violence brutalities, suffering and confusion of our time", "its revelations have been considered alien to the human spirit", "it will destroy civilization".[26] Moreover, Quimby claimed that contemporary criticism was unique in that it questioned the "basic philosophy" of science, and he thought it was caused foremost by the perceived conflict between science and religion. Specifically, he asserted that there existed a "suspicion that science is largely responsible for whatever degree of abandonment there has been of moral principles and ethical standards".[27] Such discourse accusing scientists' on ethical grounds led prominent physicists such as O.R. Frisch to reassure BBC audiences that scientists' counsel could be trusted. Instead of "worry[ing] about entirely imaginary dangers: that the air, the sea, or the earth may spread the chain reaction, or that the earth's crust may get cracked", he hoped citizens would follow the advice of atomic experts and make "civil defence preparations" so they "would know what to do when the sky turns into a sheet of blinding fire".[28]

The need for Frisch to publicly defend the "best brains in atomic physics" against supposedly irrational fears speaks to the fact that the morality of the scientific expert was no longer taken for granted.[29] Was he no more than a schoolboy, "hell-bent on letting off bigger

[26] F.H. Quimby, 'Unpopular Science', *Science*, 119 (1954), p. 162.
[27] Ibid, p. 163.
[28] O.R. Frisch, 'How the Hydrogen Bomb Works', *The Listener*, (27 May 1954), pp. 907-8.
[29] Ibid. Although Frisch defended scientists against attacks on their ultimate authority, other scientists called into question the assumed objectivity of the scientific expert by the 1950s. Perhaps the most prominent among them was Michael Polanyi, who had been trained in both medicine and physical chemistry. Polanyi would later go on to explicitly criticize reductionism in genetics; see M. Polanyi, 'Life's Irreducible Structure', *Science*, 160 (21 June 1968), pp. 1308-12. Access to Polanyi's discourse was certainly not limited to academia. Beyond

and bigger fire crackers"?[30] Even if his expertise was granted, could anyone say with certainty who he was accountable to, the common man or the government? And did he give equal weight to each citizen, or did he have particular national interests in mind? Taking note of this environment, we may problematize the opinion of many scientists, and particularly biologists, who believed that their training left them uniquely capable of informing a new world order. It was nevertheless genetics, the new science of heredity, that was seen to hold the most revolutionary potential with regard to man's knowledge of both himself and the societies in which he lived. Genetics had given biologists a mathematically precise, law abiding science which would become a platform from which they could articulate their visions of the future. In building the authority such visions required, questions of identity were paramount. It was in part through discussions of professional responsibility that scientists in the 1950s attempted to create a unified image of scientists as moral, objective, and politically neutral, though certainly not all scientists agreed this was an accurate representation.[31]

The papers of Darlington demonstrate the extent to which identity was a particularly resonant theme within biological circles in the postwar decades. Darlington, a plant cytologist by training, did not hesitate to appropriate the territory of the social sciences that he felt could be better used by geneticists, and in the 1950s and 1960s, he increasingly devoted his time to the application of genetics to society. Darlington and others saw genetics

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the books he published, his work was also brought within the public sphere through BBC programs; see, for example, E.H. Robertson, 'The Beliefs of Science', *The Listener*, (28 January 1954), pp. 183-5.

[30] O.R. Frisch, 'Scientists and the Hydrogen Bomb', *The Listener*, (1 April 1954), p. 556. Frisch, an Austrian-born physicist who had worked on the Manhattan Project as a British delegate, defended scientists as "careful, conscientious men with a high sense of responsibility".

[31] W.F. Hollander, 'The Responsibility of Biologists', *Science*, 127 (6 June 1958), pp. 1348, 1350; W.P. Taylor, 'Science and Human Affairs', *Science*, 132 (26 August 1960), pp. 557, 559-60; A.W. Adamson, 'The Scientist and the Dominant Danger', *Science*, 133 (21 April 1961), pp. 1271-2.

as central to the study of biology and biology as central to a well-rounded university education.[32] According to this view, genetics was set to play an important role in the changing social and political environment of the second half of the twentieth century, and those who did not understand genetics, whether scientist, social scientist, or politician, were openly challenged.[33]

In the early 1950s, the relationship between biology and the social sciences was tense as scholars vied for authority to speak on the nature of social behaviour. With competition playing a major role in Darwinian theory, questions concerning the extent to which violence and aggression were an intrinsic part of all life, including human, were perhaps not surprising. Moreover, this issue was significant to questions involving both inter-group conflicts, including war, and intra-group conflicts, such as those that were assumed to be race or class-based. From the early 1950s, many social scientists and biologists were divided along disciplinary lines when it came to the subject of group conflict, its solution, and its inevitability. Within these two camps, each set of scholars saw the discussion of social behaviour, and more particularly human social behaviour, to be within their domain, and their differences were caused, at least in part, by the recent rise of molecular biology and genetics and disagreements as to the level of authority these subjects should be accorded. Indeed, a central problem of biology at mid-century point lay in

[32] R. Sager and F.J. Ryan, *Cell Heredity*, (New York, 1961), qtd. in T. Dobzhansky, 'Genetics, the Core Science of Biology', *Science*, 134 (29 December 1961), p. 2091; C.D. Darlington, 'Teaching of Biology', *Nature*, 199 (13 July 1963), p. 117, CSAC106.3.85/E.360, C.D. Darlington archive, Bodleian Library, University of Oxford.

[33] C.D. Darlington, 'Psychology, Genetics and the Process of History', *British Journal of Psychology*, 54 (1963), pp. 293-8, CSAC106.3.85/E.361, Darlington archive. Nobel Prize winning biologist Peter Medawar, for example, was criticized by Darlington because his 1961 Reith Lectures, 'The Future of Man', were "shallow" by the geneticist's standard (CSAC106.3.85/E.344, Darlington archive).

defending its position as a mature, well-defined science, and genetics would prove essential for formulating its authority.

In order to present biology as a unified scientific discipline endowed with full autonomy, it had to be mechanistic, yet not entirely reducible to the level of physics or chemistry. For this reason, myth building occupied an important, even perhaps a fundamental, role in twentieth century biology. It was Julian Huxley's 'modern synthesis' of 1942 that promoted a unified image of biology,[34] but according to historian V.B. Smocovitis, it was not until the mid-1950s that "biology had become not only a unified science, and an empirical science, but a mature science secure of its foundations and well positioned within the positivist ordering of knowledge – intermediate between the physical sciences and the social sciences."[35] The fear that the biological sciences lacked cohesion nevertheless continued throughout the following decade, and multiple cultures persisted.

This was true even within the sub-discipline of behaviour studies. While some biologists sought to work collaboratively (or imperiously) with sociologists, psychologists, and anthropologists,[36] others were careful to distance their work, even if only superficially, from what they perceived to be the less rigorous social sciences.[37] Within biology itself, divisions arose. Ethologists and ecologists, for example, approached the science of behaviour through field studies at the individual or population level. Others, including

[34] The extent to which there was truly a synthesis has been called into question. See, for example, J. Cain, 'Rethinking the Synthesis Period in Evolutionary Studies', *Journal of the History of Biology*, 42 (2009), pp. 621-648.
[35] V.B. Smocovitis, 'Unifying Biology: The Evolutionary Synthesis and Evolutionary Biology', *Journal of the History of Biology*, 25 (1992), pp. 1-65.
[36] See, for example, Darlington, 'Psychology, Genetics and the Process of History'.
[37] R.N. Elston, a doctoral student in genetics at Uppsala Universitet in Sweden, indicated his supervisors were of this mindset. He was encouraged to avoid appearing "sociological" (R.N. Elston to C.D. Darlington, 20 July 1964, Darlington archive, CSAC 106.3.85/D.154).

Darlington and R.A. Fisher, began to envision the effects of differences at the microscopic level on patterns of behaviour.

The gene provided biologists with an objective and quantifiable variable and yielded a mathematical foundation to theories previously judged to be no more scientific than metaphysical pondering. It had been primarily owing to Fisher that the appearance of unity in the biological sciences was possible at mid-century. Through his 'fundamental theorem of natural selection', Fisher quantified evolved characters. In doing so, he lent mathematical authority to the theory of natural selection and made evolutionary biology a subject fit for objective study. According to Darlington's estimate, Fisher's development of statistics allowed biological problems to be approached with "a rigour hitherto beyond our reach".[38] For both Darlington and Fisher, this meant that even social problems could be assessed scientifically, with potentially revolutionary results.

The majority of social scientists in this period did not share biologists' faith in the authority of the gene, and they questioned the arguments developed by scientists, especially when they addressed political and social issues. Their wariness toward genetic explanations of social ills and the apparent differences between groups, especially in light of recent atrocities perpetuated in the name of 'eugenics', was significant because it brought into question the very status of biology as a science. The fact that social scientists did not accept the new image of a gene-centred biology made them subject to ridicule by geneticists who claimed social scientists simply did not understand or refused to keep up to date with advances in scientific knowledge.

[38] C.D. Darlington, draft of 'The Facts of Life', [n.d.], Darlington archive, CSAC 106.3.85/E.206.

As it has already been foreshadowed, the antagonism of social scientists towards the application of genetics in this period is perhaps most obviously demonstrated in the pages of the *UNESCO International Social Science Bulletin*. Here, the topics of group differences, prejudice, and race relations were taken up in 1950, and it was determined that no biological evidence supported the idea of racial superiority or inferiority and that cultural beliefs to the contrary reflected "a particularly aggressive form of 'tribal sentiment'". The editors prioritized cultural factors over biological factors in explaining the varied destinies of both individuals and human civilizations at present, but they were more guarded when they addressed the likelihood that this research could replace the "scientific fallacies and the hackneyed clichés on which racial antagonisms are based". In the American South, for example, racial ideology was admittedly so pervasive that it created "an atmosphere of passions of almost unbelievable virulence". Still, UNESCO's editors claimed that even in such extreme cultures there were individuals "ready to accept the facts when put to them". Thus, although they acknowledged that their ultimate goals may appear utopian, they hoped, at the very least, to prevent racial prejudice from ever again resembling the quasi-religious dogma of Nazi Germany.[39]

Against this background of debate, Darlington would publish what he believed to be the true, scientific evidence for racial differences. From this, he believed, a scientific basis for social and political action could be derived. What was essential to Darlington's argument was that the differences between individuals were biological. For this reason, Darlington maintained that since the rediscovery of Mendelian genetics, "precise scientific methods have been developed for dealing with [the] question" of human variability in a way that

[39] 'Preface', *UNESCO International Social Science Bulletin*, (1950), pp. 455-9.

could distinguish truth from superstition.[40] Defining the discrepancy between his views and those published by UNESCO in this way, we see that Darlington's critique of the social sciences on the issue of racial differences was deeply coloured by the Lysenko affair. To Darlington, the emphasis on environmental factors that pervaded the UNESCO documents wreaked eerily of the experimentally untenable doctrine of the inheritance of acquired characters promoted by Lysenko and his "henchmen".[41] Since UNESCO's position had the power to inform government policy on an international scale, however, he found it to be even more dangerous.

The rise of Trofim Lysenko had made the study of genetics markedly political in the postwar period.[42] Lysenko had claimed that the hybridization techniques of Ivan Vladimirovich Michurin would yield new possibilities for both agriculture and society, and from the 1940s, the esteem granted to Lysenko by the Soviet government created a fracture between Western and Eastern theories of heredity that could not be ignored. The denial of Mendelian genetics by Lysenko and his colleagues was seen to be an ideological reaction. Since Mendelian genetics had been used to support eugenic measures, it was viewed by Soviet biologists of the Lysenko strand as a capitalist construction designed to emasculate, quite literally, the proletariat.

The state endorsement of Lysenkoism created a dangerous environment for geneticists in the Soviet Union. In the 1940s, facts surrounding Stalin's cruel purge of Mendelian geneticists began to come to light, and Darlington, writing in 1946, had been

[40] C.D. Darlington, 'The Genetic Understanding of Race in Man', (1950), *UNESCO International Social Science Bulletin*, pp. 479-88.
[41] This term was used by American psychologist S.B. Sells in his article 'An Interactionist Looks at the Environment', *American Psychologist*, 18 (1963), pp. 696-702.
[42] See, for example, W. deJong-Lambert and N. Krementsov, 'On Labels and Issues: The Lysenko Controversy and the Cold War', *Journal of the History of Biology*, (2012), pp. 373-88.

among the first British biologists to condemn the rise of Lysenko and the purging of Soviet geneticists that followed.[43] That scientific data could be ignored or manipulated in the name of political ideology was etched in Darlington's mind as an absolute evil that had to be counteracted. Moreover, he saw the treacherous association between science and politics as symptomatic of members of the political left. His own almost universally conservative political beliefs, on the other hand, were purportedly based on scientific truth.[44] Though Darlington claimed to be exempt from the subjective bias of ideology and was even identified by others as a non-political scientist,[45] he was certain that his intellectual enemies were motivated by ideology alone: only the unbiased and objective scientist such as he could see the issues clearly. Writing to Julian Huxley in 1949, he declared that Lysenkoists "deduced a theory having Lamarckian substance as well as colour from a political principle. This is obvious to the serious and non-communist student".[46]

According to Darlington, the Soviet government rejected genetics due to its social and political relevance.[47] Soviet scientists such as N.I. Nuzhdin at the Institute of Genetics in Moscow did not deny such relevance. In a letter in *Nature* that had to be abridged by the editors because it was laden with terms which "would appear offensive when translated into English",[48] Nuzhdin claimed that Mendelian genetics was reactionary and "against the

[43] For a more complete account of Darlington's life and work see O.S. Harman, *The Man Who Invented the Chromosome: A Life of Cyril Darlington*, (Cambridge: Harvard University Press, 2004).
[44] One exception to his conservative stance was his belief that homosexual acts between consenting adults should be legal, a position he took publicly when he submitted evidence to the Wolfenden committee in the mid-1950s. R.A. Fisher, also politically conservative, supported loosening homosexuality laws, too. Fisher's motivation, however, was religious more than scientific: as he wrote to Julian Huxley, "My own objection to the persecution of homosexuals is that it […] flagrantly ignores the comment of Jesus that we should not sit in moral judgment on each other" (Fisher to J. Huxley, [n.d., c. 29 January 1955], Darlington archive, CSAC 106.3.85/E.252).
[45] W.E. Dick to C.D. Darlington, 7 February 1947, Darlington archive, CSAC 106.3.85/D.94.
[46] C.D. Darlington to J. Huxley, 13 April 1949, Darlington archive, CSAC 106.3.85/D.99.
[47] C.D. Darlington, review of J. Huxley's *Soviet Genetics*, Darlington archive, CSAC 106.3.85/D.103.
[48] 'Soviet Genetics: The Real Issue', *Nature*, 165 (6 May 1950), p. 711.

people". Not only did its reliance on chance mean that heredity could not be controlled but also it left no alternative to the pessimistic conclusion that "Heredity is fatal." What was significant, however, was that heredity was deemed fatal primarily to vulnerable sections of the population: Nuzhdin accused Western scientists of finding "bad genes […] spread among the broad masses of working people, also among Negroes, Jews, Malayans, etc." and declaring that "poverty and ignorance are the result of bad heredity". To prevent these genetically suspect groups from negatively impacting the population as a whole, Mendelian geneticists had supported programs involving sterilization and artificial insemination that according to Nuzhdin paralleled the atrocities committed in Nazi Germany in the name of 'science'.[49]

Thus, the accusations of political bias went both ways. Just as Darlington claimed Lysenko's theories were deduced from a political principle, so too did Nuzhdin believe that Mendelian theories were deduced to lend "scientific semblance" to capitalist doctrine. According to Nuzhdin, Western science was as coloured by political assumptions as Darlington and Huxley claimed Soviet science was: "Capitalist science which serves the reactionary class of contemporary society cannot be objective. Capitalism demands that science distorts the truth and creates reactionary theories serving capitalism as ideological tools."[50] With capitalism poised against Soviet communism in the Cold War period, an objective resolution to this debate appeared impossible, and the situation was further complicated by the fact that British scientists had been among the most outspoken Marxist intellectuals in the interwar period. Even after World War II, and at least until 1954, many remained impressed by the esteem granted to scientists in the Soviet state. This meant that

[49] N.I. Nuzhdin, 'Soviet Genetics: The Real Issue', *Nature*, 165 (6 May 1950), pp. 704-708.
[50] Ibid.

the threat posed to science by Soviet ideology extended beyond the Iron Curtain, and Darlington was concerned that with Lysenko's theories in place as official state doctrine, scientific freedom itself was endangered.

But since postwar genetics shared a recent history with international eugenics movements, Nuzhdin's critiques of the social application of Mendelian genetics were not unjustified. To be sure, the history of Mendelian genetics and the history of eugenics are wound tightly together: early proponents of Mendelism such as William Bateson were very much excited by the potential for selective breeding in the human world if single genes governed complex traits.[51] Darlington, for one, did not distance himself from the political past of genetics and its human application through eugenics. Instead, he believed that genetics was finally in position to offer objective fact on which policy ought to be based. For this reason, Darlington urged that science, and especially the science of genetics, had an important, even a revolutionary, role to play in postwar planning. Moreover, he warned against interventionist policies that threatened to disrupt a natural balance evolved to keep each in his or her appropriate place. With regard to these policies, he proved to be particularly concerned with the potential reproductive effects of universal education and the welfare state. By extension, he was interested in medical advances that allowed more individuals to survive to reproductive age by preventing premature death, called for the punishment of criminals insofar as it affected their ability to reproduce, and supported policies regarding family allowances and immigration. Already in 1948, Darlington had claimed that a conflict between science and society resulted from the fact that discovery has

[51] A. Jamieson and G. Radick, 'Putting Mendel in His Place: How Curriculum Reform in Genetics and Counterfactual History of Science Can Work Together', K. Kampourakis (ed.), *The Philosophy of Biology: A Companion for Educators*, (Dordrecht: Springer, 2013), p. 588.

the power to threaten existing beliefs and traditions.[52] With science as his weapon of choice, Darlington committed himself to a lifelong battle against the illusions, superstitions, and ideologies that threatened the very future of mankind.

**Biology Versus Anthropology**

Acknowledging this political background, we may return to Darlington's charges against what he perceived to be the environmentalist bias of UNESCO's Statement on Race. Here, as he would throughout his career, Darlington wore the hat of the "non political geneticist".[53] In fact, he saw himself as apolitical, merely seeking truth as an antidote to the liberal bias of the social sciences. According to Darlington, past the point of fertilization, the higher intellectual and emotional properties of man, like the physical structure of plants and animals, were certain and predictable. Thus, Darlington's first important conclusion was that personality and intelligence were genetically determined and largely immutable. Moreover, the genetic cause of intellectual and emotional characters, combined with the historic tendency for individuals to mate within their populations, created a net effect of "racial" differences that could not be easily ignored, nor could they be changed by education beyond "certain limits".[54]

Darlington's article inspired an immediate negative response. Though he had particularly annoyed social scientists, scientists too voiced their dissension. American-

[52] Harman, *The Man Who Invented the Chromosome*, p. 192.
[53] W.E. Dick, editor of *Discovery Magazine*, referred to Darlington as a 'non political geneticist' during the 1940s (Dick to Darlington, 7 February 1947). Others, such as Nigel Bridge, disagreed, calling Darlington a "scientist turned philosopher-priest-cum-social-reformer" (Darlington archive, CSAC 106.3.85/E.191).
[54] C.D. Darlington, 'The Genetic Understanding of Race in Man'. The meaning genetics held with regard to education policies would be promoted by Darlington for the remainder of his life as he ridiculed what he perceived to be the 'equalitarian' and 'uniformitarian' delusions of the political left; see, for example, C.D. Darlington, 'Social Genetics', [n.d.], Darlington archive, CSAC 106.3.85/D.176.

Ukrainian evolutionary biologist and geneticist Theodosius Dobzhansky, with whom Darlington was previously on friendly terms, and American geneticist L.C. Dunn, for example, took issue with Darlington's 'scientific' claims. Dunn went as far as to publish a small booklet where he argued that the assumption of biological differences between races was without scientific justification.[55] In fact, UNESCO published a number of booklets that year echoing Dunn's opposition to Darlington's conclusions.[56] Notably, however, they dismissed concepts of scientific racism without also denying the biological reality of 'race'.

In light of the controversy Darlington inspired, the editors of UNESCO's journal set aside space in which conceptions of racial differences could be discussed. Here, Maurice Freedman, lecturer in anthropology, and Julian R. Friedman, lecturer in colonial administration, balked at Darlington's attempt to delineate sharply between geneticists and his "fellow scientists in the social disciplines". But their concern reached beyond a frustration with the disciplinary hierarchy Darlington and others presumed; they were in fact more troubled by the possibility that Darlington's account of racial differences and the genetic determination of personality and ability would lend "respectable pseudo-scientific support" to the existence and perpetuation of racism. Moreover, they argued that Darlington's presentation rested on "evidence which is in scientific circles generally considered to be inconclusive". While they claimed, "it is not our intention to play off one eminent biologist against another", they did just that in citing C.H. Waddington and Julian

[55] L.C. Dunn, *Race and Biology*, (Paris: UNESCO, 1951).
[56] J. Comas, *Racial Myths*, (Paris: UNESCO, 1951); O. Klineberg, *Race and Psychology*, (Paris: UNESCO, 1951); M. Leiris, *Race and Culture*, ([Paris]: UNESCO, 1951); A.M. Rose, *The Roots of Prejudice*, (Paris: UNESCO, 1951).

Huxley as having made statements that were incompatible with Darlington's assertions.[57] Unbeknownst to them, this strategy was unlikely to be successful, as both Waddington and Huxley were both politically left of centre and therefore open to Darlington's attacks. In fact, Darlington never hesitated to criticize either when he felt their political sympathies obstructed their scientific judgment.[58]

Darlington's complaint regarding the work of Freedman and Friedman was different: he accused them of attempting to base the scientific study of man on something other than the foundations provided by biology. This, he claimed, was something akin to a repudiation of chemistry by biologists. Moreover, Darlington placed the social scientists criticizing him on the same plane as "Jesuits and also […] some modern Marxists". His message that genetics was of ultimate importance to the future of social science, indeed the future of all knowledge, was unwavering: "If social scientists are prepared to take the trouble to understand the principles and methods of genetics today they will find that, one after another, the problems of race, class and mating, of culture and language, which now sorely perplex them, will fall into an ordered and intelligible relationship." If they continued to use an out-dated method, on the other hand, social scientists would be unable to address the vast number of social problems plaguing the world and threatening the future.[59]

Though Darlington appeared vastly outnumbered in the UNESCO debate, he did not let the issue rest there. Fuelled by the controversy, he wrote to Alfred Métraux, the anthropologist at the head of UNESCO's Race Division in Paris. As Darlington saw it, the

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[57] M. Freedman and J.R. Friedman, Letter to the Editor, *UNESCO International Social Science Bulletin*, (1951), pp. 749-53.
[58] See, for example, Darlington's review of J. Huxley, *New Bottles for New Wine,* 13 November 1957, Darlington archive, CSAC 106.3.85/E.284.
[59] C.D. Darlington, Letter to the Editor, *UNESCO International Social Science Bulletin*, (1951), pp. 753-4.

organization's position on the issue of race was an emotional and ideological reaction to the recently exposed Nazi race policies and resulting genocide. Though Darlington was sympathetic to UNESCO's opposition to genocide, he maintained that racial differences, as well as biological differences between individuals of varying socioeconomic classes, were a scientific fact that could only be ignored at our peril. No policy, international or national, could eliminate the fact that humans had evolved under different environmental pressures, creating distinct groups. Even before genetics revolutionized scholars' understanding of heredity, Darlington cited Charles Darwin as having supported the view that races differ in their constitution and mental characteristics.[60] Whatever one's political sympathies, Darlington maintained that "genetics has given us every reason to agree with [Darwin]", and he warned that covering up racial differences to serve political purposes only concealed the most important problems confronting mankind.[61]

Weeks earlier, Darlington had written to anatomist Sir Arthur Keith and anthropologist Herbert John Fleure, distraught at the responses to his article and perplexed as to why so many scholars refused to see the light he had shone. "I am being vehemently criticised", he wrote; "They all agree that there are no intellectual or emotional differences between human races, and that in any case genetical principles cannot be applied to the study of Man who is altogether above such base treatment."[62] Fleure, for one, was sympathetic to Darlington's distress and frustration and pointed to a likely antagonist:

> "I suspect that the attacks have something to do with a man
> who has taken the surname of ASHLEY-MONTAGU (I think

[60] For more on Darwin and his belief in a race-language scale, see G. Radick, 'Race and Language in the Darwinian Tradition (and What Darwin's Language-Species Parallels Have to Do with It)', *Studies in History and Philosophy of Biological and Biomedical Sciences*, 39 (2008), pp. 359-70.
[61] C.D. Darlington to A. Métraux, 17 December 1951, Darlington archive, CSAC 106.3.85/E.181.
[62] C.D. Darlington to H.J. Fleure, 29 November 1951, Darlington archive, CSAC 106.3.85/J.51.

> he's an East European Jew by origin) If so, don't worry yourself. He made a Unesco Committee accept a silly statement about Race  Several, including myself, attacked it. I think that for a committee to enunciate opinions on science is a wicked folly."[63]

Although Fleure did not make it clear why Montagu's ethnicity was relevant to this discussion, given the all too pervasive atmosphere of anti-Semitism in the first half of the twentieth century and the overall tone of Fleure's letter, it is unlikely that this was construed to weigh in Montagu's favour.

In fact, Montagu was a British citizen, having been born in the East End.  He is said to have realized from an early age that he would have to change his name from Israel Ehrenberg to something more characteristic of an upperclass Englishman if he wished to advance in the world, and so, in 1937, he began to publish under an assumed name, Ashley Montagu. From the 1940s, he combatted ideas of racial superiority. His book *Man's Most Dangerous Myth: The Fallacy of Race* (1942) gained a large following, and he was indeed responsible for drafting UNESCO's Statement on Race, which echoed the conclusions of his earlier book.[64] As dismissive as Fleure and Darlington were of Montagu, his work had a profound influence on the social and political movements surrounding the issue of race in the United States; it was in fact pivotal in the U.S. Supreme Court cases that challenged segregation policies in schools in the early 1950s.[65]

The UNESCO bulletin did indeed feature a critique of Darlington's claims by Montagu. According to Montagu, Darlington's article "illustrates the dangers of uncritical

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[63] H.J. Fleure to C.D. Darlington, [n.d., c. December 1951], Darlington archive, CSAC 106.3.85/J.51.
[64] A.T. Keene, 'Montagu, Ashley', <http://www.anb.org/articles/14/14-01120.html>, *American Dictionary of National Biography Online*, October 2001, accessed 20 April 2013.
[65] J. Agar, 'What Happened in the Sixties?', *British Journal for the History of Science*, 41 (2008), pp. 567-600. For more on the work of Dobzhansky, Dunn, and Montagu, especially in relation to biological conceptions of racial difference, see M. Yudell, *Race Unmasked*, (New York: Columbia University Press, 2014).

application of the findings of geneticists on plants and lower animals to the explanation of the differences between human groups". Contra to Darlington and the absolute authority he lent to genes, he hoped to offer "a contribution to the truth". Thus, he doubted the potentially revolutionary knowledge offered by genetics. It seemed to him that Darlington had both overestimated the extent to which current genetic methods could shed light on human problems and oversimplified the case for genetic determinism. Moreover, he believed geneticists were the ones with something to learn; he hoped to be forgiven "for saying that it is important for geneticists especially to realize that, since the expression of heredity is a function of environment, it is to a certain extent subject to human control". While Montagu's position was relatively moderate, emphasizing the interaction between the genotype and its environment, it questioned assumptions that were central to a newly 'unified' biology. For Montagu, the emergence of mind could not be "explained on physical grounds", and an individual was "something more than a function of his genes".[66] This, of course, threatened Darlington's entire worldview, which placed the biological sciences, and especially genetics, at the very centre of all human knowledge.

Darlington was asked for his comments, and drafting his response on the bottom of the letter, he wasted no time. Genetics could not be so simplistically ignored: "It is no use one social scientist quoting another social scientist at me. They obviously agree because they start out from the [same] assumption".[67] Darlington curtly suggested his forthcoming book, *The Facts of Life*, which he believed demonstrated that precise scientific methods had been developed, "although they are not the methods commonly used by the social

[66] A. Montagu, 'Answer by an Anthropologist to a Geneticist About the Understanding of Race in Man', *UNESCO International Social Science Bulletin*, 4 (1951), pp. 1007-10.
[67] C.D. Darlington, manuscript on letter from K. Szczerba-Likiernik to Darlington, 29 November 1951, Darlington archive, CSAC 106.3.85/E.181.

scientists". If this changed, anthropologists would have a bright future, and their "catalogue of anecdotes" could be transformed into "a constructive science on a genetic basis".[68]

**Making Room for the 'Non-Politics' of Genetics in the Political Sphere**

In the following years, Darlington continued his attack on liberal notions of race, and in 1951 he claimed that beyond the social sciences there were also more overtly political opponents to the genetic reality he endorsed. He consistently argued that differences at the level of the gene create differences not only among individuals but also classes and races. According to Darlington, the differences "arise from changes in visible substantial particles which are extremely resistant to modification by any outside agency short of destroying life itself". Whatever social scientists and leftist ideologues may like to believe, Darlington maintained that hereditary particles "cannot be broken down by changes or agents outside, by any education, or by the action of any government, however benevolent or however brutal."[69]

By 1953, Darlington's book, *The Facts of Life*, was inspiring spirited political discussions that went beyond questions of racial differences. Thus, even though botanist S.C. Harland, with whom Darlington was on friendly terms, was hesitant to support Darlington's position on the issue of race, overall, he was enthusiastic about the agenda Darlington promoted. Reviewing *Facts of Life*, he identified Darlington as the "foremost leading biologist", who wrote "out of a passionate conviction that the men who guide our destinies, whether physical, mental, or moral, are ill-educated because they lack a special sort of biological insight which at present is possessed by the very few". Although Harland

[68] C.D. Darlington, 7 December 1951, Darlington archive, CSAC 106.3.85/E.181.
[69] C.D. Darlington, 'Communism and Science', Darlington archive, CSAC 106.3.85/E.186.

questioned whether or not Darlington had the right "to bludgeon the historian, flay the classicist, and castigate the politician" or "to promulgate views about the great problems of society, the problems of education, race, health, and crime", he felt Darlington was doing meaningful work. In the end, he agreed that there was indeed a "very great need for biological enlightenment".[70] In private, he was somewhat apologetic for having called out Darlington "on the race question". Though he admitted he agreed with Darlington and Nikolai Vavilov, a Soviet geneticist who was arrested and killed for his anti-Lysenko stance in the early 1940s, that "some races and peoples are very stupid indeed", he maintained, "we have to be extremely careful":[71] the genetics of racial differences could be a dangerous topic, even when discussed among scientists.

Other reviewers spoke positively of Darlington's call to use biology to inform policy without any of the hesitancy Harland exhibited. A reviewer in the *Discovery Magazine* maintained,

> "Most biologists know very well that our rulers neither think nor act biologically. […] Most biologists are also aware that our present educational system even at University level is singularly either reluctant or incompetent to impart biological knowledge at a level and of a kind appropriate to citizenship in a modern atomic age. Darlington rightly believes that man should survey himself and his activities in the light of new knowledge of his limitations and possibilities."

According to the reviewer, such knowledge appeared fundamental to answering the most controversial questions of the day concerning the relationship of human beings to one another, "whether as nations, groups or individuals". Moreover, the reviewer agreed with Darlington as to the centrality of genetics amongst academic disciplines: "Without the

[70] S.C. Harland, 'Facts of Life by C.D. Darlington', *Manchester Guardian*, (22 September 1953), Darlington archive, CSAC 106.3.85/E.209.
[71] S.C. Harland to C.D. Darlington, 29 September 1953, Darlington archive, CSAC 106.3.85/E.209.

necessary biological orientation the historian and the classicist; —in short, the graduates in Arts of our Universities, just cannot get to first base when this kind of subject comes under discussion."[72]

In 1954, Britain did not yet recognize itself as having significant problems related to race; it was still far too overwhelmingly white to even begin to worry about the impact increasing heterogeneity might have on social cohesion. Nevertheless, race was far from absent in British broadcasts concerning current events in other countries. The conflict between Israelis and Palestinians, for example, was identified as "A Problem in Race Relations". What is more, this particular clash was used to illustrate that the "conflict of races […], to half the world at least, is more important than the differences of Russia and those who fear her".[73] Africa was another part of the world that featured in discussions of race relations in British newspapers, and South Africa was seen to be "but a more vivid, more momentous illustration of a universal problem".[74] Of course, the United States also provided an important case study, especially after the Supreme Court ruled against segregation in 1954. If desegregation policies could be successfully implemented, it was thought to signify that a "new kind of twentieth-century society which is purged of very old and very powerful tensions" was indeed possible.[75] Although race relations had long been seen to present problems across human societies, what was significant about the claims made in these years was the co-existing sentiment that scientists should "study human nature

[72] 'Sydney', '*The Facts of Life* by C.D. Darlington', *Discovery Magazine*, Darlington archive, CSAC 106.3.85/E.209.
[73] H.S. Deighton, 'A Problem in Race Relations', *The Listener*, (13 May 1954), pp. 809-10.
[74] N. Goodall, 'Church and Race in South Africa', *The Listener*, (20 May 1954), pp. 855-6; see also, R.E. Robinson, 'The Racial Problem in Africa', *The Listener*, (16 December 1954), pp. 1051-2.
[75] A. Cooke, 'Negro Citizens in the U.S.A.', *The Listener*, (10 June 1954), pp. 996-7; see also, W. Kolarz, 'The Racial Problem in the United States', *The Listener*, (14 October 1954), pp. 601-2.

to prevent its failures". Not only *could* science understand this presumably universal phenomenon, it also had a duty to do so.[76]

Amidst such interest in the inevitability of race-based conflict as well as an understanding that science could be used to understand human nature, Kenneth Fisher positively reviewed Darlington's book in *The European: The Journal of Opposition*. With specific attention to Darlington's perception of human races as evolved to suit different niches, Fisher shunned the idea of racial superiority and yet maintained that we should save the baby of Hitlerism and agree on racial differences.

But on a larger scale, Fisher hoped the 'scientific' work of Darlington and others would contribute to a "re-interpretation of human thought in terms of modern genetic discoveries" that was long overdo. Such work, he hoped, would "entail a fundamental revolution in current thought on psychology, sociology and political economy". For this reason, the revolutionary nature of genetic understanding was identified as a specific threat to liberal and left-wing groups, especially Marxists, because their ideologies relied on the assumption that by bettering man's environment, one could improve individual men and women.[77] Thus, individuals on the political right celebrated the political meaning of Darlington's book, and in 1955, Fisher would go on to positively associate Darlington's work with a new eugenics movement. Lamenting that eugenics had gone out of fashion, "mainly for political reasons", Fisher noted that political opposition to biological 'facts'

[76] E.D. Adrian, 'Science and Human Nature', *Science*, 120 (29 October 1954), pp. 679-84. Excerpts of the talk were also published as E.D. Adrian, 'Science and Human Nature', *The Listener*, (2 September 1954), pp. 351-2.
[77] K. Fisher, 'The Facts of Life', *The European*, (September 1954), pp. 11-6, Darlington archive, CSAC 106.3.85/E.209.

would likely continue. In particular, he identified liberals and humanists as well as the Roman Catholic Church as likely to object to the biologically informed study of man.[78]

Elsewhere, University of Pennsylvania biologist Conway Zirkle agreed that Darlington's ideas would be identified as politically dangerous by "Both phanero- and crypto-Marxians". According to Zirkle, this was because "The conflict between Marxian ideology and biology, of course, still exists and some biological theories must still be rejected by the faithful".[79] Using this line of reasoning, Darlington and other biologists maintained that those who believed in the malleability of hereditary characters were ideologically rather than scientifically driven. What is more, they believed that these political motivations made even the scientific claims of their opponents inherently suspect.

While Zirkle and Fisher praised Darlington's use of 'science' to undermine the misguided doctrines of political ideologues, others were suspicious. Some claimed that *The Facts of Life* too often mixed personal opinion with scientific thought and therefore could not be taken to represent the views of all modern biologists.[80] Again, the subject of race proved central to these critiques. Dobzhansky, for example, co-wrote a review with British psychiatrist and geneticist Lionel Penrose in the *Annals of Human Genetics* that was particularly critical of Darlington's views on race. According to them, "it would be too optimistic to hope that racism died with the Third Reich" since "It is deeply rooted in the insecurity feelings of too many individuals and groups." Rather than the way forward, they argued that Darlington's book merely revealed "how naïve a biologist can be when he starts

[78] K. Fisher, 'Eugenics for Europe', *The European*, (August 1955), pp. 29-35, Darlington archive, CSAC 106.3.85/E.209.
[79] C. Zirkle, 'The Facts of Life by C.D. Darlington', *Isis*, 48, (March 1957), pp. 71-3.
[80] J.S.D. Bacon, 'Can Man Change Himself?', *Literary Guide*, 69 (September 1954), pp. 27-8; A.C. Allison, 'Scientific Calvinism', *Impact of Science on Society*, 5 (September 1954), pp. 191-200, Darlington archive, CSAC 106.3.85/E.209.

to deal with social problems". Though they acknowledged that Darlington favoured cooperation between races, they feared that his discussion of race might have the unintended consequence of lending "to the renascent racism a specious scientific basis".[81] In another review, British botanist Eric Ashby warned more generally against a closer relationship between scientists and policy makers: "One sometimes hears it said that in a scientific age scientists should have a greater influence in government. Professor Darlington's book should be read widely if only as an awful warning of the horrors which await if we ever get a scientific oligarchy."[82]

After collecting the varied reviews, Darlington set about categorizing them. The classification system he used reiterates his one-dimensional understanding of ideology and bias. The categories he used were "Serious", "Pure Marx", "Bitter", "Witty", and "Anti Marx".[83]

But as the above reviews have already hinted, Darlington's limited understanding of the effect of political commitments on the practice of science was not unanimously shared among geneticists in these years. Thus, while Darlington continued through the 1970s to rally against the left-wing biases he saw in his opponents with increasing force, some geneticists viewed his 'science' and the agenda it advocated as suspect as early as the late-1950s. In a Cambridge undergraduate syllabus from around 1957, Darlington's *Elements of Genetics*, co-written with Kenneth Mather in 1949, was listed under "Text-books" with a

[81] T. Dobzhansky and L.S. Penrose, 'The Facts of Life', *Annals of Human Genetics*, 19 (1954), pp. 75-7.
[82] E. Ashby, 'Society and Genetics', *The British Medical Journal*, 2 (7 November 1953), p. 1033.
[83] C.D. Darlington, 'Reviews of F.o.L. (classified)', Darlington archive, CSAC 106.3.85/E.211.

caveat: "Not particularly recommended […] much of the book contains hypothetical matter presented as if it were well-established."[84]

Nevertheless, in these years such hesitation toward Darlington's work was not universal even among Cambridge lecturers, and in another list of recommended texts, *Elements of Genetics* was listed under the heading "Somewhat difficult for first reading but very informative". The same syllabus also listed Darlington's more recent publication, *Evolution of Genetic Systems* (1958), and favourably noted his *Chromosome Botany* (1956) as a book that was easy to read despite considering a more specialized topic.[85] *Chromosome Botany* was also recommended to Cambridge undergraduates taking courses in botany, and it was described as "Stimulating—even at times controversial!—and readable".[86]

While his fellow biologists may have been polarized in their responses to his work, there is evidence that to the layman Darlington's position as a scientist was comparable to that of Julian Huxley. In 1951, for example, Mr. George Adcock wrote to Huxley, copying Darlington. Adcock had been working for some time on "the problem of human evolution" and believed that he had recently hit upon "the key to human evolutionary theory". He hoped Huxley and Darlington would agree to look at his ideas in greater detail and was willing to wager £1, to be donated to the charity of each scientist's choice if his work was found to be "misconceived or erroneous".[87] Beyond demonstrating that in 1952 Huxley and Darlington were similarly esteemed on issues of human evolution, Adcock's letter implies the extent to which even those with little scientific training saw evolutionary theory to be

[84] 'Books on Genetics', [n.d., c. 1957], W.D. Hamilton archive, British Library, Loan 123, Z1X83/1/2.
[85] 'Books on Genetics', [n.d., c. 1959], Hamilton archive, Z1X83/1/2.
[86] '2nd Year Lectures, Michaelmas Term Suggested Reading List', [n.d., c. 1958], Hamilton archive, Z1X83/1/14.
[87] G. Adcock to J. Huxley, 15 December 1952, Julian Sorell Huxley archive, Woodson Research Center, Fondren Library, Rice University, Box 20.

both significant to understanding mankind and within reach in a way that the sciences of physics and chemistry were not. This would frustrate evolutionary biologists throughout the following decades, and it would also contribute to the political nature of evolutionary debates in these years.

Although the overt political agenda of Darlington's later publications would undermine his position as a reputable scientist, the political opponents of co-founder of ethology Konrad Lorenz, who had been one of Huxley's protégés in the biological study of behaviour, had already threatened his status as a scientist by the 1950s. In fact, the history of ethology was deeply coloured by the pertinence that it was seen to have to political ideology. This was in part due to the fact that although on the surface Lorenz was interested in the physiological study of instinct, in private he revealed his higher aims: he believed that the "highest and best" characters of human behaviour likely had an instinctual basis.[88] His science, then, was meant in part to speak to the nature of humans as either ethical or unethical.

While concerns about Lorenz's affiliation with the Nazi party during World War II were called into question after his Nobel Prize nomination in 1973,[89] the political bearing of his work had, in fact, already drawn notice as early as 1950. In August of that year, Lorenz reported to Julian Huxley that he had been passed over for a chair position at the University of Graz after the ministry's attention had been called to a paper of his "which clearly showed [him] to be the most horrible and inveterate of Nazis". Although Lorenz denied the allegations, arguing that the paper was meant to challenge Ernst Kriek, an influential

[88] Burkhardt, *Patterns of Behavior*, p. 171.
[89] See, for example, 'Nobel Prize Winner Replies to Nazi Hunter's Charge', *The Times*, (10 December 1973), The Times Digital Archive, Web, accessed 14 September 2012.

member of the Nazi party who claimed evolutionary theory was incompatible with Nazi ideology, he nevertheless admitted that it had been a mistake to have used "Nazi terminology" when writing his rebuttal. He even agreed that if one only saw disconnected excerpts from the paper, he would appear to be "a damn Nazi indeed".[90]

What is more, Lorenz conceded that at the time of the Anschluss he had wanted to make "Eugenics a sort of state religion". Still, he claimed to have had no idea that the façade of science created through eugenic discourse would be used "as an excuse to kill off Jews and other 'racially inferior' peoples". Moreover, Lorenz suspected that the allegations against him were in fact not about his political beliefs; rather, he saw them to be part of a plot to dismiss his science of Tierpsychologie on ideological grounds. For that reason, he insisted, "Confound Nazism, Catholicism - and Marxism too, since it has given birth to Mitchurin and Lysenko!"[91] As he saw it, the preponderance of political ideology over scientific objectivism, in addition to a string of bad luck, was preventing him from occupying a stable academic post from which he could conduct his research on animal behaviour. Agreeing that political prejudices stood in the way of Lorenz's work and the development of ethology more generally, Huxley and other British biologists, including W.H. Thorpe at Cambridge and Alister Hardy, David Lack, and Niko Tinbergen at Oxford, endeavoured to find Lorenz a position in England or America. Huxley went as far as to recommend him to the Rockefeller Foundation and a "Committee on 'Social Thought'" at the University of Chicago.[92]

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[90] K. Lorenz to J. Huxley, 19 August 1950, Huxley archive, Box 19.
[91] Ibid.
[92] See, for example, J. Huxley to W.H. Thorpe, 4 September 1950; J. Huxley to K. Lorenz, 7 September 1950; W.H. Thorpe to J. Huxley, 21 October 1950, Huxley archive, Box 19; According to Huxley, members of the

Thus, despite being viewed as both politically relevant and, at times, politically suspect, biologists who focused on behaviour and heredity were poised to act as experts concerning social issues in the postwar decades.[93] Still, not all scientists were glad to accept their increasingly public position. In 1958, for example, a prominent cell biologist at the Rockefeller University, Philip Siekevitz, went so far as to argue that because the "non-scientific public, in and out of government" viewed science as a necessary part of "any and all progress in military, economic, social, and even political matters", the position of the scientist in relation to society was changing. Once a "virtual outcast", the scientist was now "forced to participate in the affairs of society whether he wants to or not".[94]

Whether the call to service came intrinsically or extrinsically, several obstacles stood in the way of scientists who wished to assume a more central role in society. With public distrust of science running high, scientists acknowledged that their relationship with the larger community would have to be repaired if society was to overcome the unprecedented difficulties posed by the threatening nature of the atomic age and overpopulation. Public faith in science, it was thought, could be redeemed through the reform of science education and a broad dissemination of scientific knowledge. Upon receiving the 1959 Kalinga Prize for "outstanding contributions to the dissemination of scientific knowledge to the general public", French biologist Jean Rostand claimed that besides filling gaps in school education, the popularisation of science could keep politicians informed "and politicians have an ever greater need to be familiar with scientific developments". His message to scientists was

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Committee of 'Social Thought' were "anxious to get a first class man with a biological backing" (J. Huxley to W.H. Thorpe, 26 October 1960, Huxley archive, Box 19).

[93] Darlington was not the only biologist eager to discuss the nature of man. See, for example, G.C.L. Bertram, *Adams Brood: Hopes and Fears of a Biologist*, (London: P. Davies, 1959); C.H. Waddington, *The Ethical Animal*, (London: G. Allen & Unwin, 1960); J. Huxley, *The Human Crisis*, (Washington: University of Washington Press, 1963).

[94] P. Siekevitz, 'Scientists and the Government', *Science*, 127 (9 May 1958), p. 1120.

clear: "Whether we like it or not, the laboratory henceforward opens right onto the street. Science not only affects us at any moment of our day-to-day existence, it dogs us, it pursues us."[95]

**Biology as Politics and the Threats Posed by Overpopulation**

As it has already been hinted, perhaps one reason that an evolutionary understanding of humans and society was both political and politicized in the postwar decades, whether discussed in terms of our genetic legacy or our instinctive behavioural repertoire, was its perceived accessibility when compared with the physical or chemical understanding of the natural world. The public appeal of evolutionary theory was further impacted by the philosophical relevance it was seen to have in a time of increasing moral ambiguity. From the discussions taking place amongst scientists in leading journals, for example, it is clear that many experienced a sense of urgency regarding the question 'how we are to live'. Indeed, scientists felt the need to delineate the realm of biology as well as their own position as biologists in relation to other citizens[96] and to define the challenges that lay ahead in "the century of biological sciences".[97] There were also compelled to outline the social responsibility of biology in supporting ideals such as general welfare, individual freedom, and international peace.[98] In the postwar years, Julian Huxley was one among many who believed that it was important to find an alternative to political and religious dogmas, especially Marxism and Catholicism. The alternative he proposed was evolutionary

[95] J. Rostand, 'Popularization of Science', *Science*, 131 (20 May 1960), p. 1491.
[96] J.B. Kahn, N.W. Pirie, H. Elias, and J.C. Braddock, '"True" Scientists', *Science*, 117 (1953), pp. 697-9; R.D. Manwell, 'True Scientists', *Science*, 118 (1953), pp. 418-9.
[97] P. Weiss, 'The Challenge of Biology', *Science*, 118 (1953), p. 33.
[98] J.K. Marcus, 'Snares Awaiting the American Scientist', *Science*, 117 (1953), p. 508; W.P. Taylor and M. Phillips, 'Dangers for Science? or, Snares for the Scientist?', *Science*, 118 (1953), pp. 449-50.

humanism. Not only did evolutionary humanism appear to have a greater basis in rational thought and objective truth than did Marxism and Christianity, granting it the potential for universality; it was also seen to speak to present problems, both national and international.

Though scholars such as Julian Huxley and British philosopher H.J. Blackham saw evolutionary humanism to be a liberal force, not everyone agreed. When Huxley reviewed Earl Parker Hanson's *New Worlds Emerging* for the *London Observer* in 1950, for example, the author adamantly rejected Huxley's favourable comments concerning the work of Yale geographer Ellsworth Huntington, whose "entire intellectual structure", according to Hanson, was based on "the a priori racist assumption of the Negro's inferiority to whites". Moreover, Hanson claimed that Huntington had relied on the conclusions of Thomas Malthus, which had first been published in 1798 as a reaction to what he perceived to be the utopian views of Marquis de Condorcet. There was some danger, Hanson thought, in "men like Huxley who are today determined to help build a workable new world" giving lip service to sources which had been articulated within an "accepted colonial economic structure" and had served historically to give "to all too many people 'valid' scientific excuses for doing nothing".[99]

The resurgence of Malthusian assumptions in the work of postwar biologists, especially those concerned with population growth, had a particular political meaning that did not go unnoticed by W.A. Lewis in the Faculty of Economic and Social Studies at the University of Manchester. Lewis was keen to point out to Huxley the fact that Malthusian parameters had been used "mainly as a stick with which to beat the progressives" in the nineteenth century. Malthus had argued that reforms were, at best, ineffective since they

[99] E.P. Hanson to J. Huxley, 16 September 1950, and attached letter, Huxley archive, Box 19.

would allow the reproductive rates of the lower classes to surge, creating an ever increasing and unappeasable need for welfare. Lewis feared that the recent enthusiasm surrounding Malthusian ideas meant that they were again being used as an argument against improving the conditions of the poor. This time, however, the pessimism of Malthus was directed not towards the inhabitants of London's slums but towards people in "developing backward countries".[100]

For this reason, Lewis believed that policies blocking welfare provisions in India until national programs on birth control had been successfully implemented simply replayed nineteenth century discussions of welfare reform. He was impatient with the frequency with which this line of reasoning was put forward: if only we would "get on with developing the world's resources", he claimed, "population will take care of itself. […] Develop India, and people will want to know about birth control".[101] In his advocacy for improving the social and economic situation of the poor, rather than attempting, at the outset, to limit their ability to reproduce, Lewis's position challenged the common line taken by those involved with the Eugenics Society, as Huxley was, in the 1950s and 1960s. The position of this society, a continuation of that which was taken in the interwar years when the deterioration of the British stock was a major concern,[102] was that individuals in lower socioeconomic classes in particular were having too many children. It was therefore these individuals that the birth control movements, to a large extent, continued to target.

[100] W.A. Lewis to J. Huxley, 30 September 1952, Huxley archive, Box 20.
[101] Ibid.
[102] See, for example, R.A. Fisher, *The Genetical Theory of Natural Selection*, (Oxford: The Clarendon Press, 1930); E.J. Lidbetter, *Heredity and the Social Problem Group*, i, (London: E. Arnold, 1933).

While many scholars had worried about the declining population of Britain in previous decades,[103] the 1949 Royal Commission on Population gave some scientists reason to turn their presumably unbiased eyes toward the bedroom.[104] As it has already been foreshadowed, they were not merely concerned with reproduction amongst their fellow citizens; they were increasingly troubled by population growth in developing, "backward" countries, where overpopulation was seen to be both the "cause and effect" of poverty.[105] Although scientists were certainly not alone in identifying overpopulation as a looming threat,[106] their contributions on the topic speak to the unique role they expected themselves to play in political decision making. For this reason, it is worthwhile to briefly discuss the issue of overpopulation in the politicized intellectual environment surrounding the science of genetics in this period.

Beyond their usual 'Marxist' opponents, some biologists denounced national governments and religious institutions for resisting population control on what they believed to be a scientifically indefensible basis; overwhelmingly, the rhetoric of ideology versus fact remained central to debates concerning overpopulation. This is most obviously demonstrated through reports from September 1954, when the United Nations hosted a World Population Congress in Rome attended by both Western and Soviet scientists. Despite appearing to be a cooperative movement, the meeting revealed that the prognosis for international action

[103] See, for example, E. Charles, *The Twilight of Parenthood: A Biological Study of the Decline of Population Growth*, (London: Watts, 1934); G.F. McCleary, *Population: Today's Question*, (London: G. Allen & Unwin, 1938).
[104] See, for example, 'Report of the Royal Commission on Population', *The Lancet*, (25 June 1949), pp. 1110-3; E. Grebenik, 'The Report of the Royal Commission on Population', *Nature*, 164 (20 August 1949), pp. 298-300; F.W. Notestein, 'The Report of the Royal Commission on Population: A Review', *Population Studies*, December 1949, pp. 232-40.
[105] G. Tyson, 'Planning Help for Backward Countries', *The Listener*, (8 April 1954), pp. 600-1.
[106] See, for example, Lord Simon of Wythenshaw, 'A Danger as Great as the Hydrogen Bomb?', *The Listener*, (6 May 1954), pp. 763-4.

against overpopulation was quite bleak. As Marcello Boldrini, Professor of Economics at Milan University, testified, "The Soviet view of population problems, as put forward at the Rome Congress, was essentially one of denying that there are such problems. Population and available economic resources could always be successfully balanced, not by arresting the increase of numbers but through the achievement of social revolution."[107] A. Buzzati-Traverso, Professor of Genetics at the University of Pavia, was equally discouraged. He reported, "At the Rome conference as everywhere else the Marxist approach to scientific problems is still very different from the free and objective outlook which we regard as the highest ideal of science."[108]

Despite the obstacles posed by the convictions of Soviet scientists, the objective outlook of Western science was nevertheless moving forward in its attempts to offer new insight into the nature of man, one that was meaningful to both international and domestic policies. In 1958, *Science* called upon the readers to support "a national effort to expand research in human behavior as a means of fostering improved international relations and strengthening national defense". The effort was meant to increase "understanding of human beings as individuals and in social relations", and it was hoped that American researchers had the upper hand in the science of human behaviour since the Soviets were "constricted by Communist Dogma".[109] In the same month, *Science* advertised the American Association for the Advancement of Science (AAAS) Socio-Psychological Prize. The prize was to be awarded for a contribution that would "further the comprehension of the psychological-

[107] M. Boldrini, 'Conflicting Viewpoints at the Rome Congress', *Science and Freedom*, (April 1955), Darlington archive, CSAC 106.3.85/E.217.
[108] A. Buzzati-Traverso, 'Soviet Propaganda Versus Scientific Standards', *Science and Freedom*, (April 1955), Darlington archive, CSAC 106.3.85/E.217.
[109] 'Research in Human Behavior', *Science*, 127 (7 March 1958), pp. 511-2.

social-cultural behavior of human beings". It was "offered to encourage studies and analyses of social behavior", and contributions were welcome from any discipline so long as they addressed "the area variously known as social process, group behavior, or interpersonal behavior".[110] With new hope for the knowledge scientific research might yield, the relationship between scientists and government agencies grew more pronounced. By October 1959, the relevance of science to public policy was so well acknowledged that the British Prime Minister Harold Macmillan appointed a science minister. At the same time, a bill that would create a secretary of science in the President's cabinet was under debate in the U.S. Congress.[111]

By the end of the 1950s, concerns of overpopulation and the territorial nature of the Cold War made the question of man's aggressive nature more urgent. In 1959, psychobiologist Curt Richter concluded that guaranteeing resources would be as catastrophic to the human race as it had been to wild rats after generations of domestication. He urged that legislators be made aware of the potential consequences of welfare on both population growth and the future of man and proposed that a group of physicians, biologists, psychologists, and sociologists be put in place to advise the federal government.[112] In 1961 and 1962, articles by ethologists Irenäus Eibl-Eibesfeldt and J.B. Calhoun indicated that aggression served to naturally distribute organisms of the same species throughout an available area, but when populations grew too large, overcrowding would exacerbate aggression and social deviancy.[113] From studies on rats, population density was identified as

[110] 'AAAS Socio-Psychological Prize', *Science*, 127 (21 March 1958), p. 636.
[111] 'British Science Attains Cabinet Status', *Science*, 130 (23 October 1959), p. 1099.
[112] C. Richter, 'Rats, Man and the Welfare State', *The American Psychologist*, (1959), pp. 18-28.
[113] I. Eibl-Eibesfeldt, 'The Fighting Behavior of Animals', *Scientific American*, 205 (1961), pp. 117-22; J.B. Calhoun, 'Population Density and Social Pathology', *Scientific American*, 206 (1962), pp. 139-48.

a major biological as well as a social concern. Biologists Julian Huxley, William Thorpe, and G.C.L. Bertram, for example, believed that the greatest social problem facing the world in the early 1960s, before even the nuclear threat, was overpopulation.[114] The control of disease through medical advances in combination with expanding affluence meant that the world population was growing at an unprecedented rate. Initially, scientists worried whether economic and social development could occur alongside such rapid population growth,[115] but by 1957 the problem was identified as politically important: in *TIME Magazine*, the population explosion was even identified among the factors involved in "The Capitalist Challenge".[116] In 1960, what overpopulation meant both politically and socially remained an important question.[117]

At stake, some believed, was democracy itself; rising populations would cause the deterioration of the already fragile socioeconomic conditions in developing countries, especially those in Latin America and Asia, and this deterioration would make foreign aid efforts useless. If such instability was exploited by the Soviet Union, the added pressures could stimulate revolution in these countries and add to already rocky international relations. By 1960, Adlai E. Stevenson, U.S. Democratic politician and twice presidential candidate, went as far as to send a warning to his friends of the anti-Americanism he witnessed while traveling in Latin America. He was concerned that population growth there was "the fastest in the world" far "out-stripping production", and he cautioned, "if they don't achieve their

[114] See, for example, G.C.L. Bertram, *Socio-biological Responsibility*, (Hull: University of Hull, 1965), p. 5; Huxley, *The Human Crisis*, p. 43; W.H. Thorpe, *Science, Man, and Morals*, (London: Methuen, 1965), pp. 119-20.
[115] 'Population Trends', *Science*, 128 (11 July 1958), pp. 77-8.
[116] 'The Capitalist Challenge: The Population Explosion', *TIME Magazine*, (28 October 1957), pp. 44-5.
[117] See, for example, J.J. Spengler, 'Population and World Economic Development', *Science*, 131 (20 May 1960), pp. 1497-1502.

desire for a better economic and political life, we may find enemies, not friends, on our doorstep".[118]

**Conclusion**

This chapter has demonstrated the extent to which geneticists in the 1950s believed 'fighting communism' was among their professional obligations. Through identifying themselves as apolitical and their work as objective, various biologists sought to draw clear lines between their work and that of their opponents, whether Marxist, religious, or merely uninformed. In doing so, they set the stage for battles between objective scientists and others with questionable motives on major issues including race, overpopulation, and the defence of democracy throughout the following decades. When the prevailing belief system amongst biologists that the field of genetics held ultimate and potentially revolutionary power was challenged, the rhetoric used to subjugate competing agendas was almost always the same: although the laws of genetics and the tenets of evolution meant there was an identifiable 'truth' uniting the past, present, and future of humankind, the majority of the population would find the lessons of biology too unpalatable to embrace in any meaningful way.

As University of California zoologist Curt Stern concluded in 1952, "The decisions to be made [concerning man's genetic future] will be revolutionary for man's thinking, his private life and his social organization. They will carry with them the danger of his loss of freedom".[119] For this reason, it is not surprising that Bill Hamilton was mesmerized from his youth by the fields of evolution and genetics and the very real implications they was seen to have, especially amidst the chaos of the Cold War. He saw no room for error in determining

[118] A.E. Stevenson to 'Bill Benton's Friends and Mine', 1 December 1960, Huxley archive, Box 30.
[119] C. Stern, 'Man's Genetic Future', *Scientific American*, (February 1952), p. 74.

both who we were as a species and the equally important limitations of who we could hope to be.

Thus, while biologists in the late-1950s hoped that scientific thinking would lend new insights into important ethical questions, Bill Hamilton was framing the question of what was moral or immoral another way. He asked, to what extent are humans as individuals capable of being concerned for the well being of others or indeed the future of humanity itself? If his own set of experiences was any indication, he assumed that the answer would be overwhelmingly negative. In resolving this problem, he ultimately aimed to quantify the degrees to which individuals would exhibit both generosity and animosity towards those around them. In doing so, he was inevitably in dialogue with many of the most pressing political issues of his day. On the side of generosity, his topic addressed the degree to which a social safety net would meet the standards of wide public appeal. Perhaps more importantly, it asked how this agreement would be altered if societies grew to consist of more culturally and physically different peoples as a result of increasing immigration. On the side of animosity, it questioned the extent to which different countries, especially the world's superpowers with their vastly different social and political structures, could coexist peacefully. To examine how Hamilton came to understand these questions in biological terms, we must closely track his personal development from 1954.

# CHAPTER TWO

## Coming of Age and the "humble rejection of dogma"[120]

That Bill Hamilton should become a biologist is due in part to the early and enthusiastic introduction to nature that he was given by his mother, Bettina. She was a physician by training but abandoned her professional work to care for what would become a brood of six children. She especially nurtured their interests in collecting and identifying plants and insects. Growing up in rural Kent with a mother who appeared to know as much about nature as she did about medicine, collecting was in some ways an obvious hobby for the young Hamiltons. For Bill, it would become a lifelong obsession.

Bill later claimed that his mother had done more than inspire him to collect. In fact, it was she who first introduced him to Darwinian theory when, around the age of twelve, he inquired about the similarities between the leaves of carrots and those of parsnips. When he read Darwin's books for himself at age fourteen, he was immediately committed. As he later recollected, his complete devotion to Darwinian theory went beyond interests in plants and animals and resulted in repeated attempts to "apply evolutionary interpretations to absolutely everything – including all the emotions I could find by introspection in my own mind".[121] As we will see, it was through such rigorous attention to his own evolved nature that he hoped to make a scientific impact.

[120] C. Hudson and J. Hudson to W.D. Hamilton and C. Hamilton, August [1969], Hamilton archive, WVJ13/1/7.
[121] W.D. Hamilton, 'New Aspects of Evolution and Their Relation to Man and Human Affairs', [n.d., c. 1977-8], Hamilton archive, Z1X73/1/12.

The purpose of this chapter is to try to understand how Hamilton came to see altruism as a topic fit for scientific study. Acknowledging that Hamilton's theory was not originally drawn from the case of social insects,[122] it also attempts to understand why it was that Hamilton was so intrigued by the potential meaning natural selection held for human societies. Such an understanding of Hamilton's early work on the biology of social behaviour and more specifically, self-sacrificing behaviour, shows that he was not merely opportunistic, having found a gap in the literature—how can altruism evolve against selection pressures that favour individualism—that needed filling. Indeed, we see that Hamilton was much more concerned at this time with the state of the world than he was about the prevalence of 'benefit for the species' claims within biology. It seemed to Hamilton that myths rather than rational thought were ruling the day, and he feared the results would be disastrous.

With this in mind we may return to 1954, at which point Hamilton was finishing his final year at his elite public school at Tonbridge and had signed up to begin his National Service. Through close attention to Hamilton's diaries and letters, this chapter will trace his on-going commitment to viewing both the natural world and the human condition in what he saw to be the tradition of Charles Darwin. Moreover, it will highlight some of the major political and social events he witnessed, demonstrating how these developments were viewed through his particular biological lens. Following this, it will reconstruct as much as possible the major developments during Hamilton's undergraduate career at Cambridge. This includes his conflict with Cambridge anthropologists, although evidence will be given to show that Hamilton continued to engage with anthropological texts in the following years.

[122] Scholars began to assume this as early as 1965. See, for example, A.S. Rand to W.D. Hamilton, 14 March 1965, Hamilton archive, Z1X89/1/1.

It will then sketch Hamilton's decision to enter the London School of Economics as well as his relationship with various social scientists as he sought funding for his project. Moreover, it gleans insights from notes and early drafts of Hamilton's ideas concerning relatedness and social interactions, wherein we see that because his theoretical framework first developed intuitively as opposed to experimentally, it is worthwhile to consider the possibility that extra-scientific factors may have influenced the direction his theories took.

**A Devoted Darwinian with an Eye for the Social**

As we have already seen, Hamilton traced his commitment to Darwinism to his secondary school years. His journal entries from 1954 confirm his dedication to using the theory of natural selection as an explanatory tool. Most significantly, Hamilton was interested in understanding his own behaviour and that of others as having a meaningful evolutionary legacy. For this reason, when he worried he might have contracted tuberculosis at the age of eighteen, he hoped that the threat of impending death might provide him with the impetus he needed "to get a move on with whatever it is that I am going to do (this sounds as if I don't know what it is, but this is not so) Properly I ought to join the ranks of all the great consumptive artists, but if its only to be different I will stick to science science [sic] as my main line whatever happens."[123] Referring to Darwin as "the Great Man", he found the original Darwinian texts to be a continuous source of inspiration.[124] In fact, three of Darwin's major questions, why are humans moral; why does sex exist; and why does

[123] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 27 December 1954, Hamilton archive, Z1X42/1/1.
[124] W.D. Hamilton, entry in 'Rough Notes', 7 April 1954, Hamilton archive, Z1XUN/4.

death need occur, would be the chief subjects Hamilton would pursue, not only in his early career but also throughout the remainder of his life.

Psychologist Howard Gruber has claimed, "Darwin treated man as a unique *opportunity* for the biologist, an opportunity to study intelligence as a central feature of adaptive change, and to study it in that organism in which it is most prominent, man".[125] Hamilton, too, was interested in human intelligence. By 1954, he had recorded his long-term goal: "My life's work will be on evolution, if I can work it so, & Darwin is my ideal".[126] At this time, he was particularly interested in the "subject of improving man's brain by selection", even referring to this as "my subject".[127] Thus, we see that his early interest in eugenics[128] was tied to his interest in the evolution of intelligence.[129] His assumption that intelligence was a heritable trait is not surprising; that it could be improved through selective breeding, however, had certainly become a less fashionable idea after World War II. The general acceptability of Hamilton's beliefs, however, was never a real issue for him. Following what he believed to be the tradition set by Darwin, he was comfortable playing the role of a 'scientifically' informed non-conformist, and this would be true throughout his life.[130]

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[125] H.E. Gruber, *Darwin on Man: A Psychological Study of Scientific Creativity*, (Chicago: University of Chicago Press), p. 179.
[126] Hamilton, entry in 'Rough Notes', 7 April 1954.
[127] W.D. Hamilton, entry in 'Rough Notes', 14 October 1954, Hamilton archive, Z1XUN/4.
[128] Even in 1996, Hamilton was forthcoming about his early and continued commitment to eugenics; see Hamilton, *Narrow Roads of Gene Land*, i, 15.
[129] He was interested in the inheritance of intelligence throughout his career. In his copy of *The Eugenics Society Bulletin* for June 1976, for example, he underlined the claim that there was scanty evidence for the effect of malnutrition on mental development (Hamilton archive, NCRX4/1/1).
[130] Still, his commitment to idealism sometimes led him to feel very alone, unable at times to even relate to his sister Mary, who shared many of his values; see, for example, W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 5 May 1957, Hamilton archive, Z1X42/1/6.

In trying to use science to create a better world, Hamilton's outlook was not dissimilar to that of many other British geneticists who were negotiating their place in the postwar world, and this was something Hamilton recognized. In particular, Hamilton acknowledged that he shared the scientific view of J.Z. Young, Julian Huxley, and "to a lesser degree […] Arthur Keith". He described these men as examples of "great brains in the world who think the same as I do – think the same things as I synthesised in my own brain, before I had ever read them", and this gave him confidence that he, too, would become a great scientist.[131]

Each of the scholars Hamilton identified as prototypes for the type of work he wanted to accomplish was particularly concerned with human evolution. Although at the time of Hamilton's death in 2000, he did not own any of Young's books, his reference to his own brain in the above quote is nevertheless suggestive of Young's *Doubt and Certainty in Science: A Biologist's Reflections on the Brain* (1951). Of Keith's texts, we know that he owned three: *Concerning Man's Origin* (1927), *Essays on Human Evolution* (1948), and *An Autobiography* (1950).[132] In these, it seems likely that he would have sympathized with the emphasis Keith placed on the role of in-groups and out-groups in the evolution of social behaviour. Moreover, Keith's idea that nations were not a political unit but an evolutionary unit may also have influenced Hamilton. Like Keith, Hamilton certainly believed that man's evolutionary past had significant bearing not only on his current perceptions of what is right and what is wrong but also on his seemingly unrelenting tendency towards war.

As for the parallels Hamilton drew between himself and Julian Huxley, these could have resulted from his familiarity with any of a number of texts or broadcasts, but there is

[131] W.D. Hamilton, entry in 'Rough Notes', 13 February 1954, Hamilton archive, Z1XUN/1/4.
[132] Hamilton archive, WVJX11; WVJX8; WVJX2.

only evidence that he owned one of Huxley's books written before 1954, *Evolution: The Modern Synthesis* (1942).[133] Nevertheless, when Hamilton compared his worldview with that of Huxley, known today for his position as a statesman of science throughout the postwar decades, he pointed to a shared belief that went beyond a faith in the explanatory power of evolution within the natural world. In fact, he was tuning into discussions underway amongst socially concerned biologists who wished to replace superstition, whether religious or communist, with scientific fact. Moreover, it was on account of his understanding of evolution that Huxley viewed the threat of communism,[134] and even more importantly the dangers presented by overpopulation, as being so immediate.[135] As we will see, these issues were equally present in the mind of the young Bill Hamilton. For him, as for Huxley, the only solution was science. Nevertheless, the vexing question remained: how could one convince the public to listen?

As he prepared for a future of scientific greatness, Hamilton spent much of his spare time reading, and he was particularly fascinated by Russian literature. This interest dates at least from 1954, and it was indeed connected with his dedication to evolution. In fact, it seems that Hamilton was actively looking for evidence of evolution working in human society through the depictions of human nature he found in literature. Having read Maxim Gorky in 1954, for example, Hamilton wrote,

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[133] Hamilton archive, WVJX12.
[134] See J. Huxley, *Soviet Genetics and World Science*, (London: Chatto & Windus, 1949).
[135] Huxley repeatedly emphasized the extent to which overpopulation was the most pressing problem facing mankind in the postwar decades; see, for example, his exchanges with American Democratic politician and twice Presidential candidate, Adlai E. Stevenson (15 September 1958, Huxley archive, Box 28). By 1960, however, Huxley was concerned that too few policy makers understood the danger presented by overpopulation, so he paired with Cass Canfield, president of the Planned Parenthood Federation of America, Inc., to ask "distinguished men and women including Nobel Prize winners" to sign a statement of conviction concerning the importance of widespread birth control (June 1960, Huxley archive, Box 29).

> "the idea has been occurring to me very persistently that possibly Mankind is not evolving by a steady progress as I like to imagine, but his evolution has got wildly out of control & he is evolving ever more rapidly to his own destruction. Russia seems to exemplify this view more than any where else – with all the innumerable cranks, oddities, debaucheries, cruelties as Gorki [sic] presents."[136]

Through Hamilton's reflections on Russian literature, we can begin to unpack his frame of mind and the extent to which the particular social and political climate of the postwar years impacted it. In April of 1954, for instance, Hamilton's discussion of Gorky's *The Mother* gives some indication of his wider beliefs concerning not only the illusory visions arrived at through ideological bias but also issues surrounding the subject of class and intelligence, which are particularly interesting in light of his desire to improve the human brain. The novel had, in fact, left Hamilton deeply frustrated inasmuch as it "absolutely reek[ed] of concentrated propaganda". He guessed that the book had been written quickly "with but one end in view to produce something that would help to uphold Socialism by its appeal to the workers". According to Hamilton, the result was "so silly – surely Gorky himself didn't have such a narrow view of the ruling class against which he was fighting – he makes them so similar, so uniformly petty, wicked & cruel."[137]

Indeed, he felt that Gorky's view was "too biased" and his outlook "too narrow". Having read Chekhov, Hamilton was certain that Gorky's depiction could not be accurate: "I know that Chekov's [sic] level of society at least were not actively cruel, malicious, & wicked; infact [sic] in their way they suffered as much as did the working classes." The cause of Russia's misery, therefore, was not "the senseless selfishness of the capitalists; the cause was not personal, no one could be blamed". Instead, the cause "was external in origin,

[136] W.D. Hamilton, entry in 'Rough Notes', 11 January 1954, Hamilton archive, Z1XUN/4.
[137] W.D. Hamilton, entry in 'Rough Notes', 3 April 1954, Hamilton archive, Z1XUN/4.

malignant by chance, not by any humanised purpose – a vast accident".[138] Hamilton does not go as far as to say, then, that if the cause of Russia's wretchedness was not created, it was natural, but there is reason to believe he was thinking along these lines.

Through his further analysis of the situation in Russia, two things emerge. First, we see that Hamilton's preferred technique of understanding the world was through generalizations based more on intuition than on available data. Using his personal database of information confidently arrived at through "all [his] knowledge of Russian literature", Hamilton constructed an explanation for what he perceived to be Russia's pervasive unhappiness. Although he made a brief attempt to research Russia in encyclopaedias, he did not find the additional information helpful. It was "Much to [sic] historically complicated for me" since "I still hanker after general tendencies in the masses".[139] This strategy of prioritising general trends over specific case studies would later contribute to the development of his theories in a meaningful way.

Hamilton's discourse on Russian literature also demonstrates the extent to which Hamilton had appropriated assumptions about the relationship between wealth, poverty, and inherited intelligence that were not uncommon in his time. For example, he described the upper class of Russia as rich, bored, and intelligent; they know that "something is monstrously wrong" but they do not have the energy to act. The middle class, Hamilton claimed, was rich, "stupid, bourgeois having recently risen from the peasants"; they were controlled by their love of money and power, and their close kinship with the lower class exacerbated relations between the two. Lastly, Hamilton wrote, "The lower class is poor &

[138] W.D. Hamilton, entry in 'Rough Notes', 3 April 1954.
[139] Ibid.

stupid & because of these things they are miserable (?), dissatisfied, but apathetic in their dissatisfaction"; overall, he characterised their life and mentality as "animal".[140]

Because he saw intelligence as heritable and believed that its paucity was the cause of the misery of the poor, Hamilton assumed that changing the social and economic environment of the poor would only change their condition superficially. He claimed that after the revolution in Russia, the lower class was "better off physically than before the revolution, but not mentally".[141] The relationship between class and intelligence, the heritability of both, and the effect this would have on future societies due to differential rates of reproduction would be a concern of Hamilton's throughout his life.

Apart from the insights into society Hamilton garnered through fiction, there was an additional reason that the Russian literary tradition interested him. Indeed, the nineteenth century Russian authors that he read were overwhelmingly concerned with the same questions that had occupied Hamilton in an increasingly morally ambiguous world. In an undated essay, Hamilton demonstrated not only that he admired the realism of the stories told by Russian authors, the fact that the characters were "credible" and the plots depicted "pictures of life as it is", but he also sympathized with the ever present theme, why do we live. Hamilton claimed that this question transcended all others in the Russian literary tradition, and to him it seemed that the question had "immediate relevance". According to Hamilton, the importance of the question and the genius of those who addressed it did not mean that it would be resolved. In fact, he argued, "That no answer has been provided is not

[140] Hamilton, entry in 'Rough Notes', 3 April 1954.
[141] Ibid.

surprising." Indeed, it may be that such answers "lay beyond the writer's station". At least according to Chekhov, "it was for his readers, the jury, to decide."[142]

Hamilton does not say, however, whether the answer might be arrived at, or at least illuminated, scientifically. What is clear is that he did not approve of the answers derived through Marxist ideology, and as much as he loved Russian literature, he regretted the new Soviet variation on it. When *The Cherry Orchard* was staged in Moscow Arts Theatre in London, Hamilton disapproved: he believed it had been transformed into Soviet propaganda. So, too, had recent Russian films forsaken Chekhov's tradition of presentation for preaching. In the last scenes of *The Cranes Are Flying* (1957), for example, it seemed to him that "Soviet Russia has Solved the Problem of Life" was "scored […] in huge black type".[143] Rendering it, in fact, unsolved, Hamilton would nevertheless dedicate the remainder of his life to using evolutionary theory to illuminate the 'nature' of humankind that made utopian views of society both impossible and dangerous.

**A Darwinian in the National Service**

By the end of 1954, scholars and politicians alike acknowledged that the end of colonialism would bookend an era for Britain.[144] What is more, some began to question the likelihood that Britain would be able to "stay great".[145] Amidst such doubts, there is no indication that Hamilton was eager to enter the National Service as a measure of loyalty,

[142] W.D. Hamilton, 'Their Question', [n.d.], Hamilton archive, Z1X95/1/6; it is possible that this essay was written as late as 1962 because that is when Hamilton discussed making plans to see 'The Cherry Orchard' (Hamilton to C. Hudson, 13 February 1962, Hamilton archive, Z1X74/1/9). If this is the case, it is indicative of the continuity of his concerns from the mid-1950s to the mid-1960s.
[143] Ibid.
[144] M. Perham, 'Britain's Response to the End of Colonialism', *The Listener*, (30 December 1954), pp. 1139, 1153.
[145] O. Franks, 'Britain and the Tide of World Affairs', *The Listener*, (11 November 1954), pp. 787-8, 807, 811.

dedication, or sense of duty to his country, despite the fact that he was a patriotic young man. Rather, like it was for many,[146] this decision was a practical one, endorsed by various people including G.C.L. Bertram, a prominent member of the Eugenics Society and professor at Cambridge.[147] However necessary the decision was, Hamilton's patience quickly wore thin, and amidst great frustration in the early days of 1955, he was often overtaken by existential pondering. Among other things, he wondered whether he was too selfish. Responding to his mother's recent illness, he wrote, "I have the sneaking suspicion that my sorrow is still selfish."[148]

Nevertheless, his familial relationships were altogether strong; it was his peers who made him doubt the extent to which he was naturally social, and he often felt himself an outsider. After an event in his second year of service, for example, he wrote, "And I try all through this to defend mentally my chosen way of life & can't & see myself as a bumptious fool, imagining himself a genius, I shall suffer in chagrin & disillusionment later."[149] Reporting to his parents on the same day, he wrote: "I hate these things & hate myself for being so unsociable & so incapable of normal social intercourse."[150] Still, he remained confident in his intellectual abilities and his potential for greatness. Imagining what would become of his life, he wrote, "At times I doubt my ability for anything but for the petty side of my chosen subject, & at times, when I seem my abilities & shortcomings least clearly, fancy myself capable of grand scientific syntheses".[151]

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[146] C. Shindler, *National Service, From Aldershot to Aden: Tales from the Conscripts, 1946-62*, (London: Sphere, 2012).
[147] See W.D. Hamilton to A. and B. Hamilton, 6 December [1954], Hamilton archive, Z1X42/1/16.
[148] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 25 February 1955, Hamilton archive, Z1X42/1/1; see also W.D. Hamilton, entry in 'Rough Notes', 11 May 1954, Hamilton archive, Z1XUN/4.
[149] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 27 March 1956, Hamilton archive, Z1X42/1/1.
[150] W.D. Hamilton to A. and B. Hamilton, 27 March 1956, Hamilton archive, Z1X42/1/16.
[151] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 12 July 1955, Hamilton archive, Z1X42/1/1.

In the meantime, however, Hamilton was deeply concerned about the trajectory of his own country. When he could, he escaped the confines of army life to visit his sister Mary, who was training as a medic in London. After discussing current events with Mary's landlady one afternoon, he reached the conclusion that what was needed was a "vote of censure on the frantic emigration that is going on at present & a vote of faith in Britain."[152]

Certainly, his concerns were piqued when in July 1956 Britain's global authority was questioned after the Suez Canal was nationalized by Egyptian President Gamal Abdul Nasser. By August, the Suez Crisis made doubts concerning Britain's role in the postwar world an all too serious reality. Even from within the military, the reason for the crisis as well as the question of what should be done remained unclear.[153]

At this point, however, international politics did not diminish his tendency toward existential pondering. He wrote to Mary that he had "known for a long time, & have now almost convinced my self, that happiness does not exist, not as anything more than a mathematical function of the variables of evolution". Longing to escape his present obligations and "yearning – as if I could drop into a life more full of meaning through the floor", he recognized the fact that such desires were "all nonsense, scientifically". Still, this did not make them avoidable. According to Hamilton, one "can't help yearning, not at our age anyway. Evolution requires it, I think."[154]

Obviously unable to predict the impending crisis that would emerge in October, Hamilton's mind was for the moment occupied with another international issue: nuclear proliferation and the threat it posed through genetic mutation. It was a subject that also

[152] W.D. Hamilton to A. and B. Hamilton, 25 January 1956, Hamilton archive, Z1X42/1/16.
[153] W.D. Hamilton to M. Hamilton, 18 August 1956, Hamilton archive, Z1X42/1/17.
[154] Ibid.

interested Mary. In fact, it was Mary who had sent Hamilton a recent pamphlet on nuclear hazards. Having studied it, she was "cheered by its rather negative findings, from my own personal safety point of view, though even I did have an urge to get up & shut windows to keep out malicious rays", but at the same time she was "disappointed in its wide scope & rather wandering & inconclusive sources of evidence". She hoped her brother could help her to understand "the idea of mutations".[155]

Hamilton was happy to have Mary as a confidant who shared his faith in science and his belief in the social importance of genetics. Since Hamilton had already read a great deal on the subject, it is not surprising that Mary turned to him for guidance. Responding to her letter in great detail, he wrote, "you really can't study this sort of thing at all without going into the mathematics", and going back to the issue of mutations and intelligence, he wondered why, "seeing that families of great brains do appear", giving the Huxleys as an example, the genes do not spread through the race rapidly. He thought it might be "that the mutation, or gene-complex or whatever it is, is counter-balanced by some correlated characteristic: decreased fertility, or some physical imperfection". Even if a new, favourable combination of genes did arise, the process by which it naturally spread would be "extremely slow", and Hamilton argued, it would be inhibited further by "the increasingly world wide 'welfare-state'".[156]

The British welfare state, put in place after an overwhelming victory by the Labour Party in 1945, and its 'cradle to grave' mentality was symbolic of Britain's dedication to collective interests in the wake of World War II. Gone were the days of the Victorian workhouse in which those seeking assistance were separated from not just their partners and

[155] M. Hamilton to W.D. Hamilton, 14 September [1956], Hamilton archive, Z1X42/1/17.
[156] W.D. Hamilton to M. Hamilton, 3 October 1956, Hamilton archive, Z1X42/1/17.

children but essentially all of society and made to adopt a subhuman existence. The welfare state was also meant to chase away any remembrances of the belittling dole system of the interwar period and guarantee that those hard on their luck would not be punished or shunned but buttressed until such assistance was no longer necessary. The rise of Labour and the welfare state it put in place was in fact symbolic of a postwar public that wanted not only peace but also assurance that the fairer society successfully set in motion by the wartime coalition government would remain: a return to laissez faire through a conservative government, and its potential to unleash another economic depression, was simply too risky a choice in the eyes of most working and middle class voters to deserve serious consideration. Within six years, however, there were already reasons to question the viability of the welfare state, and as Hamilton saw it, both its survival odds and its long-term effects deserved serious consideration.

For Hamilton, the welfare state had to be understood from a biological perspective. From this vantage point, it represented something surprisingly more sinister than previous assistance schemes had. In the welfare state, Hamilton wrote, "the intelligent man earns no more money than the fool & is unable to support more children". In fact, it seemed to him that "the more uneducated & stupid a person is the more children he tends to have". Still, he could not say whether the blame lay with the government, for ignorantly rejecting efforts to expand access to birth control, or with impoverished individuals and their personal shortcomings. At least, he thought, the pamphlet Mary had sent him recognised that medical advances that kept individuals "afflicted by hereditary conditions" alive increased their likelihood of surviving long enough to reproduce, thus increasing the "prevalence of the condition in the population & with it an increase [sic] need for medical services". For this

reason, he believed that as fortuitous as medical advances and the welfare state appeared to society in the short term, their effect on the future of civilization necessitated caution. He recommended another article on the subject to his sister, demonstrating that their conversation on this topic was more than a one-off event.[157]

Mary's letter also indicates the extent to which she and her brother saw their shared devotion to evolutionarily informed thinking to be at odds with the views of those around them. For example, she had evangelized the tenets of natural selection within her shared house but reported that the devotion of her housemates to Christianity impeded rational discussion.[158] Hamilton shared Mary's annoyance with religious individuals. In fact, he likened religious proselytizing to the promotion of what was for him the irrational ideology of communism. In 1954, for example, he compared the required Divinity lectures at Tonbridge to "having to listen to a continual stream of Red propaganda" and it worried him "to hear people expounding hundreds of lies so confidently". Like his response to communism, Hamilton claimed his antagonism toward religious teaching was based on his profound "hatred of lying & hypocrisy" and his genuine "passion for truth". It was this commitment that characterised what he referred to as his "deep-rooted" idealism;[159] by this, of course, he meant his commitment to a scientific worldview, however unpleasant.

Some time after this, however, he met a devoted Christian who made him question which he valued more, that a person lived according to certain ideals or that a person lived outside the shroud of religious belief. Hamilton described the Christian man as "so sincere, so strong in his belief, how happy he must be to think he knows all the answers to this

[157] W.D. Hamilton to M. Hamilton, [n.d., c. 3 October 1956], Hamilton archive, Z1X42/1/17.
[158] M. Hamilton to W.D. Hamilton, 14 September [1956].
[159] W.D. Hamilton, entry in 'Rough Notes', 6 March 1954, Hamilton archive, Z1XUN/4.

unbelievable hotch potch of an existence". In fact, while Hamilton was committed to expounding the evolutionary framework from which he worked to any potential convert, he believed that faith-based opposition to evolution might be so uncompromising that arguments against it were futile: "Against intellectual arguments for belief in a religion I am adamant; […] But against simplicity, unreasoning belief sincerity, I am at a loss. It isn't fair to produce evolutionary & scientific arguments to combat such things & besides I myself soon begin to think they are irrelevant". Hamilton could not condemn the man for showing no regard for Darwin, "for after all what is scientific evidence to him". The experience left Hamilton "firmly convinced" that people such as this man "are useless, or at least useless in what they imagine to be useful",[160] and in the following years, Hamilton would continue to see Christianity as an unproductive or even counterproductive way of determining social ideals.

With an international crisis unfolding, however, Hamilton was forced to realize that the major concerns of the decade went beyond the domestic. By the beginning of November, all eyes were on the Suez Canal, leading Hamilton to exclaim, "What the Hell is going on in the Middle East?" It certainly made no sense to him, and as much as people were talking about it, he was convinced that it did not make sense to anyone:

> "Who is trying to do what? […] Why has Britain stepped in? Why are Egyptian airfields being bombed when nothing else happens? […] Who do we favour, Egypt or Israel? And who do all these people who chat about it so gaily favour? They don't say, but I think it is the Jews because the Egyptians are Wogs. What are our moral grounds? Revenge for the dirty trick Egypt played on us so successfully?"

[160] W.D. Hamilton to B. Hamilton, [n.d., c. December 1956], Hamilton archive, Z1X42/1/16.

Those he encountered seemed to think the answer was to "drop an Atom Bomb […] Where for Christ's sake they didn't tell me. In Sinai? In the Canal? In the Nile? On Cairo?" He was obviously appalled at the suggestion and reported, "Oh yes, one priceless [response] was that we should damn the Nile in our own territory up in the Sudan somewhere as is 'quite within our rights' so as to take all Egypts [sic] water." Certainly, he feared the possibility of war and wondered whether "a storm of hatred somewhere worse than before" could be prevented.[161] Events such as these highlighted the moral ambiguity inherent to Cold War international relations.

But according to Hamilton, the real devastation was the fact that the events in the Middle East diverted attention away from the revolt in Hungary. In his mind, this had been "the one thing that has been really fine & sane in the last few years". He had at first been "wild with delight when I heard how the Hungarian people & students were facing massacres to make their voices heard", only to see that "this superb patriotism was fobbed off at last with false promises & a few government dismissals, & now under-cover, when nobody's looking that way, the promises are all being broken as quick as they can it seems".[162] Only a few days later, thinking of the failed revolt was enough to bring him to tears.[163] Indeed, current events seemed to teach again and again that in the end it was every man for himself.

With only three months left of his service, the sense of pervasive uncertainty was wearing on Hamilton. Accordingly, he wrote, "My National Service […] has been spent in mounting mental tension & confusion." In part the confusion was personal: why should he

[161] W.D. Hamilton to M. Hamilton, 2 November 1956, Hamilton archive, Z1X42/1/17.
[162] Ibid.
[163] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 5 November 1956, Hamilton archive, Z1X42/1/1.

order soldiers, "Why should I who can't make head or tail of my own life, rule theirs". In part it was domestic: "Houses of Parliament, low courts, tumble, administrative establishments are thrown into confusion […] Miners: we will flood the pits". The greatest tragedies were, however, international. He recorded fretfully,

> "Tanks crush Budapest's Freedom Fighters. […] Fascists incite counter revolutionaries, Egyptian airports are bombed […] bodies of Russian hostages thrown in the streets, suspected personnel hung from bridge in Budapest, from telegraph poles on Walburg Hill, Others shot from the mouths of cannon, torn apart by wild horses, hung by the feet, starved, raped, tortured & burnt, […] riots of reservists in Cyprus, […] riots in Algeria, in Trafalgar Square […] in Hong Kong, in Singapore, Poland, Egypt, Rumania, Southern Russia, France […] ~~Help me, get me out of this army. Where can I hide.~~"[164]

It is perhaps in part due to the widespread anxiety brought on by such chaos that Hamilton found solace in science, and in particular, the simplified, well-organized worlds he could devise and understand through theoretical biology. In this context, Hamilton's interest in what types of social or anti-social behaviours are favoured by evolution is notable. While society was grappling with questions of how to act, Hamilton asked how it was natural for men to act given their evolutionary history. While there is no evidence that Hamilton viewed the nature of sociality, and thus, the evolved limitations of self-sacrifice, to be strictly immutable, he certainly believed that they made extreme changes to our evolved capacities unlikely if not impossible.

The image we gain through Hamilton's private writing is one of a young man who tried desperately to be objective, but more importantly, one who believed objectivity was possible if a person only set his or her mind to it fully. We see someone who was already annoyed but not hateful of the religious beliefs that created myths around the topic of human

[164] W.D. Hamilton, note, [n.d., c. December 1956], Hamilton archive, Z1X42/1/1.

nature, who admired individuals who had ideals by which they lived. Hamilton was someone who worried about his lazy streak and at other times was convinced he would achieve his high ambitions. He opposed communism enough that he could be brought to tears over its failed overthrow in Hungary; he could not see rhyme nor reason behind the decisions being made by government officials in international affairs; and he was concerned about the genetic future of mankind. To him, it was too seldom recognised that political decisions, such as the proliferation of nuclear technologies and changed immigration policies, and social commitments, such as the imprudent application of advances in medicine and the implementation of the welfare state, would impact the human gene pool in significant ways. It was with this understanding that he committed himself to further training in the natural sciences at Cambridge. Scientists were characterised as "this century's version of the explorers of earlier times",[165] and by the fall of 1957, Hamilton aimed to join their ranks.

**The Haggard Life of a University Student… and an Idealist**

Hamilton's first response to the Oxbridge lifestyle was not surprising. Transitioning from a scheduled life in the National Service to life as an undergraduate, where students are thought to belong in the libraries, he wrote home in September 1957, admitting, "I haven't much clue what I'm supposed to be doing here yet." Moreover, the two years in the army had changed him. When he ran into classmates from school, he felt it was "like meeting a lot

[165] 'Bright Spectrum', *TIME Magazine*, (18 November 1957), p. 20.

of ghosts, or as though I'd been dead & am now resurrected; […] the old idioms which I hardly realised I'd lost, begin to come back to me."[166]

As he adjusted to life on campus, he reported the events at Cambridge through letters home and journal entries. Of particular note was a talk by a Soviet ambassador in November 1957 that reflected more general anxieties concerning perceived Soviet prowess in all things technical. Not only had the Soviets recently launched a second satellite into space, this time carrying a dog; they were also rumoured to have nearly two million scientists and technicians between their universities and technical colleges. Britain could only report a fraction of this number.[167] The dangers associated with the Soviet's scientific advantage were compounded by observations that they were penetrating the Middle East.[168] It was in light of these perceptions that British Prime Minister Harold Macmillan declared, "Never has the threat of Soviet Communism been so great".[169] Weeks after *TIME Magazine* warned of the threat "Communism's new coalition of dazzling technology and cutthroat politics" posed to the "free world",[170] Hamilton reported his own understanding of how the Soviets were blending their obvious advantages in the fields of science and technology with an impassioned proselytization of their worldview: "it occurred to me that another reason why Communism will dominate the world is that they have a positive view & still the enthusiasm to propound it. It is hard to imagine a British diplomat speaking to Russian students with such enthusiasm about the way of life in Britain."[171]

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[166] W.D. Hamilton to B. Hamilton, 5 September 1957, Hamilton archive, Z1X42/1/16.
[167] 'Note by Lord Cherwell', 28 December 1955, cited in P. Hennessy, *Having It So Good: Britain in the Fifties*, (London: Penguin Books, 2007), p. 362.
[168] 'Summit Meeting', *TIME Magazine*, (28 October 1957), p. 1.
[169] 'Ties That Bind', *TIME Magazine*, (18 November 1957), p. 25.
[170] 'A Time of Danger', *TIME Magazine*, (11 November 1957), p. 1.
[171] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 28 November 1957, Hamilton archive, Z1X42/1/6.

The ambassador had also remarked that in twenty years, he would be able "to talk about many more things". This, to Hamilton, was admirable; "It suggests another factor which I suspect & which makes me so certain of their coming ascendency: the existence of a really long term plan, &, what is more, a long term balancing of what they consider good & evil." After the talk had finished, Hamilton approached the speaker with a question, and although he does not say precisely what it was, it involved gathering data from the Soviet Union for a comparative study. Hamilton doubted that the ambassador realised "the exact significance of my question", and pondering "Why he took such a fancy to me", Hamilton wondered if he misunderstood and thought he had "wanted to discuss 'philosophical questions' as he called them". Perhaps why "he pour[ed] out to me such a flood of Party Ideals & his visions as to the future" was because "he is trained to recognise an idealist, of whatever sort when he sees one." Hamilton was left "impressed not by his ideals but by his sincerity".[172]

Not to be won over, Hamilton remained committed to his Darwinian ideals at university, yet, contrary to Segerstrale's interpretation of Hamilton's school record, he seems to have struggled somewhat in his examinations and coursework. Rather than answering only a few questions on his examinations because he was bored with his coursework and found it mundane, as Segerstrale implied,[173] Hamilton relayed to his parents that his low scores in chemistry and physics on his scholarship examination—in fact, he did not anticipate scoring higher than 50% in chemistry and 40% in physics—were due to his inability to finish the tests within the time allotted. He explained that he "could have done the Chem. paper quite well if given about a day. For instance there was a question on

[172] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 28 November 1957.
[173] Segerstrale, *Nature's Oracle*, pp. 33, 45.

catalysis, a subject I thoroughly revised yesterday, but I might as well have not bothered considering the amount I had time to put down." His letter hints that this was a persistent problem, even one that his parents had previously given him strategies for coping with. Their advice, however, was to no avail; had he spent no more than thirty minutes on each question as they recommended, Hamilton claimed that he would be unable to even start writing before having to move on to the next question.[174]

Even after he had begun coursework at Cambridge, his eventual success was by no means predictable. Indeed, he reported that he was only managing in his physiology course,[175] and he was also finding his mathematics course difficult. He was, in fact, "floundering in the last stage: Differential Equations".[176] Even in his botany excursion, he "felt a fool" despite all of his childhood collecting: "so many people there […] seemed to know so much, & I didn't even have a fair start, coming in half way through as I did."[177] Of course, these issues were likely compounded by the fact that he eagerly over-enrolled in coursework his first semester, at least inasmuch as he could tell from what he knew about the schedules of other students.[178] Writing to his sister for advice, however, he showed a formidable devotion to learning. Although he wanted to join some societies, at least the few that were not Christian, so as not "to become a recluse", he felt that he must play catch up since he had been out of school for two years.[179]

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[174] W.D. Hamilton to A. Hamilton and B. Hamilton, 6 December [1954], Hamilton archive, Z1X42/1/16.
[175] He would later say he found physiology "all rather mechanistic and somewhat descriptive for my taste" (W.D. Hamilton to J. Lovelock, 29 January 1997, Hamilton archive, Z1X68/1/4).
[176] W.D. Hamilton to B. Hamilton, 21 November 1957, Hamilton archive, Z1X42/1/16.
[177] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 30 November 1957, Hamilton archive, Z1X42/1/6.
[178] W.D. Hamilton to A. Hamilton and B. Hamilton, 14 October 1957, Hamilton archive, Z1X42/1/16.
[179] W.D. Hamilton to M. Hamilton, 8 January 1957, Hamilton archive, Z1X42/1/17.

Genetics, a subject in which Hamilton had long been running casual experiments at home, proved much less daunting, and it was in C.O. Carter's class on evolution that Hamilton noted "Not much behaviour is known to be an [sic] Mendelian basis". Moreover, he recognized that a concise evolutionary understanding of cooperative behaviour had not been realized,[180] but overall he found the lectures "a trifle slow going". According to Hamilton, this was because Carter spent two days covering the evidence that evolution, rather than special creation, was responsible for the origin of species. Having read Darwin in secondary school, Hamilton needed no convincing, and he picked up R.A. Fisher's *The Genetical Theory of Natural Selection* (1930) in his college library to supplement the course.[181] It remains unclear what exactly drove Hamilton to Fisher's book, but he was certainly already familiar with the fact that both Fisher and Haldane were using mathematics to understand evolution even before coming to Cambridge.[182] Fisher's book impressed Hamilton so much that he was quick to identify Fisher as having greater intelligence than even Darwin had.[183]

Although he could not follow the mathematical argument outlined in the first part of Fisher's book, he was fascinated by Fisher's account of the rise and fall of civilisations and convinced of his argument concerning what he saw to be an inverted birth rate. By this Fisher had meant that the professional classes were reproducing less frequently than the working classes, thereby causing a worrisome decline in average intelligence. In fact, Hamilton was so enamoured with the latter point that he wrote home to explain to his parents that they were an anomaly, both being of "the professional class" and still having six

[180] W.D. Hamilton, 'Zoology 2', Hamilton archive, Z1X83/1/12.
[181] W.D. Hamilton to B. Hamilton, 21 November 1957.
[182] See, for example, W.D. Hamilton to M. Hamilton, [n.d., c. 3 October 1956].
[183] W.D. Hamilton to B. Hamilton, [n.d., c. 1959], Hamilton archive, Z1X74/1/8.

children. Hamilton felt this should earn them some kind of medal and, not least, a fat family allowance.[184]

In later years, Hamilton was quick to acknowledge the extent to which Fisher impacted his thinking as an undergraduate.[185] He was, however, never forthcoming that it was the human chapters of *The Genetical Theory* that had initially caught his eye. In fact, by January of his first year at Cambridge, he had his own hypothesis concerning man: "Is it possible, I wonder, to show, either empirically or a priori that organic evolution will occur most vigorously in the regions where there is most climatic & geographical flux […] Finally Man. Note that all great civilisations are temperate, not tropical. That the most intelligent animals are predators (if this is relevant)."[186] This would not be the last time Hamilton would compare the trends in temperate and tropical countries; when he travelled to Brazil, for example, he would ponder the relevance of geography to work ethic.

Hamilton would later describe Fisher as "a thinker after my own heart".[187] As we have already seen, the rehabilitation of Darwinian theory in the twentieth century was due, at least in part, to Fisher's key text. Indeed, Fisher was quite alone in his commitment to natural selection for most of his career. Throughout the first part of the twentieth century, evolution was widely accepted among biologists, but the power of natural selection as the main, or even a major, evolutionary force was questioned. At the turn of the century, the reconsideration of Gregor Mendel's experiments on pea plants had appeared to many to be the final nail in the coffin for Darwin's floundering theory that relied on small, gradual

[184] W.D. Hamilton to B. Hamilton, 21 November 1957, Hamilton archive, Z1X42/1/16.
[185] See, for example, W.D. Hamilton to J.F. Crow, 28 July 1997, Hamilton archive, Z1X66/1/2.
[186] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 19 January 1957 [sic, 1958], Hamilton archive, Z1X42/1/6.
[187] W.D. Hamilton, '1. R.L.T. & W.D.H. course, Harvard', 1978, Hamilton archive, Z1X73/1/12.

changes. According to the recollections of British geneticist E.B. Ford, this meant that he and Fisher were "almost alone […] in preaching the importance of selection" even by the mid-1920s.[188]

Fisher had committed himself to Darwinian thinking at an early age, and by 1911, he had compared the methods of Mendelism and biometry at a meeting for the Cambridge University Eugenics Society, a group that he had helped to form.[189] His 1918 paper, 'On the Correlation between Relatives on the Supposition of Mendelian Inheritance', reconciled the then antagonistic methods of biometricians and Mendelians. The publishing history of this paper, however, was complicated. Originally submitted to the Royal Society, it was reviewed by statistician Karl Pearson and geneticist R.C. Punnett and rejected by both, probably because each believed it conflicted with his own school of thought. In the end, the paper was only published with the help of one of Charles Darwin's sons, Leonard Darwin, who we can guess was thrilled to see his father's theory defended.

Although Fisher's place in the history of evolutionary theory is well established, it is important to recognize that Fisher was motivated by his conservative political commitments to pursue many of the questions he did. His former student, geneticist and statistician A.W.F. Edwards, has written that Fisher's 1918 paper was the "work of a scientist inventing new mathematical techniques to attack a specific scientific problem",[190] and this was certainly not the last time Fisher would devise new methods to tackle questions concerning heredity. The questions he addressed, however, must be noted for their potential for

[188] E.B. Ford, 'A Reminiscence of R.A. Fisher', *The American Statistician*, 59 (2005), p. 312.
[189] B. Norton and E.S. Pearson, 'A Note on the Background to, and Refereeing of, R.A. Fisher's 1918 Paper', *Notes and Records for the Royal Society of London*, 31 (1976), p. 155.
[190] A.W.F. Edwards, 'R.A. Fisher – Twice Professor of Genetics: London and Cambridge', *Journal of the Royal Statistical Society*, 52 (2003), p. 313.

application. In fact, Fisher required that his mathematics and models were applicable to real world problems.[191] It was his emphasis on applicability that had inspired him to approach biological questions from a statistical perspective in the first place. Evolutionary biologist John Maynard Smith went so far as to say that Fisher's interest in population genetics was motivated by his need to justify his faith in eugenics.[192]

The fact that Fisher was still in the genetics department at Cambridge was one of the factors that made Hamilton choose the subject for his third year course.[193] Soon after he began it, however, he found it "not all I had hoped". The biggest problem was that he had little reason to believe that he would receive "any support in doing the sort of research [he] would like to do later on". Although he does not specifically say what project he had in mind, it likely concerned humans. He had been frustrated by his "clash with Dr [A.R.G.] Owen", who was not enthusiastic about his proposal to read social anthropology as his supplementary subject. He got along better with John Thoday, "the new Prof.", but was still doubtful that he would be able to move forward with his work in anthropology. He complained that Cambridge genetics "consists very largely in calculating".[194] He much preferred theoretical genetics to the detailed analysis of real world examples.

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[191] E.A. Thompson, 'R.A. Fisher's Contributions to Genetical Statistics', *Biometrics*, 46 (1990), p. 908.
[192] J. Maynard Smith, 'Genetics, Evolution and Haldane', *The Quarterly Review of Biology*, 67 (1992), p. 189. Whether or not Fisher was motivated by eugenics has long been a point of contention. J.F. Box, in *R.A. Fisher: The Life of a Scientist*, (New York: John Wiley & Sons, 1978), as well as J.H. Bennett, in *Natural Selection, Heredity and Eugenics*, (Oxford: Clarendon Press, 1983), supports the idea that Fisher was primarily interested in natural selection and only secondarily concerned with heredity and thus, eugenics. B. Norton, in 'Fisher and the Neo-Darwinian Synthesis', *Human Implications of Scientific Advance*, (Edinburgh: Edinburgh University Press, 1978), R.C. Olby, in 'Introduction to Symposium on Relations Between Theories of Heredity and Evolution, 1880-1920', *Human Implications of Scientific Advance*, and D.A. MacKenzie, in *Statistics in Britain, 1865-1930*, (Edinburgh: Edinburgh University Press, 1981), support the claims of Maynard Smith.
[193] W.D. Hamilton to B. Hamilton, [n.d., c. 1959], Hamilton archive, Z1X74/1/8.
[194] W.D. Hamilton to B. Hamilton, 25 November 1959, Hamilton archive, Z1X74/1/8.

The Social Anthropology Department, and in particular Edmund Leach, proved equally unexcited by Hamilton's efforts to bridge the gaps between evolutionary theory and an understanding of human societies. Hamilton later cited his failure to obtain support from either department as the reason he was determined to leave Cambridge after graduation; he believed future work there would prove wholly unproductive.[195] Still, he did not give up his hope that anthropology would prove useful to his developing ideas concerning the evolution of social behaviour.[196] In fact, he seems to have worked out a way to take anthropology as his required "special branch of study" for his Cambridge degree after all.[197]

Beyond his endeavours in anthropology, Hamilton continued to seek guidance in Darwin's texts. In March 1958, for example, he copied quotations into his journal, hoping it might help "to fix them in [his] memory […] since the words of the man himself are a useful weapon". While Hamilton did not make explicit whom he wished to target with the words of Darwin, the theme of struggle indicates that he may have been searching for arguments against individuals who placed less weight on competition in the natural world. The recorded statements were among those he had "admired since 1950", and he considered it beyond him "to consider the debt which my present stance owes to phrases like these: they started me on this whole business". Thus, two of the Darwin passages that most struck him were, "----- one general law leading to the advancement of all organic beings, — namely, multiply, vary, let the strongest live & the weakest die", and, "Thus from the war of nature,

[195] Hamilton, *Narrow Roads to Gene Land*, i, 23.
[196] See, for example, card folder, 'Cambridge: Anthropology', Hamilton archive, Z1X95/1/3. At LSE, Hamilton also sought reading lists from Lorraine Lancaster on the subject of kinship (Hamilton archive, Z1X95/1/3).
[197] A.T. Welford, 25 April 1961, Hamilton archive, Z1X74/1/5.

from famine & death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows."[198]

It was indeed the 'higher' animals that had most occupied Hamilton, and as he began to concentrate on the evolution of social behaviour, his approach drew upon his understanding of man. Thus, by the late-1950s, the main issue taking shape in Hamilton's mind was to what extent are humans as individuals capable of being concerned for the well being of others or indeed the future of humanity itself. Already, in an undated essay probably dating to his pre- or early Cambridge days, he had grappled with the relationship between individuals and society. According to Hamilton, "a human being posesses [sic] an inheritance of two kinds of instinct: one set is directed at ensuring the well-being of the individual, & the other, which obviously overlaps the first, at ensuring the well being of the community. Both are the product of Natural Selection". Moreover, Hamilton believed that an understanding of the human condition through evolutionary theory held great potential. According to him,

> "We are uniquely favoured to decide what legacy we leave, living as we do in the shadow of Darwin, the potentialities of whose discoveries seems hardly to be realised. […] we can not go far wrong in striving to acquire more & more knowledge for our race in the hope that before long what now puzzles us will become plain, & perhaps even the 'right' course appear with incontrovertible clarity."[199]

While it is commonly assumed that Hamilton's theory of inclusive fitness was derived in light of his understanding of social insects, this point is not open to debate. It was in fact quite late, probably not until 1962 or even 1963, that he realised the importance of social insects. Hamilton himself later said that he had not understood the relevance of male

[198] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 4 March 1958, Hamilton archive, Z1X42/1/6.
[199] W.D. Hamilton, 'The idea of life after death is fundamentally selfish', [n.d.], Hamilton archive, Z1X42/1/1.

haploidy to his theory until after he had arrived at the mathematical equations.[200] Nevertheless, discussion of his contribution is often implicitly or explicitly connected to the case of social insects. In his recent biography of George R. Price, for example, historian of science Oren Harman wrote that it was "Thanks to the unusual life of the *Hymenoptera*" that Hamilton was able to introduce "an original idea".[201]

If inclusive fitness was not, from its beginnings, about social insects, what was it about? Materials from Hamilton's archive strongly suggest that his particular concern was the fate of human society. With the data accumulated by geneticists and eugenicists, especially during the interwar period, however, we must eliminate the possibility that Hamilton initially worked with human data sets because that was simply what was available. While it is true that Hamilton's commitment to viewing man as part of nature, as much an animal as any other, meant that he was unlikely to distinguish facts concerning human fertility from animal fertility more generally, the above evidence demonstrates that he had been particularly interested in the meaning of evolution for human societies, both present and future. His earlier concerns regarding the bearing of the welfare state on human health and intelligence, his dismissal of religious and Soviet ideologies, and his belief that social ills resulted from inherited deficiencies reiterate the idea that he was not merely interested in human data for what it could say about the natural world more universally.

Thus, it is significant that of all Darwin's passages, Hamilton chose in 1958 to quote those that most emphasised struggle. Indeed, strife was the most pervasive of natural facts

[200] W.D. Hamilton to T.H. Clutton-Brock, 2 July 1991, Hamilton archive, Z1X88/2/6.
[201] For more examples of the assumed relationship between the theory of inclusive fitness and the particular case of social insects, see P.J. Bowler, *Evolution: The History of an Idea*, 2nd edn., (Berkeley: University of California Press, 1989), p. 329; M. Ruse, *Monad to Man: The Concept of Progress in Evolutionary Biology*, (Cambridge and London: Harvard University Press, 1996), p. 458; A. Brown, *The Darwin Wars: How Stupid Genes Became Selfish Gods*, (London: Simon and Shuster, 1999), p. 83; M. Ruse, *Darwinism and Its Discontents*, (Cambridge and New York: Cambridge University Press, 2006), p. 48.

for Hamilton. By 1962, he would go as far as to characterise man's ability to sympathize with his fellows as a "limited tenderness". According to Hamilton, it was simply a fact of nature that "Of course while it might prove possible to stop national animosities and so cause the decline of patriotic altruism, it would be very difficult to stop all forms of inter-group competition."[202] In the Cold War decades, the ramifications of this sentiment were profound, and for Hamilton, there would be no easy solution.

Hamilton communicated his concerns for humankind to his friend, Colin Hudson. While at Cambridge, Hamilton found a kindred spirit in Colin, who would go on to have a career in agriculture. They discussed at length the relationship between evolution and the human condition, and in one example, they proved especially concerned with the evolution of senility in relation to altruism, which they saw to be relevant to "population problems".[203] This exchange came after Hamilton had read American biologist Raymond Pearl's *Natural History of Population* (1939),[204] and Hamilton was sure that Pearl's caution—"The landing field for the more aeronautical explorers of population problems is still but dimly illuminated, & full of pit-falls & boggy spots"—was directed at people like Colin, himself, "& Professor Fisher!"[205] Still, such warnings would not interrupt his scientific pursuit of solutions to problems that he believed threatened humanity.

In his exchanges with Colin, Hamilton made explicit his "innate dislike to recognise complexity unless I have to".[206] When Colin used separate explanations for car 'survival' curves and human survival curves, which they agreed had been manipulated by "modern

[202] W.D. Hamilton to C. Hudson, 13 February 1962, Hamilton archive, Z1X74/1/9.
[203] W.D. Hamilton to C. Hudson, 25 March 1959, Hamilton archive, Z1X74/1/9.
[204] R. Pearl, *Natural History of Population*, (London: Oxford University Press, 1939).
[205] Hamilton to Hudson, 25 March 1959.
[206] W.D. Hamilton to C. Hudson, [n.d., c. March 1959], Hamilton archive, Z1X74/1/8.

medicine, hygiene & soft-living", Hamilton balked.[207] Ever more extreme than Colin, Hamilton was eager to find a single explanation for the breakdown of parts in both living and non-living entities, and to accomplish this, he combined the theory of natural selection with the creation of imaginary worlds that he could understand "with certainty & precision". For him, such understanding was as exciting as "knowing what probably, possibly, conditionally goes on in the much more complex real world". Indeed, he recognised that understanding more simplistic scenarios was "all science ever does"; science could only "hedge the real world more & more closely about with all the imaginary ones which can possibly imitate it". Through the creation of imaginary worlds, Hamilton combined his interests in art, engineering, and science in search of an "ideal" world that defied the "hopeless irrational disorder of the real world".[208] Thus, for Hamilton, theoretical biology was a means by which he sought order within chaos, but, of course, his approach risked the inclusion of cultural artefacts in the worlds he created.

An undated, typewritten essay reiterates some of the ideas that Hamilton discussed with Colin. It is significant for a number of reasons. First, it is an example of Hamilton's early thoughts on the evolution of self-sacrificing behaviour, namely the sacrifices made by parents on behalf of their offspring and the extent to which they were "genetically justified". Second, it clearly states that what Hamilton offered were predictions based on intuition rather than conclusions based on data. Thus, although there was no "direct evidence" that genes caused parental behaviour, at least none of which he was aware, he felt it was reasonable to assume such actions were "mainly instinctive" and therefore "modifiable by

[207] W.D. Hamilton, on C. Hudson to W.D. Hamilton, [n.d., c. March 1959], Z1X74/1/8.
[208] Hamilton to Hudson, [n.d., c. March 1959].

gene substitution".[209] Moreover, he claimed that the truthfulness of his ideas did not depend on observations that held "in more than a general approximate way". Nor were his ideas falsifiable: he could only offer avenues by which they would be "most open to verification".[210]

The essay is also significant because it explicitly concerned human societies. Perplexed at the existence of post-reproductive life, Hamilton proposed that individuals who could no longer reproduce granted survival value to their relatives through education. In human societies, it made sense that individuals would live well beyond their reproductive years because education was so important to human survival.[211] Elsewhere, he also indicated that he had humans in mind when thinking about self-sacrifice. Arguing that altruism was a character that was under at least some degree of genetic control, he claimed that "Willingness to listen & readiness to be moved by exhortations to altruistic action" might be the hereditary components of self-sacrificing behaviour.[212]

According to Hamilton, his ideas accomplished more than simply to "show a way in which it is possible for altruistic behaviour to evolve": they set "precise limits to the lengths to which altruistic behaviour will go".[213] Certainly it would not go as far as doctrines of Christian charity or communism maintained. That a mother would sacrifice for her children was "quite obvious", that is to say, natural, to Hamilton. It was less obvious that she would

[209] W.D. Hamilton, 'PARENTAL ALTRUISM IN BIRDS ETC', [n.d.], Hamilton archive, Z1XUN/1/7.
[210] Ibid.
[211] Ibid.
[212] W.D. Hamilton, 'W.D. Hamilton', [n.d.], Hamilton archive, Z1X74/1/8; Hamilton would continue to think about the ways in which altruistic propensities could be genetic and therefore inherited. In a 1977 lecture, for example, he proclaimed his belief that "all variation in man has at least some genetic component". Conscience in particular, he thought, was "encoded internally" and therefore potentially the point at which altruistic tendencies "could be genetically variable" (W.D. Hamilton, 'Aud. 4 MLB 4 PM', 14 October 1977, Hamilton archive, Z1X73/1/12).
[213] Hamilton, 'PARENTAL ALTRUISM IN BIRDS ETC'.

make equal sacrifices for her nephews, and, as it was directed towards individuals sharing fewer of her genes, such sacrifice would significantly reduce her ability to be represented in future generations. Following this line, we see that Hamilton believed there was an "instinctively held ranking of classes of people"[214] that created a spectrum ranging from immediate family to complete strangers. The socio-political ramifications of these ideas were profound: it was simply not natural that one would sacrifice for strangers, and especially not for foreigners.

In the early 1960s, Hamilton's intuitive understanding of social tendencies would reach a new level of sophistication. Combining the mathematics of genetics with the theory of natural selection, he aimed to quantify the degrees to which individuals would show both generosity and animosity to those around them. As we have already seen, the relevance of such research to both domestic and international problems came to the surface in Hamilton's journals and correspondence. After leaving Cambridge in 1960, Hamilton's next step was uncertain, but his passion was unchanged.

**The London School of Economics and the Department of Demography**

Upon finishing his undergraduate degree in natural sciences with a final year in genetics and receiving a 2:1,[215] Hamilton was not sure he would find a place to continue researching the evolution of social behaviour. For this reason, he considered becoming a schoolteacher. Earlier in the spring, he applied to the University of London Institute of Education, hoping to teach biology, but his application was unsuccessful.[216] By August, he

[214] W.D. Hamilton, 'W.D. Hamilton', [n.d.], Hamilton archive, Z1X74/1/9.
[215] 'Cambridge Tripos: Natural Sciences, Part II', *The Times*, (15 July 1960), p. 6.
[216] University of London Institute of Education to Hamilton, 14 April 1960, Hamilton archive, Z1X30/1/3.

had plans to study teaching at Moray House, Edinburgh the next academic year,[217] but in September, a letter from Edinburgh indicated he withdrew his application. According to the letter, Hamilton was considering a Master's course in economics.[218]

His plan to study economics did not materialize either, but knowing Hamilton's research interests, John Hudson, Colin's father who was also a professor of horticulture, and C.O. Carter, a senior member of the Eugenics Society, suggested the human demography course at the London School of Economics. They put him in contact D.V. Glass.[219] Hamilton applied for the course and was interviewed by Norman Carrier, who took interest in him and helped him to find funding.[220] Finally in October, Hamilton was told he would receive the Leverhulme Research Studentship award for a project in demography.[221]

Of Hamilton's biographers, Dugatkin seems to have overlooked Hamilton's entry into demography entirely,[222] and while Segerstrale acknowledges that Hamilton entered LSE to study the social sciences, her discussion is loaded with qualifying factors: he had a hard time finding a postgraduate placement despite his "interesting, potentially revolutionary idea" and a course in demography might "somehow 'anchor' his apparently interdisciplinary research topic".[223] In fact, Hamilton does not seem to have applied to any programs in the natural sciences, and, as we have seen, his entrance to LSE was not his first foray into the social sciences: he had long thought social anthropology might provide him with useful frameworks to understand the relationship between family and pro-social behaviour.

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[217] [A.L. Maycock?] to W.D. Hamilton, 24 August 1960, Hamilton archive, Z1X30/1/3.
[218] [I.N. Groves?] to W.D. Hamilton, 15 September 1960, Hamilton archive, Z1X30/1/3.
[219] Hamilton, *Narrow Roads of Gene Land*, i, 25.
[220] Segerstrale, *Nature's Oracle*, p. 60.
[221] Director of LSE to W.D. Hamilton, 8 October 1960, Hamilton archive, Z1X30/1/3.
[222] Dugatkin, *The Altruism Equation*, p. 92.
[223] Segerstrale, *Nature's Oracle*, pp. 60-1.

At the London School of Economics, Hamilton fell under the supervision of statistician John Hajnal, but he would also be supervised by geneticist C.A.B. Smith at the University of London. His dual supervision, and indeed his dual enrolment, was due to the fact that the London School of Economics could not support work in genetics.[224] Still, Hamilton seems to have been interested in pursuing work relevant to human genetics in particular. Upon moving to London, he had inquired of G.C.L. Bertram, whom he had known at Cambridge, whether it was possible for him to join the Eugenics Society and gain access to the society's library.[225] By the end of the year, he was a paying member,[226] which meant he received *The Eugenics Review*, had rights to the library, and could attend symposiums and lectures hosted by the society. While I do not intend to claim that Hamilton's involvement with the Eugenics Society is directly tied to the outcome of the next three years of his research, it is important to keep in mind what he perceived to be relevant to his topic at the time, as this no doubt reflects the social and political context in which he both formulated his ideas and saw them to be significant.

The extent to which Hamilton's post-graduate research continued to pertain to human evolution is further evidenced by his funding applications. By 1961, Hamilton's Leverhulme funding ran dry, and he applied for a grant from the Medical Research Council. This application, combined with the fact that he had already applied unsuccessfully in 1960 for the Darwin Research Fellowship at the Eugenics Society,[227] suggests that Hamilton believed his research on the evolution of social behaviour was relevant to human society. This is further corroborated by the assistance given to Hamilton by sociologist D.V. Glass,

[224] Secretary of LSE Graduate School to W.D. Hamilton, 1 December 1960, Hamilton archive, Z1X74/1/5.
[225] As indicated in G.C.L. Bertram to W.D. Hamilton, 9 November 1960, Hamilton archive, Z1X30/1/2.
[226] Receipt, 6 December 1960, Hamilton archive, Z1X30/1/2.
[227] W.D. Hamilton to The Eugenics Society, 15 May 1963, Hamilton archive, Z1X30/1/5.

known for his studies on population. Acknowledging Hamilton's desperate funding situation, Glass had reached out, pointing to Sir Aubrey Lewis, a psychiatrist at Maudsley Hospital, who was looking for a research assistant on a project concerning "the relationship between fertility and various forms of mental disorder". Since Hamilton was interested in human genetics, it seemed conceivable to Glass that he might be well suited to join Lewis "on a project which might have some elements in common" with the work Hamilton had himself proposed.[228]

It is uncertain how closely this project matched with Hamilton's interests because only a day later, Hamilton's own grant application proved successful, and though he did not return Glass's letter for three weeks, he was able to give this change of fate as his reason.[229] Hamilton reached out to Lewis around the same time. Lewis was disappointed that Hamilton would not join his team, but he hoped that in Hamilton's future work he "may come closer to the fertility problem which I am anxious to see further investigated, and perhaps (by a round-about route) get involved in studying it along the lines we talked about".[230]

Hamilton had also annotated the abstracts of papers given at the 1961 International Conference of Human Genetics in Rome. He paid particularly close attention to two themes that he had previously mentioned in the letters he wrote to his mother and sister before moving to Cambridge. The first is the effect of isolation on human populations.[231] This was something he had thought about while traveling by foot in Ireland, pondering the effects of

[228] D.V. Glass to W.D. Hamilton, 25 July 1961, Hamilton archive, Z1X30/1/5.
[229] As implied in D.V. Glass to W.D. Hamilton, 28 August 1961, Hamilton archive, Z1X30/1/5.
[230] A. Lewis to W.D. Hamilton, 29 August 1961, Hamilton archive, Z1X30/1/5.
[231] W.D. Hamilton, 'Notes of Interesting Abstracts of Papers Given at the 2nd International Conference of Human Genetics, Rome 1961', [n.d.], Hamilton archive, Z1X83/1/2.

low immigration on Irish communities.[232] The second theme concerned the inheritance of intelligence. Hamilton recorded that "As family size increases beyond 5 children, parental I.Q. decreases sharply, as does that of the children when categorized by size of family."[233] In doing so, he demonstrated a lasting engagement with concerns he had relayed to his sister in 1956 regarding which groups of humans were being encouraged to reproduce.[234] Additional records from his time at LSE indicate the extent to which he was interested in the relationship between family size and intelligence, and he repeatedly engaged with data concerning the relationship between economic and social factors and fertility.[235]

Hamilton was also interested in the relationship between professional class, family size, and intelligence, noting in one instance, "The very gifted are, on average, very infertile & this is true of all social classes."[236] Furthermore, he took notes on discussions of the inheritance of intelligence[237] and pondered the possibility that it was not inherited as one of a number of facts that would undermine Fisher's assertions concerning the future of man. If intelligence were not inherited, he realized, "education in its broadest sense would provide all the answers".[238] In doing so, he appears to have indicated a belief that evolutionary theory could inform policy debates.

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[232] W.D. Hamilton to B. Hamilton, [n.d., c. 1955-7], Hamilton archive, Z1X42/1/16.
[233] Hamilton, 'Notes of Interesting Abstracts of Papers […] Rome 1961'.
[234] W.D. Hamilton to M. Hamilton, 3 October 1956, Hamilton archive, Z1X42/1/17.
[235] See W.D. Hamilton, 'The Determinants & Consequences of Pop. Trends: Pop. Studies no 17 Chap. V: Econ. & Social Factors affecting fertility'; 'Non-use of birth-control with Social Class & the reasons given U.K.: Papers of the Royal Comm. on Pop. Vol 1: Family Limitation', [n.d., c. 1960-2], Hamilton archive, Z1XUN/3.
[236] See W.D. Hamilton, 'Sibship as an index to Fertility Fraser Roberts Eugenics Review', [n.d., c. 1960-2], Hamilton archive, Z1XUN/3.
[237] See W.D. Hamilton, 'Lawrence E.M. 1931 An investigation into the relation between intelligence & inheritance Brit. Journ. of Psychology', [n.d., 1960-2]; copy of C.B. Goodhart, 'The Inheritance of Intelligence', *New Scientist*, 22 August 1957, Hamilton archive, Z1XUN/3.
[238] W.D. Hamilton, 'What facts will definitely exclude Fisher's Theory?', [n.d., c. 1960-2], Hamilton archive, Z1XUN/3.

Of course, it would be going too far to say that Hamilton only worked from the behaviour of man in trying to discover its evolved limits. Like Darwin, he drew insights from every source, and any organism, that he could get his hands on. In August 1962, for example, Hamilton wrote to the director of the Royal Botanic Gardens. Stating his interest in the "inter-relation of group selection and that based on individual advantage which forms the basis of classical theory", he inquired into the possibility of competition between seeds produced by a single plant.[239]

Still, Hamilton's profound engagement with issues unique to humankind cannot be ignored, and it is important to keep in mind that his scientific idols, Darwin and Fisher, were also forthcoming with their views concerning the relevance of natural selection to man. In fact, through the material in Hamilton's archive, we find additional evidence of Fisher's lasting impression on Hamilton. Around 1960, for instance, he contacted two post-graduate students in Fisher's laboratory, Walter Bodmer and A.W.F. Edwards, about their work on sex ratios. Here, we see how interchangeable the animal world and the human world was for Hamilton. He began one argument with the phrase "In Man at least",[240] indicating his tendency to work from assumptions about man in search of conclusions that would resonate with non-human organisms. Elsewhere, he discussed the evolution of altruism in relation to Fisher's ideas about sexual selection for heroism in tribes. In fact, the image of Horatius on the bridge,[241] bravely risking his life in defence of Rome, would resound throughout Hamilton's early manuscripts.[242] Thus, we see that, following Fisher's example, Hamilton

[239] W.D. Hamilton to 'Sir', 1 August 1962, Hamilton archive, Z1X74/1/9.
[240] W.D. Hamilton to W.F. Bodmer and A.W.F. Edwards, [n.d., c. 1960], Hamilton archive, Z1XUN/1/13.
[241] This refers to the story of Publius Horatius Cocles.
[242] Hamilton, 'W.D. Hamilton', Z1X74/1/9; W.D. Hamilton to C. Hudson, 13 February 1962, Hamilton archive, Z1X74/1/9.

continued to assume a single explanation could be used to understand examples within the human and non-human worlds.

Acknowledging his dedication to Fisher's thinking, one must not fail to imagine the meaning that evolution, both for nature and for society, likely held for Hamilton. One of Hamilton's essays, written around 1962 and titled 'Genetical Models for the Evolution of Competitive Behaviour', provides evidence of the extent to which examples from nature and society were entangled in Hamilton's mind. Here, he weaved together evidence from deer, earthworms, and Blowfly larvae to make the point that models of competition must take into account whether competition is occurring across a population or locally. He claimed that local interactions alter the environment in which natural selection operates because interactions occur between related individuals. In such an environment, extreme selfishness through all-out competition would be detrimental to the survival of shared genes. Noting family commitments in man in particular, Hamilton thought there was no biological reason "to be surprised at the heavy import [of] a statement like 'All men are brothers'". Still, his ideas pointed not to the likelihood of cooperation but instead to the adaptive advantage of aggressiveness: "The war-like and aggressive aspect presented by all levels of grouping in these societies, and in particular the expansive aspect of the peoples as a whole, suggest the direction in which a search for a possible biological basis for social behaviour can be most profitably extended."[243] In another draft concerning similar ideas, he claimed that "the negative conclusion of the present model" meant "selection under the circumstances

[243] W.D. Hamilton, 'Genetical Models for the Evolution of Competitive and Social Behaviour', [n.d., c. 1962], Hamilton archive, Z1XUN/1.

specified can only cause the evolution of genetical selfishness and never of genetical altruism".[244]

Still unaware of the case of social insects that would later illustrate the strength of his theory so effectively, he proposed a few alternative possibilities for verification. These included instances "where other conditions are sufficiently constant for the expected differences between full-sib and half-sib competitors to show up" or "in the young of monogamous and polygamous or promiscuous animals". He even thought sufficient data might be collected through a comparison of "the behaviour of seeds and seedlings in wind- and insect-pollinated plants".[245] Thus, while social insects remained outside his purview, Hamilton was already convinced that relatedness could mitigate competitive instincts in a meaningful way.

**Conclusion**

A major function of this chapter has been to show the extent to which Hamilton relied on theoretical possibilities rather than observations or experiments. Beyond this fact, however, we have seen the extent to which the extreme worlds he imagined to illustrate his theories were informed by uniquely human experiences. Even in very late drafts of his work on altruism, he cited human constructs such as marriage. For example, in discussing the idea of reproductive encroachment, Hamilton asked his readers to "Imagine for example an essentially monogamous species in which the males were inclined by their instincts to

[244] W.D. Hamilton, 'Natural Selection Involving Competition Between Relatives', [n.d., c. 1960-2], Hamilton archive, Z1XUN/2.
[245] Hamilton, 'Genetical Models for the Evolution of Competitive and Social Behaviour'.

encroach on the marital rights of their neighbours to varying degrees."[246] In drawing upon his understanding of the human world to construct more simplistic, imaginary worlds, his interpretation of the human problems that pervaded national and international discussions in these years becomes important. While it would be foolish to assume a causal relationship between his concerns for humankind and the theory of social behaviour he derived, it is equally unwise to ignore that these issues were present, and indeed, interconnected, in his mind.

This chapter has also questioned the common narrative surrounding Hamilton's work, which assumes the dogma he 'humbly' rejected was that associated with 'benefit-to-the-species' claims within biology. I have shown instead that Hamilton's major concerns to this point were not scientific but sociopolitical, and it is therefore worthwhile to consider whether the dogma he initially rejected was that associated with Marxism and Christianity. Such a claim is supported by the fact that he hoped to follow in the footsteps of Darwin, who he saw as a nonconformist willing to upset traditional Victorians with his materialist account of human history. Hamilton took for granted the fact that this trajectory would place him at odds with most of society. What seems to have motivated him to move forward in spite of this was his dedication to understand human society in light of evolutionary truths.

By January 1963, Hamilton had written a summary of inclusive fitness. Confident in the importance of his work, he sent it to *Nature*, only to be shocked by the response. In fact, in sending his regrets that space could not be found for 'The Evolution of Altruistic Behaviour', the editor suggested the paper instead "be submitted to a socialogical [sic] or psychological journal", perhaps in part because Hamilton had listed his department as

[246] Hamilton, 'Genetical Models for the Evolution of Competitive and Social Behaviour'.

sociology.[247] This recommendation would grate on Hamilton throughout his life, confirming his suspicions that the world was simply not ready for the objective truths he derived, but giving his address in this way may have been a mistake on Hamilton's part not for what it implied but because it was simply untrue. His supervisor at LSE, John Hajnal, later corrected him by locating himself within "the Statistics Department, not the Sociology Department".[248] Perhaps this unconscious misidentification is further indication that Hamilton believed his theory would have sociological relevance.

Rejected from *Nature*, Hamilton prepared his paper for submission to the *American Naturalist*, still listing his address at the Department of Sociology. Drafting the abstract, he explained that selection pressures acting at the level of populations were often invoked to explain the existence of traits that appeared disadvantageous at the level of the individual. According to Hamilton, however, such "Interpopulation selection […] is a mode so far unsupported by mathematical models." It was "in fact hardly credible". Nevertheless, he argued that traits such as altruism could evolve if "individuals affected by ~~the~~ altruistic behaviour are relatives of the altruist".[249] Hamilton's model would assume this condition and elaborate on the specific requirements for altruism to be selected. On 2 March 1963, the summary was accepted.[250]

[247] Editor of *Nature* to W.D. Hamilton, 24 January 1963, Hamilton archive, Z1X30/1/6.
[248] J. Hajnal to W.D. Hamilton, 22 February 1965, Hamilton archive, Z1X89/1/1.
[249] W.D. Hamilton, 'The Evolution of Altruistic Behaviour', [n.d., c. February 1963], Hamilton archive, Z1X89/1/1.
[250] V. Bryson to W.D. Hamilton, 2 March 1963, Hamilton archive, Z1X89/1/1.

# CHAPTER THREE

## A New Audience: Bringing a Science of Human Nature to the Public

By the early 1960s, anthropologists had come to focus on the use of tools and the development of weapons in human evolution.[251] At the same time, an audience was emerging, eager to be told the 'true' nature of man as well as what were assumed to be the resulting social ills. Though the public would never see Hamilton's science of human nature first-hand, suffering as even his mother complained it did from a lack of clarity,[252] the stage was already being set for the pessimistic conclusion that man was naturally aggressive, territorial, and selfish—an idea which Hamilton's work would eventually help to codify. The first to profit from the growing demand for popular science addressing human behaviour, however, was not a scientist at all: he was an American playwright. Turning the nature of man into a bestselling work of non-fiction was the stellar feat of Robert Ardrey. Amid accusations that he was soft on communism in the dark days of the McCarthy era, Ardrey moved to South Africa and began to engage in amateur work in anthropology.

These accusations would amount to nothing, and Ardrey's books would demonstrate just how strongly devoted to capitalism he was. In fact, he argued that it was only natural for man to own property and any system that commanded individuals do otherwise was artificial and destined to fail. Although the subtitle of Ardrey's first successful anthropological account, *African Genesis* (1961), belied the subjective backbone of the text, it nevertheless was transmitted as science, even among members of the Hamilton family.

[251] E.L. Milam, 'Making Males Aggressive and Females Coy: Gender across the Animal-Human Boundary', *Signs*, 37 (2012), p. 946.
[252] B. Hamilton to W.D. Hamilton, 7 January 1964, Hamilton archive, Z1XUN/5.

Ardrey worked within the paradigm of Australian anthropologist Raymond Dart, who had discovered a species he named *Australopithecus africanus* in 1925. Dart's discovery was not immediately accepted, contradicting as it did widely held beliefs about where and from what the human species had evolved, but Dart held strong. Articulated, his ideas were later referred to as the 'killer ape theory' since Dart believed that markings on the skeletons he found indicated that each specimen had been brutally killed by his fellows. It was from these individuals, so capable of violently murdering their own, that mankind was thought to have descended. Though support for the theory was first delayed and then short-lived, it captivated a wide audience when it was visually and dramatically represented to moviegoers in the 1968 film *2001: A Space Odyssey*.[253] Regardless of the transience of the theory, the question remains: why were scholars, writers, and audiences alike eager to view man's evolutionary past in this way? Their enthusiasm seemed, in fact, to correlate with other shifts underway in this turbulent period. Indeed, the tides were turning throughout society, and the shared faith in the goodness, or at least reasonableness, of one's fellow man was noticeably fading.

To explore this question in greater detail, this chapter relocates Hamilton in 1963, as he prepared to leave England to do fieldwork in Brazil that was tangentially related to the theory he had already developed. It sees Hamilton and his scientific work in a continuous dialogue with the social and political world of the early 1960s. Now, however, in addition to middle-class England, he had observations from the developing world to contend with, and with great consistency, he saw the global economy and especially economic disparities

[253] Among those who reassessed and reclassified the injuries sustained by the skeletons Dart uncovered was South African palaeontologist C.K. Brain; see, D. Fry, *Beyond War: The Human Potential of Peace*, (New York: Oxford University Press, 2007), pp. 35-40.

through his narrow evolutionary lens. As he segued back to life in England in 1964, he met a disparate set of initial reactions to his published work, and recognizing this, we may uncover the extent to which the theory of inclusive fitness was seen to have significant philosophical meaning for questions that were prevalent in these years. Furthermore, as Hamilton transitioned from a graduate student to an early career researcher and lecturer at Imperial College London, we will see that his enthusiasm for an evolutionary understanding of human society, so essential to the development of inclusive fitness theory, did not wane as it began to enter a more public domain.

**The Dialogue Surrounding Social Behaviour**

Hamilton was sympathetic to Ardrey's view of mankind. In fact, he noted Ardrey's claim that "if mankind survives the contemporary predicament, it will be inspite [sic] of, not because of, the parochial powers of our animal conscience" and filed the citation on one of his notecards.[254] His father, however, ever more optimistic than his son when it came to assumptions of human goodness, saw Ardrey's theory in another light; to him, it appeared to provide no more than "an excuse for American aggressiveness".[255] Bill Hamilton nevertheless judged Ardrey's work to have academic credibility. In fact, he saw Ardrey's ideas as not only scholarly in their own right but also well in line with recent work done in physical anthropology, such as that of Sherwood Washburn and Virginia Avis.[256] By 1966, Hamilton would go as far as to expand upon Ardrey's work while promoting a four-person

[254] See R. Ardrey, *African Genesis: A Personal Investigation into the Animal Origins and Nature of Man*, (London: Collins, 1961), p. 349; appears on note written by W.D. Hamilton, [n.d.], Hamilton archive, Z1X40/1/2.
[255] B. Hamilton to W.D. Hamilton, 23 October 1962, Hamilton archive, Z1XUN/5.
[256] Hamilton favourably noted, "it seems these authors are fully in accord with Ardrey's line", (13 February 1967, Hamilton archive, Z1X40/1/1).

game that he had devised to illustrate problems concerning the evolution of the sex ratio. Writing to the editor of *Science*,[257] he claimed that Ardrey's paleontological evidence had demonstrated "that as man acquired the use of tools he quickly adapted them as weapons of combat. There is nothing the least improbable in the idea that simultaneously he adapted his intellectual tools of language and intelligence as weapons of deceit."[258]

Seeing man as naturally deceitful, selfish, and violent, Hamilton was not alone in the fears he nursed about society in the early 1960s. As we have seen in Britain, Julian Huxley, C.D. Darlington, and G.C.L. Bertram were among those who assessed human societies from a biological perspective only to arrive at gloomy prospects for the future. Major biologists in America also believed there was reason to worry. Palaeontologist G.G. Simpson went as far as to claim, "the future of mankind is dim, indeed – if there is any future,"[259] and geneticist Theodosius Dobzhansky summarized the general attitude of the time as an age of anxiety in which "prediction of final extinction has become the fashionable view".[260] But while the hard line of biologists in this period was decidedly pessimistic, even alarmist, V.C. Wynne-Edwards brought forward a positive view of evolved social tendencies.

Wynne-Edwards was an Oxford-trained zoologist who in 1962 published *Animal Dispersion in Relation to Social Behaviour*. Weighing in at over six hundred pages, it was perhaps not the most likely zoological text to reach a wider audience, but beyond its many examples of bird behaviour as observed in the field, its message catered to those concerned with the question of overpopulation and those interested in protecting the environment,

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[257] Hamilton's note was a response to J.C. Liebman, J.T. Flynn, et al., 'Mathematical Illusions', *Science*, 153 (12 August 1966), pp. 688, 690, 692.
[258] W.D. Hamilton to 'Sir', 'Games and Computer Simulation in Biology', 10 October 1966, Hamilton archive, Z1XUN/1/12.
[259] G.G. Simpson, 'The World into Which Darwin Led Us', *Science*, 131 (1 April 1960), p. 974.
[260] T. Dobzhansky, 'The Present Evolution of Man', *Scientific American*, 203 (September 1960), p. 206.

especially in light of American biologist Rachel Carson's *Silent Spring* (1962). Carson attacked the unfettered use of synthetic pesticides and, in doing so, she questioned the core outlook of science in years past, emphasising as it did control and domination. She changed the minds of many in the following years, including Hamilton's dear friend Colin Hudson, who was working on agricultural problems in Barbados. After reading Carson's book, Hudson abandoned his previous stance advocating the chemical control of pests[261] and began to sing a different tune: "I've just finished reading Rachel Carson's 'Silent Spring'; although it makes one tremble to see how low a scientific writer can sink to emotionalise and overstate a case, never the less [sic] one can't escape the conclusion that there is quite a lot in what she says; therefore I'm going to at least try some crude biological control."[262]

Although Wynne-Edwards' tome received a mixed reception among professional scientists, it appealed to those concerned that the environment was being destroyed by the excessive demands of humankind. Wynne-Edwards theorized that there was an intrinsic mechanism that allowed organisms to sense forthcoming shortages and adjust their behaviours accordingly. The reproduction of individuals would thus be curtailed for the long-term benefit of the species. By 1964, *Animal Dispersion* had sold upwards of 350,000 copies and was championed by political and environmental factions.[263] If only man could attune himself to his true nature and self-regulate, policies restricting reproduction and enforcing the protection of natural environments would be unnecessary. Unfortunately, as Hamilton already saw it, though certainly not in response to Wynne-Edwards' work, man's natural self-interest would make such optimism appear almost farcical.

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[261] See C. Hudson to W.D. Hamilton, 8 April 1965, Hamilton archive, WVJ13/1/8.
[262] C. Hudson to W.D. Hamilton and C. Hamilton, 9 January 1968, Hamilton archive, WVJ13/1/8.
[263] M.E. Borrello, *Evolutionary Restraints: The Contentious History of Group Selection*, (Chicago and London: University of Chicago Press, 2010), p. 86.

Hamilton's view was well developed by the time he had come across Wynne-Edwards' book. The idea that self-regulating traits could evolve for the 'benefit of the species' has nevertheless been understood to be part of a larger trend in which terms like the 'herd instinct' or natural 'gregariousness' were thrown about to explain the apparent absence of competition in some settings. Such 'good for the species' thinking was counter to the opinions of R.A. Fisher, for one, but this type of rhetoric surrounding the evolution of self-sacrificing traits continued to have a place in contemporary thought throughout the 1960s and 1970s. Far from reacting against these ideas, Hamilton himself had trouble sticking to the individual as the highest possible unit of selection in some of his early essays.[264] What is more, significant frustration with 'benefit of the species' claims is curiously absent from his early work, even to 1965. In fact, upon first reading Wynne-Edwards in 1962, he remarked that the author's approach was "admirable". What is more, it had given him "more examples of biological nastiness than I could have hoped for".[265]

At this time, Wynne-Edwards' claims were seen to have been well in line with the Darwinian tradition, despite the fact that Darwin's theory of natural selection had been developed in light of Thomas Malthus's treatise on human population, which was itself a reaction to the Enlightenment thinking that saw perfection within human societies to be a real possibility.[266] Nevertheless, even Darwin recognized that tribes whose members were

[264] W.D. Hamilton, 'The Nature of Isolation', [n.d., c. 1960], Hamilton archive, Z1XUN/2.
[265] W.D. Hamilton to C. Hudson, 30 June 1962, qtd. in Segerstrale, *Nature's Oracle*, p. 83.
[266] For more on the relationship between Malthus and evolutionary theory, see, P.J. Hale, *Political Descent: Malthus, Mutualism, and the Politics of Evolution in Victorian England*, (Chicago and London: University of Chicago Press, 2014). For a history of 'Darwinian' thought in Russia, where its Malthusian components were minimized, see D. Todes, *Darwin Without Malthus: The Struggle for Existence in Russian Evolutionary Thought*, (New York: Oxford University Press, 1989). The emphasis on cooperation over competition was an important part of Peter Kropotkin's *Mutual Aid: A Factor of Evolution*, (London: William Heinemann, 1902), but it was also significant to H. Drummond, *Lowell Lectures on the Ascent of Man*, (London: Hodder &

sympathetic towards one another would be victorious over other less cohesive tribes.[267] This, too, he claimed, would count as natural selection. In the 1960s, Wynne-Edwards' argument was not seen to rely on glaringly erroneous assumptions, even by Hamilton. Although they would indeed become a particular target in subsequent decades, and John Maynard Smith and ornithologist Christopher Perrins had already begun to critique them by 1964,[268] Hamilton was initially hopeful that Wynne-Edwards' work might increase the visibility of his research.

Hamilton's theory had, in fact, brought forward an alternative view: traits did not evolve to benefit the group nor the individual but the gene. This was a point that he believed escaped the notice of many biologists because in most cases traits which benefited the individual, say increased agility to escape from predators, also benefited the group. Similarly, there was no doubt that a trait that disadvantaged both the individual and the group, perhaps general lethargy even in the face of predators, would not be selected. But Hamilton identified two cases in which selection at the level of the group and selection at the level of the individual would yield very different results: "(a) Behaver benefits himself while other members of the population are harmed. (b) Behaver harms himself while one or more other members of the population are benefitted". Hamilton used the term "selfishness"

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Stoughton, 1894); P. Geddes and J.A. Thomson, *The Evolution of Sex*, (London: Walter Scott, 1889; B. Kidd, *Social Evolution*, (London: Macmillan, 1894).

[267] C. Darwin, *The Descent of Man*, [1871], (London: Penguin Books, 2004), p. 130.

[268] J. Maynard Smith, 'Group Selection and Kin Selection', *Nature*, 201 (14 March 1964), pp. 1145-7; C. Perrins, 'Survival of Young Swifts in Relation to Brood-size', *Nature*, 201 (14 March 1964), pp. 1147-8. Maynard Smith's publication prompted Hamilton's lasting hard feelings toward him, which centre on the idea of scientific priority and are described at length in Segerstrale, *Nature's Oracle*, pp. 107-9 and Dugatkin, *The Altruism Equation*, pp. 98-9. Archival materials (especially W.D. Hamilton to B.C.R. Bertram, 2 May 1980, Hamilton archive, Z1X64/1/15) offer more direct insights into Hamilton's frustration. He later revealed that he had worried that his work would "be eclipsed under the names of Haldane and MS [Maynard Smith]" (W.D. Hamilton to E.O. Wilson, 27 January 1986, Hamilton archive, Z1X69/1/16).

to apply to the first case and "altruism" to apply to the second case.[269] Moreover, he claimed that these discrepancies disappeared if one considered the problem from what he called the "gene's point of view".[270]

O.W. Richards at Imperial College was also hopeful that Wynne-Edwards' publication prophesied good things to come for the theory of inclusive fitness. Richards had not found Wynne-Edwards' account "very convincing"; he preferred Hamilton's choice of limiting self-sacrifice to "a small family group".[271] Hamilton himself was not immediately concerned about alternative theories of social behaviour. He had only sought Richards' feedback because Richards had experience doing fieldwork on social insects in South America, and Hamilton hoped he might advise him.[272] What he had not expected were Richards' comments on inclusive fitness. First, Richards was not sure that the mathematical equation that Hamilton defined at the beginning of the paper was even necessary; it seemed to him that "Any zoologist can understand the idea that altruism may be selectively encouraged if at the same time it automatically helps ones [sic] own genotype". Richards also felt there was some danger in Hamilton's assumption that the behaviour of social insects was "primitive", especially given that "social life in insects is very ancient".[273]

Richards' first point especially irritated Hamilton. If inclusive fitness was really so intuitive, he complained, why had it taken him so many years to work out? Although Hamilton "agree[d] that the thesis is so simple as to be almost trivial", he was adamant that "all the algebra is necessary to establish it." Regarding Richards' specific point that any

[269] W.D. Hamilton,'neodarwinist approaches converging on social behaviour', [n.d.], Hamilton archive, Z2X29/1/9.
[270] Hamilton, 'The Genetical Evolution of Social Behaviour. I', p. 16.
[271] O.W. Richards to W.D. Hamilton, 20 March 1963, Hamilton archive, WVJ13/1/8.
[272] W.D. Hamilton to A. Hamilton, 17 February 1963, Hamilton archive, Z1X42/1/13.
[273] O.W. Richards to W.D. Hamilton, 22 April 1963, Hamilton archive, WVJ13/1/8.

zoologist could understand it, Hamilton argued that "most are unaware of it. Many biologists still write about individual fitness on one page and about 'the benefit of the species' on the next, apparently invoking whichever seems most suitable for 'explaining' the adaptation in question; the idea that there can be conflict between the two kinds of advantage seems to occur to very few." Citing his recent experience at Cambridge, he reported that despite having "pestered quite a number of people, both biologists and mathematical geneticists", he was unable to find someone who could give a "satisfactory" answer to his questions concerning altruism. Most frustrating to him was the fact that biologists were unwilling to admit that current interpretations of the evolution of social behaviour left much to be desired. Their reluctance, he felt, was not due to the fact that "they saw intuitively the results which it has cost me so much trouble to work out", results which he found personally useful and which, he hoped, "may prove of some use to others".[274]

At the receiving end of Hamilton's frustration, Richards was somewhat apologetic: "I did not mean to imply that zoologists understood your conclusions – rather that the proving of them can be done verbally without algebra though doubtless without the same rigour." Moreover, as a mark of his respect for Hamilton's work, Richards mentioned an upcoming job opening in "elementary statistics and possibly some genetics" at Imperial College. Hamilton was invited to visit the campus at Silwood if the position was of any interest to him. Although he was no shoe in, Richards divulged, "we could at least settle whether you would want to be a candidate."[275] The potential job offer, as we will see, seems to have given both Hamilton and his parents confidence that his ideas would eventually reach a wide audience. Moreover, Richards' recommendation to make the theory of

[274] W.D. Hamilton to O.W. Richards, 29 April 1963, Hamilton archive, WVJ13/1/8.
[275] O.W. Richards to W.D. Hamilton, 1 May 1963, Hamilton archive, WVJ13/1/8.

inclusive fitness a purely verbal argument is also interesting; it validates Hamilton's later reports that few faculty members at Imperial College believed in the methods he used. In the following decades, however, the algebraic aspects of Hamilton's argument proved fundamental; it was, in fact, what piqued the interest of scholars across a variety of disciplines.

**The Continued Importance of Man in Hamilton's Theorizing**

By 1963, Hamilton had become tired of the run-around he was being given by university professors, and he was also frustrated with his theoretical work in London. He felt it was "high time" he moved on to something more practical, which is why he had contacted Warwick Kerr and applied for a British Council Scholarship to study in Brazil.[276] A naturalist from his upbringing, Hamilton found the opportunity to study the social wasps of Brazil that presented particular problems for his theory appealing. His excitement was only checked by his concern that his funding from the Medical Research Council might be revoked because his work in Brazil would be, he admitted, "somewhat remote from the problems of human population genetics and evolution",[277] for which he had received funding over the past three years. In articulating this fear, Hamilton confirmed earlier evidence that his initial interest in the topic of evolved social behaviour and the funding that he garnered for it lay in its implications for mankind.

This fact is further corroborated by Hamilton's second application for the Darwin Research Fellowship. In a letter to G.C.L. Bertram, Hamilton indicated his belief, unchanged since 1960, that his work on social behaviour was "very relevant to eugenics".

[276] Hamilton to Richards, 29 April 1963.
[277] W.D. Hamilton to 'Sir', 2 July 1963, Hamilton archive, Z1X30/1/5.

His application, he admitted, "remains largely the same except that a part of it has now been carried out". As he reported, his "just-completed paper […] indicates the limits of truly social behaviour between related organisms". He also had ideas for three part-time projects.[278]

The first involved "investigat[ing] Galton's theory of 'gregarious and slavish instincts' by means of mathematical models". For Hamilton, the work of Galton, like the work of Darwin, was not to be treated historically. Rather, he saw Galton's work to be a scientific treatise brimming with objective claims that should be further tested and improved upon, and he believed that Galton had been correct in thinking that behaviour that appeared social was actually selfish, having "no, or little, benefit for the group".[279] The second project involved using statistical tests to understand patterns of human reproduction, "including failure to marry, differences in fecundity, virility etc.". Thus, we can see that Hamilton was not only reading studies concerning differential reproduction in man, he was also actively engaging with this topic as he thought about ways that it could be further investigated. The third project was derived from Fisher's theories, and, indeed, was another indication that Hamilton was deeply interested in Fisher's conclusions on man. It concerned the evolution of human economic instincts.[280]

Bertram responded immediately but with guarded enthusiasm, not because he did not find the projects intriguing but because he did not believe a part-time project for the award would be competitive. Still, he figured it was worth a try. With regard to Hamilton's proposed projects, he noted the third in particular and even suggested Hamilton "study the

[278] W.D. Hamilton to The Eugenics Society, 15 May 1963, Hamilton archive, Z1X30/1/5.
[279] His paper on the topic, 'Geometry for the Selfish Herd', would see publication in 1971.
[280] Hamilton to The Eugenics Society, 15 May 1963.

situation in Arabia, where over recent decades the late King Ibn Saud was truly the father of his people".[281] Only a few days later, Bertram noted the receipt of Hamilton's application for the fellowship,[282] but in the end, it proved unsuccessful. He was provided with the limited consolation that "Various people were certainly interested in your work and it is hoped that you will be able to pursue it".[283]

Despite this disappointment, Hamilton remained committed to developing a project in Brazil. His interest in Brazilian wasps was not unrelated to his desire to understand human evolution. Concerning his initial motivation to pursue the project, he later wrote, "I learned that in warmer climates wasp colonies exist that have not just one queen but many." Hamilton initially saw this characteristic to be important to his theory because multi-queened wasps more closely approached the "diffuse" breeding patterns of human communities "than do most bees, wasps and ants",[284] and he was determined to go even if he had to personally front the costs.

In the end, Hamilton received funding for his travels from the Medical Research Council with an application backed by D.V. Glass,[285] and as he sailed from Portugal to Brazil on the R.M.S. Aragon in September 1963, he was optimistic. It appeared to him that the forces that had so bitterly opposed him in years past were finally turning in his favour, and he said as much in a lengthy letter home to his parents. Here, he not only detailed his life on-board but also reflected on his work over the last three years, what meaning its recent publication held for him, and what he hoped for in the future. Overall, he was "confident &

[281] G.C.L. Bertram to W.D. Hamilton, 16 May 1963, Hamilton archive, Z1X30/1/5.
[282] G.C.L. Bertram to W.D. Hamilton, 20 May 1963, Hamilton archive, Z1X30/1/5.
[283] G.C.L. Bertram to W.D. Hamilton, 22 July 1963, Hamilton archive, Z1X30/1/5.
[284] W.D. Hamilton, 'Supplement to Curriculum Vitae', [n.d., September 1969], Hamilton archive, Z2X29/1/7.
[285] F.M. Taylor to W.D. Hamilton, 21 January 1966, Hamilton archive, Z1X89/1/1.

even look[ed] forward to the approaching continent with its teeming foreigners & its heat". In fact, he felt that he was leading "a charmed life"; even Darwin, traveling on the Beagle, had been "hardly luckier" than he was proving to be. It seemed to him that the words of Rudyard Kipling, that if one "want[s] anything sufficiently intensely & persistently it usually turns out that our desire is granted in the end", had rung true. Also true, he guessed, was its opposite: "If one fails I think it [is a] lack of persistence that is likely the root of the trouble".[286] Indeed, Hamilton would attribute the poverty he saw in Brazil to the innate character of the people there.

**Hamilton in Brazil, 1963**

Did Bill Hamilton, then twenty-seven years old, think the biology of social behaviour would ultimately change the way human societies were understood? Did he think an evolutionary understanding of man would yield practical results during a time when the nature of society was undergoing a reassessment? His repeated Medical Research Council and Eugenics Society applications certainly indicate that he did, but on his way to Brazil, he indicated his doubts as to whether or not his ideas would ever prove useful. Still, he figured that if he was honest in laying out what he thought his research could achieve, and it was selected for funding because of its potential, then he could not be blamed if he should fail to ever attain those results – that was simply the nature of research. Ever the pessimist, he acknowledged that he might have to reconcile himself to school teaching if his luck wore out. He had avoided this option because he believed that "man is rather like a barnacle larva – once he settles he tends to settle for life". If he settled too soon, Hamilton risked "los[ing]

[286] W.D. Hamilton to B. Hamilton and A. Hamilton, 3 September 1963, Hamilton archive, Z1X42/1/13.

my present energy & my animating genius". For now, however, he was happy to leave his family and girlfriend, Marion, behind for an overseas adventure.[287]

With a paper accepted for publication, he was confident. Though he had always known "in some semi-conscious way that I was completely right & the arguments I criticised completely wrong", he now had even his previously "scornful" professors on his side. To make what was on the horizon appear brighter yet, the *Journal of Theoretical Biology* had accepted the full version of his theory for publication,[288] though they would later inform him that the paper would have to be revised significantly and split into two parts; as it stood, it was nearly incomprehensible.[289] He was also in the process of writing up a paper "on the moulding of senescence by natural selection", which would also see publication within the next few years,[290] and for the moment he was caught up in the "task of devising an analysable & yet plausible mathematical organism with which to illustrate my thesis".[291] As with his theory of inclusive fitness, he continued to work from imaginary worlds when concocting the possible outcomes of natural selection. The real world data would come later, if they would come at all.

For Hamilton, his 1963 publication signified that his theory had at least been provisionally accepted, and he had no doubt that the relevance of his theory "to every kind of living organism from man to bacteria" meant it "must provoke a good deal of discussion when it comes out". Even if mathematical mistakes were found or his assumptions questioned, he was "convinced that the central idea is right – it seems indeed to be one of

[287] W.D. Hamilton to B. Hamilton and A. Hamilton, 3 September 1963.
[288] Ibid.
[289] W.D. Hamilton to B. Hamilton, 22 November 1963, Hamilton archive, Z1X42/1/13.
[290] W.D. Hamilton, 'The Moulding of Senescence by Natural Selection', *Journal of Theoretical Biology*, 12 (1966), pp. 12-45.
[291] Hamilton claimed that the lectures by Norman Carrier at LSE gave him the "demographic grounding" for what would be his 1964 paper; W.D. Hamilton to B. Hamilton and A. Hamilton, 3 September 1963.

those simple truths which no one seems to have made clear before, despite its realisation in particular cases by Fisher & Haldane among the pioneer generation in ~~population~~ the mathematical theory of evolution". He commended himself for having "done almost precisely what I was proposing to do when I left Cambridge, & what was scoffed at by so many as a ridiculous & pretentious project".[292] Though a more practical problem had been recommended to him time and again, his persistence now seemed to have paid off.

Among his most surprising converts was John Hajnal.[293] At first discouraging Hamilton's "Fisherian views", Hajnal came to exhibit "great enthusiasm" for Hamilton's end product despite "disagree[ing] with most of [his] conclusions".[294] More precisely, while Hajnal believed that the "mathematical coherence" of Hamilton's work was worthy of praise, he continued to believe it had "no relevance to biology leave alone human sociability at all".[295] Hamilton would later be disappointed that Hajnal continued to deny the relevance of his theory to sociology,[296] but in the meantime, he celebrated with family and friends that even medical geneticist Lionel Penrose was now "speak[ing] favourably of [his] intentions".[297]

Hamilton found it hard to work while on the ship, so he spent much of his time learning Portuguese and playing chess. With regard to his fellow travellers, Hamilton had much to report. First to catch his eye were two missionaries who were not "even trying" to learn Portuguese. He wondered at the unlikely success of their attempts to "convert the

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[292] W.D. Hamilton to B. Hamilton and A. Hamilton, 3 September 1963.
[293] Robin Fox later remembered Hajnal identifying Hamilton as "undoubtedly a genius […] and so far ahead of his time that the academic geneticists didn't understand what he was doing" (R. Fox, *Participant Observer: Memoir of a Transatlantic Life*, (New Brunswick and London: Transaction, 2004), p. 354).
[294] Shortly after working with Hamilton, Hajnal decided to pursue training in genetics himself (J. Hajnal to W.D. Hamilton, 7 November 1963, Hamilton archive, Z1XUN/5).
[295] W.D. Hamilton to B. Hamilton and A. Hamilton, 3 September 1963.
[296] W.D. Hamilton to B. Hamilton and A. Hamilton, [n.d., December 1963], Hamilton archive, Z1X42/1/13.
[297] J. Hudson and C. Hudson to W.D. Hamilton, 11 August 1963, Hamilton archive, Z1XUN/5.

indians [sic] of the Amazon to the Baptist version of Christianity" when the absence of any language skills was paired with their alarming geographical ignorance. Hamilton supposed "it is their faith or something that makes them so unperturbed by the looming continent of incomprehension". He also lamented the "streak of religion" in a husband and wife team who were moving to Brazil for commercial purposes. Apart from their orations on the evidence for Noah's ark, their penchant for "pseudo-scientific theories" made Hamilton grumble; he simply could not imagine "where they picked it all up".[298]

Beyond the specifics of individual travellers, Hamilton also reported generalities about the ship's population. It struck him, for example, that certain groups avoided the sun altogether: "On the whole I notice the native Brazilian & Argentinian people we picked up in Lisbon & Vigo don't go on the upper decks nearly so much, but whether this is because they don't like the sun or like to keep their already dark skins as fair as possible for socio-racial reasons, or for some other reason, I don't know." As far as chess was concerned, he reported his potential opponents were among the "more latin-looking [sic]" travellers, and they played "remarkably well" despite the fact that "they don't look at all educated types". Although he had not played many of them, he was confident that he could beat them.[299] Disregarding the potential inaccuracies that could result from Hamilton's reliance on assumptions, his mother encouraged his "study of people",[300] and his father would later urge him to write up his observations for the popular press.[301] With their support, Hamilton proved to be a keen observer of human behaviour, but doubtless many of his assertions were

[298] Hamilton to B. Hamilton and A. Hamilton, 3 September 1963.
[299] Ibid.
[300] B. Hamilton to W.D. Hamilton, 16 September 1963, Hamilton archive, Z1XUN/5.
[301] A. Hamilton to W.D. Hamilton, 6 May 1964, Hamilton archive, Z1XUN/5.

coloured by the values and prejudices he had absorbed growing up in middle-class, rural England. This was only made clearer as the months went on.

After he arrived in Brazil, Hamilton's reports home continued. He was particularly alarmed by the level of bribery and corruption he saw, even though he had been told that "it is quite normal for Brazil". Immediately after disembarking the ship, for example, he had been confronted by a "shark". Thinking he was someone official, Hamilton dutifully handed over his passport, only to realize that the man "was just offering his services to get me through the customs expeditiously & illegally". Disgusted, Hamilton fought to have his passport returned, but he later wondered if he had made the right decision. In the end, his morals prevailed; the cost combined with the "unpleasantness of giving a bribe" made him ultimately glad to have acted honestly. Still, he had learned a lesson from this brief encounter, and while he had originally thought about coming back for his luggage at a later point, he now recognized that "leav[ing] baggage anywhere in Brazil is as good as throwing it away".[302]

Though the culture of Brazil represented a huge contrast to his life in Britain, Hamilton's comments concerning Brazilian life nevertheless give some indication as to his beliefs regarding issues in British politics. For example, a comment concerning a recent dock strike in Brazil reveals that he did not view the actions of unions with sympathy.[303] He was also concerned about the state of science and the limitations on research that were caused by insufficient government funding. Moreover, though government support for science in Britain was decidedly below what Hamilton thought it should be, he quickly realized how much worse the situation could get, reporting home that "The dept. of biol. is a

[302] W.D. Hamilton to B. Hamilton and A. Hamilton, 10 September 1963, Hamilton archive, Z1X42/1/13.
[303] Ibid.

building hardly bigger than an overshed – research is on a shoestring even by comparison with G.B."[304]

It is true that Hamilton was a naturalist from his youth, and he described in detail the flora of Brazil in letters home to his mother. He was also an enthusiastic observer of man. Though this has been an underrated facet of his work and motivations, his archive preserves the extensive record of his attempts to understand human individuals and human societies through an evolutionary lens. As we have already seen, these were dominant themes in his notes, letters, and essays from the 1950s. In Brazil, however, Hamilton was presented with the opportunity to collect more data on what he perceived to be the underlying causes of the world's inequities. Accordingly, Hamilton found the Brazilian population as a whole "extremely nice & hospitable […] but at the same time a bit lazy & feeble".[305] When he met a Brazilian who refused money for his mangoes, saying "he had more than enough of them", Hamilton assumed the man was a communist. Moreover, he found the man's attitude to be representative of "the spirit of rural Brazil: the idea that it might be worth selling mangoes to a willing buyer, & so make a little money to buy some shoes with or improve his door post so that it didn't rock so much when he leaned against it, would never occur to him". It was no wonder, he thought, that the natives got poorer and poorer, and it was therefore almost inevitable that immigrants would "gradually take over their land from them".[306] With communist commitments, they were in his view destined to fail.

It would nevertheless be misguided to interpret Hamilton's dismissal of the far left to mean he identified himself as a conservative. In fact, he and his sister Mary admired the

[304] W.D. Hamilton to B. Hamilton and A. Hamilton, 12 September 1963, Hamilton archive, Z1X42/1/13.
[305] W.D. Hamilton to R. Hamilton, 4 November 1963, Hamilton archive, Z1X42/1/13.
[306] W.D. Hamilton to B. Hamilton and A. Hamilton, 27 December 1963, Hamilton archive, Z1X42/1/13.

Kennedy administration, although this was largely due to its emphasis on science. They thought Kennedy himself stood "for science, scientific adventure + scientific responsibility" as the world stood at the "frontier of annihilation". What is more, Kennedy appeared to represent a younger generation, one that the Hamilton siblings hoped would place science at the centre of decision-making. It was for these reasons that Mary Hamilton had been so shaken by John F. Kennedy's assassination on 22 November 1963.[307]

The Brazilian administration, however, was judged by Hamilton to be much more suspect, and between the "lazy & corrupt officials" and the "general indigence of the population", he theorised about the "root of [Brazil's] economic difficulties".[308] What stood out to him was that there seemed to him to be a problem with individual initiative among the people of Brazil. Despite their having "an inferiority complex about being an under-developed country", they simply had no willpower "as far as exploring & colonising their own 'wild west'".[309]

The lack of stick-to-itiveness among people in tropical cultures was a recurring point of discussion for Hamilton and his friends who travelled or lived abroad. Hamilton's friend Colin, for example, saw his contribution to agriculture in Barbados as the most effective form of foreign aid Britain could offer in the early 1960s. Concerning Hudson's decision to stay in Barbados another year, and Hamilton's resulting "(jocular) accusation of infidelity to Mother England", Hudson argued that tropical countries needed precisely what only scholars from more temperate climates could offer. Hudson believed a cool climate was necessary if one was to learn "the art of deep thought and sustained effort"; it was "only too

[307] M. Hamilton to W.D. Hamilton, 23 November 1963, Hamilton archive, Z1XUN/5.
[308] W.D. Hamilton to A. Hamilton, 14 May 1964, Hamilton archive, Z1X42/1/13.
[309] Hamilton to R. Hamilton, 4 November 1963.

easy to underestimate the difficulties which anyone born in the Tropics has of really studying and learning to concentrate and, for many at any rate, learning to be faithful to a job which needs doing for long enough to really get it done!" For that reason, 'expatriates' would be a necessary form of foreign aid until more "coloured students" entered engineering and agricultural programs in temperate climates. As a do-gooder himself, his major concern was how long he could stay in Barbados without his work ethic being corrupted by the tropical environment.[310]

While in this case, Hudson claimed that the causes of inferiority were environmental and therefore not inescapable, elsewhere there is evidence that the culture in which Hamilton, his family, and his friends operated nurtured the belief that genetics played a major role in boosting or impairing the future of mankind. It was concerns such as these that influenced the personal strategy undertaken by Hamilton's father in combatting the population problem: simply stated, intelligent people needed to have more children. This policy was explicitly laid out to Hamilton after he had indicated that he was considering forgoing parenthood. His father would have none of it. He already feared that his "ethnic group of 'intelligentsia'" was at risk of dying out "even if all my children have average families!" Citing an article on population in the September 1963 issue of *Scientific American*, Archibald was concerned "that the least fitted + most backward peoples are still increasing at the greatest rate of all – faster than Europe + Japan + the British + American people ever did". Accordingly, he encouraged Hamilton to forget his worries about ever having too large a family even as the world was threatened by overpopulation; indeed, he had a duty to see that there were individuals in the next generation "of your own type […] to

[310] C. Hudson to W.D. Hamilton, [n.d., 29 July 1963], Hamilton archive, Z1XUN/1/5.

help run it properly". He asked Hamilton to set an example for his siblings by being a family man.[311] Whatever his potential contributions to science, Archibald was certain that his son could make a meaningful genetic impact on future generations.

Back in Brazil, Hamilton had more immediate concerns than deciding his future family size. He was perturbed at the situation surrounding currency exchange. When converting his funds from the Medical Research Council, he declared it "unpatriotic to accept less […] for my country's money than it is really worth". The real problem for Hamilton was that doing so meant he had "to hand over more to Brasil than Brasil is really entitled to receive". For Hamilton, no individual, group, or nation was deserving of a hand out: "If Britons work harder than Brasilians & produce goods which the latter would like to possess except that they have nothing to offer in return, there seems to be no moral reason why Britons should give away their goods, just because Brasilian politicians try to make them do so." Although he admitted that his knowledge of international finance was "extremely primitive", he still felt confident that he grasped the "essence of the situation",[312] informed as it was by his biological schema. Accordingly, he believed it was up to individuals and individual countries to make their way in the world. Their failure to do so, as well as the poverty and devastation that may result, was simply the natural course. As Hamilton saw it, artificial readjustments were simply not the moral alternative that some proclaimed them to be.

The Hamilton family's political leanings are also revealed through the articles they clipped for Hamilton while he was in Brazil. An article by Edward Crankshaw in *The Observer*, 'Russia Turns Her Back on Marx and Lenin', for example, was sent with the

[311] A. Hamilton to W.D. Hamilton, 19 March 1964, Hamilton archive, Z1XUN/1/5.
[312] W.D. Hamilton to B. Hamilton, 21 November 1963, Hamilton archive, Z1X42/1/13.

label, "Dad thought you might be interested in this". The article claimed, "it is in those countries which subdue their economies to a rigid ideological test that the conflict between the real and the ideal can assume a seriously damaging character". To save itself, the Soviet government would have "to give some play to the spirit of individualism […] which, until lately, provided the sole dynamic of material progress in the West".[313] Of course, this is just what Hamilton believed the experiment of socialism in the Soviet Union was doing, sacrificing the true, individualistic nature of man for the illusions brought on by ideological commitment.

Despite these annoyances, by the end of November 1963, there was cause for celebration. A letter to Hamilton from home exclaimed,

> "This seems to be your day of early fame for we had a bundle of cards + letters from L.S.E. today + plus requests for your letter to the A.N. journal + also the new scientist [sic] mentions your article on your subject by Dr. Hans Kalmus […] If you are not well out there just come home at once + reap some of your hard earned fame!! Now may be the right time to return when your stock is high!"[314]

Hamilton was more composed, telling his parents that the offprints were no "special honour; every scientist receives them by the dozen & writes off for those of other people before he has hardly bothered to look at the article in question". In addition, he was not necessarily surprised that Kalmus had published on the subject.[315] Kalmus was in fact the only person to whom Hamilton had given a copy of his paper before leaving for Brazil, and he claimed that this was because no one else at the Galton Laboratory had shown the "slightest interest" in

[313] E. Crankshaw, 'Russia Turns Her Back on Marx and Lenin', *The Observer*, (22 March 1964), Hamilton archive, Z1X42/1/13.
[314] A. Hamilton to W.D. Hamilton, 28 November 1963, Hamilton archive, WVJ13/1/7.
[315] H. Kalmus, 'The Evolution of Altruism', *New Scientist*, 20 (28 November 1963), pp. 550-1.

his work. Still, Kalmus had not told Hamilton that he intended to write on the subject, and it appeared to Hamilton that he did not wholly understand his theory.[316]

Nevertheless, Hamilton had reasons to join his parents in celebration. It seemed to him that interest "in the problems of social evolution" was increasing, and more and more, "old clichés like the 'benefit of the species'" were being questioned. What is more, "a big book on the subject" had recently been published.[317] Though according to Hamilton, the "author's theory is very largely wrong, just because he assumes 'group-selection' so uncritically", he admired the vast number of examples drawn "from all over the animal kingdom". These, Hamilton admitted, were "extremely interesting & certainly seem to demand some explanation".[318] As we have seen, Hamilton's respect for scholars despite the fact that they advocated group selection was not unique. Hamilton had also viewed the work of Robert Ardrey favourably, and the next chapter will show that Hamilton was sympathetic to the ideas of Lorenz. These reactions prompt us to reconsider the assumption that he was primarily motivated by the desire to undermine collectivist sentiments within biology, seeing them as opposite to the true natural order. In fact, he was possibly more motivated at this point by his commitment to undermine widespread political and cultural collectivist sympathies, which he would later say challenged "the almost tectonic forces of human nature as it evolved".[319]

Alternative theories of social behaviour aside, there were also things to celebrate concerning Hamilton's career prospects in the new year. John Hajnal was confident that

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[316] W.D. Hamilton to B. Hamilton and A. Hamilton, [n.d., December 1963], Hamilton archive, Z1X42/1/13.
[317] This likely refers to V.C. Wynne-Edwards' *Animal Dispersion in Relation to Social Behaviour*, (Edinburgh: Oliver & Boyd, 1962).
[318] W.D. Hamilton to B. Hamilton and A. Hamilton, [n.d., December 1963], Z1X42/1/13.
[319] W.D. Hamilton, 'Changing and Evolving Nature: Human Paths and Health of the Next Millenium', [n.d., c. 1998], Hamilton archive, Z1X37/1/3.

Hamilton could get a position within academic biology, if that was the path he chose. He had sent an offprint of Hamilton's 1963 summary to Peter Medawar, who passed it to John Maynard Smith, with a favourable response.[320] Moreover, he had been formally invited to apply for a lectureship in genetics at Imperial College, and his parents urged him to do so.[321] Hamilton, still confident with the recent turn of events in his favour, was not as easily excited; he did not think that it would be difficult to find a job when he returned and was therefore not worried about getting this job in particular. His supervisors also thought that they had leads on potential jobs for him, and more importantly, this interest was all coming "before a shred of real logical evidence for my theory has been published". His only worry was that a mathematical error in his theory might be discovered in the interim.[322]

But there was at least one item of bad news for Hamilton in the first part of 1964; his sister Mary informed him that his girlfriend, Marion, was moving on. The reason for the break up, however, reveals the extreme eugenic ideals Hamilton held at the time. According to Mary, Marion could not marry Bill because he "wanted her to have artificial insemination".[323] Although she usually maintained a good rapport with her brother and, indeed, shared many of his commitments concerning the future of man and the necessity of understanding social ills scientifically, this left Mary confused. Despite the fact that she, like her brother, strove to respond to the world's problems in an objective rather than an emotional way,[324] she was exasperated with him: "I cannot for the life of me see why you should wish to subject Marion to [artificial insemination] unless you wished her to have a

[320] J. Hajnal to W.D. Hamilton, 30 January 1964, Hamilton archive, Z1XUN/5.
[321] O.W. Richards to W.D. Hamilton, 7 February 1964, Hamilton archive, Z1X42/1/13.
[322] W.D. Hamilton to A. Hamilton, 17 February 1964, Hamilton archive, Z1X42/1/13.
[323] M. Hamilton to W.D. Hamilton, 14 March 1964, Hamilton archive, Z1XUN/5.
[324] See, for example, M. Hamilton to W.D. Hamilton, 23 November 1963, Hamilton archive, Z1XUN/5.

collection of differently sired children for some reason or another".[325] Indeed, it is not difficult to imagine that Hamilton may have seen his own reproduction as an opportunity for experimentation on a subject that was normally outside a scientist's grasp.

**An Academic Post at Imperial College**

In the end, Hamilton assumed the Imperial College post offered by Richards after he returned to England in 1964. Hamilton's pair of papers on inclusive fitness had been published in the same year, and his theory was quick to inspire a range of responses. Like Darwin in his 1859 publication of *On the Origin of Species*, Hamilton had made no explicit reference to man, but paralleling the public reception of natural selection, inclusive fitness was immediately seen to be relevant to human evolution. Still, despite the precision implied by Hamilton's mathematics, the true meaning of his equations was arguably open to interpretation. It is therefore worthwhile to register a few of these responses.

An early reader of Hamilton's work, and, of course, one of his major cheerleaders, was his father Archibald. Through the letters exchanged between father and son, however, it is difficult to say how clearly Archibald understood his son's intentions.[326] Already we have seen that father and son shared a collection of beliefs that could be characterised as eugenic in purpose, and they also nursed real fears about what the future would hold for humankind. Still, Archibald first interpreted his son's theory as proving the ultimately 'good' nature of humankind. According to Archibald, "even a layman like myself can see the coming importance of this subject". He thought that his son might be a herald of optimism amidst

[325] M. Hamilton to Hamilton, 14 March 1964.
[326] Bettina Hamilton implied that she and Archibald did not fully understand Bill's work on inclusive fitness when she wrote that had her son discovered a new species of wasp, "There would be an achievement Dad + I could fully understand" (B. Hamilton to W.D. Hamilton, 12 December 1963, Hamilton archive, Z1XUN/5).

present pessimism and was glad that Hamilton might "tell the world that altruism + good social behaviour are on the upgrade with mankind". In fact, Archibald thought his son promoted "a real message people will think most welcome!" and this came in addition to "the many ordinary applications of genetics".[327] Not only would genetics shed light on the world's greatest ills; it would also show the way forward.

Archibald Hamilton was in good company in assuming that his son's theory meant good things lay ahead. Francis Emeric Binet, a Senior Research Scientist in the Division of Animal Genetics at the Commonwealth Scientific and Industrial Research Organization, saw Hamilton's theory to have equally positive implications. Binet felt very deeply that inclusive fitness mattered as much philosophically as it did scientifically, and his long, discursive, and sometimes illegible letters to Hamilton reiterate this point. Concentrating on the idea that pro-social behaviours could, even should, evolve within groups and ignoring the limitations on which Hamilton himself often focused, Binet was enthusiastic. He read Hamilton's publications with great delight, believing that they in fact revealed "Darwin's true intentions and outlook formulated in unexceptionable mathematical rigour". He therefore hoped that they would "restore Darwin's true and humane meaning from H. [Herbert] Spencer's (and his followers') antisocial distortions" in a way qualitative arguments could not.[328]

When Hamilton engaged the philosophizing scientist, he doubted that such morals could be drawn from scientific fact,[329] but Binet was unrelenting. For Binet, Hamilton's papers proved that "the usual distortion of Darwinism, used as a justification of the 'morality' ('immorality' a better word!) of cut-throat, commercialism […] is refutable". He

[327] A. Hamilton to W.D. Hamilton, 2 April 1964, Hamilton archive, Z1XUN/5.
[328] F.E. Binet to W.D. Hamilton, 27 May 1965, Hamilton archive, Z1X89/1/1.
[329] His reply, presumably dated 28 July 1965, is referenced in F.E. Binet to W.D. Hamilton, 17 August 1965, Hamilton archive, Z1X89/1/1.

went on to claim, "Your paper clinches mathematically the fine argument against the cruel nonsense."[330] Moreover, this was not simply a historical issue for Binet; he feared that the Darwinian 'fact' of intra-specific competition was being used in present-day attacks against the welfare state. According to Binet, such an ideological stance was thankfully "CONTRADICTED by [Hamilton's] models". Hamilton did not agree; he pencilled in the margin, "unfortunately not",[331] but waited over a year to reply. When he finally did, he avoided discussion of philosophical points and instead insisted that Binet had overrated his contribution.[332]

Though Hamilton certainly did not agree with Binet's assessment of inclusive fitness, Binet's letters are indicative of the depth of meaning Hamilton's theories held. Regardless of the actual meaning of inclusive fitness, both Binet's and Archibald Hamilton's reactions indicate the extent to which inclusive fitness was seen to hold both social and political importance in a turbulent period.

Of the early commenters, Colin Hudson knew Hamilton's line of thinking best. As we have seen, he had extensively discussed human evolution with Hamilton while they pursued their undergraduate degrees together.[333] But even Hudson was cautious of Hamilton's attempt to weigh individuals and genes against species to the extent he did. Moreover, he was "certain that [Hamilton] would not act according to the argumants [sic] if actually faced with the situations [he] discuss[ed]",[334] indicating that perhaps the insights Hamilton gleaned from an 'honest' assessment of his own motivations were not a

[330] Binet to Hamilton, 17 August 1965.
[331] F.E. Binet to W.D. Hamilton, 2 December 1965, Hamilton archive, Z1X89/1/1.
[332] W.D. Hamilton to F.E. Binet, 4 August 1967, Hamilton archive, Z1X89/1/1.
[333] They continued to discuss subjects such as the human population crisis throughout the 1960s; see, for example, C. Hudson to W.D. Hamilton, 3 October 1966, Hamilton archive, WVJ13/1/8.
[334] C. Hudson to W.D. Hamilton, November 1965, Hamilton archive, WVJ13/1/8.

completely accurate portrayal of man's evolved nature after all. Even his closest friend saw things less pessimistically.

In New Zealand, however, Hamilton's godfather, Charles Brasch, was less hesitant than Hudson was to assume that a biological understanding of animals could be meaningfully extended to the human world. Having read Hamilton's papers, he wrote, "The habits of your little insects are very intriguing. But the habits of humans aren't radically different, although usually seeming more decorous."[335] These same ideas were put forward within academic circles back in London. Norman Carrier, for example, found the 1964 papers to exhibit ideas that were both "fairly novel" and "quite fascinating". Though Hamilton had restricted his discussion to animals, Carrier thought the papers spoke to "what is happening as regards evolution today and what it 'ought' to be doing". In fact, Carrier believed that Hamilton's "ultimate objective" concerned the current human condition. He only lamented the fact that the meaning might come too late for the present generation if they were not shrewd in understanding the natural laws that govern society. Still, he hoped future generations would benefit from a full understanding of the meaning of inclusive fitness.[336]

We have already seen that Carrier's suggestion was on point. First, Hamilton had consistently exhibited concerns about human evolution from his secondary school days, and he continued to be concerned about issues of population and the biological meaning of medical advances, especially when combined with increased welfare provisions. Second, his politics and prejudices, while by no means radical when understood within the context of his time, make his allegiance to a gene-centred approach unsurprising: by limiting prosocial

[335] C. Brasch to W.D. Hamilton, 7 December 1966, Hamilton archive, WVJ13/1/8.
[336] N.H. Carrier to W.D. Hamilton, 8 November 1964, Hamilton archive, WVJ13/1/7.

behaviour to family groups, he may have been accommodating his fears concerning the changing state of the world and especially the decline of white Britain.

Moreover, Hamilton was committed to prioritizing intuition over experiment, which perhaps left his ideas even more open to influence by extra-scientific factors. His views on the usefulness of intuition were in fact shared by Colin, who once lamented after a conference that "all the other conferees seemed to be exponents and devotees of the 'scientific method' instead of using intuition -- which anyone can see is the fastest way of getting results and producing theories".[337] That Hamilton often thought of biological problems in human terms is also clear. In his descriptions of wasps sent home from Brazil, for example, he described them as seeming "faithful to their nests", hypothesized strategies that "underdogs" might adopt,[338] and categorized the actions of some organisms as "sensible".[339]

Through the newspaper clippings he saved from 1960-2 and 1965-8, we may also note a pronounced engagement with issues of reproduction that were fundamental to understanding the evolution of man. The clippings record his interest in the subjects of abortion, population control, the castration of criminals, the murder or abandonment of children by their parents, desires of couples to adopt these abandoned infants, and the relationship between the politics of reproductive issues and religious beliefs as they appeared in the popular press. Because Hamilton rarely annotated these clippings, it is

[337] C. Hudson to W.D. Hamilton, 18 September [1965], Hamilton archive, WVJ13/1/8.
[338] W.D. Hamilton to B. Hamilton and A. Hamilton, 18 September 1963, Hamilton archive, Z1X42/1/13.
[339] W.D. Hamilton to B. Hamilton and A. Hamilton, 7 February 1964, Hamilton archive, Z1X42/1/13.

difficult to tell exactly why he saved them, but he most often annotated articles on issues related to religious opposition to birth control and abortion.[340]

These clippings indicate that Hamilton remained interested in the human applications of his work beyond the tenure of his Medical Research Council funding and after his first trip to do fieldwork in Brazil. What is more, in a long letter to anthropologist John Pfeiffer in 1965, Hamilton revealed that "the hope of arriving at some new understanding of human social evolution was a major incentive to" do the work he did. Still, he cautioned that his current ideas on the topic were "not very definite yet". In fact, he hesitated to publicly declare his beliefs until they were better thought out, "having found that people seem to react rather more sharply to half-baked ideas on this subject than to half-baked ideas in general". Until then, however, he was happy to share them with Pfeiffer.[341]

Among Hamilton's admittedly "half-baked ideas" were musings on the limited applicability of inclusive fitness outside of large populations, the effects of division of labour on his model, the restraints placed on cultural potential by natural selection, the evolution of man's "love of ideas for their own sake", the importance of money in human evolution, and "our wonderful capacity and inclination for lying and concealing our thoughts". By looking at these ideas in more detail, we see that Hamilton had some doubts about the applicability of his theory in early hominids because his model broke "down for the population systems of small and presumably rather endogamous groups that seem to be characteristic of apes and baboons". Nevertheless, he had reason to believe evolution in man still occurred and remained important.[342]

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[340] See Hamilton archive, Z1X30/1/2.
[341] W.D. Hamilton to J. Pfeiffer, 15 February 1965, Hamilton archive, Z1X89/1/1.
[342] Ibid.

It was for this reason that he thought that more recently evolved phenomena, such as the division of labour and the emergence of money, might change the conclusions of his model when it was applied to the human species. Considering the division of labour in particular, Hamilton conceded, "It would be ill-advised to be 'selfish' towards a distant relative if one is dependent on him for some vital service." And this truth was exacerbated if the special skill was genetically determined, in which case "one must value him even if one does not carry the same alleles oneself because the well being of the community in which one's own offspring have to live also depends on them". Still, there were restraints on how much individuals could be taught to work against their tendency to favour relatives because they would risk being replaced by groups more in tune with their evolved prejudices. It was for this reason that Hamilton doubted the *tabula rasa* ideas then in vogue, and taking a stand against the social scientists of his time, he concluded, "it seems doubtful to me if our seemingly blank cheque of mental development is really so blank as is sometimes assumed".[343]

In the same letter, Hamilton made explicit his attitudes towards Fisher's theories on human evolution and declared that most of his "thought in this field is inspired by that amazing book of Fisher's", which he felt was undeservingly treated as speculative: "I do think that Fisher's whole line has been rather too severely disregarded just because he proved wrong in his interpretation of contemporary population trends, and therefore also on certain parts of the theory he based on this interpretation." In the end, he believed Fisher's

[343] Hamilton to Pfeiffer, 15 February 1965.

ideas would triumph, as "it will have to be recognised eventually that a lot of the ideas in this section of the book are basically correct".[344]

Although Hamilton met with considerable trouble in his efforts to bridge an understanding of man with an understanding of genetics and evolution, he was not the only young scholar to communicate the challenges inherent in attempts to understand traditional sociological, psychological, or anthropological subjects through evolutionary theory in these years. Another doctoral candidate in the early 1960s, Robert N. Elston, wrote to C.D. Darlington in 1964 regarding his work on human population genetics in Uganda. Elston was keen to have his work published in *Heredity*, an international journal of genetics co-founded by Darlington and Fisher, and he was torn between Darlington's desire for his thesis to contain more psychology and sociology and his examiner's requirement that he "not write a line which I have not good statistical evidence for". Elston explained to Darlington that as far as the genetics department at Uppsala Universitet in Sweden was concerned, "the less sociological the investigation appears, the better". He had even been pressured by one professor to transfer to the psychology department, which was not intended as a compliment. The same professor went as far as to deduct points from Elston's thesis mark because he felt that the discussion contained too much psychology.[345]

Derek Freeman, an Australian anthropologist and, in later years, an avid critic of Margaret Mead, also seems, like Hamilton, to have rejected in large part the prevailing culture at LSE. According to Freeman, the mantra when he was a student in 1946 was unwavering in its assumption "that biology had nothing whatsoever to do with

[344] Hamilton to Pfeiffer, 15 February 1965.
[345] R.N. Elston to C.D. Darlington, 20 July 1964, Darlington archive, CSAC106.3.85/D.154.

anthropology".[346] Hamilton was aware of Freeman's work. In fact, he claimed to have "noticed [Freeman] as an iconoclastic anthropologist" even before he had fully articulated his theory of inclusive fitness.[347] This was because Freeman had participated in a meeting on 'The Natural History of Aggression' in 1963 that was hosted by the Institute of Biology, a British organization founded in 1950 for practicing biologists and others with biological training.[348] The meeting resulted in an edited volume that Hamilton both owned and annotated, and Hamilton later remembered this volume "as a breath of realism in all I was reading ~~about~~ in anthropology" in the 1960s.[349] As we will see, he was particularly interested in the comments made on the nature of human conflicts.[350]

Freeman's sympathy for evolutionary studies of behaviour by ethologists[351] also stood out to Robert Ardrey as he prepared his second book on the animal nature of man. Ardrey had been surprised that the Institute had been bold enough to "enter the no man's land between the social and biological sciences" with clear support for the view that aggression was a nearly universal, evolved trait. To Ardrey, this position so contradicted

[346] D. Freeman to W.D. Hamilton, 29 June 1997, Hamilton archive, Z1X66/1/5.
[347] W.D. Hamilton to M. [Hamilton] Bliss, 2 February 1998, Hamilton archive, Z1X66/1/5; while Mary found Freeman's discourse "a bit one sided", she could sympathize with him, "knowing sociologists political attitudes too well […] They are not scientists at all." Still, she argued "scientists are not much better, + neither are doctors & nurses" (M. [Hamilton] Bliss to W.D. Hamilton, 6 February 1998, Hamilton archive, Z1X66/1/5).
[348] By 1964, the Institute calculated its membership to be approximately 41% of the 8,000 biologists in Britain, and it was hoped that over 50% would be members by the end of 1965 ('Membership', *Institute of Biology Journal*, 12 (February 1965), p. 4).
[349] Hamilton archive, Z1X10; Hamilton dates reading this text to "about 1962", but the fact that he was still heavily engaged in anthropological literature in 1964, when the book was actually published, reaffirms my claim that he continued to view his work as relevant to the human species after his theory was published (Hamilton to M. [Hamilton] Bliss, 2 February 1998).
[350] W.D. Hamilton to Ruth Hamilton, [n.d.], manuscript on D. Freeman, 'The Debate, at Heart, Is About Evolution', Hamilton archive, WVJ14/1/8.
[351] D. Freeman, 'The Debate, at Heart, is About Evolution', (1995), Hamilton archive, WVJ14/1/8.

pervasive cultural beliefs that he applauded what he saw to be the tremendous courage of the symposium's organizers.[352]

Ardrey reported that Freeman as well as the British psychiatrist Anthony Storr broke with the emphasis on environment that was so common in their disciplines to join the ethologists. Storr believed the nuclear arms race was an example in man of ritualized aggression. Apart from Freeman's and Storr's transgressions, however, the event proved rather uneventful, "as if some defect in the meeting room's acoustics had prevented one side of the house from hearing what the other side was saying".[353] Freeman's position favouring the biological determination of aggression is not surprising given the fact that he named Darlington and Lorenz as the scientists who most impacted his thinking about anthropological problems. Freeman, in fact, believed the "doctrine of 'absolute' cultural determinism" was little more than an idealist reaction to evolutionary theory. He hoped that his work would do something to hasten the demise of the cultural emphasis in the social sciences "or, at least make it so intellectually disreputable as to assist materially in the emergence of a biologically-based science of anthropology".[354]

**Putting a Scientific Eye Toward the Future**

By October 1965, Hamilton's ideas concerning man were beginning to be noticed, and in the eyes of his younger sister Margaret and his brother Robert, he seemed to have made it. Robert remembered that their father had only recently been "very perturbed about whether you were doing any good to the world but I guess he must be happy now sitting in

[352] R. Ardrey, *The Territorial Imperative: A Personal Inquiry into the Animal Origins of Property and Nations*, (London: Collins, 1967), pp. 300-1.
[353] Ibid.
[354] D. Freeman to C.D. Darlington, 20 March 1969, Darlington archive, CSAC106.3.85/J.59.

the glory of a famous son".[355] In Margaret's note of congratulations, she also mentioned Hamilton's recent review of Ken Mather's *Human Diversity* (1964), printed in *Population Studies*.[356] It concerned issues related to population growth and discussions of the corrective measures that should be implemented.

As the next chapter will emphasize, overpopulation was one of the issues that most concerned Hamilton in the 1960s; he feared both the environmental and biological ramifications of population growth. While he had been initially torn between his interests in art and science when deciding his career path, he had long praised appeals to reason over appeals to emotion. Contrasting the cold objectivity of science with what he perceived to be the irrational character of actions arising from emotion, he had recorded self-assessments of his own ability to remain detached, and entries such as, "What an abominable helpless fool I am! Putty in the hands of my emotions", are thus contrasted with "Cold & scientific, […] I will record."[357]

Beyond aiming to perfect scientific qualities in himself, however, Hamilton had admired people who were able to control their emotions and view the world objectively. This becomes clear in a journal entry written in 1956. Here, Hamilton approvingly described another young man as "cool & calculating & I think [he] has hardly an ounce of sentimentality". It was owing to these qualities, in fact, that Hamilton admired him.

[355] R. Hamilton to W.D. Hamilton, 31 August [1965], Hamilton archive, WVJ13/1/8.
[356] She mistakenly refers to the review as appearing in 'Population Genetics'; Margaret Hamilton to W.D. Hamilton, 11 October 1965, Hamilton archive, WVJ13/1/8.
[357] W.D. Hamilton, entries in 'Tonbridge School. Mathematics', 4 June 1956; 13 June 1956, Hamilton archive, Z1X42/1/1.

Moreover, Hamilton was happy to report that their outlooks coincided "on a number of points", including "the population problem".[358]

Of course, Hamilton and his friend were not the only individuals who saw population growth as a major problem. As we have already seen, many biologists saw the population crisis to be the most significant problem facing man in the second half of the twentieth century. Population was the major subject of numerous books written between 1959 and 1961.[359] In addition, discussions of population were prominently featured not only in *The Eugenics Review*,[360] to which Hamilton continued to subscribe through the 1970s, but also in the leading journals of *Science*[361] and *Nature*.[362] Beyond academic journals, fears of overpopulation were transmitted to the general public through magazine and newspaper articles.[363] The subject was seen to be of such phenomenal importance in the following years that Hamilton's father even suggested that he become a public intellectual, expanding his discussion of social behaviour to include an explicit discussion of "population warnings".[364]

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[358] W.D. Hamilton, entry in 'Tonbridge School. Mathematics', 2 July 1956, Hamilton archive, Z1X42/1/1.
[359] G.C.L. Bertram, *Adam's Brood*, (London: Peter Davies Ltd., 1959); R.M. Fagley, *The Population Explosion and Christian Responsibility*, (New York: Oxford University Press, 1960); P.M. Hauser, *Population Perspectives*, (New Brunswick: Rutgers University Press, 1961); W. Petersen, *Population*, (New York: Macmillan, 1961); M.G. Shimm (ed.), *Population Control*, (New York: Oceana Publications, 1961).
[360] A brief survey of the copies of this journal held by Hamilton reveals, for example, A.C. Stevenson, 'Modern Trends in the Population of Man', *The Eugenics Review*, 53 (April 1961); J. Peel and F. Schenk, 'Domiciliary Birth Control: A New Dimension in Negative Eugenics', *The Eugenics Review*, 57 (June 1965); S.C. Reed, 'Towards a New Eugenics: The Importance of Differential Reproduction', *The Eugenics Review*, 57 (June 1965), Hamilton archive, NCRX4/1/1.
[361] See, for example, in the year 1961 alone, A.F.K. Organski, 'Population and Politics in Europe', *Science*, 133 (9 June 1961), pp. 1803-1807; A.J. Coale et al., 'Population Density and Growth', *Science*, 133 (16 June 1961), pp. 1931-2, 1934-5, 1937; A.J. Coale, 'Population Growth', *Science*, 134 (22 September 1961), pp. 827-9; 'Birth Control: No Reaction to Revelation of NIH Role', *Science*, 134 (10 November 1961), p. 1512; D.S. Greenberg, 'Population Boom: Administration Presents a Policy Statement That Is Ingeniously Confusing', *Science*, 134 (15 December 1961), pp. 1970-1.
[362] See, for example, W.R. Matthews, 'The Expanding Population', *Nature*, 190 (1 April 1961); A.S. Parkes, 'Biological Control of Conception', *Nature*, 191 (23 September 1961), pp. 1256-7.
[363] See, for example, 'The Capitalist Challenge: The Population Explosion', *TIME Magazine*.
[364] A. Hamilton to W.D. Hamilton, 6 May 1964, Hamilton archive, Z1XUN/5.

Reviewing *Human Diversity* in 1965, Hamilton made his longstanding concerns about society and their relevance to biology clear, and he demonstrated his intimate knowledge of literature on human demography, including studies that found negative correlations between intelligence and family size. For Hamilton, the ultimate cause of the population crisis lay in man's innately selfish behaviour as it concerned reproductive decisions; very few people chose not to reproduce or to reproduce fewer times because this contradicted their natural inclinations to pass as many copies of their genes as possible. According to Hamilton, Mather's book touched on the subject of eugenics and was useful in helping "to persuade anyone that cautious rational intervention is in general both right and possible", but Hamilton admonished Mather for providing policy recommendations that were too cautious. Mather had suggested that dissortative mating, or reproduction between dissimilar individuals, could reduce the incidence of recessive traits in the population, but Hamilton saw this to be at best a "temporary policy". What really needed to happen was to ensure that defective genes did not pass to future generations at the same or higher rates. For this reason, Hamilton recommended infanticide as an alternative to sterilization, viewing it as "less unnatural". As he saw it, there was an "intense will to abandon a malformed child", and this was proven, as the newspaper clippings that he collected detailed, by the fact that some mothers resorted to infanticide even though it was prohibited. A failure to rationally adopt eugenic measures was not moral or humane, it would simply lead eventually to the de facto policy of the animal world: "wholesale killing by strife, famine and disease".[365]

Hamilton's review mentioned another point that was closely related to his recent research on the evolution of social behaviour. He argued that "another class of suffering-

[365] W.D. Hamilton, review of *Human Diversity* (1964) by K. Mather, *Population Studies*, 29 (November 1965), p. 203, Hamilton archive, Z1X37/1/8.

causing genes" that were seldom acknowledged included "genes for anti-social behaviour". While he admitted that the development of criminality was due in part to cultural factors, he pointed

> "to the possibility of the existence of such genes, against the consensus of modern opinion, because (a) consideration of the possible foundations of our social behaviour shows that there is no reason why they should not occur, and (b) there is some evidence that they do exist in other animals, most notably in the social insects, manifesting themselves in forms that do bear some faint resemblance to human crime".[366]

In his observations of wasps in Brazil and his knowledge of honeybee, he claimed "traces of jealousies over reproduction" were present. If such biologically based jealousies existed in animal groups that were so closely related, surely they would also be exhibited in human populations that did not share such close degrees of kinship. Despite popular claims of innate social cohesion, the "natural legacy" of man meant that any cohesive factors within our nature served primarily to ally individuals against outsiders. Mere education could do nothing to change that, but if cultural practices could shape anything, Hamilton hoped they would attempt foremost to teach the "concepts of restraint and control in reproduction".[367]

Dismissing any ambivalence her brother may have had about publishing these ideas, Margaret reassured him, "If people regard your opinions with disgust this surely is not to be feared even if it is annoying, someone has to lead the way to new opinions". That the Roman Catholic Church seemed already to have a hard time deciding whether or not to condemn contraception was to her an indication that "eugenics may be acceptable before long". She only had one question for when it did: "who decides who is sick and who healthy and what

[366] Hamilton, review of *Human Diversity*.
[367] Ibid.

about mental illness including the madman who would judge his fellow humans, where is the dividing line?"[368] Hamilton's response either went unwritten or has since been lost.

Interest surrounding population growth continued to mount, and by 1965, the Royal Society saw overpopulation to be so important a subject that they organized a Population Study Group. Australian Rhodes Scholar and Nobel Prize-winning physician Lord Howard Florey served as its chairperson. Its original members numbered twenty-six and included physicians, physical and social anthropologists, demographers, activists in family planning initiatives, sociologists, statisticians, geneticists, and evolutionary biologists. The abstracts of proceedings from its first meeting record its fundamental assumption: "The correlation in an optimal way of human beings with their environment is probably the greatest task that confronts mankind". Indeed, the importance of population was threefold: it threatened the environment through pollution, it created water and food demands that could not necessarily be perpetually fulfilled, and it potentially caused "psychological derangements […] associated with overcrowding".[369] Each of the group's members, from the social sciences to the medical and biological sciences, was thought to hold knowledge that would contribute to a better understanding of this colossal problem.

Among the original members was Hamilton's supervisor, John Hajnal, and it is likely through Hajnal that Hamilton was recruited when the Group decided to expand its membership to forty-five in 1966.[370] Though Hamilton regularly attended meetings in the next year and a half, he does not seem to have been involved with any of the committees organized in 1967 to report on the relationship between demography and economics, the

[368] Margaret Hamilton to Hamilton, 11 October 1965.
[369] H. Florey, 'Foreword', The Royal Society Population Study Group, *Abstracts of Proceedings*, No. 1 (1965), Hamilton archive, Z1X37/1/1.
[370] [D.C. Mertin?] to W.D. Hamilton, 11 July 1966, Hamilton archive, Z1X37/1/1.

current states of family planning services and contraceptive technology, or the need for training individuals in both genetics and the social sciences.[371] Nevertheless, his lack of participation need not indicate disinterest; in fact, Hamilton would later consider rescinding his membership because the Group continually failed to take a political position. Likely, he feared that if scientists failed to advance a rational position on otherwise political issues, ideology and superstition would rule the day.

Beyond his interests in human population, Hamilton remained engaged with subjects that were distinctly human as he transitioned into life as a lecturer.[372] In November 1967, for example, he planned to attend a talk by British zoologist W.M.S. Russell and his wife, Claire Russell, on "The Social Dets. of Aggression".[373] The Russells published prominently on the subject of human behaviour from the 1950s, often articulating the extent to which human behaviour was compulsive and therefore contradicted rational routes to happiness. They argued that the evolved nature of man was not just problematic in the lives of individuals; it also touched on the historically uncontrolled subjects of "economic upheaval, over-population or even war".[374]

**Conclusion**

Hamilton's record through the 1960s allows us to see the maturation of his ideas concerning communism, welfare states, overpopulation, and the importance of using science to solve problems previously seen to fall within the realm of politics and the social sciences.

[371] See items in folder 'RULES', Hamilton archive, Z1X37/1/1.
[372] See, J. Hajnal to W.D. Hamilton, 13 January 1965; J. Hajnal to Hamilton, 22 February 1965, Hamilton archive, Z1X89/1/1.
[373] W.D. Hamilton, personal diary, 1967, Hamilton archive, Z1X29/1.
[374] C. Russell and W.M.S. Russell, *A New Approach to Human Behaviour*, (Worcester and London: The Trinity Press, 1961), p. 1.

Chief among these were issues surrounding the relationship between the individual and society. With this in mind, we are in a position to question the extent to which the political assumptions he held might have impacted his biological observations. For example, his anthropomorphic interpretation of wasps in Brazil involved imagining them to be perpetually caught up in moral quandaries of how to behave.[375] Even before Hamilton returned to England to assume a position as a lecturer at Imperial College, his letters, diaries, and essays reveal the extent to which his commitment to naturalism in fact reinforced pre-existing political sympathies. As later chapters will demonstrate, Hamilton continued to engage with the problems that he believed plagued human societies, and he articulated his dedication to uncovering scientific knowledge surrounding or determining these problems through his classroom lectures, public talks, and private musings. The extent to which his scientific subjects were deeply intertwined with his personal beliefs will therefore persist as a theme of the following chapters.

This chapter has also undermined another assumption inherent to discussions of Hamilton's theory of inclusive fitness, namely the idea that it was primarily articulated in response to the prevalence of group selection theories. As we will see, Hamilton became more engaged with group selection from the mid-1960s, and, it seems, especially after George C. Williams published *Adaptation and Natural Selection* in 1966. It is only then that he was driven to spend significant time on a subject he had long been interested in, Galton's idea that gregarious behaviour can result from selfishness, which will be discussed at length in the next chapter. What is important to note now, however, is the fact that there is little indication that the theory of inclusive fitness itself was motivated by distaste for 'benefit of

[375] W.D. Hamilton to M.J. West, 6 October 1967, Hamilton archive, Z1X83/1/10.

the species' thinking. What Hamilton did record frustration with, on the other hand, were wider cultural beliefs, based on either religious or ideological dogma, that man was naturally, and in a truly altruistic fashion, interested in the well being of strangers.

Lastly, one of the major points I have tried to illuminate in the last two chapters is the very limited ways in which social insects featured in the early development of Hamilton's theory. In light of this, I have argued that at least two major social and political discussions of the late-1950s and early 1960s featured in Hamilton's early thinking about how biology can be used to solve persistent problems in society: first, the recently established welfare state in Britain and its biological implications; and second, the threat posed by communist doctrine, both scientifically and politically. A third relevant issue had been around since 1950, but it was not until the late-1960s that biologists came to focus on it so intently. This issue was the nature of racial and class-based conflict, as well as the extent to which it was deemed eradicable, and it will be the focus of Chapter Four.

# CHAPTER FOUR

## Race and Reproduction: Biological Problems in an Age of Anxiety

As we have seen from Chapter One, the study of genetics had been markedly political in the 1950s, and the relationship between genetics and society continued to be bidirectional in the decades that followed. Geneticists felt they were particularly suited to assess the political and social situation and offer novel, even revolutionary, policy solutions, but as earlier chapters have already indicated, biologists sometimes used information gathered from human society when creating their theories. In Hamilton's case, the original context of his work was quickly forgotten. Although the socio-political ramifications of his theory of inclusive fitness were implicit in his early publications, the previous two chapters have shown that Hamilton felt his ideas regarding the evolution of social behaviour held significant meaning in a rapidly changing society.

This chapter will follow Hamilton from the mid-1960s in an effort to understand the extent to which he continued to be in dialogue with prominent social and political problems. As a measure of this, it will pay particular attention to the first public lecture in which Hamilton made explicit the socio-political meaning of inclusive fitness, as he saw it. It will also measure the attention that this topic garnered amongst academics, journalists, and the more general public by 1969. Through an examination of Hamilton's early career, this chapter will also begin to explore the implicitly conservative nature of developing theories of social behaviour in this period. This will be highlighted through an exploration of the relevance of inclusive fitness to the subject of race-based differences and race-based conflicts as well as issues surrounding overpopulation. In discussing the biological

interpretations of these features of the postwar British political culture, I will show that Hamilton was in part reacting to the climate of his time, and in particular, he was reacting against belief systems that saw humans and other animals as naturally gregarious. Finally, I identify two previously unknown pieces written by Hamilton in the early 1970s, an application of game theory to the problem of overpopulation and a fictional dystopian short story concerning unrestricted population growth, as examples of the alarmist rhetoric that was prevalent as the 1960s gave way to the 1970s. Through these warnings, we may understand the persistence of Hamilton's perception that only with the rationality of science could the realities of our animal nature be thwarted.

**Inclusive Fitness in the 1960s**

Despite Hamilton's faith in his theory and the natural law it revealed, the success of inclusive fitness was by no means immediate. In the decade after Hamilton published, inclusive fitness was not, in fact, overwhelmingly adopted within the biological community. Moreover, there was little respect for him as a lecturer at Imperial College. Among other things, he felt that the lack of enthusiasm for his methodology among his colleagues exacerbated the apathy of biology students towards mathematics.[376] At Imperial, he would go twelve years without promotion.

By 1967 he had yet to receive his doctorate, but this did not shake his confidence. As he explained to Warwick Kerr, the absence of a degree did not affect his present position, so he had simply not bothered to submit the final paperwork.[377] When he began to contemplate another trip to Brazil, however, he changed his mind; a more prestigious title and the

[376] W.D. Hamilton to C. Hubbs, 23 November 1976, Hamilton archive, Z1X64/1/16.
[377] W.D. Hamilton to W. Kerr, 27 February 1967, Hamilton archive, Z1X89/1/2.

authority it granted, he thought, may have its advantages.[378] Beyond this, however, his lack of formal qualifications and, one might say, the relative absence of external approval for his ideas did not seem to worry him. In fact, we can gain some insight into just how highly he rated the significance of his ideas in the mid-1960s by noting the inquiries he made concerning his eligibility for a higher doctorate.

Hamilton had initially asked the University of London whether he might apply for a higher doctorate in the fall of 1966, but he found the academic registrar unenthusiastic. He was told, "the published work submitted should represent something like ten years after obtaining the Ph.D. Degree".[379] At Cambridge in 1967 the response was no better. There, Hamilton's potential application was discouraged by both the psychologist A.T. Weldon, whom Hamilton had known from his time at St. John's College, and J.M. Thoday, the chair of genetics. Welford warned that a doctor of science degree was usually awarded "on the basis of twenty years hard research".[380] In contrast, Hamilton would be applying just four years after his first paper was published, and he had only four academic papers in total to his name.

Still, Hamilton made a case for himself. He argued that his papers contained "more novelty per printed page than is usual in scientific writing".[381] Thoday was not convinced. He agreed with Welford that Hamilton's submission for the ScD, however novel his work, would be "premature and could only lead to disappointment", and he explained to Hamilton that the degree was, in fact, reserved for a candidate who was recognised as a "world

[378] W.D. Hamilton to A.T. Welford, 12 July 1967, Hamilton archive, Z1X74/1/5.
[379] Academic Registrar, University of London to W.D. Hamilton, 1 December 1966, Hamilton archive, Z1X89/1/1.
[380] A.T. Welford to W.D. Hamilton, 19 July 1967, Hamilton archive, Z1X74/1/5.
[381] Hamilton to Welford, 12 July 1967.

authority in his main field", signifying an achievement that was approximately equivalent to the level of work that would be required "for consideration for the Royal Society".[382] Far from being a world authority, Hamilton could only number his true devotees at two: E.O. Wilson at Harvard and G.C. Williams at the State University of New York.[383]

It is important to keep in mind that Hamilton may have pursued the option of a higher doctorate at least in part out of fear; he was not sure he would be granted a doctorate from the University of London for reasons that he believed were rather political. Still, the fact that his original inquiry was directed at the University of London, where the potential problem supposedly lay, as well as the numbers he gave in support of his application, detailing the quantity of offprint requests he had received, indicates that he felt his claim was legitimate.[384] Moreover, he did not follow up on the suggestion given separately by both Weldon and Thoday that he submit for a Ph.D. from Cambridge if he was worried the University of London would be uncompromising.[385] In the end, Hamilton's fears were for naught. He submitted his published papers to the University of London in September 1967[386] and was granted his doctorate on 8 February 1968.[387]

Beyond the enthusiasm of Wilson and Williams, however, one of Hamilton's early devotees was Mary Jane West (later, West-Eberhard). She had been Richard Alexander's

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[382] J.M. Thoday to W.D. Hamilton, 31 July 1967, Hamilton archive, Z1X74/1/5.
[383] E.O. Wilson to W.D. Hamilton, 4 January 1967, Hamilton archive, Z1X89/1/2; G.C. Williams to W.D. Hamilton, 31 May 1963, G.C. Williams archive, Stony Brook University Libraries.
[384] He recorded having received twenty-three requests for his 1963 paper and 297 requests for his 1964 papers. Moreover, his recently published papers, 'The Moulding of Senescence by Natural Selection' (October 1966) and 'Extraordinary Sex Ratios' (April 1967), had already been requested 142 times and 143 times respectively. He expected the number corresponding to his last paper to double within the next few months and anticipated more requests for his 1966 paper as well; Hamilton to Welford, 12 July 1967.
[385] Welford to Hamilton, 19 July 1967; Thoday to Hamilton, 31 July 1967.
[386] W.D. Hamilton, 'The Genetical Evolution of Social Behaviour', September 1967, Hamilton archive, Z1X74/1/5.
[387] Academic Registrar, University of London to W.D. Hamilton, 8 February 1968, Hamilton archive, Z1X74/1/5.

student at the University of Michigan before becoming a research fellow in biology at Harvard's Museum of Comparative Zoology. Having learned from Wilson that Hamilton was planning another trip to Brazil in 1967, she was moved to write to him, though it had been something that she had meant to do since reading his 1964 papers. So inspiring had she found them that, "Next to Huckleberry Finn", she regarded his papers on inclusive fitness to be "the most important things I have ever read (inspired, inspiring, heuristic)".[388] Hamilton was pleased to be on the receiving end of such praise. What is more, Mark Twain's 1884 story detailing the adventures of a young boy in the pre-Civil War American South happened to be Hamilton's favourite American novel. He, too, found it "very inspiring".[389]

According to Hamilton, he had thought often of Twain's story while studying wasps in Brazil, but "whether this was because of the human associations connected with the ramshackle buildings where I used to watch the wasps or whether it was because of an indescribable quality of the wasp life itself – wayward, mysterious, almost human – I can't clearly remember". What he believed connected his work with Twain's novel was a heightened sense of moral ambiguity. As Hamilton recalled, "I often had the feeling that the wasps themselves must be in a great dilemma how to act, just as mankind seems to be, both as to what is expedient, as in the sense of the theory I was trying to test, and also perhaps as to what is 'right'!"[390]

Hamilton did not shy away from admitting the extent to which he read the traits of humans and indeed the constructs of human societies into nature. In fact, he was forthcoming in his praise for the work of wasp expert Phil Rau, whom West had mentioned,

[388] M.J. West to W.D. Hamilton, 6 September 1967, Hamilton archive, Z1X83/1/10.
[389] W.D. Hamilton to M.J. West, 6 October 1967, Hamilton archive, Z1X83/1/10.
[390] Ibid.

"because he anthropomorhises [sic] his subjects like I do!"[391] From this we can see that Hamilton did not draw a sharp line between animals and humans. Given our earlier discussion of Hamilton's motivations to study social behaviour, this fact is perhaps not surprising, but by imagining wasps deliberating between 'right' and 'wrong', Hamilton certainly risked reading other artefacts of human culture into nature.

Despite West's interest in Hamilton's fieldwork, even he saw his experiments and observations to be less significant than his theoretical work at this point. In fact, he admitted to West that his theory still required "considerable elaboration before it begins to match the complexity of biological situations"; as it stood, it was simply a model of how altruistic behaviours could evolve and potentially said nothing for how they really did. As for the usefulness of his impending Brazilian fieldwork, he confessed that he would likely "fritter away my time as I did before, trying to cover far too much and doing nothing properly". He was going to Brazil for a second time because he had enjoyed it so much the first, not because he expected the trip to advance his scientific career.[392] What is more, he was newly married to Christine Friess and the trip was to be a honeymoon of sorts. The fact that he was a theory-driven biologist is further emphasized in his communication with other scholars in this period. When he was asked to comment on the statistics that F.G.W. Jones had used in a recent paper, for example, he hesitated: "I have been so far a very theoretical population geneticist and have very little experience of problems arising in practical genetical work".[393]

Whether theoretical or practical, Hamilton saw great potential in the science of genetics, but since his ideas were not overwhelmingly adopted among his peers, it was

[391] Hamilton to West, 6 October 1967.
[392] Ibid.
[393] W.D. Hamilton to F.G.W. Jones, 26 May 1967, Hamilton archive, Z1X89/1/2.

perhaps through teaching the next generation of biologists that most of his hope rested. A tongue-in-cheek interpretation of lecturing that was familiar to Hamilton described it as "The process by which the notes of the teacher become transmitted to the notebooks of the pupils without passing through the minds of either",[394] but it was not only the lecturer's notes that were inherited by Hamilton's students. Through his lectures, Hamilton also transmitted deeply held beliefs about the advantages of using scientific methods to investigate what were acknowledged to be politically controversial subjects. For this reason, Hamilton's lectures reveal his firm faith that science could combat ideological myths.

Hamilton went as far as to communicate to his students the idea that "Among scientific subjects Genetics is perhaps uniquely privileged in being so much at the fore-front of knowledge, perhaps particularly of human self-understanding, that its scientists can undergo persecution for the simple act of publishing the truth."[395] Referring to the case of Lysenko, Hamilton admonished Soviet ideologues for masking what he saw to be biological truths. What is more, Hamilton felt his own genetic theory had something to say about those who promoted ideals of global brotherhood: it simply was not biologically possible. This 'fact' of nature was important to Hamilton, and he often repeated it.

As it has already been stated, the theory of inclusive fitness not only explained how altruism might have evolved; it also delineated the evolved limitations of self-sacrificing behaviour. The reason that pro-social behaviours could not exist without limits was due to the fact that societies were not organisms, and therefore, they could not be selected. This point had provided the backbone for Hamilton's October 1965 lecture at Imperial College. Here, he had admitted that although there were many similarities between societies and

[394] 'Some Useful Guidelines', [n.d.], Hamilton archive, WVJ13/1/6.
[395] W.D. Hamilton, 'Lecture 2', [n.d.], Hamilton archive, Z1X90/1/21.

organisms, including the presence of a division of labour, there were also activities within a society for which no physiological equivalent existed. Among these, he included the "wasteful inactivities" of strikes, prisons, disputes, and crimes. The closest possible intraorganism equivalent, phagocytes, which destroyed foreign particles or dead cells within the body, he claimed, were "not really similar".[396] The presence of such differences indicated to Hamilton that the survival of societies and the survival of individual organisms could not be effectively compared. As we will see, this conclusion had important ramifications for Hamilton when it came to considerations of human survival.

In the same lecture, Hamilton also began to articulate what he saw to be the inadequacies of collectivist thinking within popular accounts of evolutionary adaptations. According to Hamilton, Darwinian adaptations were those that maximised survival and reproduction. When a population is thought of as an organism, he claimed, it became difficult to determine "who is 'trying' to maximise what". To Hamilton, it was clear that "Sometimes Darwinian adaptations will be to the benefit of the species. Sometimes NOT."[397] In any case, altruism would not occur for reasons that suited the idealist; it was simply a matter of strategy. In the theory of games, the conditions of the game could check competition, but it could never be eliminated.

Acknowledging that the nature of altruism and selfishness held significant meaning in the human world, Hamilton understood that there were difficulties associated with using such human terms to describe self-sacrificing traits and their opposites in non-human species. To this end, Hamilton admitted having weighed the "value of their vividness […]

[396] W.D. Hamilton, 'Why Society Is Not an Organism', 11 October 1965, Hamilton archive, Z1X90/1/18.
[397] Ibid.

against their slight emotional content".[398] At some point around 1969, however, Hamilton confessed that his choice of labels, a decision he now claimed to have made "following Haldane I think", was causing him "increasing misgiving". He went as far as to say, "The only kind of altruism that I greatly admire in man is reaching out in the service of ideals that have no connection with kinship or race." Owing to this commitment, he had considered replacing the loaded 'altruism' with 'nepotism' or 'donorism', which had both been recommended to him. In the end, however, he maintained that the practical value of 'altruism' outweighed any doubts he had: replace it, and he worried "fewer readers would begin, and fewer still finish" his papers.[399] This decision is ultimately less telling than is the fact that Hamilton felt it was necessary to declare his belief that the only laudable manifestations of altruism were those that were applied regardless of kinship or race. This declaration is indicative of the profound relevance that biological discussions of social behaviour had to increased commonwealth immigration as well as the bitter battle for civil rights in America during the 1950s and 1960s.

**Biology, Race-Based Conflict, and Racial Differences**

As we saw in Chapter One, conflicts within the international sphere that seemed to be wholly or partially influenced by tensions between racial groups were a topic of concern in the first decade after World War II. Although political discussions of domestic race relations remained largely outside the purview of the British middle class in the 1950s, the explosion of non-white immigration from Commonwealth countries, a result of the 1948 British Nationality Act, was nevertheless a significant concern for many members of

[398] W.D. Hamilton, [no title], [n.d.], Hamilton archive, Z2X29/1/1.
[399] W.D. Hamilton, 'Supplement to Curriculum Vitae', [n.d., September 1969], Hamilton archive, Z2X29/1/7.

Whitehall. No restrictions would be implemented until the Commonwealth Immigrants Act was passed in 1962, but they had been considered as early as 1951. Moreover, the initial discussions surrounding immigration restrictions were purposely kept secret not only from the press but also from Parliament; in fact, they remained under wraps until 1982.[400]

Government documents nevertheless reveal that politicians across the spectrum contemplated immigration curbs in the 1950s; the Labour position would only change in 1961. Historian Peter Hennessy even went as far as to claim that restrictions had been avoided throughout the 1950s in part because it was politically difficult to distinguish "between white would-be immigrants from the old dominions", who were welcome, and "non-white [immigrants] from the newly independent Commonwealth countries […] and from British colonies", who were suspect.[401] Despite these difficulties, Colonial Secretary Oliver Lyttelton was certain in 1955 that restrictions would be implemented in the very near future. In fact, he believed they must: if the "colour problem" was not tackled immediately, Britain faced "a situation of great proportions in the next twenty-five years".[402] Moreover, the concerns regarding immigration were not unrelated to considerations of the viability of the welfare state. Lord Salisbury, for example, attributed "this sudden inflow of blacks" to the lure of the welfare provisions, and he warned his colleagues of a "coloured problem".[403]

While these particular discussions were not made public, similar sentiments pervaded a still overwhelmingly white Britain in these years. On the subject of race,

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[400] B. Harrison, *Seeking a Role: The United Kingdom 1951-1970*, (Oxford: Oxford University Press, 2009), pp. 83-4; M. Risebrow, 'An Analysis of the Responses of British Government to Coloured Colonial Immigration During the Period 1945-51, unpublished undergraduate thesis, University of East Anglia, 1983, cited in Hennessy, *Having it So Good*, p. 222.
[401] Hennessy, *Having it So Good*, p. 222.
[402] A. Roberts, *Eminent Churchillians*, qtd. in Hennessy, *Having it So Good*, p. 224.
[403] Salisbury to O. Lyttelton, 19 March 1954, qtd. in Hennessy, *Having it So Good*, p. 224.

Hamilton was certainly of his time. Although he opposed racial segregation,[404] he recognized that "the seeds of" racial prejudice were deeply planted in his own mind. When he shared a room with two Jamaican immigrants while working as a research assistant in Aylesford in 1957, he drafted a letter to a friend that illuminates this prejudice: it began, "my room is in a sad state, what with all this packing up & what with this invasion of black men".[405]

Hamilton had not been the only one impacted by the 'invasion'. His landlady, he surmised, was instinctively terrified of the men, and to him, this fear was as natural as the pervasive fear of "caterpillars & spiders". Hamilton himself had initially been "most disturbed" by the two men, and days later he still could not "help finding 2 blackmen [sic] rather more overwhelming than two white". It was not just that he found their habits odd; he also saw their actions through the lens of common stereotype, believing them to be both hypersexual and in other ways childlike. He had at first found them

> "rather feckless & empty-headed individuals just as negroes are so often represented. Partly it was that wild […] laughter (which I now believe is namely the product of nervousness due to our lack of understanding & mutual prejudice) & partly their prompt insinuation into what I would consider my private affairs […] They seem to have a rather unpleasant licence in discussing sexual matters."

Though he had initially been glad to be leaving the shared room, his inner naturalist later lamented that he would not have the opportunity "to study them for longer".[406]

Beyond his assessment of West Indian immigrants, previous chapters have demonstrated Hamilton's tendency to make generalizations about individuals from tropical

[404] W.D. Hamilton to B. Hamilton, [n.d.], Hamilton archive, Z1X42/1/16.
[405] W.D. Hamilton to 'David', [n.d., c. June 1957], Hamilton archive, Z1X42/1/1.
[406] Ibid.

nations, but he also saw groups closer to home through a biological lens. When he travelled through Ireland by foot, for example, he wrote, "All up that valley there is a most striking resemblance between the people; they are all short dark, swarthy, a really gaelic [sic] people I expect." Ireland was of special scientific interest to Hamilton because, he thought it "must be one of the few European countries where racial types are at least preserving themselves if not evolving. There is absolutely no immigration". While "Some say the Irish are dying out", Hamilton argued that "this is only apparent: it's just that since the famine the state of the country has been such as to encourage all the more fertile members to emigrate."[407]

What is more, Hamilton doubted whether government policies could turn the country around, and it was clear to him where the blame should be placed. When he ran into people who "look[ed] enviously at the progressive industrial North" and complained that it is subsidized by Great Britain, he could not help but feel "that is their own fault": they had withdrawn from the Commonwealth.[408] As it has already been observed, what comes out of these and other conversations between Hamilton and his confidantes is the idea that poverty and hard luck have an internal cause, whether or not it was completely or even largely genetic. But it was not only negative qualities that were correlated with racial groups in Hamilton's mind. In fact, he told his parents about the "remarkable racial talent of the Hungarian jews [sic]" that had manifested in some of his professors.[409]

The topic of race was also a concern for others who urged that science represented the objective face of the future. By 1963, Julian Huxley had already called for a replacement

[407] W.D. Hamilton to B. Hamilton, [n.d.], Hamilton archive, Z1X42/1/16.
[408] Ibid.
[409] W.D. Hamilton to B. Hamilton and A. Hamilton, 3 September 1963, Hamilton archive, Z1X42/1/13. The academic success of Jewish immigrants in this period is summarized in Harrison, *Seeking a Role*, p. 227.

of "old frameworks of thought" with a new scientific morality.[410] Such a morality rejected the competition between populations, which Huxley believed formed the basis of Nazi ethics,[411] but elsewhere, science was being used to explain the 'nature' of conflict between groups, especially racial conflicts. Moreover, the increasingly publicised issue of civil rights in the United States did not go without notice by biologists concerned with the nature of aggression and its counterpart, social cohesion.

At the aforementioned Institute of Biology symposium in 1963, which Huxley had attended, prominent theorizers proposed biological interpretations for the continued manifestations of racial conflict in the postwar decades. W.M.S. Russell, James Fisher, and L. Harrison Mathews, for example, discussed whether antagonisms between racial groups could be effectively compared to "geographical races of one animal species, when they meet again after the long period of genetic divergence necessary for them to become separate species". Russell had claimed that human conflicts were "only cultural", but Fisher and Mathews disagreed. They believed such conflict could be a biological response to genetic divergence.[412]

This discussion did not escape the attention of Hamilton, who annotated the relevant passages in his copy of the volume produced from the symposium. Considering Russell's claim that prioritized cultural divergence over genetic divergence as a cause of intergroup conflict, Hamilton scribbled, "I don't see why". In the responses of Fisher and Mathews, on the other hand, Hamilton found ideas he could get behind.[413] For him, increasing genetic

[410] J. Huxley, *The Human Crisis*, pp. 75, 79.
[411] J. Huxley, *Evolutionary Ethics*, (London: Oxford University Press, 1943), p. 59.
[412] L.H. Mathews, 'Overt Fighting in Mammals', J.D. Carthy and F.J. Ebling (eds.), *The Natural History of Aggression*, pp. 22-34, Hamilton archive, Z1X10/1/19.
[413] W.D. Hamilton, note in *The Natural History of Aggression*.

differences were at the root of decreasing social sympathies, which contributed to the prevalence of racial conflict, however distasteful.

It was not only racial conflict that scientists recognized as having a genetic basis in these years but also racial differences. In April 1969, C.P. Snow discussed what he perceived to be the relationship between race, genetics, and intelligence. He asked, "Is there something in the Jewish gene pool which produces talent on quite a different scale from, say, the Anglo-Saxon gene pool? I am prepared to believe that that may be so." Despite Snow's enthusiasm, at least one reporter feared that his comments represented "the kind of half truth liable to anger scientists while promoting political mischief". Moreover, although Snow had referred to the Jewish gene pool as compared to the Anglo-Saxon gene pool, the statement was seen to be relevant to discussions of race in America.[414]

Data sets had, in fact, already been used not only to correlate intelligence and race but also to lend credibility to certain political beliefs. Most famously, Berkeley psychologist Arthur Jensen had suggested that differential intelligence among racial and socioeconomic groups meant that the provision of government funds toward early education programs for disadvantaged groups would prove futile.[415] Over the following decades, scholars would continue to use statistics to support concepts of biological determinism.

In fact, debates concerning race and the heritability of intelligence would go unsettled but widely discussed well into the 1990s.[416] Leading the attacks against deterministic claims of scientists such as Jensen was Harvard biologist Stephen Jay Gould.

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[414] A. Tucker, 'Facts and Fancies About Racial Traits', sent to W.D. Hamilton by C. Hudson, 19 April 1969, Hamilton archive, WVJ13/1/7.
[415] A. Jensen, 'How Much Can We Boost IQ and Scholastic Achievement?', *Harvard Educational Review*, 39 (1969), pp. 1-123.
[416] See, for example, S.J. Gould, *Mismeasure of Man*, (New York and London: Norton, 1981); R. Herrnstein and C. Murray, *The Bell Curve: Intelligence and Class Structure in American Life*, (New York and London: Free Press, 1994).

As we will see more clearly in Chapter Seven, Hamilton resented Gould's position; it was one that he saw to be simply unscientific, catering to what people wanted to hear instead of what the facts of nature revealed. Evidence from Hamilton's archive also indicates that he may have looked on intelligence testing positively, or at the very least that he saw it to have real meaning. He was, for example, a member Mensa, an organization for individuals with high IQs.[417] Furthermore, it does not seem that Hamilton applied merely to satisfy his curiosity. Elsewhere, he mentioned having written an article for Mensa that remained, for the time, unsent, "partly because I am ashamed of it, and partly because I consider the idea is so good someone might promptly deprive me of the chace [sic] of making a fortune!"[418] Unfortunately, my archival research so far does not reveal exactly what sort of scheme Hamilton had in mind.

We may see that beyond the correlation of race and intelligence, the issues surrounding the genetic determinism of race and class were an implicit part of another popular topic among geneticists in the 1960s: assortative mating. A 'fact' of nature that was especially promoted by Darlington,[419] assortative mating referred to the tendency of like to pair with like in the biological world. The meaning of this phenomenon for biologists was clear: it created increasing divergence between what were, at least for the present, coexisting groups of people. With little extrapolation, it allowed one to assume that if the line between the haves and the have-nots was not already genetically determined, in future generations it

[417] His intelligence quotient according to the Cattell scale was 158, placing him in the 99th percentile (V. Serebriakoff to W.D. Hamilton, 23 November 1961, Hamilton archive, Z1X74/1/5).
[418] W.D. Hamilton to C. Hudson, 13 February 1962, Hamilton archive, Z1X74/1/9.
[419] Hamilton also took notes on assortative mating as it related to R.A. Fisher's theory; see, W.D. Hamilton, 'What facts will definitely exclude Fisher's theory?', Hamilton archive, Z1XUN/3. The relationship of assortative mating to social mobility, differential reproduction, and wealth distribution was discussed in a committee organized by the Royal Society Population Study Group to study the interrelation of demography and economics in 1967 (Hamilton archive, Z1X37/1/1). Furthermore, assortative mating in man was also a topic of *The Eugenics Society Bulletin*, Supplement No. 2, (September 1977), Hamilton archive, NCRX4/1/1.

would be. It was in fact this kind of thinking, strongly upheld by Darlington into the 1970s, that made pleas for indiscriminate policies such as universal education appear almost laughable.[420]

In 1967, Hamilton lectured on the topic of assortative mating. While he admitted that he could not say with certainty that British persons with light-coloured eyes more often paired together than the assumption of random mating would predict, he declared that this was certainly the case with respect to those sharing similar characters with regard to "stature and intelligence".[421] What is more, assortative mating was important for Hamilton's idea that altruism could spread through populations because it meant that individuals with an inherited propensity toward self-sacrifice could be expected to mate more often with organisms similarly predisposed. Still, as I have already foreshadowed, assortative mating was not without significant cultural meaning in these decades. The vividness of this fact can be seen in a note Hamilton made with respect to a 19 April 1969 article in the *Guardian* that warned of increasing incompatibilities between different racial groups: "The time is very short to prevent a racial war which is fast becoming an ugly inevitability in the world." Furthermore, the article claimed that the "white man […] will suffer most".[422] With no annotation, it is difficult to say whether Hamilton shared this anxiety or thought it ridiculous. Regardless, he was certainly aware of the alarmist rhetoric surrounding the increased heterogeneity of British society in the postwar decades.

[420] C.D. Darlington, '(Class +) Race Morality Popultns', 10 December 1973, Darlington archive, CSAC 106.3.85/D.173. Darlington believed that population growth was exacerbating race-based strife because when individuals of different races had to live more closely together, their hate towards one another increased.
[421] W.D. Hamilton, 'Lecture 12, 1967', Hamilton archive, Z1X90/1/22.
[422] W.D. Hamilton, 'Akar, J. (1969)', [n.d.], Hamilton archive, Z1X40/1/1.

Though Hamilton opposed racial segregation, he would explicitly state that "nepotism, tribalism and racialism are natural phenomena with deep roots in the animal ancestry of man" in his abstract for the 1969 'Man and Beast' symposium discussed below.[423] This talk was in fact meant to highlight the potential of inclusive fitness to contribute to a new understanding of the human world. It therefore demonstrates the potency of Hamilton's theory when considered in connection with pervasive assumptions about race-based conflicts: it is also striking for what it suggests about the inevitability of war. In his discussion of the latter, Hamilton was following the tradition of Austrian ethologist and accused Nazi apologist Konrad Lorenz. Certainly, for Lorenz, who had been born in Vienna in 1903, the inevitability of war was not merely theoretical; it formed the reality of his lived experience.

Hamilton had already developed what he referred to as his 'racialistic principle', derived from the assumption that increased cohesion within groups of related individuals would correlate with increased hostility towards outsiders, before he had read *On Aggression*. Lorenz's chapter on rats merely reinforced Hamilton's intuition by highlighting the fact that despite "very harmonious intragroup relations", the "intense intergroup aggressiveness" of rat colonies meant that an outsider placed within an existing group was almost always brutally killed. In fact, it seemed to Hamilton that rats were possibly the "most communistic of mammals", and he lamented that Lorenz avoided the explicit comparisons that could have been made to the human scenario, preferring to speak instead "in veiled terms".[424]

[423] W.D. Hamilton, 'Selection of Selfish and Altruistic Behaviour in Some Extreme Models […] ABSTRACT', Hamilton archive, Z2X29/1/8.
[424] W.D. Hamilton, 'Lorenz, K. (1966) On Aggression', Hamilton archive, Z1X40/1/1.

In some ways, full disclosure of the relevance of Lorenz's ideas to man was not necessary. Even poet W.H. Auden recognized *On Aggression* as a "key book for the understanding not only of the 'dumb' beasts, but also of the loquacious human species".[425] So pervasive, in fact, were references to the lessons Lorenz had taught that a 1967 article on road violence in the *Guardian* cited *On Aggression* and the idea that the current organization of society was provoking man's "innate aggression".[426] By 1968, Lorenz's book was cited as an "instant classic study of animal (and human) behaviour".[427] Furthermore, in 1969, Elizabeth Elliot communicated to the *Guardian* a lesson she had learned from Lorenz's "excellent book": human history had reaffirmed that the most dangerous form of intergroup aggression in humans were religious wars. With Northern Ireland "on the brink of such a war", she asked, "Is it not time that a law against incitement to religious hatred comparable to our law against incitement to racial hatred, was introduced by the Stormont Parliament"?[428]

The human situation appeared equally dire to Hamilton, and as he prepared his paper for the 1969 symposium inspired by Lorenz's book, he seems to have vowed to be bolder. In examining the organization of the symposium in greater detail, however, we might assess, beyond Hamilton's specific contribution, to whom and for which purposes biological theories of social behaviour appeared most relevant by the end of this turbulent decade.

[425] W.H. Auden, 'Books of the Year: Some Personal Choices', *The Observer*, (18 December 1966), p. 23.
[426] A. Raphael, 'Violence on the Roads', *The Guardian*, (17 November 1967), p. 10.
[427] 'Paperback Pickings', *The Guardian*, (26 January 1968), p. 6.
[428] E. Elliott, 'Letters to the Editor', *The Guardian*, (28 April 1969), p. 8.

**The Genetic Determinants of Behaviour: A "complex, mysterious, and fascinating subject"**[429]

Veiled or not, the socio-political ramifications of Lorenz's discussion for human society were clear. In fact, in light of Lorenz's "expose of man's inner nature", individuals at the Smithsonian Institution felt it necessary to invite biologists to discuss the science of social behaviour in May 1969. Although Lorenz's book was the initial impetus behind the event, the organizers recognised that it was not unique in either its themes or its concerns. When writing to Henry Allen Moe, who had first suggested the event, Secretary of the Smithsonian S. Dillon Ripley exclaimed, "Now Lorenz has been followed by Robert Ardrey, Ardrey by Desmond Morris, and now Anthony Storr's Human Aggression. The books continue to pour out!"[430] The event was scheduled to follow an international symposium on the relationship between man and the environment, which, according to Ripley, had successfully served its purpose of increasing "the knowledge, insights and curiosity of the general public about scientific matters". In addition, "it brought science to the "Washington 'Establishment'", and it was anticipated that 'Man and Beast' would do the same.[431]

The audience for the symposium was to consist of forty natural and social scientists, forty members of the U.S. government, fifteen "representatives of associations or professional societies interested in the subject areas of the Symposium", twenty-five individuals from publishing and communications, "twenty writers and journalists, and twenty educators, especially those interested in general education and the inclusion of social behavior in the undergraduate curriculum". It was hoped that thirty international

[429] S.D. Ripley to H.F. Guggenheim, 14 October 1968, Smithsonian Institution archives, Washington, D.C., Box 494/1.
[430] S.D. Ripley to H.A. Moe, draft, [n.d.], Smithsonian Institution archives, Box 494/3.
[431] Ripley to Guggenheim, 14 October 1968.

organizations would also be represented, and in addition to the corporate sponsors, "forty representatives of public-interest organizations such as foundations, charities, organizations, labor unions, and others with an interest in promoting the application of the results of scientific inquiry to human needs" would be invited.[432] Lorenz was contacted as early as 1967 and briefed on the plans for a potential symposium. He was naturally enthusiastic,[433] but in the end, illness prevented him from attending.[434]

One of the primary goals of the symposium was to bring "the expanding frontier of knowledge recently attained by specialists" to policy makers and the public. With the above audience in mind, the main question the organizers hoped to address was "what can man learn from the scientific study of the behavior of animals that might help him to deal with himself". The major fear of the symposium's organizers was that the "meaningful insights" of biologists risked being "lost in a shrill debate between partisans of exaggerated, ideologically influenced stereotypes of human nature". Moreover, the organizers hoped the insights from comparative studies would move beyond inquiry to application; they wondered, "what new possibilities for controlling human behavior" may open up and "how can we guarantee their exercise shall be by democratic means?" Their concern was not only for domestic policy but also for international relations, and they argued, "the behavior of nations in the postwar period should be examined for clues to patterns of self-restraint as a basis for survival."[435] The organizers were in fact so convinced of the importance of their

[432] S.D. Ripley, 'Announcement', 3 February 1969, Smithsonian Institution archives, Box 494/3.
[433] S.D. Ripley to Members of the Secretariat, 14 June 1967, Smithsonian Institution archives, Box 494/4.
[434] Ripley to Guggenheim, 14 October 1968.
[435] 'An Interpretation of Comparative Social Behavior for Public Programs and Popular Education', Smithsonian Institution archives, Box 494/4.

event that they attempted to secure Prince Philip as the event's honorary chairman,[436] but unsurprisingly, he could not or did not wish to assume this role.[437]

Hamilton's paper for the symposium was published in a volume commemorating the event in 1971,[438] but slide marks on a draft in his archive give us reasons to believe that the paper he presented differed to some extent from the one that was printed. Aiming for accuracy, it is therefore this draft that I will draw upon in discussing Hamilton's first major lecture on the relevance of inclusive fitness to humans.[439]

What Hamilton claimed was that the evolution of altruistic and selfish characters, and indeed that these traits could evolve at all, depended on the breeding structure of a particular population. What remained clear to him, however, was that total social harmony across populations was impossible. A limited degree of altruism could be promoted in stable groups, that is to say, in those with low migration rates, but increasing harmony within a group would likely correlate with increasing hostility towards individuals outside the group.[440]

It was for this reason that Hamilton saw the problems plaguing human societies, including nepotism, tribalism, and racialism, to be natural. What is more, he noted that the cruellest wars were often those that involved racial and religious differences. As evidence for this claim, he cited among his sources social anthropologists, namely, the aforementioned Derek Freeman, but he also claimed to have drawn upon historical literature

[436] S.D. Ripley to D.K.E. Bruce, 25 March 1969; W.W. Warner to Mrs. M.F. Howard, 17 December 1968, Smithsonian Institution archives, Box 494/4.
[437] J. Orr to S.D. Ripley, 7 January 1969, Smithsonian Institution archives, Box 494/4.
[438] W.D. Hamilton, 'Selection of Selfish and Altruistic Behavior in Some Extreme Models', in J.F. Eisenberg and W.S. Dillon (eds.), *Man and Beast: Comparative Social Behavior*, (Washington, D.C.: Smithsonian Institution Press, 1971), pp. 59-91.
[439] W.D. Hamilton, 'Selection of Selfish and Altruistic Behaviour in Some Extreme Models', [n.d., c. 1969], Hamilton archive, Z2X29/1/8.
[440] Ibid.

when constructing his ideas. With regard to more biological sources, however, he referenced the fossil record and American playwright Robert Ardrey's 'killer ape' interpretation of it, studies in primate behaviour, and theoretical considerations of the evolution of social behaviour.[441] As we have already seen, the latter was longhand, to a large extent, for Hamilton's own intuition. He later made this point explicit when he stated that the paper reflected beliefs that "for better or worse […] originate out of […] an honest analysis of [his] own psyche". Particularly, he noted the ease with which "violent and sadistic ideas" arose in his own mind.[442]

Hamilton's naturalization of tribalism is particularly noteworthy, as he claimed that warfare was the extension of tribalistic tendencies by intelligent animals; for this reason, he believed that a tendency toward war was a "natural development from the evolutionary trends taking place in the hominid stock". As further proof, he cited similar phenomena between ant colonies, which, curiously enough, also exhibited behaviours that resembled slavery and robbery. Since these behaviours were "elaborate instinctive patterns" evolved by natural selection in ants, Hamilton found it hard to imagine that the corresponding phenomena in man were without any natural basis.[443] His conclusion, therefore, was that "natural human culture is inhuman".[444]

As it has already been noted, the audience for Hamilton's talk included politicians. Hamilton "vividly" remembered one senator's wife "pinning me at once with her chin and her fierce eyes as she asked me how my theory could reduce violence and crime in

[441] Hamilton, 'Selection of Selfish and Altruistic Behaviour in Some Extreme Models', [n.d., c. 1969].
[442] Hamilton, *Narrow Roads of Gene Land*, i, 190-1.
[443] Hamilton, 'Selection of Selfish and Altruistic Behaviour in Some Extreme Models', [n.d., c. 1969].
[444] Hamilton, 'Selection of Selfish and Altruistic Behaviour in Some Extreme Models […] ABSTRACT'.

America".[445] Indeed, his discussion of intergroup fighting may have appeared extremely relevant in the U.S. where news of race riots had been constant through the long, hot summers. In fact, right-wing periodicals such as the *National Review* quoted Ronald Reagan as having already, albeit more casually, compared the behaviour of rioters to animals, calling them "mad dogs against the people".[446] Even left-wing magazines had traced the core issue to "human nature itself, which can't be changed".[447] While some believed that poor blacks were being manipulated by outside agitators, and that the organizers of the riots were actually members of the Communist Party,[448] antagonisms were nevertheless reported to be largely race based. Upon being arrested in Cleveland in 1968, Black Nationalist leader Fred Ahmed Evans was reported to have said, "If my rifle hadn't jammed, I'd still be killing you whites […] This is only a warm-up. This is only a preliminary to what is going to happen."[449] Such reporting fed prevalent assumptions, especially among whites, that blacks were violent, criminal people.

In fact, public fear may have contributed to the relative ease with which the 'Man and Beast' conference organizers funded their elaborate event. The budget for the symposium was estimated at $51,415,[450] although $65,000 had initially been calculated.[451] In seeking funds, Dillon Ripley was careful to note "that one of man's best opportunities of learning about himself lies in the study of that biological heritage which is important not merely for his physical character but for innumerable continuing influences upon his psyche

[445] Hamilton, *Narrow Roads of Gene Land*, i, 186.
[446] R. Reagan, qtd. in 'Riots and '68', *National Review Bulletin*, (15 August 1967), p. 5.
[447] C. McWilliams et al., 'The Violence', *The Nation*, (14 August 1967), p. 101.
[448] See, for example, P.A. McCombs, 'Who is Behind the Race Riots?', *National Review*, (20 September 1966), p. 934.
[449] 'The Cleveland Affair', *National Review*, (13 August 1968), p. 789.
[450] 'Budget', 27 April 1969, Smithsonian Institution archives, Box 494/3.
[451] Ripley to Guggenheim, 14 October 1968.

and now, as we are learning more and more, his social behavior". It was clear to him that society would have to come to terms with the fact "that human societies […] must play roles for which our species was cast in a shadowy and immemorial past". Biology was thus set to illuminate "deep secrets of human identity", and policy makers became the target audience.[452]

Among the major donors for the symposium were the Russell Sage Foundation ($15,000), the Commonwealth Fund ($5,000), the Alfred P. Sloan Foundation ($5,000), the Grant Foundation ($5,000), CBS ($2,500), and the Luana Foundation ($1,500).[453] As John A. Schneider, the Executive Vice President of CBS, initially endorsed the symposium, he wrote,

> "This sounds like an extremely worthwhile and important meeting, […] there is indeed a growing interest in this whole area of animal behavior, and anthropology appears to be entering a new, exciting and very fruitful dimension of inquiry that will help us better understand why man is what he is -- and does what he does. […] In this period of great social change and challenge we are […] only beginning to understand the importance -- even urgency -- of this analysis."[454]

Ripley had previously indicated that CBS could provide television coverage of the event: "Pictures of scientists talking may not be very interesting, but scientists talking about humans as animals, with the possibility of some live creatures as props, might suit."[455] In addition to offering a spot for the symposium on '60 Minutes', Schneider made phone calls to Capital Cities Broadcasting, Twentieth Century-Fox Television, and Storer Broadcasting on Ripley's behalf. In addition, he gave Ripley the contact information for "eleven other

[452] S.D. Ripley to D.D. Bond, 9 January 1969, Smithsonian Institution archives, Box 494/3.
[453] 'Financing the Symposium', [n.d.], Smithsonian Institution archives, Box 494/3.
[454] J.A. Schneider to S.D. Ripley, 5 March 1969, Smithsonian Institution archives, Box 494/3.
[455] S.D. Ripley to J.A. Schneider, 18 February 1969, Smithsonian Institution archives, Box 494/3.

companies […] involved in communications, and, like CBS, deeply concerned with modern social issues and problems".[456]

Schneider was not alone in articulating the weight and meaning he perceived the event to have. In April 1969, Paul R. Ignatius, president of the *Washington Post*, wrote to Ripley to declare his $1,000 corporate sponsorship of "this important event".[457] Also giving $1,000, Marshall K. Evans of the Westinghouse Electric Corporation wrote, "the Symposium will serve a very desirable objective".[458] Warner Brothers-Seven Arts declined sponsorship, as did ABC, but the latter was careful to note that they were nevertheless "aware of the importance of this convocation".[459] Others cited budgetary pressures due to "the urban and racial crisis" as the reason that they could not contribute.[460] In a similar vein, Harry F. Guggenheim, targeted by Ripley as a potential lead sponsor for the symposium, regretted that the development of a program within his own foundation "on man's relation to man" meant no funds would be granted to institutions dealing with overlapping topics. The organizers responded to this "screwy letter" by proposing that the Carnegie Endowment for International Peace be recruited as a primary supporter instead.[461] There were certainly no fears that appropriate sponsorship would be found.

Beyond the acknowledged importance of the symposium by a diverse set of corporate sponsors, reports covering the event highlighted a shared faith in the potential for insights that could be gleaned from the biological study of 'lower' animals in contributing to

[456] Schneider to Ripley, 5 March 1969.
[457] P.R. Ignatius to S.D. Ripley, 4 April 1969, Smithsonian Institution archives, Box 494/3.
[458] M.K. Evans to S.D. Ripley, 31 March 1969, Smithsonian Institution archives, Box 494/3.
[459] A.R. Schneider to S.D. Ripley, 23 April 1969, Smithsonian Institution archives, Box 494/3.
[460] J.A. Linen to S.D. Ripley, 14 February 1969, Smithsonian Institution archives, Box 494/3; see also, W.M Bennett to S.D. Ripley, 4 March 1969, Smithsonian Institution archives, Box 494/3.
[461] H.F. Guggenheim to S.D. Ripley, 1 November 1988, Smithsonian Institution archives, Box 494/1.

an understanding of human problems.[462] While not everyone agreed that worthwhile comparisons could be made between group behaviour in other animals and group behaviour in man,[463] Arkansas Senator J. William Fulbright, known for his racist views and unrelenting opposition to civil rights reform in the 1950s and 1960s,[464] evidently saw potential in the discussion; he held a mini-symposium in his hearing room on the second day of the event, during which "bright young scientists" discussed "war, ABM [anti-ballistic missiles], education, masculinity, primates, incorrigible youth, the pill and related subjects". Reporter Herman Schaden claimed that what Fulbright and others really wished to know was, "How can we induce people to live together harmoniously?" Unfortunately, no succinct answer was forthcoming.[465]

Also interested in the relevance of the symposium to current events was, Louis J. Halle, an international affairs scholar who gave the concluding remarks.[466] Halle highlighted two key facts that give us insight into this turbulent period of shared anxieties. First was the

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[462] H. Schaden, 'Behavior of Man and Beast Is Topic at Smithsonian', *The Washington Star*, (23 March 1969); 'Animal Symposium Planned', *The Federal Times*, (14 May 1969); P. Casey, 'Cocktails and Elephants', *The Washington Post*, (14 May 1969); H. Schaden, 'Twas a Fit Night for Man and Beast', *The Washington Star*, (14 May 1969); H. Schaden, '"Man and Beast" Rush-Hour Bagpipers Kick Off Symposium', *The Washington Star*, (15 May 1969); P. Casey, 'It's Not That Simple: Man's Aggressive Inheritance Questioned', *The Washington Post*, (15 May 1969); W. Delaney, 'Dr. Mead Speaks: The 'Man and Beast' Pitfalls', *The Washington Star*, (15 May 1969); J. Leo, 'Expert Says Man Can Change in 10 Generations', *The New York Times*, (15 May 1969); 'There May Be Some Hope: We're Beasts, Symposium Here Finds', *The Washington Daily News*, (15 May 1969); P. Casey, 'Man's Option', *The Washington Post*, (16 May 1969); J. Leo, 'Man as Prisoner of Evolution Debated at Smithsonian Parley', *The New York Times*, (16 May 1969); P. Casey, 'Man the Hunter', *The Washington Post*, (17 May 1969); P. Casey, 'Idea of Man Inheriting Aggressive Trait is Disputed by Scientist', *The Cleveland Plain Dealer*, (18 May 1969), Smithsonian Institution archives, Box 494/3.

[463] A.M. Kriegsman, 'A Pernicious Source of Confusion', *The Washington Post*, (17 May 1969), Smithsonian Institution archives, Box 494/3.

[464] For a detailed account of Fulbright's life, see R.B. Woods, *Fulbright: A Biography*, (Cambridge: Cambridge University Press, 1995).

[465] H. Schaden, 'A Mini-Symposium: Fulbright and the Scholars', *The Washington Star*, (16 May 1969); P. Casey, 'Behaving Better Than We Do', *The Washington Post*, (16 May 1969), Smithsonian Institution archives, Box 494/3.

[466] A.C. Free, 'Meet Louis Halle, Example of a Vanishing Species', *The Washington Star*, (25 May 1969), Smithsonian Institution archives, Box 494/3.

general agreement among symposium organizers and attendees that 'love one another' was a hopeless mantra, a delusion of the past that proved unsuitably idealistic throughout human history. Second was the relevance that the symposium was seen to have to recent instances of "racial antagonism in the United States". Halle believed it was inevitable that the two groups would "continue to dislike one another", supposedly on the basis of racial differences alone. He saw this to be only natural.[467]

It does seem that people took notice of the natural boundaries Hamilton posed in considering pro-social behaviours. Senator Fulbright, for example, is said to have asked at the conclusion of the event: "How does one go about influencing the attitudes of people to get them to look beyond their own little groups?"[468] For Hamilton, the question was likely even more severe: *can* we get people to look beyond their own little groups? Human history seemed to prove again and again the reality of the ingrained animosity between populations. Accordingly, neither policy changes nor indoctrination were likely to change it. But did this make it a biological fact determined by our genetic make-up?

Keeping in mind the wide range of individuals and corporations who saw the biological understanding of man to be extremely relevant during the late-1960s, it is also important to recognise the authority that biologists saw themselves to hold when discussing the social problems that appeared to plague mankind. Hamilton, for example, later imagined telling the aforementioned senator's wife what he really thought, which was that she should persuade her husband to enact eugenic laws that would "encourage not merely the direct influence but also the breeding of citizens democratically considered above average in

[467] L.J. Halle, qtd. in W. Delaney, 'A Matter of Manners: Attitude Shift Held Man's Key to Survival', *The Washington Star*, (17 May 1969), Smithsonian Institution archives, Box 494/3.
[468] J.W. Fulbright, qtd. in Delaney, 'A Matter of Manners'.

ability, kindliness, and health, while discouraging influence and breeding from opposites". If such laws were not passed, he believed the alternative would eventually be the implementation of "tranquillizers and happiness drugs" to control the population.[469] Nevertheless, he doubted that he had the courage to say as much in 1969.[470]

Outside of interest in Hamilton's work at the 'Man and Beast' symposium, social scientists were also curious about the meaning of inclusive fitness. In November 1968, for example, Hamilton was invited by a psychologist at the University of Durham to a conference on the topic of 'The Integration of Family and Social Groups'.[471] Having only recently returned from Brazil and feeling pressed to complete his paper for the 'Man and Beast' symposium, Hamilton initially passed on this invitation, only to later accept. He gave his 'selfish herd' paper, which will be discussed in detail below.[472] What is important to note at this point, however, is that the invitation serves as a further example of the extent to which Hamilton's ideas were seen to be relevant to areas outside of biology, including politics and the social sciences, by the end of the 1960s.

Indeed, there were many individuals both inside and outside of academia who were sympathetic to Hamilton's view of man, and as we have already begun to explore, the public was quickly warming to the idea that biologists could speak to social issues. Already in 1968, members of the Royal Society Population Study Group had met as a committee to

[469] While this may appear to have been a rather bizarre conclusion, Hamilton was not alone in articulating it. For example, in 1954, American physicist Harrison Brown warned that overconsumption of resources would lead to a world "where social organization has become all-persuasive, complex, and inflexible, and where the state completely dominates the actions of the individual". This concern was echoed by American conservationist Fairfield Osborn in 1956, who predicted that human society would increasingly resemble an anthill, and American political scientist Lynton Caldwell, who imagined a "scientifically managed animal farm", in 1966 (as qtd. in T. Robertson, *Malthusian Moment: Global Population Growth and the Birth of American Environmentalism*, (New Brunswick: Rutgers University Press, 2012), p. 80).
[470] Hamilton, *Narrow Roads of Gene Land*, i, 194-5.
[471] F.V. Smith to W.D. Hamilton, 1 November 1968, Hamilton archive, Z1X89/1/6.
[472] W.D. Hamilton to F.V. Smith, 1 January 1969, Hamilton archive, Z1X89/1/6.

discuss the relationship between genetics and social sciences. According to the report they issued, the fact that gains in the social sciences and genetics had not brought the two subjects closer together was due primarily to the stubbornness of social scientists who "are not interested in any aspect of human biology and often deny the relevance of human genetics to their particular studies". This problem was compounded by the fact that "practically no-one in the country […] has sufficient professional expertise in both sociology and human genetics". The result was a gap in knowledge that was not only an academic problem but also one that affected "many practical problems of human affairs". Issues surrounding IQ, mating patterns, social and geographical mobility, and the selective effects of particular policies were among those listed as requiring joint insight from geneticists and social scientists. Beyond recommending that such issues be discussed as part of a liberal education, the committee urged that some institutions offer "a full first degree training in the Human Sciences". Such programs would prepare students for successful "careers in school teaching, social welfare, the administrative class of the Civil Service, and even industry, where their training would not only be helpful to themselves and their employers, but also to the community as a whole".[473]

**The Population Bomb: Redefining a Social and Political Problem in a Biological Age**

In 1968, American biologist Paul Ehrlich famously published *The Population Bomb*.[474] Here, he warned that overpopulation would lead to social unrest and mass

[473] Royal Society Population Study Group, 'Report of the Genetics and Social Sciences Committee', [n.d., c. 1968], Hamilton archive, Z1X89/1/8 and Z1X35/1/1.
[474] P. Ehrlich, *The Population Bomb*, (New York: Ballantine Books, 1968); a selection of other works on overpopulation published around this time includes T. Gordon, *The Biological Time-Bomb*, (London: Thames and Hudson, 1968); G. Hardin, 'The Tragedy of the Commons', *Science*, 162 (13 December 1968), pp. 1243-8;

starvation as early as the 1970s and 1980s. As we have seen, this was not the first time the population bomb, under the alias 'population explosion' or 'population problem', was targeted for discussion by biologists, and it was also not the first non-fiction book written by a biologist to appear on the bestseller lists. As the organizers of the 'Man and Beast' symposium highlighted, several popular science books throughout the 1960s brought the topic of man as naturally aggressive and territorial to the public. These voices of 'science' varied from guarded optimism to alarmism, but in the end, they arrived at similar conclusions: the world situation was grim, our evolved natures were proof that social harmony and political peace were utopian visions, and if there was to be any hope at all, we had better trust biologists to reveal our true human nature and with it, the way forward.

Overpopulation continued to be an issue of great social, political, and biological importance in the late-1960s and early 1970s. Though the population concerns of biologists appear exaggerated in retrospect, especially in Britain where the birth rate actually declined from the 1950s,[475] Bill Hamilton had nevertheless noted the social, political, and biological problems brought about by population growth from the late-1950s. The pressures of population had in fact made him reconsider his position on nuclear disarmament. By 1962, he had begun to think that "a dark age where the survivors had room to move once again and freedom to rethink another attempt at the human self-conquest might not besuch [sic] a bad thing. […] This may sound a doctrine of despair but at moments thought of the population crisis, and of ruthless despoilment of this lovely world, provokes me to it."[476]

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M. Mead, 'Population: The Need for an Ethic', *The Journal of Medical Education*, 44 (November 1969), pp. S30-5.

[475] B. Harrison, *Finding a Role? The United Kingdom 1970-1990*, (Oxford: Oxford University Press, 2011), p. 211.

[476] W.D. Hamilton to C. Hudson, 13 February 1962, Hamilton archive, Z1X74/1/9.

Others echoed Hamilton's concerns. The tensions of the time brought into question the strength of social bonds, both national and international, and these problems were seen to be exacerbated by the demands of overpopulation. Citing experiments on animal models, many biologists argued that these bonds became more fragile as population density increased.[477] By January 1965, overpopulation was seen to be such a significant threat to the quality of life in the decades to come that United States President Lyndon B. Johnson underlined it in his State of the Union Address.[478]

Whether discussed in terms of an 'explosion' or a 'bomb', overpopulation was intimately tied to political questions involving the fate of democracy as well as the reproductive rights of individuals. It was also fundamental to social concerns regarding the viability of the welfare state and, as already discussed, the inevitability of intergroup conflict, either race or class based. By characterising the 1960s as a biologically unprecedented age[479] and the problems of overpopulation as inherently biological, biologists positioned themselves to play an important, even a fundamental, role in society. Disaster could be averted, biologists claimed, but only if ideology and superstition were replaced with scientific knowledge. As G.C.L. Bertram urged, "new knowledge is […] accompanied by new responsibilities", and these responsibilities could only be neglected at our peril.[480] Assuming the identity of the hero, if only society was willing to listen, biologists hoped that their work would be transformed from a practice at the edges of an old, and in many ways, a failed society to the very centre of a new, scientifically informed world.

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[477] See, for example, Calhoun, 'Population Density and Social Pathology'.
[478] Robertson, *Malthusian Moment*, pp. 83-4.
[479] Bertram, *Socio-biological Responsibility*, p. 5.
[480] Ibid, pp. 7-8.

Hamilton's attention to other biological questions in these years does not negate the fact that overpopulation remained a concern for him, as it did for many other biologists, throughout the 1960s and into the 1970s. By 1969, Hamilton recorded a quote by David Lack, that "If we are to end human warfare, we should seek first to change not Man's aggressive drive but the Malthusian compulsion".[481] Like Lack, Hamilton believed that the future of humanity hung on a very thin string, and if we would not approach overpopulation rationally and scientifically, there would likely be no future at all.

In fact, Hamilton was so concerned about overpopulation by the end of the 1960s that he urged biologists take a political stand. Having returned from Brazil and done a short tour in America in 1969, Hamilton resumed his attendance at the meetings held by the Royal Society Population Study Group. Soon after, however, he drafted a letter withdrawing his membership: "I had been feeling increasingly doubtful about the usefulness of continued membership even before I went [to Brazil] […] & now, in view of what I heard yesterday, I feel that I should resign."[482]

The point of contention was a recent report on 'Science and Population Policy in the United Kingdom and United States', prepared jointly by committees of the Royal Society Population Study Group and the National Academy of Sciences Committee on Population. According to Sir Bernard Katz, "some members objected on grounds that the Report contained recommendations which they considered to be of a political nature, and that on the whole it was felt not to fulfil the criteria of being a 'dispassionate scientific' statement, as

[481] W.D. Hamilton, note on D. Lack, 'Of Birds and Men', *New Scientist*, 41 (1969), pp. 121-2, Hamilton archive, Z1X40/1/1.
[482] W.D. Hamilton to A.S. Parkes, [n.d., c. March 1969], Hamilton archive, Z1X64/1/15.

stipulated by Council last November."[483] Hamilton attempted to get a copy of the report unsuccessfully.[484] Although he had not read it, he claimed,

> "if I had anything to do with it I am sure it would have been more objectionable on the 'political' count than it was. My strong feelings about the urgency of the population problem & the need to avoid wishful thinking makes it very unlikely that I will be considered of use in any future publicising activity of the group. […] I remain very much in sympathy with the general aim of the group. If you think my continued membership is of any definite use in keeping it alive I will gladly remain a member."[485]

Copies of meeting details from the early 1970s in Hamilton's archive indicate that he continued to be a member of the group. Not only did Hamilton continue to participate in the Population Study Group, he also recruited for it, putting Richard Southwood's name forward for membership in November 1970.[486] Southwood's reply highlights a continued streak of elitist eugenic concerns within academic circles in the postwar decades:

> "I am indeed interested in Population Problems + have strong views on the need to regulate Homo sapiens. I think one of the frightful problems facing Britain is the high rate of reproduction in the backward families + I am not sure that the answer is just more welfare. Of course outside Britain the situation is even worse - here at least contraceptive advice is fairly freely available, c.f. France, Italy, Latin America."[487]

Thus, while Brian Harrison has characterised government strategies on population control in Britain in the early 1970s as stemming from "high-minded rationalistic progressive attitudes",[488] Southwood's account indicates that British biologists were specifically

[483] B. Katz to A.S. Parkes, 10 March 1969, Hamilton archive, Z1X89/1/8.
[484] G.A. Harrison, a professor of anthropology at Oxford, reported to Hamilton that there were not enough copies of the report and since he was not "particularly involved in the preparation of this Report", one could not be sent to him (G.A. Harrison to W.D. Hamilton, 21 April 1969, Hamilton archive, Z1X89/1/8).
[485] Hamilton to Parkes, [n.d., c. March 1969].
[486] W.D. Hamilton to G.A. Harrison, 6 November 1970, Hamilton archive, Z1X89/1/6.
[487] T.R.E. Southwood to W.D. Hamilton, 5 February [1971], Hamilton archive, WVJ13/1/7.
[488] Harrison, *Finding a Role?*, p. 211.

concerned with the reproduction of 'others'. What is more, their discussions contain a note of fear as to what might happen if these groups grew.

**Overpopulation and Scientific Alarmism in the Early 1970s**

Was there a natural means by which population growth could be curbed, as Wynne-Edwards had suggested, or would limitations on individual reproduction need to be imposed from the outside, as Hamilton repeatedly advised? As it has already been noted, both Wynne-Edwards and Hamilton were members of the Royal Society Population Study Group. There is no evidence that the two interacted directly, but Wynne-Edwards' ideas featured prominently in the published proceedings from 1966, the year in which Hamilton had begun to participate.[489] For this reason, it is plausible to think that Hamilton may have started to draft a new paper on the selfish motivations behind seemingly gregarious behaviours in response to Wynne-Edwards, despite the fact that he had not initially viewed *Animal Dispersion* with particular disdain.

Looking back in 1996, however, Hamilton claimed he had more than one motivation to write his 'selfish herd' paper, indicating the extent to which his views toward Wynne-Edwards had changed between 1963 and 1966. By 1966, he aimed to undermine Wynne-Edwards, to add to the arguments of American evolutionary biologist G.C. Williams who was also attacking 'group selection' in this period,[490] and to garner support for his inclusive fitness papers.[491] In what became 'Geometry for the Selfish Herd', Hamilton claimed that

[489] V.C. Wynne-Edwards, 'Regulation of Numbers as a Homeostatic Process Involving Social Behaviour', *The Royal Society Population Study Group: Abstracts of Proceedings*, 2 (1966), pp. 7-12.
[490] See G.C. Williams, *Adaptation and Natural Selection: A Critique of Some Current Evolutionary Thought*, (Princeton: Princeton University Press, 1966).
[491] Hamilton, *Narrow Roads to Gene Land*, i, 229-33.

social behaviour could serve an individual's self-interest, or at least its "cowardly cover-seeking". Rejected by *Scientific American* in 1967 and *Science* in 1968, the paper was set aside while Hamilton again ventured to Brazil for fieldwork in April 1968.

If population control was not natural, as Wynne-Edwards had claimed, Hamilton needed to propose an alternative. He did so by arguing that eugenic policy was the only way to curb population growth in human societies. In a letter to the *New Scientist* in 1969, Hamilton maintained that governments had only two options: they could abandon the welfare state and let nature take its course or they could actively control population size through policy. Finding government intervention more palatable, he recommended that the right "to participate in the parenthood of two children" be given to each individual of marriageable age. He admitted that the issues inherent to state intervention in reproductive decision making "are perhaps unpleasant to contemplate, but, from a humane point of view, so is natural selection".[492] While for Wynne-Edwards, hope could be procured from a 'back to nature' approach when it came to population control, Hamilton regretted that nature only promoted unregulated reproduction.

Beyond this discussion of population policy, Hamilton had gone back to his draft of the 'selfish herd' around 1969, and by then, his depiction of herds as consisting of self-seeking individuals was receiving a good deal of attention. The paper that resulted was not unrelated to the position he took on human problems, undermining as it did assumptions regarding the nature of gregariousness in both man and other animals. In fact, hints that even Hamilton believed that 'The Selfish Herd' was more reactionary than scientifically true are revealed through his discussion of the paper in letters and his 1996 autobiographical

[492] W.D. Hamilton, 'Population Control', *New Scientist*, 44 (20 October 1969), pp. 260-1.

account. Even when he first discussed the topic at length at the Association for the Study of Animal Behaviour in Durham in July 1969, the theory he put forward came with several caveats, especially since it contradicted evidence from field studies by prominent biologists.[493] Relying as usual on his intuition, Hamilton could not contradict these observations with real world examples of his own. By 1970, Hamilton himself had become "convinced that there are all sorts of other ~~reasons~~ factors besides cover-seeking that make animals gregarious". Realizing this, he admitted that his paper "rather over-states the case for coverseeking [sic]". He was nevertheless convinced that it was worth publishing, "overstatements and all".[494]

Indeed, it was not until September 1971 that Hamilton heard any "real evidence for a 'selfish group'". Before then, he admitted, his "'review' was very vague and circumstantial", and to be sure, it was unmotivated by evidence. Furthermore, Hamilton would later claim that the idea of the selfish herd was "little more than common sense". Still, the nature of gregariousness was so widely assumed in the postwar decades that he feared no one would consider the alternative view he provided. For this reason, he included a set of geometrical models in the paper that had little bearing on his conclusion: academics, he claimed, were more likely to listen "if you first intimidate them with equations".[495]

In light of this, one is led to wonder if it was not the strength of Hamilton's own convictions that pushed him to articulate views that, if not ideological themselves, certainly were meant to contradict other political sympathies, namely those which emphasized the nature of moral or economic collectivism. Writing to the investigator who discovered

[493] W.D. Hamilton, 'Geometry for the Selfish Herd', Hamilton archive, Z2X29/1/5.
[494] W.D. Hamilton to G.C. Williams, 22 October 1970, G.C. Williams archive.
[495] Hamilton, *Narrow Roads to Gene Land*, i, 229-33.

evidence for the selfish herd, Jeremy Hatch, Hamilton admitted that he had earlier suffered from "the uneasy feeling that I rather over-emphasised my point" when writing the paper. For this reason, he found it "very heartening to see your graphs!" Still, he warned Hatch that 'The Selfish Herd' should not be taken too seriously: "I hope you read my paper in a fairly sceptical and free-wheeling spirit. Judging by requests for copies it seems to have attracted more attention than it deserves."[496]

Knowing her brother's work had been relevant to various human issues that seemed to trouble humankind and threaten its future, Hamilton's sister Mary continued to see the meaning of his work in relation to human society even when he was less explicit about such meaning himself. Responding to one of his papers in April 1971, she asked whether "the advantage you demonstrate, even if slight, accounts for people's predilection for their own race & hatred of increasing intensity for persons of increasing dissimilar races?"[497]

Whether the 'selfish herd' was understood in relation to human groups or other species, it was exceptionally well received, and despite Hamilton's hesitation concerning both the relevance and the importance of the paper, the academic community remained enamoured. There seemed to be something about the image of the selfish herd and its 'objective' contradiction of long-held beliefs about the cooperative nature of groups that scholars found appealing. In 1976, for example, L.R. Taylor at the Rothamsted Experimental Station wrote that even if Hamilton did not consider 'The Selfish Herd' to be among his most important contributions, Taylor still regarded the paper to be "of very great value to me personally and […] to population dynamics as a subject".[498]

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[496] W.D. Hamilton to J.J. Hatch, 23 September 1971, Hamilton archive, Z1X89/1/8.
[497] M. [Hamilton] Bliss to W.D. Hamilton, 30 April 1971, Hamilton archive, Z1X102/1/3.
[498] L.R. Taylor to W.D. Hamilton, 2 June 1976, Hamilton archive, Z1X89/1/19.

Long in the making, 'Geometry for the Selfish Herd' was finally published in 1971, and Roger Lewin at *New Scientist* was so impressed that he invited Hamilton to write "an article for us on herding and altruism" that would be accessible to non-biologists.[499] The resulting essay was concerned with both biological puzzles and their relevance to human society. In this case, it began with the latter: "Why do the workers strike?" He postulated, "Suppose it is true and clearly to be seen that their standard of living will rise more in the end if they don't strike, may they not still strike because they assume that other unions will, or that their employers will not share out fairly the gains from their restraint?" Continuing, he claimed:

> "Certainly one worker's enjoyment of a raised standard of living will be marred if he sees others getting not only what he gets, bought by his restraint, but also more, bought by their militancy. It is easy to imagine his initial altruism giving place to a competitive attitude, with less interest in the absolute standard of life and more in relative position in the hierarchy."

What Hamilton was considering was a situation known to game theorists as the 'prisoner's dilemma', though he hesitated "to call it a game – it is simple, baffling, and painfully like real life".[500] By the early 1970s, game theory was in fact seen to be useful in a wide range of fields. In fact, recent historians have discussed the extent to which the prisoner's dilemma impacted concepts of rational political decision making in a nuclear world.[501]

Hamilton certainly knew of the importance of the prisoner's dilemma to contemporary military strategy because he had read psychologist Anatol Rapoport's article

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[499] R. Lewin to W.D. Hamilton, 19 May 1971, Hamilton archive, Z2X29/1/12.
[500] W.D. Hamilton, 'Animals in the Prisoner's Dilemma - personal copy', Hamilton archive, Z2X29/1/12.
[501] P. Erickson, 'Mathematical Models, Rational Choice, and the Search for Cold War Culture', *Isis*, 101 (June 2010), pp. 386-92; P. Erickson, J.L. Klein, L. Daston, R. Lemov, T. Sturm, and M.D. Gordin, *How Reason Almost Lost Its Mind: The Strange Career of Cold War Rationality*, (Chicago: University of Chicago Press, 2013).

in *Scientific American*, which cautioned that knowledge of game theory did not make one a better military strategist because it could not be usefully applied to all scenarios. For this reason, Rapoport had urged policy makers to pursue wisdom over calculated know-how.[502] Hamilton cited Rapoport often from 1965 through the early 1970s but does not seem to have wholly agreed with his conclusions.[503] Whether this means that Hamilton, unlike Rapoport, believed that game theory could provide solutions for problems plaguing the nuclear world remains unclear. He certainly saw game theory to be useful in discussing the behavioural strategies assumed by both humans and other animals in a variety of contexts, including a topic that had long interested him, reproductive decision making.

In the prisoner's dilemma, two individuals are arrested for a crime that they have committed together. They are interviewed separately, and each must decide for herself what to plead. Whether the individual acts in solidarity or selfishly defects, the choice is hers alone. If the goal of the individual is to escape punishment altogether, her only choice is to defect, selfishly saving her own hide with little consideration for the fate of her partner's. If her partner cooperates, the cheating individual is awarded her freedom while her dependable colleague is served the most severe sentence, say ten years in prison. Such treachery does not come without significant risk, however; if her also partner defects, both individuals will receive a tedious sentence, perhaps five years in prison. Perhaps, then, it is better to cooperate. Indeed, if both of the accused cooperate, they face a comparably light, one-year term. Still, cooperation comes with the greatest risk: if her partner defects, she will land the

[502] A. Rapoport, 'The Use and Misuse of Game Theory', *Scientific American*, 207 (December 1962), p. 108.
[503] See, for example, W.D. Hamilton, 'Why Society Is Not an Organism', 5 November 1965, Hamilton archive, Z1X90/1/18; W.D. Hamilton to F.E. Binet, 4 August 1967, Hamilton archive, Z1X89/1/1; W.D. Hamilton to R.L. Trivers, 2 February 1970, Hamilton archive, Z1X69/1/12; W.D. Hamilton, 'The Sex-Ratio Game', [n.d., c. 1971-3], Hamilton archive, Z1X83/1/8; W.D. Hamilton, 'Reviews Relevant to These Lectures', [n.d., c. 1971], Hamilton archive, Z1X90/1/7; W.D. Hamilton, 'Reading List', [n.d., c. 1971-3], Hamilton archive, Z1X90/1/7.

most severe, ten-year sentence. Given these parameters, can we predict how the accused will act?

Game theory, concerned from its origins with economic models[504] and defined as a science of conflict,[505] asks: what is the best strategy to adopt when playing this game? Evolutionary theory, however, asks whether individuals using one strategy will out-survive those using another. More specifically, in this example, it predicts whether the characteristics of selfishness or cooperation will have a reproductive advantage over time.

Considering selfishness, Hamilton wrote, "Many people suppose that animals are less selfish than mankind. Indeed most biologists seem to support this opinion." According to Hamilton, if this were a correct assumption, when presented with a situation resembling the prisoner's dilemma, animals "would unhesitatingly choose the unselfish course", but this was not the case. Thus, he claimed that recourse to "an animal heritage of sane thought and action that was somehow mislaid when the malaise of civilisation burst upon us" was mistaken. In Hamilton's estimate, the reason selfishness existed, both in animals and in man, was because "There is little theoretical reason why a mutation which implies the selfish choice in a prisoner's dilemma should not spread and so lead its species into trouble". There was one escape: if individuals interacted with relatives, altruism would be "unequivocally favoured". But the reality of this situation was perhaps even more discouraging in the end, as it meant that "if the animals become too good at knowing their relatives they merely meet the dilemma again at the level of groups, and in some ways it has a worse face than before because lethal fighting between members of different groups seems to be one new

[504] See J. Von Neumann and O. Morgenstern, *Theory of Games and Economic Behavior*, (Princeton: Princeton University Press, 1944).
[505] Rapoport, 'The Use and Misuse of Game Theory'.

outcome". According to Hamilton, this unfortunate outcome was realistic: it could be found "in rats, in group hunting dogs and hyaenas, and in primates". Moreover, "in ants and in men such fighting takes an almost institutional character".[506] Therefore, there was no use hoping that traits would evolve for the benefit of the species or population as a whole. Nor was it any use relying, as Wynne-Edwards had, on natural inclinations to regulate population size. In nature, organisms were consistently looking out for number one.[507]

In his conclusion, Hamilton turned to the relevance of game theory to population control in human societies. He asked, "should we be surprised if a questionnaire about population reveals a number of people who both think that Britain, say, is already overpopulated, and at the same time declare laissez-faire attitude to birth control regarding large families, or even a personal intention to have ~~four~~ five or ~~five~~ six children?" According to evolutionary models, of course, the situation was not surprising. He concluded that overpopulation in human societies was evidence of man's animal nature. Furthermore, the population explosion and nuclear arms race were proof that human extinction could only be prevented if we forego utopian visions.[508]

Already in 1970, Hamilton was considered to be a world leader in the field of social insects,[509] but the fact that his initial motivations to study social behaviour lay in its relevance to human society[510] was already largely unknown or had been conveniently forgotten. Nevertheless, he continued to articulate his biological fears for the future of humankind, even reaching into the world of fiction to do so. In response to an article titled

[506] Hamilton, 'Animals in the Prisoner's Dilemma - personal copy'.
[507] R. Ringer, *Looking Out for Number One* (New York: Fawcett, 1977) was a best-selling self-help book.
[508] Hamilton, 'Animals in the Prisoner's Dilemma - personal copy'.
[509] P.H. Abelson to W.D. Hamilton, 21 October 1970, Hamilton archive, Z1X89/1/6.
[510] W.D. Hamilton to The Eugenics Society, 15 May 1963, Hamilton archive, Z1X30/1/5.

'Pacifica', which warned "of a disillusionment which those who fight for population control and so on might well come to feel", he drafted a short story he called 'Martiala' in an attempt to show "an opposite". Although he claimed "It does not even try to be realistic for 1990", he did feel "in its general direction […] it is a rather more probable glimpse of the future than Pacifica" because it did not rely upon "a human will for change that has hardly begun to exist". In making this point, Hamilton seems to have seen his colleagues to be devoid of the "crusading spirit"[511] necessary to put forward a policy recommendation. Indeed, this is what had irked him about the Royal Society Population Study Group's failure to enter the political discussion in 1969.

The setting of Hamilton's story was post-apocalyptic: "the city was destroyed not because it was weak with too few inhabitants but because it was burdened with too many". It was owing to his prophetic teacher that the narrator knew "The city might have been saved […] if more had vowed to remain unmarried, or, failing this, had cut the cords of their manhood as he had done." With the city destroyed, however, the remnants of human society resembled an insect colony with slaves who were barred from reproduction. A combination of nationalism and xenophobia kept slaves submissive. Hamilton's theory of inclusive fitness featured inasmuch as it lent credibility to dominant nationalist myths. The narrator claimed, "I know that it is a crime against God to harm one's kin, and, according to Gunder, all free men in Martiala are each other's kin."[512]

[511] W.D. Hamilton to *New Scientist*, 30 September 1970, Hamilton archive, Z1X89/1/7.
[512] W.D. Hamilton, 'Martiala', Hamilton archive, Z1X89/1/7.

**Conclusion**

Hamilton and other biologists concerned with evolution in the 1960s hoped that genetics would occupy a central role in the generation of new knowledge. They believed that revolutionary insights into social and political issues would emerge from the study of genetics and man's evolutionary past. As we have seen from an examination of the issue of overpopulation in this period, the objectivity that biologists claimed stood in contrast to what they identified to be the ideological biases of their opponents. When we look more closely at the image of biology they were constructing, however, their scientific positions must be viewed as a reaction to a particular social and political climate.

But overpopulation was not the only political issue that Hamilton approached through the application of his theory of evolved social behaviour. By the end of the 1960s, he had begun to publicly discuss the 'natural' limits of cooperation between groups. In doing so, he spoke to prevalent fears concerning the likelihood of a third world war as well as the inevitability of race-based conflicts. Whether or not the advice he offered was scientifically defensible, it certainly belied his own biases.

While the previous chapters have demonstrated the ways in which Hamilton's cultural beliefs both impacted his choice of research topics and limited the solutions at his disposal, this chapter has begun to outline the range of social and political questions Hamilton believed his work spoke to. Far from an isolated scientist more at home with insects than his fellow humans, Hamilton was in dialogue with a number of pressing issues in a turbulent decade. In dismissing past collectivism as overly idealistic, however enticing, Hamilton articulated a knowledge of 'nature' was particularly well suited to a changing culture that increasingly embraced individualism. By 1974, he would go so far as to claim,

"Morals can not [sic] be drawn from nature but guidance may be".[513] Still, the obvious applicability of his theory, 'from man to bacteria', had not yet been realised, and Hamilton was increasingly dissatisfied with the limited attention his work had been given. In the next chapter, we will see that these factors impacted his decision to move to America, and they also meant he would make another push to appear relevant.

[513] W.D. Hamilton, 'Incest of Mice and Men', 4 August 1974, Hamilton archive, Z2X29/1/13.

# CHAPTER FIVE

## Whither Social Biology? To Talk or Not to Talk about Man

Earlier chapters have shown the extent to which Hamilton was interested in using evolutionary thinking to inform human society. To substantiate this thesis, the present chapter follows Hamilton through the mid-1970s. Moreover, it will briefly examine the trajectory of two of Hamilton's early colleagues, George R. Price and Robert L. Trivers, who were motivated by the potential applications of evolutionary theory to human problems. A brief examination of these researchers and their work related to altruism is demonstrative of a wider desire to use biology as the basis for a new understanding of human society in the second half of the twentieth century.

Beyond highlighting the work of Price and Trivers, this chapter continues to examine what social meaning the study of genetics and evolutionary biology had as the 1960s gave way to the 1970s as well as the extent to which it was changing. To accomplish this, it asks what role Hamilton and his theory of inclusive fitness played in undergraduate curriculum at Imperial College. Recognizing the 1970s as a unique environment for inclusive fitness theory, compared to the 1960s, it also explores the extent to which the levels of selection debate was becoming increasingly heated in light of the implications that 'groups' were perceived to have. Moreover, it looks beyond those attending Hamilton's lectures to see who else made up the audience for the new science of social biology as it emerged in more public forums. In doing so, it examines how a cooperative dialogue began between biologists and those in other academic disciplines, particularly anthropology, even before the discussion of evolved social behaviour had become mainstream.

In examining Hamilton's work in the early 1970s, we also bear witness to his post-Smithsonian attempts to highlight the relevance of his theory to the human world. I will argue that these efforts were likely made, at least in part, as a tool for self-promotion. By 1974, he had gone ten years without advancing at Imperial. What is more, his ideas seemed to elicit hardly any more support amongst academics than they had received initially. What Hamilton could not anticipate, of course, was that these actions would ultimately prove unnecessary. Indeed, his position in the history of biology would be secured by the popularity and ensuing controversy surrounding the publications of E.O. Wilson's *Sociobiology* in 1975 and Richard Dawkins' *The Selfish Gene* in 1976. These bestselling books would in fact change Hamilton's trajectory altogether.

**A Physical Scientist Turned Evolutionary Biologist: George Price**

George R. Price was initially trained in chemistry.[514] From 1944 to 1946, he worked on uranium analysis as part of the Manhattan Project, after which he spent two years as a lecturer at Harvard. By 1957, Price's interest in human affairs was apparent. In his typically idiosyncratic way, he recorded having tried his hand at the popular press, writing a book with the working title "NO EASY WAY (first for Harper's, later for Doubleday) on what the United States should do about Russia and China, while supporting [himself] as a freelance magazine article writer and a subcontract technical writer". To clarify the outcome of this project, he noted, "The book was never finished: the world kept changing faster than I could write about it!"[515]

[514] For a detailed account of Price's life, see O. Harman, *The Price of Altruism: George Price and the Search for the Origins of Kindness*, (London: Bodley Head, 2010).
[515] G.R. Price, CV, [n.d., c. 1974], Hamilton archive, Z1X102/1/3.

Having moved through many fields of study, by November 1967 Price had become more serious about attacking the problems plaguing mankind. His particular plan of action involved his using a life insurance settlement to move to London to study evolutionary biology. It was from London that Price wrote to Hamilton in March 1968. Having understood the significance of Hamilton's theory of inclusive fitness, Price had some ideas for further research but first needed to understand the mathematics of genetical theories of natural selection better, and he hoped that Hamilton might be willing to help him.[516] By Price's own account, his particular research interest was human evolution, and to serve this end, he had concocted a reading list that included texts in ethology and psychology.[517] In another letter, Price disclosed that the paper he planned to write concerned a second implication of inclusive fitness. While Hamilton had detailed a process by which natural selection could promote benevolence between highly related individuals, Price wondered if there could equally be something said for the "Natural Selection for Malevolence toward Non-Relatives". Still, he ultimately hoped that he could argue a way by which a "population will become increasingly moral".[518]

Hamilton later claimed that Price was "a brilliant mind willing to work on any problem that appealed to him of being of permanent significance for man".[519] The first problem Price would tackle concerned the extent of human goodness, and Hamilton recruited his former supervisor at University College London, C.A.B. Smith, to get Price up to speed with the methodologies currently used in evolutionary biology. Nevertheless, it is clear from Price's application for a research position that Hamilton's theory formed the

[516] G.R. Price to W.D. Hamilton, 5 March 1968, Hamilton archive, Z1X89/1/2.
[517] G.R. Price, CV, [n.d.], Hamilton archive, Z1X89/1/2.
[518] G.R. Price to W.D. Hamilton, 3 August 1968, Hamilton archive, Z1X89/1/2.
[519] W.D. Hamilton to 'Mrs. Kelley', draft, [n.d., c. 1974], Hamilton archive, Z1X102/1/3.

backbone of his research questions. Price felt that Hamilton's conclusions must be further examined and perhaps qualified, as they likely "require[d] modification in groups of small size, such as probably applied to prehistoric man".[520] Thus, a glimmer of hope remained that the natural limits of altruism, at least in man, might not be as severe as Hamilton had first predicted.

Coming from the physical sciences, Price took the objectivity of equations for granted. What is more, he believed that mathematical investigations into human nature were essential because they "help[ed] to protect against biasing effects of emotional prejudices about human nature and human ancestry". Summarizing his research proposal in May 1969, Price claimed, "The general plan of work is that mathematical tools will be developed specifically in order to handle problems of human evolution, but when developed they will be applied to both human and animal evolution problems."[521]

But an unforeseeable development in Price's life would complicate these plans. As early as 1969, Price had converted from devout atheism to Christianity. At first, this distracted him from his research in minor ways as he spent time applying scientific thinking to biblical stories. By 1973, however, Price began to take a more fundamentalist approach to his religion and was thus determined to abandon his projects in biblical analysis as well as his research in evolutionary theory to live what he saw to be a truly Christian life.[522] Unsurprisingly, this created increasing instability in both his social and academic life, and he ultimately gave up his position at the Galton Laboratory. Moreover, his vow of poverty

[520] G.R. Price, notes on proposed research, [n.d., c. 1968], Hamilton archive, Z1X89/1/2.
[521] G.R. Price, 'Supplementary Details of Intended Research', May 1969, Hamilton archive, Z1X102/1/3.
[522] G.R. Price to W.D. Hamilton, 30 May 1973, Hamilton archive, Z1X102/1/1.

meant that he suffered financially, and when his social philanthropy backfired, he also suffered physically at the hands of the groups he had tried to help.

An opponent of religious dogma from his student days, Hamilton often had difficulty understanding his friend's intense convictions. In at least one instance, this put Price on the defensive. He felt mocked by Hamilton's interpretation of Old Testament characters and the implications of their stories, if literal, for concepts of free will and barked, "Do you think that it is something that I wanted to believe in?" He was adamant that the conversion he had undergone was philosophical rather than emotional: he desperately wanted to be his own master, but the reality of life seemed to prove just the opposite. Price was therefore convinced that his reconsideration of biblical truths came on the basis of objective fact. That is to say, he had undergone a scientific conversion.[523]

He was genuinely hurt by Hamilton's remarks and not the least angry. Having tried to explain his own position, he asked what Hamilton's point was: "Isn't 'why respect Jesus' a sort of rhetorical question since you don't respect him?" In fact, Price claimed to be doing exactly what Hamilton begrudged social scientists and the public for not being able to do when it came to understanding human behaviour and human society as evolved features. He was "suppress[ing] considerations about [how] one would like things to be, in order to figure out how things are".[524] In his opinion, Hamilton had repeatedly failed to apply scientific thinking to theology, instead turning to aesthetics, philosophy, and wishful thinking since he assumed religion was useless. Indeed, according to Price, religion threatened Hamilton's "system of beliefs" and he dismissed theological arguments "in self-defense".[525] What

[523] G.R. Price to W.D. Hamilton, 15 November 1971, Hamilton archive, Z1X89/1/7.
[524] Ibid.
[525] G.R. Price to W.D. Hamilton, 14 March 1972, Hamilton archive, Z1X102/1/1.

Hamilton did not seem to realize was how closely his faith in evolutionary explanations of social phenomena matched his friend's religious convictions.

By July 1973, Price was still not able to find his way back into research. In particular, he had difficulty finding a place to work where he would not be disturbed by the homeless populations he had tried to help.[526] Over the following months, the situation worsened. Recognising Price's downward spiral, Hamilton appealed to the Teilhard Centre in an effort to find him funding. According to Hamilton, Price was "a scientist and Christian who is at present out of work and virtually homeless in London". Even more alarming, Hamilton reported that the "last time I saw him he looked both ill and starving and I had he impression that he might not last much longer if his present way of life continues". Even though Price had actively chosen the path that was now causing him such great agony, it appeared to Hamilton that the experiment had gone far enough: "he has allowed poverty and dedication to reach a point where he is no longer active mentally or an effective force in any other way, and where perhaps he is unable to rehabilitate himself even if he wants to." A recent letter hinted that Price himself recognized that things had gone too far, and he admitted that he should perhaps spend "more time to solving problems of his own life before he started to solve other people's". Still, it may have been too late: "now his weakness and ill health would obviously be very strongly against him in any job where he had to appear for interview."[527]

What Hamilton did not mention was that by 1974 Price had decided to abandon biology to pursue economic research because he had begun to fear "that the sort of theoretical mathematical genetics [he] was doing wasn't very relevant to human

[526] G.R. Price to W.D. Hamilton, 5 March 1974, Hamilton archive, Z1X102/1/2.
[527] Hamilton to 'Mrs. Kelley', draft, [n.d., 1974].

problems".[528] Thus, while the explanatory power of genetics was assumed in the late-1960s, by the early 1970s its supremacy appeared far less certain. For Hamilton and others, these years offered little indication that inclusive fitness would ever be acknowledged as a universal explanatory force.

Unfortunately, Price would never see his proposed transition from evolutionary biology to economics through. His mental and physical health was rapidly deteriorating, and without any sense of social or economic stability, he was growing more and more isolated. On 10 December 1974, Price wrote a note to Hamilton and his wife Christine that was full of apologies, indicating a sharp decline in his mental state.[529] Worried that he was becoming a burden on the few friends he could number, Price tragically ended his life in the first weeks of 1975.

The dramatic life that Price led and its unfortunate, shocking end attracted immediate attention.[530] Writing to Price's brother, Hamilton claimed that he had collected some of George's things because it was likely that someone in the future might like to learn more about his life. He also admitted his regrets, believing he could have tried harder to push Price back into his biological research, and lamented the fact that "a friend almost like a second self is gone".[531]

**Another Model for Human Sociality: Robert Trivers and Reciprocal Altruism**

Bob Trivers was also inspired by Hamilton's work and, like Price, he was especially interested in its relevance to human society. Seven years Hamilton's junior, Trivers had first

[528] G.R. Price, CV, [n.d., c. 1974].
[529] G.R. Price to W.D. Hamilton and C. Hamilton, 10 December 1974, Hamilton archive, Z1X102/1/1.
[530] 'Jesus "Hot-Line"', 15 January 1975, Hamilton archive, Z1X102/1/2.
[531] W.D. Hamilton to E. Price, 15 February 1975, Hamilton archive, Z1X102/1/1.

studied history, but after being exposed to evolutionary theory through a job he took writing educational materials for the *Man: A Course of Study* (MACOS) curriculum project,[532] he pursued graduate studies in biology at Harvard from 1968 until he received his doctorate in 1972. Although there is no room to discuss Trivers' life in the detail it deserves, his work on reciprocal altruism is particularly relevant to our understanding of the development of theories of social behaviour in this period; it was an attempt to explain altruistic behaviour in humans, where Trivers believed Hamilton's model broke down.

Trivers' theory of reciprocal altruism focused on altruistic behaviour between non-relatives. According to Trivers, individuals would benefit from acting altruistically toward others if their likelihood of meeting again was high enough that a returned favour could be anticipated in the future. Although the theory of reciprocal altruism was not published until 1971, Trivers gave Hamilton his paper, 'The Evolution of Altruism', when Hamilton visited Harvard in the fall of 1969.[533] Hamilton's initial response to the manuscript was not surprisingly hesitant. Next to Trivers' discussion of human aggression, for example, Hamilton noted his preference for his own theory. He believed inclusive fitness could explain altruism in humans inasmuch as "our evolutionary line may have evolved high altruism during a long period when it had much more tribal organisation than it does now & hence higher relationships between interactants". It was relatively recent that humans were confronted with "a much more panmictic system" in which "higher levels of 'cheating'"

[532] The MACOS curriculum combined ethnographic case studies with examples of social behavior in the nonhuman world. It came under fire in the 1970s for its promotion of cultural relativism and, some believed, its espousal of secular humanism (E.L. Milam, 'Public Science of the Savage Mind: Contesting Cultural Anthropology in the Cold War Classroom', *Journal of the History of the Behavioral Sciences*, 49 (2013), pp. 306-330).

[533] R.L. Trivers, 'The Evolution of Altruism', 6 April 1969, Hamilton archive, Z1X69/1/12. An account of their first meeting, and the recollections of Trivers concerning this period more generally, can be found in R.L. Trivers, *Natural Selection and Social Theory*, (Oxford: Oxford University Press, 2002).

were favoured. Though Hamilton did not mean to "deny that [Trivers'] selection process is also a factor", he cautioned that Trivers' depiction of human aggression was "Not very clear".[534]

These criticisms aside, Hamilton certainly respected Trivers. In 1969, Hamilton had even gone as far as to ask Trivers for feedback on his 'Man and Beast' paper. Trivers liked the paper, but again they disagreed as to how much weight should be given to inclusive fitness. In making room for reciprocal altruism, Trivers was not as pessimistic as Hamilton was in thinking that our animal nature could not give rise to commendable, civilised behaviours. Instead, he felt that man's "moral concern, feelings for fairness and justice, while sensitive to the influences of degree of relationship, are independently derived as suggested in my paper".[535]

By 1969, Trivers was himself closer to publishing,[536] and he had recently reviewed the psychological literature on human altruism. Though he found it in general to be "very weak", so much so that he hesitated to cite it, he nevertheless believed it supported his ideas concerning the importance of reciprocity. For the time being, however, he was reluctant to dig deeper into the literature. Other responsibilities meant he would seek publication immediately, knowing that his word was unlikely to be definitive. He simply did not have the time to attempt "any sort of complete and final statement on human altruism".[537] Even if it was not intended to be conclusive, Trivers' and Hamilton's attention to Anatol Rapoport's discourse on game theory and Wilton Dillon's work on the 'reciprocal gift' in international

[534] W.D. Hamilton on R.L. Trivers, 'The Evolution of Altruism', 6 April 1969. Part of the trouble was Trivers' mathematics, against which there would be more complaints from Hamilton in the following years. See, for example, W.D. Hamilton to R.L. Trivers, 26 May 1970, Hamilton archive, Z1X69/1/12.
[535] R.L. Trivers to W.D. Hamilton, 14 November 1969, Hamilton archive, Z1X69/1/12.
[536] The eventual publication would be R.L. Trivers, 'The Evolution of Reciprocal Altruism', *The Quarterly Review of Biology*, 46 (March 1971), pp. 35-57.
[537] Trivers to Hamilton, 14 November 1969.

affairs[538] indicates the wide range of relationships, personal, domestic, and international, that these scholars hoped evolution would eventually explain.

Whether the behaviour Trivers described was indeed more 'altruistic' than those covered by inclusive fitness remained a point of contention between the two researchers. Trivers thought that reciprocal altruism was more worthy of the name in that it was not limited to organisms that shared their genes whereas Hamilton insisted that kin-directed altruism was more commendable because it was less obviously "a sophisticated kind of self-seeking behaviour".[539] Nevertheless, both agreed that reciprocal altruism played a significant role in the development of pro-social human behaviours,[540] and Trivers was optimistic that his theoretical paper suggested "a wealth of testable hypotheses and lines for experimental research and anthropological field work".[541]

**Reassessing the Human Meaning of Inclusive Fitness in the 1970s**

Friendly competition with Trivers aside, by 1971 Hamilton was beginning to feel discouraged about the attention inclusive fitness was receiving. Harvard entomologist E.O. Wilson had also been baffled since 1967 by the "apparent lack of appreciation in Britain of your altruism paper". What is more, Wilson could not understand "The antagonism shown by the several leading entomologists at the London meetings" of the Royal Entomological Society in 1966. To him, it had "no apparent rational basis", and he concluded, "these

[538] See, for example, R.L. Trivers to W.D. Hamilton, 23 January 1970; Trivers to Hamilton, 15 March 1970; Hamilton to Trivers, 2 February 1970, Hamilton archive, Z1X69/1/12.
[539] W.D. Hamilton, notes for Social Biology course, [n.d., c. 1971], Hamilton archive, Z1X90/1/7.
[540] W.D. Hamilton to R.G. Smolker, 20 August 1970, Hamilton archive, Z1X89/1/6.
[541] R.L. Trivers to W.D. Hamilton, 28 July 1970, Hamilton archive, Z1X69/1/12.

gentlemen were just simply dense".[542] Around this time, Hamilton had been more cautious than Wilson in declaring the validity of his theory,[543] but Wilson had no doubts. What is more, he assured Hamilton, "The response to your ideas on this side of the Atlantic has been wholly different", and he encouraged Hamilton to consider emigrating.[544] By the end of 1967, the University of California, Santa Barbara had offered Hamilton a position on their campus,[545] and although he was grateful, he remained hesitant: "on the whole I like Britain too well and feel too well suited where I am to consider emigration seriously at the moment."[546] By the end of 1968, he had received at least one more offer from America.[547] Nevertheless, things did not appear to be so desperate that he was willing to forsake his allegiance to England to further his career.

He could, of course, rest assured that there had been some enthusiasm surrounding inclusive fitness from its early days. Even accomplished biologists such as G.C. Williams had referred to themselves as "disciples" by 1969.[548] Hamilton's contribution was nevertheless proving niche. In March 1969, for example, as Hamilton prepared a talk for a Harvard audience, Wilson was careful to remind him that many American biologists "are still unfamiliar with your basic ideas on the genetics of altruism and origin of social behavior in the insects".[549] Still, 1969 brought more job offers. Robert Ricklefs at the University of Pennsylvania, for example, identified Hamilton among scholars being

[542] E.O. Wilson to W.D. Hamilton, 4 January 1967, Hamilton archive, Z1X89/1/2.
[543] W.D. Hamilton to W. Kerr, 6 May 1966, Hamilton archive, Z1X89/1/1.
[544] Wilson to Hamilton, 4 January 1967.
[545] D.B. Mertz to W.D. Hamilton, 3 November 1967, Hamilton archive, Z1X89/1/2.
[546] W.D. Hamilton to D.B. Mertz, [n.d., c. November 1967], Hamilton archive, Z1X89/1/2.
[547] D, Simberloff to W.D. Hamilton, 4 December 1968, Hamilton archive, Z1X89/1/2.
[548] G.C. Williams to W.D. Hamilton, 14 April 1969, Hamilton archive, Z1X89/1/10.
[549] E.O. Wilson to W.D. Hamilton, 3 March 1969, Hamilton archive, Z1X89/1/6.

considered for future positions.[550] Hamilton was nevertheless resolute: for family reasons, he would remain in Britain.[551]

According to Trivers, the discrepancy between Hamilton's hopes for his work and the shallow enthusiasm it had actually garnered were due to the fact that his early papers' "main predictions concern Hymenoptera".[552] In fact, Hamilton's theory was so closely associated with social insects by this time that Philip Abelson at the Carnegie Institution of Washington invited Hamilton to participate in a symposium as part of "a group of about 20 of the world's leader in the field" of social insects.[553] While such recognition was good news, the assumption that inclusive fitness concerned social insects was divorcing it from its intended universal value, and in the early 1970s, such assumptions threatened to curtail Hamilton's career. Perhaps it was with this in mind that Hamilton publicly reprised his evolutionary evaluation of man.

The 'Man and Beast' symposium volume was finally published in 1971, and Hamilton continued to believe that some good could come from an explicit discussion of evolved social behaviour and man. In light of this, when Robert Barrett at the University of California, Los Angeles asked Hamilton to give a talk updating his 'Man and Beast' paper,[554] Hamilton accepted the invitation with pleasure.[555] Carl Jay Bajema at the Harvard Center for Population Studies also saw the paper to have significant meaning. When he updated the bibliography on 'HUMAN DEMOGRAPHY-POPULATION GENETICS-

[550] R.E. Ricklefs to W.D. Hamilton, 3 April 1969, Hamilton archive, Z1X89/1/6.
[551] W.D. Hamilton to R.E. Ricklefs, 25 April 1969, Hamilton archive, Z1X89/1/6.
[552] R.L. Trivers to W.D. Hamilton, 21 November 1971, Hamilton archive, Z1X69/1/12.
[553] P.H. Abelson to W.D. Hamilton, 21 October 1970, Hamilton archive, Z1X89/1/6.
[554] R. Barrett to W.D. Hamilton, 18 October 1972, Hamilton archive, Z1X89/1/11.
[555] W.D. Hamilton to R. Barrett, 23 November 1972, Hamilton archive, Z1X89/1/11.

ONGOING EVOLUTION-EUGENICS' in the *Eugenics Quarterly* in 1973, he wished to include some of Hamilton's papers.[556]

Beyond these inquiries, the relevance of inclusive fitness to human problems also featured in Hamilton's undergraduate lectures. In 1970, for example, his notes for a "penultimate" lecture include a reminder to "Go on to Smithsonian Lecture", indicating that he ended his undergraduate course with a discussion of human societies.[557] By 1971, the human meaning of inclusive fitness was more explicitly trumpeted within Hamilton's teaching schedule.

Although Hamilton had not initially been convinced that the 1969 Man and Beast symposium served a meaningful purpose,[558] he nevertheless remained committed to the idea that evolutionary theory could inform human society. In fact, he believed the topic was promising enough in October 1969, just five months after the conclusion of the Smithsonian symposium, to justify plans for a course on social biology. The four-week course would begin in 1971,[559] and together with colleagues L.E. Brown, Stephen Young, and T.R.E. Southwood, Hamilton drafted a provisional syllabus covering the following topics: "Learning and intelligence. Communication and language. Innate and acquired behaviour. Aggression. Breeding structure and social behaviour. Human demography. The study of communities." Brown and Young committed themselves to teaching the bulk of the lectures, and plans were made to recruit a sociologist and anthropologist, who would each lecture

[556] C.J. Bajema, [n.d., c. 1973], Hamilton archive, Z1X89/1/25.
[557] W.D. Hamilton, 'Penultimate lecture 1970', Hamilton archive, Z1X90/1/22.
[558] W.D. Hamilton to C. [Friess] Hamilton, 25 May 1969, Hamilton archive, WVJ13/1/7.
[559] Hamilton would continue to teach for this course until he left Imperial in 1977, as evidenced by 'SOCIAL BIOLOGY: Programme 1976-77', Hamilton archive, Z1X90/1/7.

twice.[560] Hamilton would conduct three classes, and in his lectures, he would specifically refer students to papers that had been given at 'Man and Beast'.[561]

'Social Biology' marked a collaboration between zoologists and social scientists within the Industrial Sociology Unit. The lifetime of the Unit was short; it was created in 1965 as part of the Department of Mechanical Engineering, became self-sufficient in 1969,[562] and dissolved into the Department of Social and Economic Studies in 1978. Nevertheless, the brief history of this institution lends insights into how scientific knowledge was targeted to contribute to the efficient running of society.[563]

More specifically, the original organization of the Unit by Professor Joan Woodward is demonstrative of the relevance that psychology and sociology were seen to have to increasing the efficiency of industry and the effectiveness of management. Detailing the history of employee-employer relations from the 'Welfare Phase' of Robert Oliver to the 'Scientific Management Phase' of Frederick Taylor and Frank Gilbreth and the 'Human Relations Phase' of Elton Mayo, Woodward claimed that 1964 marked the beginning of the 'Social Science Phase', in which a marriage between perceptions of man as both an economic animal and a social animal would allow for an increased understanding of industrial behaviour.[564] When Hamilton began to teach 'Social Biology', however, he

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[560] T.R.E. Southwood, 'SOCIAL BIOLOGY COURSE', 20 October 1969, Hamilton archive, Z1X90/1/7.
[561] See, for example, bibliography for Hamilton's 'Social Biology' lectures, [n.d., c. 1971], Hamilton archive, Z1X90/1/7.
[562] J. Woodward, 'SOCIAL SCIENCE RESEARCH COUNCIL GRANT TO THE INDUSTRIAL SOCIOLOGY UNIT', 12 March 1971, Imperial College archives, KIS 2.
[563] In fact, in 1971, the Unit was consulted to organize an interdisciplinary course on 'Science, Technology and Society' after the student union appealed for greater diversification within first degree coursework at Imperial College; see course submission, 'SCIENCE TECHNOLOGY AND SOCIETY'. A news article related to this proposal indicated that the student initiative came on the back of the Dainton and Swann reports, which called for the broadening of science education; see D. Griffiths, 'Imperial Preferences', *Times Higher Education Supplement*, (10 November 1972), Imperial College archives, KIS 2.
[564] J. Woodward, 'UNDERSTANDING INDUSTRIAL BEHAVIOUR', [n.d., 1964], Imperial College archives, KIS/1/2.

pushed the model back towards the economic man. According to him, the calculating self-interest of organisms was not contradicted by examples of group cooperation but, in fact, was reaffirmed.

Telling his students of the true 'nature' of sociality, Hamilton began with an exception. To his knowledge, coelenterate colonies were the only groups of organisms in which no anti-social behaviour had been recorded. In all other cases, close examination revealed "signs of some antagonism between members". Accordingly, animal communities could not be understood to be purely harmonious groups. Instead, they must be recognized to consist of organisms that worked together when it was to the individual benefit of each and who otherwise resisted social obligations.

This had real implications for man's understanding of himself as somehow above natural imperatives. Recounting an old nursery rhyme, Hamilton assured his students that however unique man saw himself to be, observations of animal groups revealed the pervasiveness of "tinker, tailor, soldier and sailor" as well as rich man, poor man, beggar man and thief across animal societies. To students who may have doubted "beggarman & thief", he admitted that chicks begging for food from their parents was the only example of intraspecific begging he could cite, but he nevertheless reassured them that "Thieving in animals [is] much easier to document". More pointedly, however, he described thieves as "parasites",[565] and in doing so, he reduced the persistence of a social ill to little more than a survival strategy.[566] Reaffirming this belief in the 1973 course exam, he asked students to

[565] Elsewhere, Hamilton said that cooperative groups were more open "to exploitation by selfish parasites or fellow travellers" (W.D. Hamilton, manuscript with no title, [n.d., c. early 1970s], Hamilton archive, Z1X90/1/8).
[566] Richard Dawkins would also make this parallel in 1976 when he discussed the benefits provided to large families by the welfare system, allowing offspring of poor families who would not survive in nature to be born

"Explain what you understand by socially parasitic behaviour. Expand your answer into an essay which compares human and animal examples of phenomena that may be called socially parasitic."[567]

Hamilton presented further evidence that man's social capabilities were but an extension of those present in other species pictorially. In a graph titled 'The Recording Angel's View of Animal Groups', Hamilton illustrated his belief that the propensity for cooperation directly correlated with selfish tendencies across animal groups; increase one, and nature inevitably increased the other. According to the graph, humans showed the highest levels of both cooperation and selfishness.

But as we have already seen, for Hamilton, man was not only an example of the patterns of nature; he was also a source of information. Encouraging his students to rely on their own intuition in understanding behavioural strategies in other species, Hamilton asked students to "think of one's own experience as a schoolboy" when trying to understand intraspecific fights. They were similarly expected to draw on their own experiences in love to understand mating strategies, and when discussing dominance hierarchies, Hamilton claimed, "if I were a bottom hen I should feel rather sceptical of being told by superior hens that my pecked and persecuted condition was necessary for the common good. […] I would suspect that they really meant […] their own good."[568] Such extrapolations from the human psyche were perhaps a good teaching tool, but certainly there was a danger in reading culturally specific attitudes into nature.

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without personal financial consequence. The cost was instead being absorbed by the state, by which he meant the rest of the population. To him, it was government-sanctioned thievery operating under the guise of social security; see R. Dawkins, *The Selfish Gene*, [1976], (Oxford: Oxford University Press, 2006), p. 117.

[567] B.Sc. Examination 1973, Social Biology, 3 May 1973, Hamilton archive, Z1X90/1/7.

[568] Hamilton, notes for 'Social Biology' course.

Beyond the relevance of animal societies to human, Hamilton's lectures also articulated the development of the levels of selection debate in which his theory of inclusive fitness featured prominently. In fact, the increasingly maligned subject of group selection was among the first topics he planned to discuss with students in 1971.[569]

That ritual-like patterns of submission had evolved to prevent species extinction, Hamilton maintained, was pure "rhubarb". He believed such an idea was problematic for two reasons: "Firstly it is by no means obvious that the species would be in anyway endangered if there was more bloodshed. […] Secondly I don't see how the implied evolutionary process, based on differential survival of species, is supposed to work." Hamilton claimed that more bloodshed would result in a lower population density, which could be an advantage in the long-term. Moreover, the assumption that there was a differential survival of species based on their intraspecific fighting patterns implied that there have been instances where organisms of the same species did fight each other to death and went extinct as a result.[570]

An additional problem was that to be selected, deference patterns would have to be genetically determined, that is to say, a change in behaviour would result from a genetic mutation. That these mutations would spread across a population fast enough to ensure that the submissive individual tended to fight a dominant organism that recognized and abided by its cues presented a puzzle that could only be solved if either selection occurred at a lower level than the species or a significant degree of genetic drift was occurring. Because genetic drift can only be of limited effect in large populations, Hamilton argued the solution was more likely to be found if we looked to lower levels of selection. This is where

[569] Hamilton, notes for 'Social Biology' course.
[570] Ibid.

inclusive fitness theory came in. He claimed that pro-social traits could evolve because they were "beneficial to small social units". As for the relation between this way of thinking and group selection theories, he argued that things that benefited the family unit could also benefit the species, but this was not necessary. Moreover, he suspected that "Mother Nature, so to speak, really cares very little which is the case."[571]

I have already shown that Hamilton's initial reading of Lorenz passed without judgment on the 'good of the species' rhetoric he so commonly used. Still, Hamilton's 1971 lectures were not the first instance in which Hamilton had taken issue with the group selection of Lorenz in particular. Already in 1969, he claimed that he had "only very limited belief in the efficacy of 'group selection' & no belief at all in the efficacy of natural selection based on 'benefit to the species'". While he professed his admiration for Lorenz and his work on animal behaviour, especially the "exciting & realistic" parallels that Lorenz drew between the behaviour of humans and other animals, he questioned whether Lorenz truly understood the process of evolution. Apart from the example of rats, which represented "one of the very few biological phenomenon" that could be reasonably ascribed to group selection, Hamilton felt that pro-social behaviours were much more likely to have evolved as described in his own theory. According to Hamilton, however, the evolution of altruism provided no guarantee of natural benevolence because "'kin selection' is producing only a slight moderation in an otherwise selfish system".[572]

[571] Hamilton, notes for 'Social Biology' course.
[572] W.D. Hamilton, untitled lecture, 1969, Hamilton archive, Z1X90/1/22.

**Hamilton and the Levels of Selection**

Hamilton's involvement in the levels of selection debate seems to have been, at least in part, a result of his interactions with G.C. Williams. Hamilton had first reached out to Williams in May 1963, and Williams responded with reprints as well as one of his "attacks on the current benefit-to-the-species thinking, which you mentioned in your letter". He also revealed his intention to write a book "on the more general problem of group-related adaptation". In this book, he planned to make a "plea for parsimony" that, if followed, would guarantee there were few cases in which group selection theories could be usefully applied.[573]

This book was eventually published as *Adaptation and Natural Selection* (1966). Williams, however, was not the only biologist to publicly target group selection ideas in monograph form. Oxford ecologist David Lack published *Population Studies of Birds* (1966) in response to Wynne-Edwards's *Animal Dispersion* (1962). According to ethologist William Thorpe, much about the book was praiseworthy, but in the end, it was "really basically polemical". He added that Lack's book supported "an *a priori* idea" but failed to test it more rigorously.[574] Ultimately, Lack's efforts did little to end the debate.

According to historian Mark Borrello, it was Williams' book that "set a new standard for evolutionary studies and focused research at the level of the gene".[575] The book itself was fairly moderate in its attack on group selection and the idea of progress in evolution. Still, Lack and Williams had a personal distaste for such thinking, and in their

[573] G.C. Williams to W.D. Hamilton, 31 May 1963, Hamilton archive, Z1X89/1/1.
[574] W.H. Thorpe, 'David Lambert Lack. 1910-1973', *Biographical Memoirs of Fellows of the Royal Society*, 20 (1974), p. 281.
[575] Borrello, *Evolutionary Restraints*, p. 130.

correspondence, they were more candid. Williams, for example, claimed it was difficult when discussing group selection "to avoid the appearance of sarcasm and ridicule".[576]

Lack himself was happy to see Williams' book in print. He hoped that the esteem Williams carried would do something to push back against the acclaim given to Wynne-Edwards by British biologists "without any specialised knowledge in evolutionary ecology".[577] But Williams was far from finished. By 1968, he was already making plans for an edited volume on group selection.

Williams wanted to include Hamilton's 1964 papers in this volume because he believed they had definitively spoken to questions surrounding the evolution of altruism,[578] but others did not see things to be so obviously resolved. Lack, for example, had been given the citations for Hamilton's papers as early as 1967.[579] It is unclear whether he failed to follow up on the recommendation or simply did not see the papers to be fundamentally important, but Hamilton, too, seems to have doubted Williams' position. Although he confidently dismissed group selection in his lectures from 1965, in private he sometimes wondered whether his theory would weather the surge of evidence put forward in the decade that followed. After asking Williams for his opinion on the work of ecologist Richard Levins in 1971, for example, Hamilton revealed that it had spurred ideas of his own concerning situations in which group selection may provide a more accurate basis of explanation than inclusive fitness would. He hoped to test this by looking at animal communities in rotting logs.[580]

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[576] G.C. Williams to D.L. Lack, 8 June 1967, David Lack archive, Alexander Library, Box 268.
[577] D.L. Lack to G.C. Williams, 2 May 1966, G.C. Williams archive.
[578] G.C. Williams to W.D. Hamilton, 25 October 1968, G.C. Williams archive.
[579] M. Williamson to D.L. Lack, 13 March 1967, David Lack archive, Box 268.
[580] W.D. Hamilton to G.C. Williams, 16 November 1971, Hamilton archive, Z1X89/1/3.

The material in Hamilton's archive demonstrates that far from dogmatic, his position towards group selection was complex and almost always in flux. In 1973, for example, he highlighted an example that he believed deserved the label 'group selection'.[581] Elsewhere, he would indicate that some of the conflict came down to little more than semantics: what some thought was 'group selection' he personally preferred to think of as 'kin selection'.[582] Moreover, he once argued that "kin selection and group selection are really just two arbitrarily defined extremes of a single process".[583] Group selection was something he continued to rethink throughout his life,[584] especially after being prompted to do so by George Price's derivation of a covariance formula that allowed fitness at the level of the gene and fitness at the level of the group to be considered simultaneously.

The influence of this formula on Hamilton's thinking was great, but Hamilton nevertheless assured audiences in the late-1970s that the focus of biologists had "moved back precipitately to the level which Darwin ~~in his texts~~ almost exclusively favoured, that is to the idea that most adaptations have to be explained as being to the benefit of the individual organisms that carry them". This statement, however, neglects the fact that individuals on both sides of the levels of selection debates saw themselves to be following in the tradition of Darwin. While Hamilton and Williams focused on the competitive aspects of the natural world, Wynne-Edwards and others had picked up on the fact that Darwin allowed for selection at higher levels, particularly "the family", in explaining the form and instincts

[581] W.D. Hamilton, 'Neodarwinism & Social Behaviour', 22 October 1973, Hamilton archive, Z1X90/1/3.
[582] See, for example, Hamilton's discussion of D.S. Wilson's *The Natural Selection of Populations and Communities* (Menlo Park: Benjamin/Cummings, 1980) in a letter to V.C. Wynne-Edwards, 24 March 1980, Hamilton archive, Z1X70/1/15.
[583] W.D. Hamilton, 'Lecture 4', 1974, Hamilton archive, Z1X73/1/12.
[584] In 1985, he would return to the idea that "most group selection that works is k.s. [kin selection]" (W.D. Hamilton, 'Strange Paths of Evolution, I.', 7 April 1985, Hamilton archive, Z1Z73/1/12). I will leave it to future researchers to determine the extent to which Hamilton's attitudes towards group selection vacillated.

of non-reproducing worker types in social insect colonies.[585] In fact, he went even further in *The Descent of Man*, and according to historian Robert Richards, Darwin clearly believed that "group selection gave rise to the biologically unselfish moral sense".[586]

Beyond Darwin, scholars in both camps saw themselves to also be following the tradition of population geneticists most commonly associated with the 'modern synthesis'. Of these, Hamilton had most closely focused on the work of R.A. Fisher, who had emphasized the individual as the level on which natural selection acts.[587] Wynne-Edwards, on the other hand, saw himself to be following in the tradition of E.B. Ford, Theodosius Dobzhansky, Ernst Mayr, and Julian Huxley. To him, their work had signalled an important shift: they recognized "that populations, rather than independent individuals, are the basic units upon which evolutionary processes act".[588]

As much as both groups defended the long tradition of their position, the levels of selection debate cannot be effectively seen as an extension of earlier discussions. This is because they necessarily spoke to two pressing questions in the 1970s. First was the threat of overpopulation, around which biologists in particular had assumed leadership positions. Second was the threat that the Cold War appeared to pose to the future of democracy. Thus, it is important to see the explosion of concern about the presence of 'benefit-of-the-species' thinking in scientific texts as part of a larger fear that leftist ideology would not only taint

[585] C. Darwin, *On the Origin of Species*, [1859], J. Carroll (ed.), (Toronto: Broadview Texts, 2003), p. 243.
[586] R.J. Richards, *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior*, (Chicago and London: University of Chicago Press, 1987), p. 219.
[587] Fisher, *The Genetical Theory of Natural Selection*, p. 49.
[588] V.C. Wynne-Edwards, 'The Nature of Subspecies', *Scottish Naturalist*, 60 (1948), pp. 195-6, qtd. in Borrello, *Evolutionary Restraints*, p. 54.

biology but would also undermine individual freedom on a much larger scale.[589] The surge on group selection must, in fact, be recognized to have coincided with a rush of simultaneous fears concerning the end of democracy. British Conservative politician Keith Joseph, for one, had a tendency toward "apocalyptic visions that linked many different elements of decline and crisis" from the 1960s, including fears of internal enemies on the political left. As further evidence of the "paranoid air" that political discussions had assumed by the 1970s, historian Richard Vinen has cited the spy novels of Robert Moss and articles in *The Times*.[590] It is indeed possible that such paranoia infiltrated academia, and as we have already seen, the threat of communism was just the sort of problem that biologists such as Hamilton thought their understanding of social behaviour could speak to.

**Inclusive Fitness Inside and Outside of Biology**

By 1971, Hamilton's work had pervaded the anthropology department at Harvard. Trivers envisioned a course "on natural selection and social behavior", in which he planned to spend several weeks demonstrating the advantages of Hamilton's theory over group selection.[591] As we have already seen, Trivers drew on his observations of the human world in creating his theory of reciprocal altruism, and he continued to work from his intuition when he approached the topic of sexual selection, which he also saw to be significant to the scientific understanding of human society.

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[589] The politics of the levels of selection debate has been discussed in greater detail in A. Shavit, 'Shifting Values Partly Explain the Debate over Group Selection', *Studies in History and Philosophy of Biological and Biomedical Sciences*, 35 (2004), pp. 697-720.
[590] R. Moss, *The Collapse of Democracy*, (1975); P. Jay, 'How Inflation Threatens British Democracy with its Last Chance Before Extinction', *The Times*, (1 July 1974), cited in R. Vinen, 'Thatcherism and the Cold War', B. Jackson and R. Saunders (eds.), *Making Thatcher's Britain*, (New York: Cambridge University Press, 2012), pp. 49-50.
[591] R.L. Trivers to W.D. Hamilton, 12 July 1971, Hamilton archive, Z1X89/1/3.

Beyond his intuition, Trivers engaged with the work of social scientists "on the part physical attractiveness plays in human life", but he begrudged them for failing to measure "reproductive success in humans as functions of interesting variables (hell, as functions of any variables)". Owing to such discrepancies as these, he could only guess that his paper would be "a bitter pill to swallow for many social scientists" insomuch as it applied to humans. But he hoped his course would act as a middleman, and he planned to use it as an opportunity "to convince by example and not exhortation that a sophisticated, comparative psychology and sociology will be built on rigorous reasoning from natural selection".[592] When sent a problem set for the course in November, Hamilton apologized for having "no time at the moment to comment on your nice-looking problems in applied social anthropology!"[593] In doing so, he implied his support for the endeavour. As theoretical as the principles that lay behind discussions of the evolution of social behaviour would later seem, they were nevertheless tied to social problems not only in their development but also in their dispersal.

As much as Trivers himself doubted that social scientists would come around to the idea that evolution is a major force shaping human societies, scholars in the social sciences had been reaching out to Hamilton for some time. In May 1971, for example, Hamilton responded to four offprint requests for his paper on selfish and spiteful behaviour[594] from psychologists J.D. Deluis at the University of Durham, D.D. Thiessen at the University of

[592] R.L. Trivers to W.D. Hamilton, 28 September 1971, Hamilton archive, Z1X89/1/3.
[593] W.D. Hamilton to R.L. Trivers, 12 November 1971, Hamilton archive, Z1X89/1/3.
[594] W.D. Hamilton, 'Selfish and Spiteful Behaviour in an Evolutionary Model', *Nature*, 228 (1970), pp. 1218-20.

Texas, Austin, Irving Zucker at the University of California, Berkley, and Monte G. Senko at Franklin and Marshall College in Lancaster, Pennsylvania.[595]

Beyond the interest that social scientists showed in his papers, Hamilton remained personally interested in using inclusive fitness theory to better understand human society. When Hamilton was contacted by one of Trivers' students who hoped to study kin selection in Japanese macaques, for example, Hamilton felt "great pleasure – even excitement – since it outlines just the sort of approach to wild primate behaviour that seems to me necessary, especially to help us see the background from which human sociality arose". It was, in fact, a project that Hamilton "had very vaguely dreamed of", leaving him with a "slight irrational jealousy" that he could not be the one to carry out the project. Already considering what the results of the experiment would be, Hamilton was not sure

> "whether I hope, or do not hope, that the results will bear out in detail the importance of relatedness in primate behaviour. I have the same mixed feelings about this as I have about studies on primitive human tribes—feelings due to a wish to believe that man has risen above this sort of thing."[596]

Anthropologist Robin Fox had also come around to the idea that evolutionary theory was vital to understanding human society. Although he had heard Hamilton discuss the subject in 1969, it had taken some time for him to buy into inclusive fitness as something more than "hypothetical".[597] When he did, however, he became "very impressed and excited about its possibilities" and invited Hamilton to summarize his "most important and illuminating" theory at a meeting of the Association of Social Anthropologists. The conference would take place in Oxford in July 1973, and Fox considered it to be a

[595] See Hamilton archive, Z1X90/1/4.
[596] W.D. Hamilton to J.A. Kurland, 13 October 1972, Hamilton archive, Z1X89/1/11.
[597] Fox, *Participant Observer*, p. 354.

significant turning point: to his knowledge, it would be the first time social scientists had called for a section on animal behaviour at one of their meetings. While the talk would introduce social scientists to inclusive fitness, Fox did not dismiss the advantages of a blitzkrieg: he wrote, "there is also something to be said for throwing them in at the deep end and showing them perhaps that the biological study of behavior packs some muscle". Fox encouraged him to mention man specifically.[598]

The conference proceedings would be published in a series of volumes, and Fox hoped that this would attract attention since at this point discussion of inclusive fitness was largely limited to biological journals.[599] Surely enough, the publication had impact. As we will see in Chapter Six, Sherwood Washburn, to whom the volume was coincidentally dedicated, was particularly concerned about the place of Hamilton's ideas within anthropological scholarship.

Hamilton accepted Fox's invitation with pleasure, having "long thought that social anthropologists should be more interested in genetic relatedness (and in evolutionary thinking in general)" than they were. He planned to draw on his recent review for the *Annual Review of Ecology and Systematics*, even though the paper mainly referenced social insects. Hamilton was already thinking about ways to turn the emphasis towards vertebrates and, with reference to game theory, even further to man.[600] Fox was, of course, pleased. He believed that Hamilton's perspective was "absolutely fundamental to everything we want to achieve in the study of the evolution of behavior in man". Moreover, he was convinced that

[598] R. Fox to W.D. Hamilton, 7 December 1972, Hamilton archive, Z2X29/1/9.
[599] Ibid.
[600] W.D. Hamilton to R. Fox, 29 December 1972, Hamilton archive, Z2X29/1/9.

"unless we really thrust this at the social scientists, they are going to let it go past them like a train in the night".[601]

By 1973, other scholars were determined to see that the genetics of social behaviour did not go unacknowledged by those in the social sciences. Richard Alexander, for example, undertook a new course "on behavior and evolution, emphasizing human aspects, under the auspices of the College of Literature, Science, and the Arts, rather than as a zoology course". He hoped the opportunity would give him a chance to finish his project on evolutionary aspects of human behaviour and philosophy.[602]

The promises surrounding the evolutionary understanding of behaviour was also implied in October 1973 when it was announced that the Nobel Prize for Physiology or Medicine would be shared between Konrad Lorenz, Niko Tinbergen, and Karl von Frisch. While Frisch was famous for his elucidation of the meaning behind the dance of the honeybee, Lorenz and Tinbergen were more generally commended for their work in establishing ethology, the biological study of behaviour. In *Nature*, the award was celebrated as evidence that studies of behaviour had moved "to the forefront of the biological sciences".[603]

It is worthwhile to briefly consider the category in which the distinguished award for ethology fell. Was it given for ethology's rather obscure relevance to physiology or its potential applications to medicine? Historian Richard Burkhardt, Jr. has argued the latter, especially in light of the fact that the award ceremony detailed the bearing of ethology "on

[601] R. Fox to W.D. Hamilton, 5 January 1973, Hamilton archive, Z2X29/1/9.
[602] R.D. Alexander to W.D. Hamilton, 13 April 1973, Hamilton archive, Z1X89/1/12.
[603] R.A. Hinde and W.H. Thorpe, 'Nobel Recognition for Ethology', *Nature*, 245 (1973), p. 346, qtd. in Burkhardt, *Patterns of Behavior*, p. 1.

such medical disciplines as social medicine, psychiatry and psychosomatic medicine".[604] While this may seem odd, it is further evidence that removed from the context of their time, the social relevance of these ideas becomes difficult to reimagine.[605] Hamilton, too, did not mention man in the majority of his papers, but medical practitioners nevertheless requested offprints consistently. By the end of the 1970s, it was not uncommon for psychiatrists to express their desire to combine sociobiological insights with the science of psychiatry.[606] What is more, by the 1980s scholars would be prompted to organize an entire society around the idea that sociobiology could inform the practices of psychiatry and psychology, and this subject will be explored more fully in Chapter Seven.

Still, in 1973, Hamilton felt that for all of its relevance inside and outside of biology, the topic of altruism remained "the most neglected idea in evolutionary theory". Was it artificial or natural, learned or innate? The pervasiveness of self-sacrifice throughout the natural world seemed to undermine ideas that it was dependent on culture. According to Hamilton, "Certainly BIRDS and INSECTS don't learn their social behaviour. And even human CULTURES must not make their bearers too unfit". What is more, to Hamilton, it was a simple "fact that altruism is obviously CORRELATED with KINSHIP", and this, he continued to think, must be the starting point for true understanding. Moreover, for altruism to be extended beyond the kin group, Hamilton believed that the crucial issue involves the restriction of migration: "Low migration between groups should lead to COMMUNISM of behaviour within groups combined with HOSTILITY TO OUTSIDERS. RATS, MICE,

[604] Burkhardt, *Patterns of Behavior*, p. 448.
[605] Lorenz had already been cited as an authority for questions of child development related to criminal behaviour in 1962; see H. Klare, 'Getting at the Roots of Crime', *The Observer*, (26 August 1962), p. 6.
[606] He was invited to lecture for the Bar Harbor Course in Medical Genetics (V.A. McKusick to W.D. Hamilton, 24 April 1978, Hamilton archive, Z1X64/1/15). See also, G.G. Dimijian to W.D. Hamilton, 12 October 1977, Hamilton archive, Z1X89/1/15; J.S. Lockard to W.D. Hamilton, 29 June 1978, Hamilton archive, Z1X64/1/16; Hamilton to S. Essock-Vitale, 9 July 1979, Hamilton archive, Z1X89/1/16.

HYENAS, WOLVES, HUNTING DOGS, BABOONS, CHIMPS, Compare to SOCIAL INSECTS, with their intra-group amicability and inter group HOSTILITY".[607] The animal world provided no evidence that global brotherhood was a distinct possibility.

Hamilton himself was perhaps buying into the celebrity surrounding ethology in these years when in 1974 he proposed topics a lecture at the University of Texas, 'Innate social aptitudes in man' or 'How to tell man from the animals'. For the latter, he was also considering the more sober title, 'Ethology and ethics'. Both talks would emphasise man, but the second "would be more concerned with how the science of evolutionary ethology impinges on human ethics, as I see the matter".[608] By 1975, however, the subject of ethology was at risk of becoming totally obsolete when faced with the quantitative and far-reaching genetic explanations of social behaviour purported by Hamilton and his colleagues. A new '-ology', emphasizing parsimony and consilience, was poised to unite not only fragmented groups within biology but also the social sciences. The time for this merging was ripe: in 1974, an article in the *New York Times* celebrated Hamilton's theory: "It is not mainstream yet, but many scientists think it's where the action is going to be."[609]

**Sociobiology: The Way Forward or a Reactionary Excuse for Doing Nothing?**

In 1975, E.O. Wilson published *Sociobiology: The New Synthesis*. He hoped the new discipline would systematically study "the biological basis of all social behavior". He would later identify Hamilton's theory of inclusive fitness as the "key organizing factor" for a

[607] W.D. Hamilton, 'Neodarwinism & Social Behaviour', 22 October 1973, Hamilton archive, Z1X90/1/3.
[608] W.D. Hamilton to K. Selander, 21 January 1974, Hamilton archive, Z1X89/1/12.
[609] S.A. Boorman and P.R. Levitt, 'Social Animals Do Not Always Compete: On the Genetics of Altruism', *The New York Times*, (10 March 1974), Hamilton archive, WVJ13/1/6.

revolutionary field with the ability to arrive at an "objective meaning of human nature".[610] With its initial publication, however, alarms sounded. According to philosopher Roger Masters, inclusive fitness was primarily controversial inasmuch as it was misconceived to be "a new version of the 19th century conservative doctrine called 'Social Darwinism'",[611] and to be sure, some individuals found in sociobiology a scientific defence of capitalism.[612] Whether the links between the new biology of behaviour and earlier 'scientific' theories of society were truly misconceived remains open for debate. While biologists such as John Alcock have insisted on the 'triumph of sociobiology' over its political critics,[613] even Bob Trivers drew upon the connection between sociobiology and previous efforts to apply evolutionary theory to human society, and he referred to Hamilton's work in the 1960s as having ushered in a second wave of social Darwinism.[614]

Trivers seems to have found this claim unproblematic, and he altogether failed to engage with atrocities committed against individuals, communities, and constructed categories deemed 'unfit' during the first 'wave' of social Darwinism. Indeed, it is difficult to exaggerate the devastation wrought through appeals to natural 'fact' with regard to harsh immigration laws, insufficient poverty relief, and forced sterilization. Given the long history

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[610] E.O. Wilson, *Sociobiology: The New Synthesis*, [1975], (Cambridge and London: Harvard University Press, 2000), pp. 4, v, vii.
[611] R.D. Masters, 'Is Sociobiology Reactionary? The Political Implications of Inclusive-Fitness Theory', *The Quarterly Review of Biology*, 57 (1982), p. 276. As historian Geoffrey Hodgson has recently examined, 'social Darwinism' emerged as a retrospective label and functioned to weaken laissez-faire ideologies. It was used from the 1940s to "dismiss any use of biological ideas in the social sciences" (G. Hodgson, 'Social Darwinism in Anglophone Academic Journals', *Journal of Historical Sociology*, 17 (2004), p. 430).
[612] See, for example, R. Wright, 'A Genetic Defense of the Free Market', *Business Week*, (10 April 1978), p. 100, cited in M. Yudell and R. Desalle, 'Sociobiology: Twenty-Five Years Later', *Journal of the History of Biology*, 33 (2000), pp. 577-84.
[613] J. Alcock, *The Triumph of Sociobiology*, (Oxford: Oxford University Press, 2001).
[614] R.L. Trivers, 'Natural Selection and Social Theory: Lecture 11', 19 April 1978, Hamilton archive.

in which biology was abused to serve political ends,[615] it is not surprising that in the 1970s scholars such as philosopher Stuart Hampshire believed that the relationship between social Darwinism and sociobiology was real. Indeed, Hampshire issued a clear warning to those who found the new bells and whistles that sociobiological explanations offered entrancing: "It is one of those old chestnuts that one can expect to be taken out of the drawer occasionally and dusted and polished until it looks almost as good as new."[616]

Even before 'sociobiology' began to make the headlines, comparisons had been drawn between evolutionary interpretations of social behaviour and 'social Darwinism'. Dillon Ripley, who hosted the 'Man and Beast' symposium, warned that the history of biology demonstrated the extent to which premature conclusions in comparative biology could harm social values.[617] Given the perceived relationship between social Darwinism and sociobiology, it is interesting that Hamilton himself remained untouched by political controversy until 1977. Nevertheless, he felt his nonconformity all the same and identified himself as early as 1964 in the passage, "Then fly and do not weaken. They will hound you yet".[618]

While we have seen in Chapter Four that there was a whirl around the biology of social behaviour at least in America in the late-1960s, not everyone was so eager to explain the prevalence of war and intergroup conflict as natural and inevitable. As early as December 1969, students rallied at Simon Fraser University, Vancouver, and the biologist

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[615] See, for example, W.R. Greg, 'On the Failure of "Natural Selection" in the Case of Man', *Fraser's Magazine*, 78 (September 1868), pp. 353-62; C.B. Davenport, 'The Effects of Race Intermingling', *Proceedings of the American Philosophical Society*, 61 (1917), pp. 364-8; K. Pearson, *The Right of the Unborn Child*, (London: Cambridge University Press, 1927); H.H. Goddard, *The Kallikak Family: A Study in the Heredity of Feeblemindedness*, (New York: Macmillan, 1927).
[616] S. Hampshire, 'The Politics of Sociobiology', *The New York Review of Books*, (31 May, 1979).
[617] S.D. Ripley, 'Preface', J.F. Eisenberg and W.S. Dillon (eds.), *Man and Beast*, pp. 5-6.
[618] Hamilton, *Narrow Roads of Gene Land*, i, 185.

they faulted was Niko Tinbergen, who "was hit by people's disapproval in a way he had never experienced before". Prior to this, Tinbergen had largely avoided work on man, but according to his former student Hans Kruuk, by 1968 Tinbergen "felt his abilities as a scientist/naturalist to be on the wane, whereas his concern about the fate of mankind was on the increase […]. He had to do something that he could justify in terms of immediate benefits for mankind."[619] He was met with deep-seated disapproval.

The students maintained that Tinbergen was "a notorious biologist who has been presenting the theories of innate aggressiveness, instinctive urges for territory, need for 'living space', etc. which have been popularized in the writings of Konrad Lorenz, Robert Ardrey, Desmond Morris and other so-called scientists". They informed Tinbergen "how his ideas were fascist, the same ideas the Nazis encouraged and developed and that they had no scientific base whatsoever".[620] Such an accusation was likely especially hard on Tinbergen since he had been placed in an internment camp from 1942 to 1944 for refusing to cooperate with German authorities as they replaced Dutch professors with Nazi party members.[621] In response to the protest, Tinbergen wrote to the Master of Wolfson College to say that he endeavoured "to understand these youngsters because we shared so much of their hostility against American commercialism and greed, but we too came to the conclusion that they had completely closed minds".[622]

Undeterred by or unaware of such controversies, E.O. Wilson was convinced by 1971 that sociobiology was the way of the future, and he believed it was particularly

[619] H. Kruuk, *Niko's Nature: The Life of Niko Tinbergen and His Science of Animal Behaviour*, (Oxford: Oxford University Press, 2003), p. 255-6.
[620] Ibid, p. 256.
[621] Burkhardt, *Patterns of Behavior*, p. 228.
[622] Kruuk, *Niko's Nature*, p. 257.

important for an understanding of man's current predicament. He wrote, "The dilemma of mankind is that […] we could perhaps cooperate better as a society with termite-like altruism and regimentation, yet we cannot and must not forsake the primate individuality that brought us to the threshold of civilization in the first place."[623] As his goals for sociobiology moved forward, the area became a hotbed for fierce public debate. By 1974, microbiologist S.E. Luria had urged biologists not to involve themselves in "socio-political traps beyond the scope of science" by attempting to biologize aggression, IQ, or the ecological crisis.[624] Against his advice, however, books continued to pour out. Konrad Lorenz, for one, persisted in making claims regarding our 'innate' aggression. His *Civilized Man's Eight Deadly Sins* was published in English in 1974, and it supported a view that science could enlighten societies previously unaware that the ideals and values promoted by religion were illusory.[625] By 1974, E.O. Wilson, too, had decided to throw his hat in the ring, and in June he informed Hamilton of his intention to write "a monograph suitable for use in upper division courses on sociobiology and related fields", tentatively titled 'The Biology of Societies'.[626]

In the wake of the publication of Wilson's *Sociobiology* in 1975, professors and students united in protest. Significantly, it was not only those in the social sciences that voiced their opposition to the new biological assessment of mankind but also the sciences, including some of Wilson's colleagues in biology at Harvard. The most prominent among them were Stephen Jay Gould and Richard Lewontin, and the debate quickly became overtly political. Wilson himself was accused of grounding the political agenda of right-wing

[623] E.O. Wilson, 'The Prospects for a Unified Sociobiology', *American Scientist*, 59 (1971), p. 403.
[624] S.E. Luria, 'What Can Biologists Solve?', *The New York Review of Books*, (7 February 1974).
[625] R. Sennett, 'Surrender of the Will', *The New York Review of Books*, (18 April 1974).
[626] E.O. Wilson to W.D. Hamilton, 20 June 1974, Hamilton archive, Z1X89/1/13.

ideologues in nature, whereas to Wilson, the opponents of sociobiology appeared to be motivated by ideological rather than scientific concern. Specifically, he believed they were incensed by the fact that sociobiology was seen to conflict with Marxist theory and the aims of the New Left.

A central part of Wilson's book relied on the concept of 'kin selection', and the problem presented by altruism was a dominant theme. It was Wilson's application of the 'new synthesis' to man, however, that was most controversial, so much so that when Wilson received the National Medal of Science in November 1976, reports indicated that the award had been given "in recognition of his pioneering research into the organization of insect societies and the evolution of social behavior in insects and other animals".[627] This choice to highlight the relevance of his work only in relation to "insects and other animals" and the overall avoidance of the term 'sociobiology' is indeed interesting. It seems possible that the more contentious chapters of his work on social behaviour, those on human evolution, were purposefully glossed over.

**The Case of the Mountain Bluebird**

For the time being, Hamilton's life remained unchanged by Wilson's publication, and he continued to lecture at Imperial College, still without promotion. As we have seen, the self-sacrifice involved in parental care had been significant to the development of inclusive fitness, and by 1975 he had reason to readdress parental care in his lectures. Although nature's tendency was to burden the female with the majority or totality of parental care, in some species, males and females shared the responsibility. What new

[627] 'E.O. Wilson Honored', *MCZ Newsletter*, [n.d., c. 1976], Hamilton archive, Z1X64/1/17.

observations showed, however, was that "where the male does help with parental care he is very sensitive, as in man, about adultery". This had recently become clear in the "Case of the mountain blue bird".[628]

This citation indicates Hamilton's familiarity with the controversial work published by Harry W. Power in 1975. Power's choice of topics speaks to the attention that altruism was garnering within the biological world, but much of the publicity surrounding his ideas was due to the wider academic community's concern for the cultural implications of the scientific study of altruism and specifically how this 'science' could be used to inform social policy.

Power had maintained that even kin altruism was absent in mountain bluebirds.[629] What is most significant, however, is Power's belief that his work was pertinent to social policy. Power argued that it was "important to assess the frequency of true altruism in nature" because "officials assume that humans […] are basically either altruistic or selfish".[630] Amidst these explicit claims of relevance, biologists and social scientists took issue with Power's publication. Ecologist Stephen T. Emlen's critique was scientific,[631] but psychologist Vladimir J. Konecni's assessment went further. There was great danger, he claimed, in "scientists eager to overinterpret their findings", and "By phrasing the altruism-selfishness issue as an either-or question, and by the very mention of social policy in a report on bluebirds, Power shows a lack of caution".[632]

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[628] W.D. Hamilton, 'Lecture 10 12/9/75', Hamilton archive, Z1X90/1/19.
[629] H.W. Power, 'Mountain Bluebirds: Experimental Evidence Against Altruism', *Science*, 189 (1975), p. 142.
[630] Ibid.
[631] S.T. Emlen and H.W. Power, 'Altruism in Mountain Bluebirds?', *Science*, 191 (1976), p. 808.
[632] V.J. Konecni and H.W. Power, 'Altruism: Methodological and Definitional Issues', *Science*, 194 (1976), p. 562.

Power attacked the implications of Konecni's conclusions. He argued that Konecni not only "denies the value of comparative method" but also "that nature has order and thus […] the possibility of science". Power, like Wilson and Hamilton, was concerned with "various ideologies (economic, religious, scientific) [which] assume humans to be altruistic, or at least fully capable of altruism". Furthermore, he continued, "because these ideologies do or would shape our lives, determining the truth […] may have vital consequences." He believed that since the presence of altruism was a testable hypothesis, science could resolve otherwise subjective beliefs concerning the nature of humans as selfish or social. Power had only mentioned social policy, he claimed, "to indicate the importance of resolving the altruism question". Indeed, it seemed to him that only a science of selfishness could defend society against unfounded political ideologies or religious sects once and for all. The extent to which this debate was presumed to be ideological is indicated through Power's declaration that "most ideologues and social scientists of my acquaintance assume human altruism and so seek to devise schemes to make manifest our supposed innate altruism".[633]

Power does not emerge again in the record left by Hamilton until the early 1990s, when he asked Hamilton to act as a referee for his promotion. His attached curriculum vitae lends more insight to the motivations behind his earlier work, but it is also indicative of a pervasive bias against non-scientific disciplines by biologists studying social behaviour in the late-twentieth century. For example, Power stated, "The worst of the students have been […] some of the non-biology majors who take classes in science only because they must in order to fulfil distribution requirements."[634]

[633] Konecni and Power, 'Altruism: Methodological and Definitional Issues', pp. 562-3.
[634] H.W. Power, 'Personal Statement', [n.d., c. 1990], Hamilton archive, Z1X69/1/2.

Summarizing his career, Power wrote that he had "always been most interested in 'why?' questions". Concerning his work on mountain bluebirds specifically, he professed its relevance to "philosophically central questions". Furthermore, he claimed that his 1975 paper was important inasmuch as it went "to the heart of a long standing argument in biology, philosophy, and politics over whether humans and other animals are fundamentally selfish or altruistic".[635] The idea of cultural ideals squashed by biological truths will continue as a theme in later chapters.

### *The Selfish Gene* and "the many roots of our suffering"

Another popular treatise on the biology of social behaviour was published in 1976, this time by Richard Dawkins. Dawkins had studied zoology as an undergraduate at Oxford; under the supervision of Niko Tinbergen he stayed on to pursue postgraduate work. Introduced to inclusive fitness by Mike Cullen, he was among the first biologists to recognize the significance of Hamilton's ideas. What is notable, however, is the fact that he began to incorporate the theory of inclusive fitness into his lectures at Oxford in 1966. Here, he drafted but crossed out the human meaning of 'selfish genes' that would be intensely debated in the following decade: did selfish genes make for selfish individuals? Dawkins' original answer was "Not necessarily, though it does mean that we must be very suspicious of expressions like 'the good of the species.'"[636]

From 1967 to 1969, he taught at the famously left of centre University of California, Berkeley, where he became involved in anti-war protests. Having returned to the UK in the early 1970s, however, Dawkins' research requiring the use of computers was interrupted by

[635] Power, 'Personal Statement'.
[636] R. Dawkins, *An Appetite for Wonder: The Making of a Scientist*, (London: Black Swan, 2014), pp. 199-200.

the constant power shortages. It was then that he decided to work from his 1966 lectures on inclusive fitness to begin writing *The Selfish Gene*.[637] Thus, although he would later say, when confronted by philosopher Mary Midgley, that he was not particularly interested in humans and human societies but in evolution more generally,[638] this contradicts the fact that his initial decision to write seems to have been made in lieu of the wide social unrest he had witnessed.

By 1976, the discouraging situation in Britain was demonstrated by a parody of 'The Lord's Prayer' titled 'The British Prayer'.

> "Our Father which art in Downing Street,
> Harold be thy Name
> United Kingdom gone,
> We shall be done on earth,
> and probably in heaven,
> Give us each day our dearer bread,
> And forgive them that speculate against us,
> Lead us not into the Common Market
> But deliver us to the unions,
> For this is the Kingdom, no
> power, no Tory,
> For ever and ever, Amin."[639]

In such years of discontent, was Dawkins looking to explain social ills in terms of man's biology? Certainly Bob Trivers saw this to be the case. In the foreword to the first edition of *The Selfish Gene*, he wrote, "Darwinian social theory gives us a glimpse of an underlying symmetry and logic in social relationships which, when more fully comprehended by ourselves, should revitalize our political understanding and provide the intellectual support

[637] R. Dawkins, *Beautiful Minds*, Dir. J. Farnham, BBC, 25 Apr. 2012, Web, <http://www.bbc.co.uk/programmes/b01glqt3>.
[638] R. Dawkins, 'In Defence of Selfish Genes', *Philosophy*, 56 (October 1981), p. 556.
[639] Unknown to W.D. Hamilton, 18 April 1976, Hamilton archive, WVJ14/1/10.

for a science and medicine of psychology." What is more, he claimed, "In the process it should also give us a deeper understanding of the many roots of our suffering."[640]

*The Selfish Gene* originally consisted of eleven chapters, the titles of which lend support to Trivers' interpretation of the book. Dawkins' book saw questions concerning war, welfare, family conflicts, overpopulation, and the relationships between men and women as having an unmistakable biological determinacy. Still, according to Dawkins, he had meant to write a biological, meaning also an apolitical, text. The extent to which 'selfish genes' were a metaphor inspired lengthy debates, but even if Dawkins did not aim to produce a text with significant political meaning, it was nevertheless read that way both by other proponents of genetic explanations of social behaviour and the more general public. Extreme right-wing groups such as the National Front were quick to quote from it, and according to Dawkins, it was their controversial adaptation of selfish genes, rather than anything he had actually said, that provoked scholars on the political left to attack the book.[641]

By July 1976, the biology of altruism had attracted enough attention that Hamilton and John Maynard Smith were interviewed for *The Listener*. Here, the relevance of questions within biology to the human world was explicitly highlighted, especially in relation to policies concerning education and aid to developing countries. Moreover, the article cited "considerable controversy" surrounding the "extent to which the pattern of human society can be regarded as […] simple consequences of the pattern of our genes", but Maynard Smith did not mince words. According to him, there was no doubt that individuals were no different from bees in being "a device invented by a gene for making more genes".

[640] R.L. Trivers, 'Foreword', July 1976, in Dawkins, *The Selfish Gene*, p. xx.
[641] R. Dawkins, *Nice Guys Finish First*, Dir. J. Taylor, BBC, 14 April 1986.

Hamilton agreed, and what is more, he claimed it had been his 1963 summary that had stimulated "present interest" in the nature of social behaviours.[642]

Perhaps owing to the prominent role Hamilton's theory played in prompting the project, Dawkins sent Hamilton a copy of his book on 30 September 1976, six months after its initial publication.[643] Later that year, Hamilton was asked by *Science* to review it. Already, parallels were being drawn between Dawkins' book and Wilson's. According to Katherine Livingston in the book review department, "The book is a presentation for the general reader of the basic concepts and arguments of sociobiology (although the author himself does not use that term)." Livingston claimed it was an important task, "considering the polemics and misunderstandings that have surrounded the subject".[644] Whether for this or another reason, Hamilton accepted, and the book quickly proved worth discussing. By 1977, Dawkins noticed that the title had even found its way onto the programme of the United Reformed Church in Summertown, Oxford, and he passed it along to Hamilton, who he thought would find it amusing. On 15 May 1977, The Reverend Donald W. Norwood was scheduled to speak on 'The Selfish Gene and the Resurrection of the Body'.[645]

Having established a name for himself with *The Selfish Gene*, Dawkins would go on to become most famous for his attacks on religion, publishing *The Blind Watchmaker* in 1986 and *The God Delusion* in 2006. If it was indeed his aim to undermine religious beliefs and promote the theory of evolution in the process, it seems that his primary motivation to become involved in the science of social behaviour differed from that of Hamilton. In the

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[642] J. Maddox, W.D. Hamilton, and J. Maynard Smith, 'The Kamikaze Bee and the Genetics of Self-Sacrifice', *The Listener*, (22 July 1976) pp. 71-2.
[643] R. Dawkins to W.D. Hamilton, 30 September 1976, Z1X89/1/17.
[644] K. Livingston to W.D. Hamilton, [n.d., c. 6 December 1976], Hamilton archive, Z1X89/1/17.
[645] Programme, The United Reformed Church, Summertown, Oxford, 15 May 1977, attached to letter from R. Dawkins to Hamilton, 4 June 1977, Hamilton archive, Z1X89/1/17.

1950s, the reach of religious beliefs was a frustration for Hamilton, but he was far more concerned about the threat posed by communism. Moving into the late-1970s and especially the 1980s, however, Hamilton's attention, too, seems to have shifted. As we will see in Chapter Six, the early crusades of liberal social scientists were proving to be insignificant compared to the rise of religious conservatism, whose followers often failed to consider the possibility of evolution altogether.

Still, in 1976 it was Richard Lewontin who was foremost in questioning the scientific legitimacy of Dawkins' celebrated achievement. Despite the fact that Lewontin was rumoured to be "about finished apparently" in his attacks against Wilson in April 1976,[646] Dawkins did not escape Lewontin's ire. Published in *Nature* in March 1977, Lewontin's review accused Dawkins of having produced no more than a "vulgar" caricature of Darwinian theory, the most recent in a string of many since 1859. Having recently "rediscovered behaviour", biologists once again set their sights on explaining the whole of the natural and human world with endless references to adaptations. According to Lewontin, Dawkins himself played a rather superficial role in all of this; he was no more than an "enthusiastic reporter" of recent work done in the developing field of sociobiology by evolutionary theorists. For Lewontin, the 'science' behind the 'selfish gene' amounted to little more than plausible story telling, the invention of which could be attributed to "high-table wit" just as much as the scientific method. Whether the theories of Hamilton and Trivers would eventually be found to be one or the other was a question left unanswered, at least explicitly.[647]

[646] J. Lloyd to W.D. Hamilton, 14 April 1976, Hamilton archive, Z1X89/1/19.
[647] R.C. Lewontin, 'Caricature of Darwinism', *Nature*, 266 (17 March 1977), pp. 283-4.

Personally provoked, Hamilton labelled Lewontin's review of *The Selfish Gene* a "disgrace" and argued that it failed "to meet any of the standards of informative value, objectivity and fairness to the views of others that are part of the code of science". What was more troubling to Hamilton, however, was that Lewontin might sweep *The Selfish Gene* under the rug. According to Hamilton, this would have been a tragedy because it was not only "the best existing outsider's introduction to a new paradigm and a new field of knowledge" but also a separate contribution to the field. Playing into the discipline's history and the Darwinian legacy he believed his colleagues to be carrying forth, Hamilton compared Lewontin's review to "Bishop Wilberforce's notorious attack on Darwin and Huxley at the British Association meeting of 1860". Whether or not it reflected "an ignorance of the difference between 'properties of sets and properties of their members' or 'confusion between materialism and reductionism'", Hamilton felt that *The Selfish Gene* was illustrative of scientists' desire to understand nature, and for this, he praised it.[648]

Dawkins had been tempted to respond to Lewontin himself and reported to Hamilton that he was being egged on by *Nature*. He was therefore pleased that Hamilton had taken the lead. Commenting on Hamilton's condemnation of Lewontin, however, Dawkins had one complaint. He thought that Richard Owen would have offered a better comparison to Lewontin: "One of the foremost biologists of his day, he realized he had missed the boat and systematically set about to sink it."[649] In doing so, he demonstrated the historical significance these actors saw themselves to have. In fact, they were very much aware that they were charting a new chapter in a long narrative of scientific fact over myth and superstition.

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[648] W.D. Hamilton to the Editor of *Nature*, 24 March 1977, Hamilton archive, Z1X89/1/17.
[649] R. Dawkins to W.D. Hamilton, 4 June 1977, Hamilton archive, Z1X89/1/17.

Dawkins had, however, drafted a reply to Lewontin. It was labelled "NOT FOR PUBLICATION" and "circulated around the Nature office",[650] and it gives us a glimpse into the heated actions and reactions inspired by Dawkins' book. For example, Dawkins begrudged Lewontin for having written him "off as an enthusiastic reporter who only superficially understands the great insights of others, but I suppose I should be grateful to have escaped insinuations of complicity in Nazi atrocities". Addressing Lewontin's "scientific misunderstandings", he was particularly perturbed that Lewontin had criticized his metaphor "of animals as robot survival machines manipulated by their genes". He asked, "If Lewontin is not a robot survival machine, albeit a highly complex and intelligent once bristling with emergent properties, then what on earth is he, the warhorse of an immortal soul?" He could only guess that the real motivation behind Lewontin's attack was the relationship he assumed there to be between *The Selfish Gene* and *Sociobiology*. In case his book was "being used as a target off which to bounce brickbats down the corridor", Dawkins made clear the fact that he had begun writing *The Selfish Gene* before he had any idea that Wilson was writing *Sociobiology*. Although he had become aware of Wilson's book when his was only half finished, he claimed not to have read it until completely finished with his draft. Although he was forthcoming in his admiration for Wilson and lamented "the ill-mannered spite he has had to endure", he insisted that his book had nothing to do with Wilson's, save the fact that he added a paragraph stressing the limitations of Wilson's reference of kin selection.[651] They were perhaps commiserators, but Wilson and Dawkins were not collaborators.

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[650] R. Dawkins to W.D. Hamilton, 15 June 1977, Hamilton archive, WVJ13/1/6.
[651] R. Dawkins, 'DRAFT', [n.d., c. 1977], Hamilton archive, Z1X89/1/17. Dawkins' editor, Michael Rodgers, nevertheless believed the controversy surrounding Wilson's book would likely help sell *The Selfish Gene* (S.

While Hamilton came to Dawkins's defence, University of Hull zoologist John M. Douglas warned him against lining up too closely with Dawkins. Though Douglas was disgusted reading Lewontin's review, thinking him "singularly lacking in the scientific objectivity and ethical standards that one might expect from someone of his experience", he felt Dawkins had "overdone it" with *The Selfish Gene*, and he worried Hamilton's "good name and reputation" might be soiled by too close an association with the more controversial aspects of Dawkins' book.[652]

An undated lecture by Hamilton indicates that he may have taken the advice of Douglas. Here, we see that even though Hamilton applauded the biological trend away from explanations involving group-level adaptations, he was not sure things should go so far as Dawkins had taken them. He wondered if Dawkins had merely "substitute[d] one philosophical problem for another" in pushing the emphasis on genic level selection to its extremes. While Hamilton could never tell what exactly was argued as being selected in discussions of group selection, he equally wondered if the 'gene' was "too small and chemical to show anything that could be called a strategy or coadaptation at all".[653] In fact, in Hamilton's opinion, the levels of selection debate remained far from a decisive conclusion, and as late as 1983, he indicated his hopes that future scholars would reach a more complete understanding of the role of group selection in evolution.[654]

While it seems that Hamilton, having already been asked to do so by *Science* at the end of 1976, was spurred to write a review of *The Selfish Gene* in response to Lewontin's

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de Chadarevian, '*The Selfish Gene* at 30: The Origin and Career of a Book and Its Title', *Notes and Records of the Royal Society of London*, 61 (2007), p. 33).
[652] J.M. Douglas to W.D. Hamilton, 31 May 1977, Hamilton archive, Z1X89/1/17.
[653] W.D. Hamilton, 'Wraiths of the Superorganism', [n.d., c. 1976-1977], Hamilton archive, Z1X90/1/23.
[654] W.D. Hamilton to B.S. Lipkin, 6 May 1983, Hamilton archive, Z1X73/1/10.

critique in *Nature* in March 1977, it is not clear why Hamilton waited until 1977 to review *Sociobiology*. As not only a late review but also only one among many reviews and even reviews of reviews, Hamilton's contribution may not seem particularly notable. What is significant, however, is the tone Hamilton assumed when writing. This tone, in fact, forms a prelude to the his new stance from 1977 as an apolitical and disinterested biologist who happened to be the intellectual figurehead behind what had arguably become the most heated biological debate of the twentieth century.

While most reviews targeted Wilson's discussion of man, limiting themselves largely to the first and last chapters of the weighty tome, Hamilton focused on technical questions and issues of semantics. One of his complaints was Wilson's failure to include a discussion of the relevance of game theory to evolutionary models of behaviour, but Hamilton's biggest hang-up was Wilson's discussion of altruism in connection with group selection. Here, he felt that Wilson had conflated the major issues by insinuating that group selection was involved in every observed case of altruism and poorly defining the concept of 'kin selection', which Hamilton already had issues with. Not surprisingly, he found 'inclusive fitness' to be more useful.

Still, he did not hesitate to predict that the book would usher in meaningful change. According to Hamilton, humankind stood "poised to cross a threshold to a new kind of self awareness: this book holds open the door". Moreover, he admitted that his own intuitive sense of things matched Wilson's, and he commended Wilson's ability to go beyond what is known and predict what would come, predictions that he believed would "prove correct in almost every part". He believed that such an ability was derived from "honest introspection,

love of knowledge and love of ants".[655] In doing so, Hamilton seems to have acknowledged self-examination as playing an important role in the development of theories of social behaviour. Nowhere, however, did he indicate any fears that such self-analysis might speak more to cultural habits than evolved instincts.

Despite the above caveats to his endorsement of *Sociobiology*, as well as his limited support of *The Selfish Gene*, Hamilton's reviews of both bestselling books in 1977 lent them a degree of scientific credibility. It was now taken for granted in most circles that Hamilton was an objective biologist, who was more at peace digging under rotting bark than navigating within the complicated human world. His interests were assumed accordingly.

**Conclusion**

As we have seen, Hamilton was not the only scholar interested in the meaning of evolution for human societies by the late-1960s. George Price, Bob Trivers, and Richard Dawkins each seem to have associated themselves with inclusive fitness because they hoped that such understanding of social behaviour promised to shed light on the human condition. Hamilton, too, continued to articulate his views regarding the meaning of inclusive fitness for man, even going so far as to help design a social biology course at Imperial College. The biology of behaviour was also garnering attention on a global scale by 1973, when the founders of ethology were awarded a Nobel Prize. Although there was already some reluctance to biological theories of behaviour within academia in the early 1970s, there were also a number of anthropologists, psychologists, and medical doctors who believed that inclusive fitness could inform their disciplines in meaningful ways.

[655] W.D. Hamilton, 'Sociobiology: The New Synthesis by E.O. Wilson', *Journal of Animal Ecology*, 46 (October 1977), pp. 975-7.

What is more, we have seen that while Hamilton vocalized his distaste for left-wing political commitments continuously from the 1950s, his reaction to group selection was much more complicated. Hamilton certainly took issue with Wynne-Edwards' treatise on social behaviour from 1965,[656] but archival evidence does not substantiate the assumption of many historians and sociologists that Hamilton was primarily motivated by an aversion to benefit-of-the-species rhetoric. Although Hamilton was willing to consider group selection throughout his lifetime, he showed no such sympathy for political ideologies that emphasized the collective. This point reinforces my earlier claim that Hamilton was more critical of collectivist political ideologies than he ever was of collectivist biological theories. Thus, Hamilton's theory of inclusive fitness may be more accurately seen to be in dialogue with prevalent cultural assumptions than it was with other scientific works.

A partial explanation for the assumption that inclusive fitness was primarily a response to group selection rhetoric is that the scientific and political aspects of group selection have often been conflated. For example, sociologist Ullica Segerstrale went as far as to say, "it is hard to get away from the suggestion that some kind of *moral interest* was driving group selectionists – particularly those who persisted even in the face of the new, fashionable kin selection paradigm.[657] The idea that only individuals on one side of the debate were impacted by their political or cultural biases has seldom been questioned, and we might also question the extent to which inclusive fitness was fashionable while it was yet new.

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[656] In particular, he complained that Wynne-Edwards offered no real theory by which group adaptations could evolve; see his notes in D.S. Wilson, *The Natural Selection of Populations and Communities*, Hamilton archive, Z1X9/1/4.

[657] U. Segerstrale, *Defenders of the Truth: The Battle for Science in the Sociobiology Debate and Beyond*, (Oxford: Oxford University Press, 2000), p. 133.

Hamilton could have hardly anticipated the extent to which his ideas would form the 'scientific' backbone of one of the most heated scholarly debates of the twentieth century. Another unexpected dimension of his post-1976 life that came with such fame, however, was the extent to which he was uncomfortable with personally involving himself in the highly confrontational controversy sociobiology triggered. Having had other theoretical questions on his mind for some time anyway, he seems therefore to have carefully weighed the benefits of asserting his views on man without restraint and the costs associated with enduring attacks by those who challenged the authority of the gene at least within the realm of man. Thus, when he was invited to speak on sociobiology and the controversy it had inspired in the late 1970s, he was suddenly reticent to discuss the topic. He claimed to find the task difficult for two reasons: he was not well informed about the controversy and he had "developed an inhibition about sprouting any ideas about what I see as useful insights concerning man".[658]

The questions he was asked, unfortunately, do not survive, but his introductory ideas do. In retracing the development of his theory, which he believed was particularly responsible for the idea that biology was "aggressively invading anthropology, sociology and the like", he hoped to also explain "how I came to be inhibited about expressing views on man unless asked specific questions".[659] His sequence of events, however, is not only vague but also does not match the earlier record we have already explored.

What is clear, however, is the fact that humans were central to his early research. Speaking to this, he declared that his supervisor at LSE, John Hajnal, was "encouraging on

[658] W.D. Hamilton, 'New Aspects of Evolution and Their Relation to Man and Human Affairs', [n.d., c. 1977-8], Hamilton archive, Z1X73/1/12.
[659] Ibid.

the idea of k.s. [kin selection] as applied to animals but very critical of any application to Man". From there, however, his story becomes more vague. Sometime after working with Hajnal, Hamilton claimed that he "began to understand the strong fears felt about a resurgence of something like the fascist and fascist pseudo-science" and therefore

> "began to feel that there were good reasons why I should not push the human issues but rather let these truths […] seep upwards towards the human level. I had realised that basically I was a very naïve person with regard human affairs […] and so was just the sort of person whose practical ideas on issues of human evolution would very likely turn out to be silly, and possibly dangerous".

It was then that he "decided to concentrate my predictions upon insects […] and leave man alone".[660] If indeed Hamilton meant to suggest that he abandoned the human component of his research before 1964, he seems to have been purposefully reconstructing the trajectory of inclusive fitness. This story contradicts what we have seen through his letters home from Brazil as well as his lectures at Imperial College and his public lectures.

In this way, he was careful to position himself outside the most controversial aspects of sociobiology. It was nevertheless clear that he believed that meaningful conclusions could be derived from comparative studies of behaviour. Referring to the case of pseudoscorpions and "African hunting dogs as an intermediate", he declared that to say "these have nothing to do with human group hunting seems to me like saying the apple falling in Newton's orchard had nothing to do with the motions of the moon and the planets.[661] In light of this, one must contemplate the extent to which Hamilton was already taking part in the construction of a particular history of biology, using familiar themes of heroism and myth busting.

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[660] Hamilton, 'New Aspects of Evolution and Their Relation to Man and Human Affairs'.
[661] Ibid.

Although this particular autobiographical account is questionable in its accuracy, it is nevertheless significant insomuch as it demonstrates a clear recognition of the limitations of his biological worldview. His choice to leave explicit discussions concerning human evolution to others, at least for the time being, ultimately meant that the minor episodes that marked his direct involvement in the sociobiology debates would pass without much notice; in fact, over the following decades, it would be hard to remember that he had participated in them at all. In the next chapter, we will examine these episodes and further survey the ways in which Hamilton and others reconstructed the history of sociobiological thinking in light of the controversy they inspired.

# CHAPTER SIX

## Moving to America: A Symptom of 'Brain Drain' or Something More?

Although the number of times Hamilton's papers were cited grew exponentially between 1974 and 1976, Hamilton did not need the publicity from either *Sociobiology* or *The Selfish Gene* to attract attention in America. As we have already seen, American universities had registered their interest in Hamilton as early as 1967. These recruitment efforts continued steadily into the 1970s.[662] By 1975, however, these efforts amounted to little, and Dick Southwood, for one, was pleased: "I am more than delighted to hear that they have been unable to tempt you away to exciting posts in the New World. Things are pretty bad in the U.K. but somehow it doesn't seem to have impinged very much on individuals – as yet".[663] Nevertheless, this pattern was not to last.

Only a year later, in 1976, Hamilton actively sought a new academic position. A general dissatisfaction with his current job, since he had by this time gone nearly twelve years without promotion, was compounded by the fact that he had recently received the Scientific Medal from the Zoological Society of London, indicating to him that his work *was* appreciated elsewhere. In light of this discrepancy, Hamilton decided to cast his net. His method was simple: he began to write to scientists who had at various points invited him to speak at their institutions. His underlying thought process was that because such invitations had implied interest in his work, they might also imply an interest in having him as a

[662] See, for example, Hamilton's appeal within entomological and psychological circles in R.H. Crozier to W.D. Hamilton, 14 January 1971, Hamilton archive, Z1X89/1/3.
[663] T.R.E. Southwood to W.D. Hamilton, 30 December 1975, Hamilton archive, Z1X64/1/16.

colleague. Even if they did not, he hoped "that such people might at least be more inclined than average to help me to make a move".[664]

This chapter examines why Hamilton's ideas appeared to have so much more acceptance in the U.S. that Hamilton ultimately set aside his desire to remain in Britain for what he believed was a necessary professional move. Despite the notable enthusiasm for his ideas in America, however, we will see that not everyone was happy to see his work gain prominence. For this reason, this chapter will also explore the often polarized reactions to Hamilton's sociobiological themes and the extent to which this type of work was attacked with as much passion as it was supported by a wide range of converts across disciplines. Specifically, it looks at the activity of Berkeley anthropologist Sherwood Washburn and members of Science for the People at Michigan, just after Hamilton had relocated there, and juxtaposes these responses with the increasing number of anthropologists, psychologists, psychiatrists interested in biological theories of social order and disorder. It will conclude with a discussion of Hamilton's reasons for returning to England in 1984.

**Making a Move**

Much to his satisfaction, Hamilton's job inquiries were met with significant interest. Burney J. Le Boeuf at the University of California, Santa Cruz numbered among his enthusiastic recruiters in America, and he applauded both Hamilton's "most important contributions to the study of social behavior" and the approach he pioneered.[665] Hamilton, however, had set his sights on Harvard,[666] and by the end of the year, his efforts paid

[664] W.D. Hamilton to M.H. Moynihan, 25 May 1976, Hamilton archive, Z1X64/1/15.
[665] B.J. Le Boeuf to W.D. Hamilton, 19 October 1976, Hamilton archive, Z1X64/1/16.
[666] R.L. Trivers to W.D. Hamilton, 31 January 1976, Hamilton archive, Z1X64/1/17.

dividends. He was formally offered the Visiting Alexander Agassiz Professorship for the spring term of 1978. As part of the position, Hamilton would teach a graduate course on kinship theory with Bob Trivers, and in addition, he would be required to give a few lectures to the general public. Far from an act of altruism, Harvard had its own reasons for offering Hamilton the position. According to A.W. Crompton of the Museum of Comparative Anatomy, Hamilton's presence would be significant considering the extent to which the sociobiology debates still raged within the corridors of the biology department. To this end, Crompton wrote, "As you well know, at the present time behavior is, in more ways than one, a lively field at Harvard and you being here for a term would be of inestimable value to both faculty and students."[667]

Hamilton seemed to agree that Harvard would be a particularly interesting place for him. Nevertheless, he was a bit concerned that the sociobiology debates had moved beyond his own level of expertise. Still, he had definite plans to resign from his job at Imperial College and expected "eventually to take up another in the United States somewhere". Thus, while in May 1976 Hamilton had been open to finding a post within Britain, by December 1976 he appears to have resigned himself to the fact that his work was simply more highly valued in the U.S. than it was in Britain.

Still, a move to the U.S. was no certain bet. The positions he had been offered to this point were only temporary, and his confidence wavered. Some of his anxieties are documented in his correspondence with Clark Hubbs at the University of Texas. Hamilton was especially concerned about his letters of recommendation. Particularly, he worried about the one that would come from his current boss, Dick Southwood. Since Southwood

[667] A.W. Crompton to W.D. Hamilton, 5 November 1976, Hamilton archive, Z1X64/1/17.

attributed Hamilton's failure to advance professionally to his "being a poor administrator and a poor teacher", Hamilton feared that a letter from him, though necessary, would be less than flattering.[668]

Circumventing these critiques, Hamilton admitted he was "certainly not a born organiser or committee man", but he felt the accusation of poor teaching to be unfair. He claimed that early in his career he had met with "hostility from students to the idea that they had to understand and use maths", but this ill feeling, as he remembered it, also existed among his colleagues. In his opinion, he had been pinned as an outsider from the beginning, and there had been "an attitude of suspicion among staff towards my line on evolution". In more recent years, he believed these attitudes had changed and his colleagues were able to "see that my line in evolutionary biology is not just an illusion", a sentiment that had been transmitted to students. Any remaining deficits, he argued, may be due to his approach. He did not enjoy proselytizing: "I tend to assume that students are fascinated by the same kinds of problems that I am and perhaps am not good at either wooing interest or providing any cut-and-dried schema that students can just learn." Owing to this, he hoped his potential employers would take into account his preference for teaching graduate students.[669]

Moreover, he was careful to note that his general line of research was moving away from the theory of inclusive fitness that had only recently granted him such esteem. Nevertheless, he specified that his more recent work on the evolution and maintenance of

[668] W.D. Hamilton to C. Hubbs, 23 November 1976, Hamilton archive, Z1X64/1/16.
[669] See also his comments related to his distaste for undergraduate teaching in Hamilton to Moynihan, 25 May 1976 and W.D. Hamilton, manuscript in 'U. Washington, Early April 1977', [n.d.], Hamilton archive, Z1X64/1/16.

sexuality as well as issues of sexual selection did not mean he was uninterested in human evolution. In fact, he hoped that his results in this area also "might apply to man".[670]

Why were Hamilton's theories so much more popular in the U.S. than they were in Britain? He certainly was not the only British scientist in this period to be tempted away from his home. There had been some concern from the 1950s that a 'brain drain' was underway, and in 1963, a report published by the Royal Society translated vague fears into hard facts. Whether lured by better salaries or better facilities, 140 recent British doctoral graduates, or approximately twelve per cent of the total, had taken permanent positions outside the U.K., and the majority landed in America. Most alarming was the fact that the rate had risen three-fold in the last decade, and it was even higher if one included those who had assumed temporary positions.[671] Moreover, it was not only new graduates who were leaving Britain; one per cent of faculty members had also been driven out, including nine Fellows of the Royal Society.[672] Such distinguished academics were later found to have nearly doubled their salaries in the process of emigrating, and this discrepancy was furthermore compounded by meaningful differences in the "pinprick" of taxation.[673]

More telling, however, was the fact that these numbers represented only the most conservative estimates. It was estimated that Britain was losing closer to nineteen per cent of its graduates each year, including "an unduly high proportion of the most promising scientists". The potential financial effects of emigration, calculated through costs of

[670] Hamilton to Hubbs, 23 November 1976.
[671] 'Emigration of Scientists from Great Britain', *Nature*, 197 (30 March 1963), pp. 1233-6.
[672] 'Emigration of Scientists from the United Kingdom', *Contemporary Physics*, 4 (1963), pp. 304-5.
[673] 'The Real Reason for the Brain Drain', *Nature*, 216 (14 October 1967), pp. 105-6.

education and estimated to be £20,000 per scientist, were perhaps not as troubling as the loss of creative contributions and the ability of educating quality scientists in the future.[674]

But beyond this larger tendency for scientists to be tempted out of Britain, it is notable that Hamilton had not been swept away by these strong tides until the late-1970s, and it is also true that Hamilton's theory of inclusive fitness was certainly seen to have meaning for the nature and extent of self-interest, a character that was assuming even greater cultural significance in these same years. For this reason, one possible explanation for his differential reception concerns the relative emphasis on individualism in America when viewed from a historical perspective. Could it be that Americans were more attuned to their 'natural' tendency towards selfishness than were their Anglo-Saxon allies? Could they have seen inclusive fitness as a scientific means by which their particularly individualized way of life could be justified?

Notably, neoliberal theories that developed and gained popularity on a similar time scale also had a geographical centre in America. To illustrate the American influence on shifts in economic thinking, historian Ben Jackson recently highlighted the dependence of the British neo-liberal campaigners in the 1960s and 1970s on the contributions of American scholars. Of the Nobel Prize winning members of the Mont Pèlerin Society, a think tank created in 1947 to promote free-market capitalism, namely Friedrich Hayek, Milton Friedman, George Stigler, James Buchanan, and Ronald Coase, all but two were American. The two that were not, Hayek and Coase, had spent a significant portion of their careers in the U.S.[675] The links between movements in conservative economics and the popularity of

[674] 'Emigration of Scientists from Great Britain', *Nature*.
[675] B. Jackson, 'The Think-tank Archipelago: Thatcherism and Neo-liberalism', B. Jackson and R. Saunders (eds.), *Making Thatcher's Britain*, pp. 49-50.

selfish genes were made explicit when in 1987 Dawkins revealed that he had been "approached by various right-wing American economists who were equally attracted [when compared to groups of the extreme right such as the National Front] by the idea that in the economic sphere completely free capitalistic market economy could be justified on biological grounds".[676]

Neoliberalism was not the only doctrine of self-interest that had grown on American soil. Also quite uniquely American in its initial popularity were the novels by Ayn Rand, particularly *The Fountainhead* (1943) and *Atlas Shrugged* (1958). What each lacked in literary value was seen by many to be compensated by their clear and convincing avowal of selfishness. By 1967, Rand's devout following caused enough alarm that *LIFE Magazine* ran an article titled 'The Cult of Angry Ayn Rand'. Amidst "the cacophony created by the New Left, the New Right, the Berkeleys, the Beatniks, and the Peaceniks", Rand's followers were argued to be at risk of being overlooked. Beyond the eighty odd groups meeting across the U.S. and Canada, 60,000 regular selling copies of *The Objectivist*, a Randian periodical, documented the popularity of Rand's philosophy in these years. The reported goals of her followers were to "abolish taxes, cut off public welfare, get out of the United Nations and roll back the Great Society. They would also stamp out religion." What is more, in looking for a model society, they seemed to find solace not in earlier decades or future eras but in an earlier century.[677]

While Rand's followers did not reference kin selection or selfish genes directly, they, too, were concerned with the biological nature of humans. Rather than a result of man's animal nature, however, they saw human selfishness to be a result of his distinguished

[676] Dawkins, *Nice Guys Finish First*.
[677] D.J. Hamblin, 'The Cult of Angry Ayn Rand', *LIFE Magazine*, (7 April 1967), pp. 92-102.

ability to reason. Rand's enemy, an appeal to altruism through the irrational demands of religions and governments, was argued to have circumvented the individual-centred life humans were meant to have. Accordingly, Rand's followers believed that if there was any hope for the future of mankind, it lay in the hands of two conservative politicians, Ronald Reagan and Barry Goldwater. According to one of Rand's disciples, it was up to Reagan and Goldwater to "stave off the great liberal swallow-up for a few years while we spread the philosophy of John Galt",[678] Rand's ultra-selfish protagonist.

There is no reason to believe that Hamilton himself was sympathetic to the rising tide of conservatism in America. In fact, a letter to Hamilton from his brother Robert indicates that he was only leaving Britain because he felt it was a necessary professional move.[679] According to Hamilton's friend Colin Hudson, however, Hamilton had outlived any previous reasons he may have had to feel misunderstood. After Hamilton had won the Royal Zoological Medal, Hudson claimed he would have to abandon "the glamour of beating a lonely path into the unknown" now that it had been "destroyed by high recognition!"[680] Although such recognition was of course reason to celebrate, it did not come without its thorns, and in America, Hamilton was beginning to garner attention he did not want. In fact, the talk he had given to anthropologists in Oxford in 1973 was coming back to haunt him.

[678] Hamblin, 'The Cult of Angry Ayn Rand'.
[679] R. Hamilton to W.D. Hamilton and C. Hamilton, 3 June 1977, Hamilton archive, WVJ13/1/6.
[680] C. Hudson to W.D. Hamilton and C. Hamilton, 16 May 1976, Hamilton archive, WVJ13/1/7.

**Sociobiology: A Threat to Anthropology?**

When Robin Fox heard that Hamilton accepted a permanent post at the University of Michigan, Ann Arbor, he was thrilled. While the merit of sociobiology continued to be debated, he hoped that Hamilton's presence would unite those who endeavoured to understand human society in biological terms. He commended Michigan for making the hire not only amidst such controversy but also in light of the financial strains on scientific research, and though Michigan did not assume as obvious a place in the controversy surrounding sociobiology as Harvard did, it was nevertheless a key location to those involved in the debates. In 1976, anthropologist and political activist Marshall Sahlins had published *The Use and Abuse of Biology: An Anthropological Critique of Sociobiology* through the University of Michigan Press. Although by 1973, Sahlins had assumed a position at the University of Chicago, his presence was nevertheless still felt, at least enough that Fox was driven to write that the position at Michigan would allow Hamilton to "bait Sahlins at close quarters".[681]

But Hamilton had himself recently been baited by Berkeley anthropologist Sherwood Washburn, and Fox offered Hamilton a summary of the anthropological complaints against him. As far as Fox understood, anthropologists felt that "The 'sociobiologists' (you) leap from evolutionary genetics to human behavior without a glance at the realities of evolution, human physiology, culture etc. etc. They want the palm without the dust as it were!" Fox paralleled this response with debates underway in economics: "The resentment is much the same as that directed at mathematical economists by 'institutional economists' who can't bear it when the math. person leaps from an equation to advice on central bank operations

[681] R. Fox to W.D. Hamilton, 10 July [1977], Hamilton archive, Z1X66/1/3.

knowing little or nothing of the latter." Finding himself in the middle of it all, Fox relayed the fact that he had often tried "to explain that your theories – and those of Ed + Bob – are simply a framework in which to place these other facts – and a way of finding which facts are relevant. But they are getting quite hysterical about it." It was a "Pity", really, and all of this had to be added to the "very personal resentment at being upstaged + bypassed". The situation was "Tough", but Fox reassured Hamilton that "One gets hardened." Furthermore, he urged, "Don't be hurt by such things or you won't last the course." In the end, he must remember that he was not alone: "We must all meet in the good 'ole US of A and drink damnation to Lewontin et al."[682]

Why, as Fox hinted, did Michigan make a controversial hire? By 1977, Hamilton's esteem, a measurement that continued to be explicitly linked to the merit of inclusive fitness theory, had increased tremendously. In the process of recruiting Hamilton in January 1977, Donald Tinkle had identified him as "truly one of the world's most outstanding biologists" who would fit in well with Richard Alexander, "a leader, also, in sociobiology" and his "active group of excellent graduate students […] investigating problems suggested by Hamilton's theories". According to Donald Tinkle, "It is almost impossible to exaggerate W.D. Hamilton's importance as a theorist" since "He is responsible for the idea of kin selection which provides the theoretical and genetical basis for understanding social behavior." Still "very young" at age forty, Hamilton was also seen to present "tremendous potential for interdisciplinary research and understanding", and failing to recruit him would therefore make a mockery of Michigan's dedication to excellence.[683]

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[682] Fox to Hamilton, 10 July [1977].
[683] D.W. Tinkle to B.E. Frye and College Executive Committee, 24 January 1977, Hamilton archive, Z1X30/1/4.

Tinkle was not Hamilton's only advocate at Michigan. Julian Adams identified Hamilton as "one of the most original workers" studying behaviour. Although the number of papers he had published was low, Adams assured his colleagues that "each one is a minor masterpiece, and has opened up new areas of investigation". Recruiting Hamilton would give the University of Michigan a chance to be "the leading institution in the country, in ecology".[684] Chairman of Biological Sciences William R. Dawson went as far as to say that the possible appointment of Hamilton was the most important decision considered during his tenure. Hamilton was "truly incisive and creative" and his instrumental role in establishing "the field of Sociobiology" meant he had the potential to contribute not only to the biological sciences but also to the behavioural.[685] By 4 February 1977, Tinkle wrote to Hamilton to report that a permanent position had successfully been created for him.[686] It had been an aspirational hire. Hamilton, however, needed time to think about it. He would not accept for nearly a year.[687]

For one thing, he still had his hand in other pots. One of the places he continued to consider was the Smithsonian Tropical Research Institute. A position there was of particular interest to him because it would entail fewer teaching requirements. He continued to nurse anxieties "about how the pace of life and teaching in U.S. universities will match with my slow thought processes and what I feel to be the most effective way of using my life". It was for this reason that he wished "to keep open the possibility of a job – short or long – in which I could mainly devote myself to research and writing".[688]

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[684] J. Adams to B.E. Frye, 26 January 1977, Hamilton archive, Z1X30/1/4.
[685] W.R. Dawson to B.E. Frye, 1 February 1977, Hamilton archive, Z1X30/1/4.
[686] D.W. Tinkle to W.D. Hamilton, 4 February 1977, Hamilton archive, Z1X30/1/4.
[687] W.D. Hamilton to D.W. Tinkle, 20 December 1977, Hamilton archive, Z1X30/1/4.
[688] W.D. Hamilton to N.G. Smith, 28 January 1977, Hamilton archive, Z1X64/1/15.

One of the hurdles Hamilton continued to face in finding a position at other institutions was the fact that his methods were so different from those traditionally used by geneticists. As Larry Gilbert at the University of Texas explained, "a few of the more classical Drosophila genetics and molecular biological people here have difficulty understanding that you are one kind of geneticist. We are busy trying to educate our colleagues." Furthermore, Gilbert warned that in "most general zoology or biology departments here in the U.S. those who know evolutionary biology will need no convincing that you are a most desirable faculty addition, but those in other areas typically misunderstand even the most straightforward versions of natural selection and may find your interests as foreign as most of your British colleagues apparently do." Moreover, Gilbert cautioned that "some colleagues outside the field have the mistaken impression from your curriculum vitae that you haven't contributed much new since the mid 60's."[689] This complaint was not unique to the biology department in Austin.[690]

As a final recommendation, Gilbert thought Hamilton should "stress the genetical component of your interests" and more importantly, emphasised that Hamilton should not fail in showing how his "own work fits into the present and future development of evolutionary genetics and 'sociobiology'".[691] He still needed to market himself, and this involved some heavy strategizing. What is clear, however, is that Hamilton's strengths as a candidate were closely tied to the newfound popularity of inclusive fitness and also to the assumption that Hamilton would continue to engage with sociobiological theory, especially in relation to man.

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[689] L. Gilbert to W.D. Hamilton, 21 February 1977, Hamilton archive, Z1X64/1/16.
[690] See, for example, M. Singer to W.D. Hamilton and C. Hamilton, 9 March 1977, Hamilton archive, Z1X64/1/16.
[691] Gilbert to Hamilton, 21 February 1977.

Outside of biology, however, interest in Hamilton was increasing. As early as 1976, Pennsylvania State University anthropologist Napoleon Chagnon had invited Hamilton to a symposium that would "explore the possibility of extending" recent advances in biology to understand topics such as "kinship, marriage, politics, warfare, life cycles, etc.".[692] Henry Harpending, an anthropologist at the University of New Mexico, had also recognized by 1976 that Hamilton's inclusive fitness papers had real meaning for his fieldwork on !Kung bushmen.[693] By November 1976, Hamilton's ideas hit the small screen when BBC aired 'The Selfish Gene'. As *The Sunday Times* reported, the show highlighted Hamilton's ideas, although they were presented by John Maynard Smith. The producer stopped short of "applying the theory of selfishness on behalf of the compulsive gene, to human beings", but the reporter nevertheless seemed to doubt the likelihood that man had "additional inner drives" beyond selfishness.[694] This is just but one example of the new meanings that arose when Hamilton's pioneering efforts entered the public arena. Moreover, their popularization through television programs was not short-lived. The BBC would in fact produce a follow-up programme in February 1977 titled 'The Human Animal',[695] in which interviews given by both biologists and anthropologists indicated a joint effort in bringing sociobiological ideas to the public.

Support for inclusive fitness theory among social scientists is also indicated through Hamilton's visits to other universities. During Hamilton's trip to the University of Washington in 1977, for example, Gordon Orians planned for him to spend half days with not only the department of zoology but also that of psychology, anthropology, sociology, as

[692] N.A. Chagnon to W.D. Hamilton, 23 January 1976, Hamilton archive, Z1X89/1/19.
[693] H.C. Harpending to W.D. Hamilton, 12 October 1976, Hamilton archive, Z1X89/1/20.
[694] 'Survival of the Selfishest', *The Sunday Times*, (14 November 1976), Hamilton archive, Z1X89/1/20.
[695] P. Jones to W.D. Hamilton, 4 January 1977, Hamilton archive, Z1X89/1/21.

well as the Primate Center.[696] Hamilton proposed as the subject of his talks "the evolutionary maintenance of sex, and sociobiology applied to man" in an effort to touch on subjects "which might be of more interest" to a variety of departments.[697] Unfortunately for Hamilton, not all anthropologists were eager to see the principles of sociobiology applied to human society.

In January 1977, the Council of the American Anthropological Association considered a resolution to "condemn the 'new synthesis' of sociobiology as an attempt to justify genetically the sexist, racist and elitist status quo in human society". The resolution was defeated,[698] prompting American physical anthropologist Sherwood Washburn to write a letter in support of this decision "because it was an unjustified attempt to limit scholarship and research". Nevertheless, he believed "the resolution correctly described a great deal of sociobiology". Using a quote from Hamilton, whom he referred to as "one of the major figures in developing the genetic basis for sociobiology", he hoped to demonstrate the extent to which this was true. The quote came from the paper Hamilton had written for the Oxford conference hosted by Robin Fox. It had recently been published in an edited volume titled *Biosocial Anthropology* (1975), but the fact that the volume had been dedicated to Washburn did little to turn his favour. The passage in question concerned the pattern connecting the conquering of civilizations and renaissances; Hamilton claimed the latter appeared to follow the former after about eight hundred years. Such episodes of invasion, according to Hamilton, resulted in the "mixing of genes and cultures (or of cultures alone if these are the only vehicles, which I doubt)" such that some individuals would have both the

[696] G. Orians to W.D. Hamilton, 28 February 1977, Hamilton archive, Z1X64/1/16.
[697] W.D. Hamilton to G. Orians, 7 March 1977, Hamilton archive, Z1X64/1/16.
[698] 'Council Refuses to Condemn Sociobiology', *Anthropology Newsletter*, 18 (January 1977), Hamilton archive, Z1X66/1/3.

"old mercantile thoughtfulness and the infused daring" necessary for innovation. According to Hamilton, the benefits of innovation by the few would affect the many, whose relationship to the innovators would be slight. The result, Hamilton projected, would be the slow reduction of "altruism of all kinds, including the kinds needed for cultural creativity".[699]

Criticizing Hamilton, Washburn wrote, "To me this is reductionist, racist and ridiculous". He had a hard time believing that anyone could take Hamilton's claims seriously, let alone count them as part of what had been called "an astonishingly rich discussion". Washburn believed that "Sociobiologists are repeating the fundamental error of earlier evolutionists who believed that their theory was so powerful that the facts could be arranged without careful analysis of the individual cases". For Washburn, the result was inherently political: "when applied to mankind, Hamilton's genetic theory turns out to be no more than his political biases." Returning to his reason for personally rejecting the resolution to condemn sociobiological research, Washburn argued that the decision did not mean that the application of sociobiology "to mankind amounts to much more than a repetition of the mistakes of many, many years ago".[700]

Reporting the series of events to Hamilton, Robin Fox was unperturbed. He thought they should "Let 'em grind their teeth", and in closing, he cheered, "Up the revolution!"[701] But Fox was moved enough to respond to Washburn's claims directly. According to Fox, Washburn's critique of Hamilton "must strike many people as a case of the proverbial pot calling the kettle black". Indeed, he testified to have "had great difficulty getting colleagues

[699] S.L. Washburn, 'Sociobiology', *Anthropology Newsletter*, 18 (March 1977), Hamilton archive, Z1X66/1/3.
[700] Ibid.
[701] R. Fox to W.D. Hamilton, 30 March 1976 [sic, 1977], Hamilton archive, Z1X66/1/3.

in the ASA to agree to my dedicating it to Washburn on the grounds that he made 'outrageous statements about human behavior on the basis of what he knows about bones and a few baboons'". For Fox, it was not sociobiological studies but the critiques of sociobiology that were politically motivated. Indeed, Fox asserted that Washburn's grievance with Hamilton had less to do with his use of mathematical genetics and more to do with the fact that "Hamilton's 'biases and prejudices' are different from his own". Moreover, Fox claimed that Washburn had previously admitted that the "mathematics and the genetics [of sociobiology] are indeed sophisticated". In fact, Fox believed, it was the very fact that Washburn's methodology was being "upstaged by a bunch of theoreticians" that must have perturbed him.[702]

Whether Washburn's criticisms were at their roots personal, political, or intellectual, he was nevertheless correct in thinking people may interpret Hamilton's claim in a way that had significant sociopolitical ramifications, though which ramifications exactly often depended on the assumptions of the reader. Having happened upon the paper, Hamilton's mother, for one, sensed in it a rather progressive meaning: "I have read about half way through […] and found it surprisingly interesting and comprehensible except for the maths which I skipped. It almost seems that you are going to arrive at the […] conclusion […] that an infusion of immigrant population into England is essential if we are to have any hope of surviving as a useful people."[703]

Perhaps already inured to controversy himself, E.O. Wilson was nevertheless apologetic for the stress the incident had caused Hamilton, writing, "Bill: Sorry the crazies

[702] R. Fox, response to Washburn's 'Sociobiology', [n.d.], Hamilton archive, Z1X66/1/3.
[703] B. Hamilton to W.D. Hamilton and C. Hamilton, 28 May 1976, Hamilton archive, WVJ13/1/6.

gave you a hard time. Things have quieted down at Harvard."[704] By the end of the year, Trivers, too, was optimistic about the future of inclusive fitness, and he affirmed Hamilton's decision to move to America. Having just returned from a trip to England himself in December, he reported to Hamilton how he was "pleased to hear that Richard Dawkins read the riot act to the British at a meeting in Germany, calling you a prophet without honor in your own country". What mattered in his eyes was the fact that "With the young people, the battle is over and your work has carried the day. Of course there are many middle-aged fools in this world (at Harvard as well as in England) but their resistance merely heightens my pleasure in the years to come."[705]

But rather than sharing wholeheartedly in this optimism, Hamilton himself was becoming more cautious, and indeed, more aware of the political snares in which both he and his work could become entangled. When he was invited to speak on the 'Biological Foundation of Altruism, Dedication and Egoism' at the Sixth International Conference on the Unity of the Sciences at which the theme would be 'The Search for Absolute Values in a Changing World',[706] he had originally responded positively.[707] Just two months later, however, he had changed his mind. His reasons were twofold. First, moving to the U.S. was more time consuming than he anticipated, and second, he had heard rumours concerning the sponsorship of the conference. He had no time to research it himself but could not risk being associated with a series that "was being used as a window dressing for profiteering and

[704] E.O. Wilson to W.D. Hamilton, 30 May 1977, Hamilton archive, Z1X69/1/16.
[705] R.L. Trivers to W.D. Hamilton, 17 December 1977, Hamilton archive, Z1X64/1/17.
[706] M.Y. Warder to W.D. Hamilton, 25 June 1977, Hamilton archive, Z1X89/1/18.
[707] W.D. Hamilton to M.Y. Warder, 14 July 1977, Hamilton archive Z1X89/1/18.

dubious right-wing politics".[708] He now understood that he needed to be cautious; his ideas were beginning to assume a life of their own.

Still, in some respects such restraint came too late, and although things seemed to be quieting down for Wilson at Harvard, the flames continued to burn in Michigan. In October 1977, Hamilton received a letter from John H. Vandermeer, Associate Professor of Biology, "cordially" inviting him to see the film 'Sociobiology: Doing what Comes Naturally' by the Ann Arbor chapter of Science for the People. According to Vandermeer, the 25-minute film was produced for use in high school classrooms and "includes interviews with Drs. E.O. Wilson, Robert Trivers, and Irven DeVore".[709] Hamilton doubted the cordiality of the invitation: he had told by reliable sources "that it is a bad film", and he refused to attend.[710]

This, however, was but one activity of the Ann Arbor branch of Science for the People that directly challenged sociobiology and, one might suppose, the presence of its 'intellectual father' on the faculty. An article titled 'Is Our Biology to Blame?' warned educators against the explanatory promises of sociobiology. Although it may be convenient, they argued, to situate the behaviour of individual students within a larger framework, it was dangerous. In fact, it threatened the promise of equal opportunities in education for both minority students and women. A biologically determined deficiency in assertiveness among female students, for example, could lead one to think, as E.O. Wilson seemed to, that "even with identical education and equal access to all professions, men are likely to continue to play a disproportionate role in political life, business, and science".[711]

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[708] W.D. Hamilton to A. Somit, 17 September 1977, Hamilton archive Z1X89/1/18.
[709] J.H. Vandermeer to W.D. Hamilton, [n.d., c. 14 October 1977], Hamilton archive, Z1X89/1/15.
[710] W.D. Hamilton to J.H. Vandermeer, 13 November 1977, Hamilton archive, Z1X89/1/15.
[711] E.O. Wilson, 'Human Decency is Animal', *New York Times Magazine*, (12 October 1975), qtd. in 'S. Schneider et al.', 'Is Our Biology to Blame?', *The American Biology Teacher*, 39 (October 1977), p. 432.

Beyond the biological determinism of gender inequality and sex roles, the University of Michigan authors were concerned about the assumptions prevalent in discussions of overpopulation. According to the authors, the idea that the fate of the world rested in the hands of the 'Third World' was contradicted by the fact that the countries with the highest population densities did not correlate with those in which starvation was a major problem. Such facts were ignored by biologists such as Garret Hardin, who seemed to support the policy of starving out populations that refused to get their birth rates under control.[712] What is more, 'control' was judged according to the standards determined by the Western world, which continued to consume at rates far above the global average.

Another complaint concerned the state of sociobiology as a science. According to the authors, sociobiologists saw behaviours as having evolved through one of three mechanisms. If the behaviour benefited the individual actor, it was explained by traditional Darwinian selection at the level of the individual. If it benefited the actor's relatives, it was explained by Hamilton's theory of inclusive fitness. If it benefited a non-relative, it was explained by Triver's theory of reciprocal altruism. Combining these features, sociobiologists had the necessary tools to use natural selection to explain all behaviours. In light of this, however, the authors argued that sociobiology was no longer falsifiable, and thus it "ceases to be a science": Darwin's theory of natural selection had become "the sophism to explain everything".[713]

What is more, the authors argued, sociobiological theories only confirmed the reality of "our own culturally biased perceptions of the world" in nature.[714] In teaching students the

[712] G. Hardin, 'Living on a Lifeboat', *Bioscience*, 24 (October 1974), pp. 561-8.
[713] Schneider, 'Is Our Biology to Blame?', pp. 435; 436.
[714] Ibid, p. 436.

evolution of social behaviour, and with it, necessarily, their own assumptions about how humans behave, the authors claimed that sociobiology risked grounding in nature what amount, in the worst case, to be in reality no more than a particular set of cultural beliefs. This line of thinking resounded when the authors' further expanded these ideas in their book, *Biology as a Social Weapon* (1977).

Before Hamilton settled into a permanent post at the University of Michigan, however, he would assume the Visiting Alexander Agassiz Professorship at Harvard for the spring semester of 1978. Given the proximity to sociobiology's primary opponents and a position with relatively few formal responsibilities, Hamilton would have had time to engage in either the defence or promotion of the sociobiological enterprise had he wanted to. Ultimately, he did not, but through his lectures at Harvard, we are nevertheless able to glimpse the process by which a controversial theory was presented to graduate students.

**'Natural Selection and Social Theory'**

The course Trivers and Hamilton taught met for the first time on 1 February 1978. Although its title purposefully maintained a distance from sociobiology, the recent controversy formed the unarticulated backdrop to the course. Trivers was also careful to position Hamilton as "an authority on Brazilian wasps indeed on wasps in general indeed the Hymenoptera in general", who was "deeply and broadly educated within entomology". In this way, the emphasis was on Hamilton as the objective and revolutionary naturalist. To this end, Trivers argued that it was not until Hamilton published his theory of inclusive fitness that a "real or profound synthesis" was made, uniting the laws of Mendelian inheritance with Darwin's theory of natural selection. In the process, Hamilton had provided

biologists with "a new definition of self-interest, a broader one than Darwin's". Beyond this, Trivers argued that the theory of inclusive fitness had given biologists "a much deeper social conception of life", and altogether, Hamilton's work had "virtually created or in any case laid the foundations for what we call evolutionary genetics".[715]

Still, while Trivers was initially silent on the sociobiology debates and under-emphasized the implications of inclusive fitness in relation to human society, these facets of the course were not invisible. When Trivers summarized the contents and importance of each of Hamilton's publications to students in chronological order, he joked that although Hamilton's 1975 paper on biosocial anthropology primarily concerned the "problem of group selection", his added thoughts on human evolution "have not been enthusiastically received by those who see it as their special mission to comment on such thinking", and the audience stifled laughter. What was funny to this group was the fact that social scientists remained so adamantly convinced that evolution had a very limited place in the understanding of human society. Further positioning Hamilton as ideologically untouched, implying a contrast with the anthropologists who attacked his paper, Trivers declared that Hamilton's "deep evolutionary training and what must be nearly twenty years now of solid thought on social evolution" meant that "even his casual thoughts […] on human evolution merit study".[716] In so doing, Trivers implied that Hamilton's comments on man were merely a corollary of his celebrated research. By Hamilton's own account, however, and reiterating archival evidence from earlier chapters, he had thought about altruism in humans for much longer than he had thought about social behaviour in any other animal group.

[715] R.L. Trivers, 'Natural Selection and Social Theory: Lecture 1', 1 February 1978, Hamilton archive.
[716] Ibid.

Trivers' efforts to distance himself and Hamilton from the sociobiology debates were in part due to his own dissatisfaction with the way in which the controversy had swept attention away from what he saw to be the more important aspects of the work pioneered by Hamilton. Though Trivers admitted a biological theory of social behaviour would apply to humans and affect the social sciences, he felt that the recent developments within evolutionary theory in fact had a deeper significance than sociobiology's opponents assumed. As he saw it, what was far more important than anything Wilson envisioned was that biologists were now articulating a theory of reproduction that took into account both genetics and investment with revolutionary, meaningful results.[717]

Hamilton, however, was more at peace with sociobiology. Although he, like Trivers, had initially had "misgivings about this title", since it "directed tension toward a certain area of social theory where 'socio-' is already heavily emphasized", he had now "reconciled [him]self with it by thinking that really what we are concerned with here is in fact nothing more than sociability at all levels from that of individual genes up to […] much more complex entities". For this reason, he now felt "that the title was appropriate and if some people chose to misinterpret it as some kind of a pseudo-political theory that was their affair and not mine". Beyond 'sociobiology' as articulated by Wilson, however, Hamilton directed students to *The Selfish Gene*. According to him, Dawkins had introduced the "general subject matter of the course as a whole" extremely well.[718] Trivers did not entirely disagree, but he did make a point to emphasize the extent to which Richard Dawkins had become "single minded […] about this selfish gene concept".[719] In doing so, he revealed two things.

[717] Trivers, 'Natural Selection and Social Theory: Lecture 1'.
[718] Hamilton, 'Natural Selection and Social Theory: Lecture 1'.
[719] Trivers, 'Natural Selection and Social Theory: Lecture 1'.

First, there was little consensus even among the 'founders' of sociobiology as to the usefulness of defining the boundaries of the discipline in this way. Second, there was even less consensus concerning who had authority in this developing field.

Thus, the sociobiology controversy involved not only the vying for authority between biologists and social scientists over who was best equipped to tackle pervasive problems within human society; it equally involved an internal competition for a seat at the centre of a new research agenda. Acknowledging this, we may understand why it was so important for Trivers to at once distance himself from 'sociobiology' and simultaneously construct the image of Hamilton as an unbiased and apolitical scientist worthy of the position as figurehead of a new evolutionary biology. In light of this, the emphasis that he placed on Hamilton as an entomologist is noteworthy, but it is nevertheless an emphasis that Hamilton himself continued to avoid.

This became clear in the next lecture of the series, where Hamilton spoke on the evolution of altruism in particular. In explaining how he came to work on this topic, Hamilton cited his chance introduction to R.A. Fisher's *The Genetical Theory of Natural Selection* while browsing his undergraduate library. This, along with the fact that even before he had left for university he had noticed how far biological studies lagged behind those in the physical sciences, where simple, universal laws prevailed, meant that he was well primed to understand the importance of theoretical biology over the experimental work on evolution then in vogue. Acknowledging the gulf that stood between Fisher's articulation of natural selection and his lecturers', he had pinpointed altruism as a subject where potential compromise seemed possible.[720]

[720] W.D. Hamilton, 'Natural Selection and Social Theory: Lecture 2', 22 February 1978, Hamilton archive.

Hamilton further recollected that although he intuitively sensed that altruism was quite common in nature, he found it difficult to think of examples of such behaviour outside of the human world. Two, however, came to mind. The most obvious was the sacrificial sting of the honeybee, which to him was quite clearly an adaptation for suicide and therefore an unequivocal example of evolved altruism. A second example, the warning calls of birds, was more tentative, as it was much more difficult to be sure who benefited and to what extent. Although he initially set out with only these examples of animal altruism in mind, he was certain that "many more would be forthcoming". To find them, he turned back to man. Seeing humans as an evolved species like any other, this hardly seemed to him to be problematic: "Although I didn't want to rely on examples which involved man, it's always seemed to me that there are such obvious parallels between the human world and the animal world that one can justifiably use one's own introspection to give one some guidance as to what sort of phenomena to look for in the biological world". Reaffirming what we have already seen in earlier chapters, then, Hamilton remembered having taken "phenomena like parental care, the existence of things like blood feuds in man where an individual felt a [sic] obligation to avenge the death of a member of his own kin" as a starting point that clearly indicated to him "that an important principle would be closeness of kinship of some kind". Looking back to the animal world, the problem had come into focus. Suddenly "it seemed to me it was quite arguable that these phenomena did in fact only arise where close kin were being benefited".[721] It only needed a mathematical proof, which would take significantly more time to work out.

[721] Hamilton, 'Natural Selection and Social Theory: Lecture 2'.

The discrepancy between Trivers' emphasis on Hamilton as a naturalist, deeply involved with observations of insects and only secondarily interested in human evolution, and Hamilton's own admission that he relied on his own intuition to move back and forth between man and other animals becomes less peculiar if we take into account the extent to which their individual career trajectories were changed by the recent publications of *Sociobiology* and *The Selfish Gene*. These books had in fact solidified Hamilton's reputation to such an extent that job offers at prestigious American universities were forthcoming. After twelve years without promotion, he was suddenly and solidly on the map. Despite teaching at one of the world's most elite institutions, Trivers, on the other hand, was on rather unstable ground. He had come up for promotion in 1974,[722] but in 1977, he was yet unsuccessful. In a letter to Hamilton, he complained,

> "the President and the Dean vigorously deny the notion that the political attacks had any effect on their decision […] In conversation with me, the Dean made the revealing comment that much of our work is 'untestable' and I have it on very reliable authority that the President has wondered whether this whole 'inclusive fitness business' may disappear without trace five years from now. […] Thus, the obvious relevance of our work for the social sciences ended up counting against me."[723]

Indeed, Trivers' research drew heavily on human examples of family conflict. As Hamilton had pointed out in a letter of recommendation from 1974, it was in fact the human that "stands out as the animal that seems to interest him most and as the one from which he derives most of his insight about the rest".[724] Trivers was convinced "that a scientific theory of that portion of the human psyche molded in the bosom of the family will eventually be built on kinship theory […] I don't even think it will take forever for social scientists to

[722] E.O. Wilson to W.D. Hamilton, 22 November 1974, Hamilton archive, Z1X69/1/12.
[723] R.L. Trivers to W.D. Hamilton, 27 May 1977, Hamilton archive, Z1X69/1/12.
[724] W.D. Hamilton to E.O. Wilson, 13 December 1974, Hamilton archive, Z1X69/1/12.

catch on."[725] The nature of his work meant that Trivers had much more to lose if social scientists were successful in rendering sociobiology untenable, and the controversial aspects of his research were more easily avoided if Hamilton's theory was derived from careful study of social insects than if it was loosely drawn from an intuitive understanding of human societies.

For all Trivers' attempts to ground his work in nature, controversy persisted, and in the last lecture of the series, Trivers recalled his experience a recent conference concerning the mental health of children, where members of the International Committee Against Racism leafleted his talk and declared he was a "sexist, fascist, racist pig". Even the Harvard student newspaper, he lamented, had accused him of helping to lay the foundations for a racist synthesis. Here, Hamilton was also deemed culpable. His theory of inclusive fitness had played a special part in the perception that sociobiology promoted racism. Inasmuch as the theory delineated the limited altruistic potential of organisms, Hamilton appeared to some to have invoked the 'metamessage' that individuals would behave more selfishly when confronted with unrelated individuals, such as those belonging to other races. The problem with this assumption, according to Trivers, was that the differences in relatedness between non-kin of the same race and non-kin of different races were absolutely miniscule.[726]

While Trivers was right to imply that Hamilton himself had never argued along these lines, he neglected the fact that Hamilton did explicitly argue that "racialism" was one of many "natural phenomena". Reaffirming this view, Hamilton had once privately sketched the "~~Wishful~~ Land of Cockaigne" as the only alternative to the "Inevitability of Malthus". Accepting both the fact of evolution and Malthusian parameters, as he did, one also had to

[725] R.L. Trivers to W.D. Hamilton, 19 September 1973, Hamilton archive, Z1X69/1/12.
[726] R.L. Trivers, 'Natural Selection and Social Theory: Lecture 11', 19 April 1978, Hamilton archive.

admit "POLITICAL ACTIVITY: A SUCCESSION OF UNSTABLE STATES BUT with elements of DEMOCRACY, NEPOTISM, RACISM". Facing these facts of nature, the only options Hamilton could imagine were "Fatalism" or the "Control of natural selection".[727] This was precisely why he could not see any alternative to eugenics, from the 1950s to his final days.

Though Trivers was hesitant to find fault in Hamilton's work, he believed Wilson and Dawkins had done their colleagues a long-term disservice by seeking short-term popularity. Reading the chapter of *Sociobiology* on man, for example, Trivers saw how easy it was to think biologists were trying to legitimize the domination of females by males. Nevertheless, he claimed that the extreme right-wing biases associated with the biology of social behaviour did not actually flow from the logic he and others invoked. In fact, he saw it to support an alternative view. Using another example from his theory of family conflict, he argued that it was just as unlikely for parents to truly dominate their offspring as it was for one sex to dominate the other. If the power differential on one side of the relationship got out of hand, he maintained that evolutionary pressures would make it likely that dominance would be undermined if not altogether circumvented, and stability would be re-established.[728]

Still, Trivers himself recognized that there was a social, if not also a political, meaning in his theory of reciprocal altruism. What is more, he argued that he had seen himself to have created an additional theory of altruism, building on Hamilton's, rather than an additional theory of selfishness. Growing up in the 1950s, he argued, American involvement in unjust wars had affected him deeply, and in light of this, he believed that the

[727] W.D. Hamilton, untitled sketch, [n.d., c. 1970s], Hamilton archive, Z2X29/1/9.
[728] Trivers, 'Natural Selection and Social Theory: Lecture 11'.

theory of reciprocal altruism would appeal to others for the same reason it appealed to him: it strengthened demands for justice in demonstrating that this quality was, to some extent, an evolved facet of social interactions. In addition, Trivers himself articulated progressive views supporting more active roles for fathers in caring for their children and opposing the distribution of income unequally towards older individuals.[729] A year later, he would go on to spend time with Huey Newton of the Black Panthers, telling Hamilton that nearly thirty members of the group had been murdered "mostly by the forces of 'law and order'".[730]

While Trivers did not actively seek the subjugation of either women or blacks and also regretted the "publicity mongering" and costs associated with superficiality and "efforts to overclaim", he nevertheless was committed to the idea that sociobiology, or as he saw it, the theory of reproduction, was among the most important subjects. Not only did he see it to be at the very centre of biology, he also understood it to have a far more practical value: according to him, it "in principle ought to allow us to guide our own decisions regarding reproduction via a deeper understanding of what it's about". In this way, he claimed that Bill Hamilton's ideas were "intrinsically much more important to the way in which we conduct our lives and particularly the way in which we reproduce than a lot of the supposedly important stuff that is taught and heard a lot about in this university".[731] Though he would soon leave Harvard behind, he would take his message to Santa Cruz, where he continued to believe that natural selection held significant meaning for social theory.

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[729] Trivers, 'Natural Selection and Social Theory: Lecture 11'.
[730] R.L. Trivers to W.D. Hamilton, 29 December 1978, Hamilton archive, Z1X69/1/12. For more on Trivers' relationship with Newton, see E.L. Milam, 'A Field Study of Con Games', *Isis*, 105 (September 2014), pp. 596-605.
[731] Trivers, 'Natural Selection and Social Theory: Lecture 11'.

**Scientists and *Science* Against Sociobiology?**

By 1978, there remained a "continual whirl of sociobiobiological activity"[732] in the United States, but some biologists, Hamilton included, worried that a prejudice against the discipline was present even within the major scientific journal, *Science*. In that year, a group of biologists submitted the surprising results of their study on kin recognition in stump-tailed macaques to the prestigious journal.[733] The paper was well vetted; drafts had been seen and approved not only by Hamilton but also by Richard Alexander, Gordon Orians, and David Barash. Despite such backing, it was rejected, presumably because one referee was not "convinced" of the existence of kin recognition abilities after reading the paper.

The authors rendered this explicable only if this referee was biased against sociobiological studies. Writing to John E. Ringle, the assistant editor of *Science*, one of its authors, University of Michigan psychologist Warren Holmes, acknowledged that "Because of the controversial nature of research related to sociobiology one would expect to find people who are ill-disposed toward the sort of work we have submitted". Beyond sending the paper to leading theorists of social behaviour for unofficial review, Holmes wrote that in light of "the controversy surrounding sociobiology and related topics such as KS [kin selection], we took extreme caution in designing, collecting and analyzing our data". Holmes asked that the paper be sent to a new set of reviewers. He concluded, "Whether or not one is disposed toward evolutionary predictions about behavior, we believe that our data are new, unique and will influence both opponents and proponents of sociobiology."[734]

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[732] W.D. Hamilton to 'George', [n.d., c. October 1978], Hamilton archive, Z1X89/1/15.
[733] In the early 1960s, Hamilton had thought that the ability of humans "to recognise relatives throughout life", and presumably to adjust social behaviours accordingly, was "probably unique" (Hamilton, 'Genetical Models for the Evolution of Competitive and Social Behaviour', Z1XUN/1).
[734] W. Holmes to J.E. Ringle, 1 May 1978, Hamilton archive, Z1X67/1/13.

Conceding to the complaint, *Science* forwarded the paper for a second set of reviews. Again, the decision was negative. What is more, one of the new referees gave no encouragement that it should be resubmitted because it contained a statistical error. Acknowledging their mistake, the authors corrected it. They were more concerned, however, with the implied bias of another referee who claimed the result was "startling" and "unexpected". After spending some time imagining alternatives, the reviewer had conceded but requested "that the authors themselves show evidence of some attempt at alternative explanations since they are the ones most able to find them". This, he believed, "would be helpful […] in allaying the disbelief that may accompany receipt of this exciting news."[735]

By 1979, Holmes seemed to have given up altogether on getting past the barricades *Science* had erected, and he sent the manuscript to *Nature* instead. In the process of doing so, however, he reached out to Hamilton for assistance. Hamilton had elsewhere indicated his grief with *Science* and his support for Holmes. He had asked, "Could not the editors of Science [sic] be more watchful for obvious anti-sociobiological bias in their referees' reports?"[736]

Hamilton had also offered to write to *Nature* on Holmes' behalf.[737] Taking this admittedly "unusual step", Hamilton identified "what seems to me an almost scandalously slow and biased processing of their paper, ending in rejection, by Science [sic]". It had been almost two years since the research was completed, and the results "quite widely discussed, all without the authors' being able to get the work printed." Hamilton did not intend to imply

[735] W. Holmes, manuscript on 'Comments from one referee following the 2nd submission of our ms.', [n.d., c. 1979] Hamilton archive, Z1X67/1/13.
[736] W.D. Hamilton, 'AAAS-Newcomb Cleveland Prize' nomination form, [n.d., c. Summer 1979], Hamilton archive, Z1X64/1/19.
[737] W. Holmes to W.D. Hamilton, 9 August 1979, Hamilton archive, Z1X67/1/13.

that a conspiracy against sociobiological studies existed within the editorial board at *Science*, but he did wish to point out that "while two referees urged that it be published immediately they have accepted as valid one referee's report which was to my eyes obviously prejudiced against the possible reality of the claimed effect and its implications".[738]

This episode involved more than Hamilton's belief that sociobiology deserved a fair trial; it also tapped into his deep-seated and long-standing belief in the fair attribution of scientific ideas to the original theorizer. His concerns, therefore, were not only that the paper was published, and preferably in a prestigious journal, but also that the paper was printed quickly so that its authors received the credit they were due for engineering such a "daring pioneer experiment". In conclusion, Hamilton reiterated his desire for the journal to "look very carefully for signs of prejudice against existence of the claimed effect in any referee's reports you receive, and also will bear in mind how Science [sic] and Nature [sic] will look, and how unjustly the authors will have been treating if the kind of ability implicated in their report eventually proves to be widespread and important."[739] Whether or not Hamilton's letter had any effect, by November 1979, Holmes wrote to thank him for his help, enthusiastically reporting, "We're finally going to see the light of the printed page!"[740]

While Hamilton did not agree with those who criticized sociobiology, he was certainly aware that, in the wrong hands, it had dangerous political potential. For this reason, when Owen Aldis, who earned a doctorate in economics before moving into the field of psychology, wrote Hamilton in 1979 to inform him of the effect he had on his thinking,

[738] W.D. Hamilton to *Nature*, [n.d., c. 1979], Hamilton archive, Z1X67/1/13.
[739] Ibid.
[740] W. Holmes to W.D. Hamilton, 30 November 1979, Hamilton archive, Z1X67/1/13.

Hamilton was initially sceptical. Aldis's book, *Play Fighting* (1975), was based on Hamilton's theories, and he wrote, "We are all indebted to you for your contribution!"[741] Hamilton admitted that on receiving the outline for a book Aldis had recently completed, he was "a bit nervous on account of the title at first, thinking that perhaps this is the book of which Lewontin and marxist [sic] and humanistic colleagues are always forewarning us of, where sociobiology (and, especially feared, my own contribution thereto) becomes the spearhead of a new wave of fascism, etc." Seeing that it was not, however, Hamilton was "flattered".[742]

Outside of the prestigious scientific journals, the disciplinary conflicts between sociobiology and the social sciences, generally construed, did not disappear as the 1970s drew to a close. What is more, even biologists had disparate reactions to the new research agenda. While an article in *New Scientist* celebrated inclusive fitness as providing the basis for "the greatest revolution in biology since 1859",[743] there continued to be conflicts within biology departments concerning the scientific credibility of sociobiological studies. A letter to Hamilton from Harvard doctoral student Jon Seger in 1980, for example, indicates that he was having trouble navigating the "strange" departmental politics at his institution.[744] This may have had something to do with the fact that Seger had worked directly with "a diverse group of Harvard professors including E.O. Wilson, E.E. Williams (especially), R.C. Lewontin, E. Mayr. A.C. Wilson (who was visiting in 1978)". In a referee report, however, Hamilton wished to make clear Seger's allegiance; he wrote, "it is worth mentioning

[741] O. Aldis to W.D. Hamilton, 10 July 1979, Hamilton archive, Z1X89/1/16.
[742] W.D. Hamilton to O. Aldis, 31 August 1979, Hamilton archive, Z1X89/1/16.
[743] J. Cherfas, 'Genes Take Care of Their Own', *New Scientist*, (4 January 1979), pp. 31-33, Hamilton archive, WVJ13/1/6.
[744] J. Seger to W.D. Hamilton, 14 January 1980, Hamilton archive, Z1X69/1/4.

anecdotally that he had the reputation of being the only person on Wilson's side of the controversy that Lewontin was afraid of!"[745] By then, Seger was at the University of Sussex, and he reported that he found the environment there "much better" than it had been at Harvard.[746]

Elsewhere, there was hope that the methods of sociobiology could be usefully combined with those of anthropology. This is illustrated through the work of Austin Hughes, whose background was multidisciplinary.[747] Hughes was careful to articulate the potential benefits of his diverse training when he wrote to Hamilton to introduce himself in 1984,[748] and Hamilton shared Hughes' hopes that he had the potential to advance sociobiological theory in a way that would be acceptable to anthropologists. Hamilton wrote, "Hughes is in a position to make a very significant extension to genetical kinship theory and human sociobiology. At the same time, hopefully, he will be able to make the approach more appealing to anthropologists."[749]

Though Hamilton had become increasingly reluctant to discuss his theory of inclusive fitness in relation to man, this was precisely the topic that interested Hughes.[750] In fact, Hughes saw sociobiological studies to be widely applicable within human society, if only the reforms for which they called were not so contrary to tradition. Having recently moved to rural Pennsylvania, he suggested to Hamilton, "The city of Scranton deserves study from a sociobiological point of view, being run by a complex patronage system in which relatedness (naturally) plays a role. Alas, any impartial investigator attempting to

[745] W.D. Hamilton to W.R. Dawson, 20 May 1982, Hamilton archive, Z1X69/1/4.
[746] J. Seger to W.D. Hamilton, 10 February 1982, Hamilton archive, Z1X69/1/4.
[747] A. Hughes, Curriculum Vitae, Hamilton archive, Z1X67/1/11.
[748] A. Hughes to W.D. Hamilton, 16 February 1984, Hamilton archive, Z1X67/1/11.
[749] W.D. Hamilton, 'Referee's Report' for 'Patterns of Genetic Relatedness as Predictors of Dominance, Conflict, and Stability', 11 April 1984, Hamilton archive, Z1X67/1/11.
[750] As reported in W.D. Hamilton to D. McFarland, 5 March 1985, Hamilton archive, Z1X67/1/11.

study the system would likely be mistaken for a muck-raker and shot. They take a dim view of reformers in these parts."[751]

To Hughes and, as we have already seen, to Hamilton, an understanding of kin selection was relevant not only to understanding pro-social behaviours in man but also to studies of aggression. Hughes project on 'Patterns of Genetic Relatedness as Predictors of Dominance, Conflict, and Stability', for example, explicitly stated its relevance to issues of violence in human societies.[752] One example of how this could contribute to an understanding of human societies was made clear in 1985, when Hughes applied for a grant from the Social Science Research Council Program in International Peace and Security Studies. While he admitted the proposal was a "long shot", he nevertheless claimed, "since the people running it seem to be very anxious to give away their money and since they are looking for 'new approaches' and 'theories and methods from diverse disciplines,' it seems worth a try." As it was reported to Hamilton, the project Hughes proposed

> "originated as a joke. I read in a newspaper the profound observation that the government forces in El Salvador were making enemies by murdering people, since the kin of slain individuals became implacable enemies of the government. I remarked at the time that there was an area where knowledge of sociobiology would prove of practical value, since sociobiological theory would predict that people shouldn't take the murder of their kin lightly. Evidently the Salvadorean government (and its U.S. sponsors) are not aware of this. It later occurred to me that there might be a serious hypothesis here, one that could be tested by comparative study of 'pacification' by colonial governments."[753]

[751] A. Hughes to W.D. Hamilton, 21 September 1984, Hamilton archive, Z1X67/1/11.
[752] A. Hughes, 'Patterns of Genetic Relatedness as Predictors of Dominance, Conflict, and Stability', 22 March 1984, Hamilton archive, Z1X67/1/11.
[753] A. Hughes to W.D. Hamilton, 30 April 1985, Hamilton archive, Z1X67/1/11.

In the referee report that Hughes requested from Hamilton, the relationship between Hughes's work and the continuing conflict surrounding sociobiology was also mentioned. Of Hughes, Hamilton claimed, "He goes at things at a deeper level that that [sic] of current controversy and this will help to get his work on human social behaviour accepted."[754]

**Moving Back To England: A Royal Society Professorship**

In February 1980, Hamilton received notification that he would soon be named a Fellow of the Royal Society.[755] Hamilton's election to the Royal Society proved just how far the status awarded to his theory of inclusive fitness had come since its publication in 1963, and while he had moved away from the evolution of altruism to devote himself to other evolutionary puzzles, it was very much due to the esteem granted to inclusive fitness theory that his standing had been secured. In fact, according to the *Royal Society News*, Hamilton's election came in light of "his contributions to evolutionary biology, especially through the concept of 'inclusive fitness'".[756]

Nevertheless, the news was celebrated for many reasons. For some, Hamilton's election signified that greater esteem had been granted to evolutionary biology, which had "seemed something of a Cinderella subject so far as the Royal, and this country, has been concerned", and there was optimism that Hamilton's election would have positive effects on the subject as a whole.[757] For others, Hamilton's achievement was something to be celebrated on a personal level: "we always thought you would 'make it' but we were

[754] W.D. Hamilton, Referee form for Social Sciences Research Council, 15 May 1985, Hamilton archive, Z1X67/1/11.
[755] T.R.E. Southwood to W.D. Hamilton, 14 February 1980, Hamilton archive, Z1X70/1/15.
[756] 'Election of New Fellows', *Royal Society News*, (March 1980), Hamilton archive, Z1X70/1/15.
[757] M.G. Rodgers to W.D. Hamilton, 9 April 1980, Hamilton archive, Z1X70/1/15.

delighted to hear the good news – and also to see and hear your work referred to in various places – 'the most important advance in the understanding of heredity since Darwin' we read somewhere (and you can't aim much higher than that, I would think!)".[758]

In one of the few records of their communication, even Wynne-Edwards wrote to Hamilton to congratulate him, noting "The speed with which you have appeared on the select list is a measure of the value of your work & the esteem in which it is held." Much as his work on inclusive fitness was well regarded, however, Wynne-Edwards asked Hamilton what he thought "of David Sloan Wilson's proposition, now that it is set out at length in his book", which had been perhaps one of the most highly regarded defences of group selection.[759] Perhaps this was Wynne-Edwards' attempt to understand his current standing in Hamilton's mind, since Hamilton's success had powerfully contributed to his own place at the margins of the historical record. Hamilton assured him that he thought "very highly" of Wilson's book while still maintaining his "own feeling that all the plausible models of intra-species group selection are based on genetical kinship".[760]

Beyond such praise, Hamilton's election also provided him with a ticket home. He had, in fact, come to the U.S. out of perceived necessity, and he was eager to leave as soon as it became an option. As his former supervisor, John Hajnal, anticipated, "suitable posts"[761] would quickly open up for the new Fellow of the Royal Society, and only a year later, this prediction proved true. In March 1981, Dick Southwood began a series of attempts to land Hamilton a position as a Royal Society Professor. So committed was he that even

[758] J. Hudson to W.D. Hamilton, 24 April 1980, Hamilton archive, Z1X70/1/15.
[759] V.C. Wynne-Edwards to W.D. Hamilton, 10 March 1980, Hamilton archive, Z1X70/1/15.
[760] W.D. Hamilton to V.C. Wynne-Edwards, Hamilton archive, Z1X70/1/15.
[761] J. Hajnal to W.D. Hamilton, 26 March 1980, Hamilton archive, Z1X70/1/15.

before contacting Hamilton to confirm his interest, he had "gently" begun the process.[762] The correspondence between Southwood and Hamilton indicates that part of Hamilton's dissatisfaction with America had to do with the visible societal unrest associated with an increasingly fragmented country. According to Southwood, Hamilton had "put [his] fingers on the aspects of life in the U.S. that people with our attitudes find difficult i.e. the bringing up of a family". While he admitted the situation had also worsened in England, as far as there was "a little more violence around here than in the late forties and fifties", he assured Hamilton that things were still "very much better than in the USA". To this point, he provided anecdotal evidence: "Of the literally hundreds of young friends of my sons, none of whom seem to lead a very sheltered life, the only girl who has suffered any violence was one who was walking home alone along a deserted street at 2 o'clock in the morning." As far as the economic situation in Britain was concerned, he further stressed, "the foreign newspaper accounts of the state of Britain are greatly exaggerated!"[763]

Only a few months later, Southwood's campaigning proved worthwhile, and in July 1981, Sir David Phillips offered Hamilton a Royal Society Research Professorship.[764] He had been selected from a pool of eighteen candidates, and since the chair had previously been occupied by a chemist, "there were non-intellectual factors against" Hamilton. It was in fact seen to be a tribute to Hamilton and the value that had only so recently been attributed to his ideas that he was chosen against such odds. A further cause for celebration was the fact that the position involved no teaching commitment.[765] Richard Dawkins urged Hamilton to accept the position, citing the presence of his talented students, Alan Grafen and Mark

[762] T.R.E. Southwood to W.D. Hamilton, 2 March 1981, Hamilton archive, Z1X70/1/6.
[763] T.R.E. Southwood to W.D. Hamilton, 19 March 1981, Hamilton archive, Z1X69/1/2.
[764] D. Phillips to W.D. Hamilton, 16 July 1981, Hamilton archive, Z1X70/1/6.
[765] T.R.E. Southwood to W.D. Hamilton, 20 July [1981], Hamilton archive, Z1X70/1/6.

Ridley, as well as the fact that John Krebs has turned down Harvard to stay at Oxford, as reasons why Hamilton should join him there.[766] Still, the future of Britain did not look bright. Accordingly, Phillips acknowledged the pervasiveness of damaging news reports of university finances and civil unrest, only to assure Hamilton that "this remains a civilized country to live in". Moreover, he claimed, "Oxford is a splendid place in which to work and that research here, especially in Biology, stands comparison with anywhere in the world!"[767]

Hamilton did not need much convincing. In fact, he found the tradition of science in America to lack "A certain slowness and thoughtfulness […] Everything goes rather pell mell and it is surprising how this affects even an ultra slow worker like me. My productivity seems to have gone up, but I feel that my standards amy [sic] have gone down, although not by more than a little I hope." It also seemed to him that graduate students were in a rush, meaning the work they produced was seldom very original. To make matters worse, "the level of violence, the lack of a real countryside, commercial bombardment, etc." were abhorrent to Hamilton.[768]

Still, his eager recruiters would be disappointed. Although Hamilton was well disposed to return to England, he felt it was financially impossible. While the salary he had been offered was competitive by British standards, it was lower than what he was earning in America. On top of that, he would have to sell his house in Michigan at a loss, making it likely that the move would leave his family not simply worse off but actually in debt. He asked to be reconsidered for a similar position at a later date[769] and was offered a

[766] R. Dawkins to W.D. Hamilton, 17 July 1981, Hamilton archive, Z1X70/1/6.
[767] D. Phillips to W.D. Hamilton, 27 July 1981, Hamilton archive, Z1X70/1/6.
[768] W.D. Hamilton to T.R.E. Southwood, 19 December 1981, Hamilton archive, Z1X70/1/6.
[769] W.D. Hamilton to D. Phillips, 26 November 1981, Hamilton archive, Z1X70/1/6.

professorship in 1983.[770] As he made plans to move,[771] he could rest assured that he had finally found esteem within his own country, albeit twenty years after he had first anticipated it.

**Conclusion**

This chapter has chronicled the trajectory of inclusive fitness from the mid-1970s. In doing so we have seen what it meant in different disciplines as well as how it was transmitted graduate students. We have also seen proponents and opponents of sociobiology who crossed disciplinary lines, indicating that there was dissension amongst researchers on social behaviour as to what their work had in common and who was authorized to speak for whom. There were no representative responses to sociobiology within any discipline.

What is more, the hubbub surrounding sociobiology after its popularization through *Sociobiology* in 1975 and *The Selfish Gene* in 1976 explain, at least in part, the surge of interest in inclusive fitness in the following years. Beyond this, I have suggested that simultaneous shifts within political ideologies and cultural systems may have furthered interest in the theory of inclusive fitness, especially insofar as it served the dual purpose of expanding upon the perceived threat posed by collectivist ideologies and justifying an enlarged emphasis on concern for the individual in questions of 'what is good' or 'what is right'. The most revealing question, however, remains: why was inclusive fitness theory so much more highly regarded in America that Hamilton finally gave in to the scores of offers coming from prestigious universities? So stark was the contrast that in only a year he leapt from his position as an unpromoted lecturer at Imperial College to a full professor at one of

[770] U.M.A. Maunsell to W.D. Hamilton, 20 May 1983, Hamilton archive, Z1X70/1/8.
[771] W.D. Hamilton to D.C. Smith, 21 November 1983, Hamilton archive, Z1X70/1/8.

the most highly respected public universities in America. Although this question deserves intense scrutiny beyond the limits of this thesis, I propose the following preliminary conclusion.

Sociobiology was controversial in both its scientific and extrascientific aspects. On the scientific front, it was arguable whether it too easily assumed that characters must have an evolutionary significance, that is to say, that they are an adaptation evolved by the process of natural selection acting on genetic mutations. On the extrascientific front, it was questionable whether sociobiological research was just the most recent manifestation of a long tradition in which 'scientific' theories ultimately served the interests of the ruling classes and more generally justified the political status quo. This latter point, which arguably influenced much of the controversy as well as inflamed the level at which the debate occurred, only mattered if sociobiological theories were prescriptive rather than merely descriptive.

A major complaint of those researching within the domain of sociobiology was that the scientific theories they concocted should be absolved from political critiques; their theories were descriptive, not prescriptive. If this was accurate, however, how can we explain the differential reception of Hamilton's ideas in America and Britain, and to a lesser extent, in the 1970s compared to the 1960s? Such discrepancies indicate that the social and political context of the theory in fact mattered deeply, and this can only be explained if inclusive fitness had socio-political relevance.

John Maynard Smith noticed the discrepancy between sociobiologists' declarations of disinterest and their opponents' criticisms as early as 1979. In fact, he claimed that this

was one of two reasons why sociobiology had proved so controversial.[772] According to him, sociobiologists and their opponents had differing beliefs concerning the extent to which "evolutionary biology [can] be a source of moral values".[773] This question had been a point of discussion since the end of the nineteenth century with the rise of what has been called 'social Darwinism'. It had again become a topic of debate when Julian Huxley advanced the idea of 'evolutionary ethics' in the 1940s. Though biologists such as Huxley believed themselves to be uniquely positioned to comment on what is or is not natural concerning the human species,[774] not all scholars agreed that this particular group of scientists were capable of answering questions previously considered by philosophers and theologians. C.S. Lewis, for example, thought that science was powerless to fully explain the primary and universal law explaining human nature, according to which each could discern right from wrong.[775] What is significant, however, is that some saw sociobiology to have successfully achieved what evolutionary ethics had failed to do. Pulling us out of a "minor dark age" in which the relationship between evolution and ethics was not understood, "sociobiology forced its way through the previously barred doorway into the social sciences", and in doing so, it allowed evolutionary ethics to regain its legitimacy.[776]

It is nevertheless commonly thought that Hamilton meant to explain behaviour in a descriptive rather than a prescriptive way. As Trivers explained to his Harvard graduate students, Hamilton's theory of kinship was not meant to imply that racist behaviour was

[772] The first pertained to the question of whether Hamilton's theory of inclusive fitness and related theories could provide causal explanations for phenomena within sociology and anthropology.
[773] J. Maynard Smith, Review of 'In the Safety of Confusion: The Sociobiology Debate', *New Scientist* (29 March 1979), p. 1051.
[774] See Huxley, *Evolutionary Ethics*, p. 6.
[775] C.S. Lewis, *Mere Christianity*, [1952], (London: Collins, 1988).
[776] P.A. Corning, 'Evolution and Ethics… An Idea Whose Time Has Come?', *Journal of Social and Evolutionary Systems*, 19 (1996), pp. 277-8.

either good or natural. Nevertheless, Hamilton's own position on this issue, and his 'racialistic' theory in particular, appears to be more nuanced. For instance, Hamilton claimed that he did in fact think that biology "can help to show whether a given course of action will succeed in procuring a chosen good or not". Like Huxley over thirty years earlier, he also believed that the question of whether biology could inform decision making in regard to ethical problems was especially important as society decided whether the governing systems should prioritize individual rights or collective interests. In line with Huxley, Hamilton argued that an understanding of evolution could help us make sense of these alternatives: "biology might warn that if the final aim is a state of perfect communism the best way of getting there is not to legislate private property out of existence in one year." In such a case, "certain deep rooted feelings about property" made it reasonable to predict "that chaos and anarchy would be the almost certain result".[777]

As we have already seen, Hamilton had shied away from the overtly political discussions surrounding sociobiology in the late-1970s, but that does not mean he abandoned this line of thinking altogether. He continued to acknowledge that his interest in the evolution of altruism had originated in reflections on human family life and examinations of his own psyche amidst great social and political change. As we have seen, the extent to which he publicly articulated his controversial views oscillated in relation to his professional standing. As a scientist, his qualifications depended on the appearance of objectivity. Thus, a deep desire to speak the truth had to be carefully balanced with the necessity of avoiding undue controversy. Once he had secured a Royal Society

[777] W.D. Hamilton, '3 Nov. 1977', Hamilton archive, Z1X90/1/18.

Professorship in 1984, he again chanced the opportunity to be more daring. This time, however, he would be more mindful of his audience.

# CHAPTER SEVEN

## Talking 'Sense' and 'Common Sense': Human Sociobiology and Conservative Politics

By 1987, Hamilton's position among evolutionary theorists was solid, and he had avoided entanglement in the political debates surrounding sociobiology, at least as far as the majority of academics and the more general public were aware. The theory of inclusive fitness, which had in large part inspired E.O. Wilson, Richard Dawkins, and Robert Trivers to pursue research that fell under the umbrella 'sociobiology', remained Hamilton's most famous idea, and at the end of that year, he reflected on its current standing. Although its history had been "rather chequered […] being at times almost over-enthusiastically received and at times rather battered", the theory of inclusive fitness was generally believed to be both "workable and valid".[778] Despite the fact that some exceptions to Hamilton's rule had been recorded,[779] biologists such as Rick Michod at the University of Arizona emphasized that these inconsistencies should not detract from the status of the theory as a "general" truth.[780]

Hamilton himself was unperturbed by criticisms, and despite the fact that his first papers relied heavily on the case he made for haplodiploid social insects, Hamilton echoed Michod's sentiment that the illustration he had given in 1964 was of nominal importance:

[778] W.D. Hamilton, 'Talk to ESA', 1 December 1987, Hamilton archive, Z1X73/1/11.
[779] See, for example, M.W. Norman, 'Sociobiological Variations on a Mendelian Theme' (1981); B.J. Williams, 'A Critical Review of Models in Sociobiology', (1981); and also the comments for *Nature* on Michod's and Hamilton's 'Coefficients of Relatedness in Sociobiology', wherein the reviewer argued that a continued overemphasis on genes had contributed to the bad press surrounding sociobiology ([n.d., c. September 1980], Hamilton archive, WVJ14/1/7). Other criticisms were, according to Hamilton, "matters of semantics" (W.D. Hamilton to R. Michod, 4 November 1981, Hamilton archive, WVJ14/1/7).
[780] R. Michod to J. Wolfe, 2 September 1980, Hamilton archive, WVJ14/1/7.

according to him, "the general importance of genetical kinship in social behaviour" was not seriously impacted by whether the individual example stood or fell.[781] In fact, Hamilton no longer felt that real world patterns that proved his theory's predictions accurate were necessary. He had come to believe his theory was meaningful inasmuch as it highlighted "what kinds of things are likely to be important in more realistic" settings.[782] Moreover, he continued to trust, as he had since the 1950s, that social and asocial behaviours had genetic foundations. Specifically in the case of social insects, he declared that such behaviour was "largely programmed by genes and has rather little additional impact from learning",[783] but by limiting his statements to other animals, he avoided public involvement with many of the on-going controversies surrounding the genetics of social behaviour in man.

Other scholars were less cautious, and far from divorcing himself completely from the use of sociobiological theory to illuminate deep-seated issues within human society, Hamilton continued to engage with those who attempted to explain phenomena such as 'ethnocentrism' in terms of natural selection. An article by Colin J. Irvin, for example, caught Hamilton's eye; he noted that the chapter "Seems good".[784] What is more, he underlined parts of a passage regarding the idea that groups will become more hostile towards one another as the differences between them increase and wrote, "I would add 'in degree of above replacement birth rate'."[785] Apart from the work of Irvin, Hamilton had also read an article by Ian Vine that appeared in the same volume. Vine's claim that extreme forms of ethnocentrism could be mitigated through changes to our socio-political systems

[781] Hamilton, 'Talk to ESA'.
[782] W.D. Hamilton to R. Michod, 4 February 1980, Hamilton archive, WVJ14/1/7.
[783] W.D. Hamilton, 'Talk to ESA', 1 December 1987, Hamilton archive, Z1X73/1/11.
[784] C.J. Irvin, 'A Study in the Evolution of Ethnocentrism', V. Reynolds, V. Falger, and I. Vine (eds.), *The Sociobiology of Ethnocentrism: Evolutionary Dimensions of Xenophobia, Discrimination, Racism and Nationalism*, (London: Croom Helm, 1987), Hamilton archive, Z1X9/1/2.
[785] W.D. Hamilton, annotation in Irvin, 'A Study in the Evolution of Ethnocentrism', p. 153.

drew less favourable comments from Hamilton. With no additional explanation, he dismissed Vine's views as "Not likely".[786]

Thus, it is unmistakable that Hamilton continued to be interested in understanding human society through the 'scientific' techniques that he and others had devised in earlier decades. In fact, rather than Hamilton's interests, what had changed most by the 1980s was the emergence of a widely held belief that Hamilton's work could be completely disassociated from the debates surrounding human evolution that it had in some ways inspired. Owing to this dissociation, Hamilton was viewed as an untainted naturalist "more at home with insects than people",[787] and when the Human Behavior and Evolution Society (HBES) formed in the late-1980s, he was therefore an attractive candidate for its first president.

Hamilton's election was somewhat unexpected, as he had little to do with the society's establishment. His participation nevertheless reflected his longstanding faith that evolutionary theory could inform our understanding of humankind. What is more, Hamilton's communications on behalf of the society are notable in that they demonstrate an enduring concern that political ideologies impeded rational discussion of human nature. As his presidential speeches will make clear, while Hamilton hoped that biology could usefully inform politics in the 1960s and perhaps even through much of the 1970s, by 1989 he feared that the topic had become too explosive: the political nature of discussions of evolved human behaviour, provoking as they did individuals on both the left and right, seemed likely to impede advances in the scientific understanding of human society for the foreseeable

[786] W.D. Hamilton, annotation in I. Vine, 'Inclusive Fitness and the Self-System', V. Reynolds, V. Falger, and I. Vine (eds.), *The Sociobiology of Ethnocentrism*, p. 63.
[787] Dugatkin, *The Altruism Equation*, p. 106.

future. The HBES meetings would be a place to 'talk *sense'*, but it was not expected that their sensible conclusions would be far-reaching.

For this reason, beyond the research agenda of human sociobiologists in the 1980s, this chapter surveys the relationship between sociobiology and a new set of political adversaries, the religious right, who threatened to cast aside the theory of evolution altogether. But in addition to the problems that emerged from a closer connection between church and state in the Reagan and Thatcher era, those concerned with developing a scientific understanding of humankind were also besieged by unsavoury politics from within. Even among those who believed that evolutionary theory should inform our understanding of human society, it required great care to both appear nonpartisan and maintain high scientific standards: in an environment where unpalatable truths were considered, those who were denied the opportunity to speak felt persecuted for having ideas that were somehow too unpleasant even for sociobiologists. Still, such minor policing did not protect the founders of sociobiology from attack. By the 1980s, Wilson, Dawkins, and Hamilton had all been accused of holding right-wing political sympathies. Though they emphatically denied these accusations, it is worth exploring the extent to which the socio-political ramifications of the theory of inclusive fitness overlapped with the neoliberal ideologies of conservative governments in these years.

**Sociobiology and the Rise of the Religious Right**

While by the early 1980s Hamilton was well regarded among academics, the authority leant to sociobiology remained a point of contention both inside and outside academia. Peter H. Fitzgerald of Newport, for one, was disturbed by sociobiologists'

assumption that behaviour was genetically determined. What is more, he found such a tenet to be "dangerously political".[788] Although sociobiologists claimed to have no ideology, Margaret Willis of Wivenhoe, Essex, believed that it was precisely the cohesive agenda of the discipline that was most intriguing. As she saw it, sociobiology seemed to invariably support the idea that "humans are naturally aggressive, competitive, and hostile to strangers; that the oppression of women and racial discrimination are permanently with us; that we are inevitably bound by our genes to a capitalist society", or at least, quoting American psychologist David Barash, that "the selfless communism envisioned as humanity's ideal state" was an illusory goal. In sum, she claimed, "Sociobiology takes capitalist ideology right down to the level of the gene."[789] Seen in this way, it is not surprising that links were drawn between the doctrine of selfish genes and a newfound faith in free market capitalism in the 1980s.

In a 1987 BBC programme meant to emphasise the extent to which long-term strategies based on cooperation rather than extreme selfishness were more successful in game theory games, Richard Dawkins lamented having been "blamed in a magazine article […] almost personally blamed for the election of Mrs. Thatcher in the last general election".[790] Having gone on to detail how "right-wingers" misinterpreted his idea of the selfish gene, Dawkins implied that his sympathies lay, on the other hand, with the political left. Thus, Dawkins, Wilson, and Hamilton each appeared at various times rather baffled by the relationship they were seen to have with neo-liberalist thought in the 1970s and 1980s,

[788] P.A. Fitzgerald, 'Disturbed', *The Guardian*, (18 February 1982), p. 15.
[789] M. Willis, 'Myth of Greedy Genes', *The Guardian*, (30 June 1982), p. 12.
[790] Dawkins, *Nice Guys Finish First*.

especially since they deeply believed in science as a liberalizing force.[791] If these scholars were not the accused conservative social theorists they were made out to be, however, why have these links so often been made?

Sociobiologists and Thatcherite politicians shared several tenets, including an emphasis on the family unit as more important than any larger collective group, an appeal to 'common sense' appreciations of human nature, and a renewed focus on individualism and the inherent value of individual freedom. For this reason, those who praise Thatcher for having anticipated shifting tides towards the individual in the late-1970s might also applaud Hamilton for realizing the 'true' nature of man in an artificially collectivized culture, but recently, historians Jon Lawrence and Florence Sutcliffe-Braithwaite interpreted Thatcher's success differently. They argued that Thatcherites "were less riding a wave than fighting a desperate rearguard action against powerful trends which appeared to be entrenching socialist collectivism".[792] Historian Ben Jackson, too, has emphasized the extent to which neo-liberalism required that advocates educate British businessmen from 1959 as to "what sort of economy and society was in their own best interests".[793] If this is true, it seems that the sociobiologists were also playing an important and very public role in changing the rhetoric surrounding individualism and self-interest. What is more, their interpretations of altruism as naturally limited and selfishness as naturally pervasive added the glamor of 'scientific' evidence.

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[791] For more on Wilson's political beliefs in particular, see N. Jumonville, 'The Cultural Politics of the Sociobiology Debate', *Journal of the History of Biology*, 35 (2002), pp. 569-93.
[792] J. Lawrence and F. Sutcliffe-Braithwaite, 'Margaret Thatcher and the Decline of Class Politics', B. Jackson and R. Saunders (eds.), *Making Thatcher's Britain*, p. 147.
[793] Jackson, 'The Think-tank Archipelago: Thatcherism and Neo-liberalism', p. 46.

As far as the 'traditional' values of the political right reinforced the sociobiologist's interpretation of the norms that evolved to serve an adaptive purpose throughout history, the agendas of the two groups do seem to overlap. For instance, Thatcher's emphasis on individual responsibility, rather than reliance on trade unions, fit well with Hamilton's interpretation of collective action as wasteful and inefficient. Likewise, the individualist agenda of the Thatcher government sought to promote hard work and financial frugality as the most effective means by which low incomes could be improved. In doing so, she hoped to counter trends toward an increasingly comfortable social safety net. Judging from his 1976 analysis, Richard Dawkins was sympathetic to this view. In *The Selfish Gene*, he elaborated upon the many problems caused by having "abolished the family as a unit of economic self-sufficiency" under the welfare system. Such a system, however "highly desirable", was left "open to abuse by selfish individuals, ready to exploit it". While Dawkins did not blame "Individual humans who have more children than they are capable of rearing" since "they are probably too ignorant in most cases to be accuse of conscious malevolent exploitation", he remained suspicious of "Powerful institutions and leaders who deliberately encourage them to do so".[794] Here, the resemblance between genetic theories of social behaviour and the line taken by political Conservatives is real. What is more, both tuned into deep, recurring, and widespread fears among the British public that the decline of the country was a result of higher than average rates of reproduction among lower socioeconomic groups.

Dawkins' assumption of the general ignorance of welfare recipients also points to a meaningful comparison between practitioners of the genetics of social behaviour and

[794] Dawkins, *The Selfish Gene*, pp. 117-8.

Thatcherite politicians who denigrated the work of British sociologists such as Richard Titmuss and the belief that socioeconomic conditions perpetuate cycles of poverty. Titmuss had drawn attention to the needless deaths caused by poverty and lack of access since the 1930s; it was for this reason that he promoted the establishment of a new social order to end inequality. In particular, he saw the welfare state "as a living embodiment of altruism and social integration". What is more, he saw capitalism as "a biological failure": by promoting individual competition and greed, it threatened the extinction of man altogether.[795]

Although Thatcher and various sociobiologists also saw themselves to be social reformers, or at least to be contributing to the knowledge base required for effective social reform through attention to either 'common sense' or biological fact, the organization of society they saw to be desirable could not have diverged more from what Titmuss had in mind. For individuals like Hamilton, collectivism obliged individuals to give to strangers as they would naturally give only to their closest relatives. In this way, it fundamentally reimagined what an individual owed to other individuals. More than unnatural, such social organizations were seen to be unstable from a biological point of view. Similarly, for individuals like Thatcher, collectivism destroyed the bonds of family and the responsibility of individuals by permitting people to undeservedly gain what they could otherwise only attain through hard work. Thus, separate but parallel claims being made by conservative politicians and sociobiologists in this time concerned the perils of the welfare state. Furthermore, they placed the onus on the individual to 'succeed' without, of course, calling for a complete destruction of the social safety net that had been built from 1948. Nevertheless, they believed the tendency to drift toward collectivism must be stopped.

[795] J. Kincaid, 'Titmuss, the Committed Analyst', *New Society*, (24 February 1983), p. 292.

Continuing down the road to socialism, Britain risked further decline, if not an altogether tragic end.

Likewise, both conservative politicians and researchers within sociobiology defended the traditional or 'natural' place of women in society. For sociobiologists, males and females had evolved distinct behavioural strategies that were coupled to their very different levels of investment in the production of offspring. Taking into account the energy and time required to produce an egg versus a sperm, combined with the obvious investment discrepancies during the gestational period, sociobiologists saw males and females to value the resultant offspring differently. For this reason, the persistence of sexual conflict came as no surprise to this set of researchers, and beyond the evolved tendencies underlying heterosexual relationships, differential investment was also seen to cause differences in behaviours towards offspring along gendered lines. More particularly, they declared that females had much more to lose than their partners in failing to contribute to the postnatal development of their offspring. The obvious implication was that females are 'naturally' positioned to become the primary care givers within the family.

While conservative politicians did not use the same logic, they reached similar conclusions regarding distinct gender roles through appeals to traditional values. Thus, Thatcher likewise saw the primary domain of a woman to be the home. It was for this reason that she was hesitant to advocate policies regarding women's 'right to work'. Rather, she committed herself to ensuring that women were not discouraged from dedicating themselves to "one of the most important jobs in the world, which is keeping family life together".[796] Later in her premiership, when groups asked for greater regulation within the part-time

[796] M. Thatcher, Scottish press conference, 26 April 1979, qtd. in L. Beers, 'Thatcher and the Women's Vote', B. Jackson and R. Saunders (eds.), *Making Thatcher's Britain*, p. 119.

labour market, a sector in which eighty-four per cent of employees were women,[797] Thatcher implied that there was nothing wrong with part-time work. What is more, it seemed to her to "suit" women.[798]

Despite the fact that the resulting message neglected to address individual differences let alone the reality of single-parent households as well as those in which men suffered from unemployment or disability, the Prime Minister's position was unambiguous: women belong in the home. The corollary to this claim, however, was that no structural changes to recruitment processes, considerations for promotion, or the workplace itself were necessary. Moreover, it would be equally unnecessary to legislate for the protection of men's rights as fathers through guaranteed paternal leave and flexibility to care for sick children. Far from residing within one political party, such views retained fairly wide support. A 1980 poll revealed that 28 per cent of women and 34 per cent of men in Britain believed that married women should be discouraged from working when jobs were scarce, and a comparison of diaries from 1961 and 1983 showed that women still spent the majority of their time at home.[799] It was treated as a given that men and women differed in fundamental and immutable ways, and the results were socially and politically meaningful.

With few exceptions, sociobiology and politics were yet a man's world in the early 1980s, and the resulting limitations of the arguments on both sides reveal the shallowness of the particular subset of experiences they deemed significant. What is more, the few women who researched within sociobiology in these years were singled out for applause when they were seen to have circumvented the emotional tendencies of the female mind. This becomes

[797] Harrison, *Finding a Role?*, p. 228.
[798] M. Thatcher, interview for Channel 4 News, 13 June 1986; interview for Scottish TV, 4 September 1986, qtd. in Beers, 'Thatcher and the Women's Vote', p. 120.
[799] Harrison, *Finding a Role?*, p. 234.

clear in the letters of recommendation that Hamilton wrote for his colleagues who happened to be women. For example, he considered Sarah Hrdy to be "a courageous and objective researcher in a field where both qualities are much needed and often absent".[800] Of Nancy Thornhill, he wrote, "She reminds me quite strongly of Margo Wilson and Sarah Hrdy. But, I would say she is even more ruthlessly objective than Hrdy, which is no light compliment".[801] He did not seem to feel it necessary to describe male colleagues as objective in similar letters, indicating perhaps that he took this quality as a given in men.

As far as 'traditional' meant 'Christian', however, the aims of the political right and sociobiologists diverged. In fact, we have seen just how strongly Hamilton and Dawkins opposed the influence of religious doctrines on social and political policies, and indeed, how this formed part of their motivations to uncover the true social nature of man from a biological perspective. It is perhaps Margaret Thatcher's emphasis on Christian morality that meant she would remain forever at odds with Hamilton's own vision of the future. A letter from David Queller written in 1983 implies that Hamilton was no supporter of Thatcher or Reagan. Having heard that Hamilton was moving back to Britain, Queller warned, "Just remember, you'll have 5 years of Mrs. Thatcher and we may get rid of Reagan in a year and a half!"[802] Science writer Marek Kohn, whose research involved interviews with those close to Hamilton, nevertheless claimed that Hamilton had exhibited "a keen admiration for Margaret Thatcher" during his lifetime.[803]

Indeed, there is something to be said for the rhetoric shared by both biologists and conservative politicians in this period, especially inasmuch as both parties felt they had

[800] W.D. Hamilton to W.G. Davis, 23 November 1983, Hamilton archive, Z1X67/1/13.
[801] W.D. Hamilton to R. Michod, 20 December 1989, Hamilton archive, Z1X69/1/5.
[802] D. Queller to W.D. Hamilton, 21 June 1983, Hamilton archive, Z1X69/1/1.
[803] Kohn, *A Reason for Everything*, p. 268.

something important to say with regards to the nature of man and the most effective means by which society should be organised. Accordingly, they each acted to undermine faith in the collective by subscribing to an unapologetic defence of the individual. For biologists, the sentiments surrounding collectivism, whether religious or ideological, were contradicted by the reality of evolution, which made us mere vehicles for our selfish genes; for politicians, they were undermined by the conclusion that there was, in the end, no such thing as society. Both, in fact, saw society to be a rather haphazard conglomeration of self-seeking organisms who had come together tenuously for their personal benefit. The idea that it had ever been anything more was but a shared figment of our overlapping imaginations, a construction to manipulate the common man into committing himself to unrealistic religious and political goals.

Beyond the conflict between sociobiology and the social sciences, by 1987, Hughes acknowledged strife within the discipline of biology: "I find the situation in biology […] rather disheartening. There are frequent bitter conflicts between 'molecular' and 'ecological' biologists. As the resources become scarcer, competition predictably becomes more intense between these two groups of pseudo-kin (or 'kindred spirits' at least)."[804] They were in fact failing to unite against a common enemy.

As the decade drew to a close, those working on the biology of social behaviours faced greater challenges than those that had been previously posed by the liberal ideologies of social scientists. The rise of political conservatism and the religious right, it turned out, created a climate in which it was even more difficult for sociobiological ideas to thrive. Under the Thatcher and Reagan governments, funding cuts for research threatened the

[804] A. Hughes to W.D. Hamilton, 3 February 1987, Hamilton archive, Z1X67/1/11.

advance of scientific knowledge altogether, and though they shared with many biologists the perception that socialism was unnatural and overly idealistic, the religious right made few concessions to the blasphemous evolutionists. A Gallup poll in 1982 found that forty-four per cent of Americans believed that God created humans in their present form,[805] and Queller noted the new conflict between evolutionary biologists and creationists in his report to Hamilton regarding a recent lecture on the topic. He wrote,

> "It went extremely well. There was a very good crowd that did not contain any hostile maniacs, or at least no vocal hostile maniacs. […] I didn't feel obliged to recite the creationist's arguments, only to shoot them down. […] For entertainment value I added some pokes, such as telling them that while biologists have been working to excavate extinct horses, creationists keep beating dead ones."[806]

Beyond his discussions with George Price in the early 1970s, Hamilton made few explicit comments about religion. He did, however, write to Jon Seger, a former student of Bob Trivers, indicating his belief that one must balance the natural beauty of a place with the idiosyncrasies of the people living there. Speaking of Salt Lake City, in particular, he recalled the landscapes as "almost dreamlike […] It's a pity that […] the local people are so stricken with the Mormon religion as to be hard to get along with."[807] Recommending Richard Dawkins for the Royal Society Michael Faraday Award for communicating science to the public in 1987, Hamilton wrote of Dawkins's *The Blind Watchmaker* (1986), it "is the most persuasive popular defence of the neodarwinian view of evolution yet written (in my

[805] F. Newport, 'In U.S., 46% Hold Creationist View of Human Origins', *Gallup*, 1 June 2012, <http://www.gallup.com/poll/155003/hold-creationist-view-human-origins.aspx>.
[806] D. Queller to W.D. Hamilton, 7 February 1985, Hamilton archive, Z1X69/1/1.
[807] W.D. Hamilton to J. Seger, 16 December 1986, Hamilton archive, Z1X69/1/3.

opinion): in particular it is going to be an ideal text to combat the ever recurrent claims of creationists."[808]

By the late 1990s, the campaign against evolution led by creationists had gained steam. Barbara Ehrenreich and Janet McIntosh, for example, argued that "the new creationism is not simply a case of well-intended politics gone awry; it represents a grave misunderstanding of biology and science". According to Ehrenreich and McIntosh, Richard Dawkins was seen not only as the "author of The Selfish Gene" but also as "a veritable Antichrist to contemporary creationists of both the secular and Christian varieties".[809]

Hamilton himself, however, was moving farther outside the firing zone. While at the end of 1978 he still reported to be "concerned with the whole range of social behaviour",[810] he had migrated away from questions of altruism to focus on the puzzle posed by the existence of two, and only two, sexes. Since the early 1980s, he claimed his research "has tended to wander a little from the more behavioral aspects of sociobiology". Nevertheless, he was "of course still glad to help students wanting to work on other kinds of social-behavior problems".[811] As we will see, Hamilton's direct interaction with studies in human sociobiology was not over yet.

**The Establishment of HBES and the Selection of the President**

Richard Alexander had organized a series of meetings on human behaviour at the University of Michigan in the years prior to the establishment of the HBES. Although he

[808] W.D. Hamilton, 'Nomination Form, The Royal Society Michael Faraday Award 1987', Hamilton archive, Z1X70/1/15.
[809] B. Ehrenreich and J. McIntosh, 'The New Creationism: Biology Under Attack', *The Nation*, (9 June 1997), Hamilton archive, Z1X66/1/5.
[810] W.D. Hamilton to D.A. Sohigian, 1 December 1978, Hamilton archive, Z1X64/1/3.
[811] W.D. Hamilton to S. Rudolf, 29 January 1981, Hamilton archive, Z1X64/1/2.

had begun his career as an entomologist, by the 1970s Alexander had expanded his repertoire to include the relationship between evolved human behaviour and culture, especially in relation to moral systems.[812] In 1988, the meetings he had nurtured, operating as 'The Evolutionary Psychology and Psychiatry Conference',[813] began to assume a life of their own. Their success seemed to Hamilton "to disclose […] a rather common trans-disciplinary need for contact and conversation in the field -- indeed one might almost say a craving to talk about and learn about sociobiological interpretations of human behaviour." As the University of Michigan meetings became too large and international to continue their attachment to a single location, plans were made to initiate the Human Behavior and Evolution Society.[814] As it began to take form, Hamilton argued that it "fill[ed] a real need and could be instrumental to a more widespread coherent thinking about human science".[815]

The main organizer behind the HBES was not Alexander or Hamilton but Randolph Nesse, a physician and associate professor of psychiatry at the University of Michigan.[816] His medical training was in fact significant to the group's initial goals. As it was originally conceived, the focus of the society was evolutionary psychology and psychiatry, and it would attempt to address a wide range of issues, both national and international.[817] By October 1988, however, this focus was recognized to be too narrow inasmuch as it risked the exclusion of "anthropologists, biologists, lawyers, sociologists, and many others who are

[812] 'Graduate Studies in Biological Sciences, The University of Michigan', [n.d., c. 1985], Hamilton archive, Z1X64/1/2.
[813] J.R. Feierman to 'Colleague', 7 November 1988, Hamilton archive, Z1X73/1/2.
[814] W.D. Hamilton to D.A. Hamburg, 4 April 1989, Hamilton archive, Z1X73/1/4.
[815] W.D. Hamilton to R. Dawkins, 12 November 1988, Hamilton archive, Z1X73/1/4.
[816] Nesse is today perhaps most well known for the book he co-authored with G.C. Williams, *Why We Get Sick: The New Science of Darwinian Medicine* (New York: Times Books, 1994).
[817] See, for example, David Barash's proposed talk, 'Evolutionary Aspects of War, Including Nuclear War and the Nuclear Arms Race', on 'Evolutionary Psychology and Psychiatry List', [10/18/88], Hamilton archive, Z1X73/1/3.

doing research in this area", the evolutionary understanding of human behaviour.[818] Still, Hamilton and others remained hopeful that it would be especially influential on the fields of psychology and psychiatry.[819]

Nesse was the worker bee of the nascent group, and his attempts to locate funding for the society are indicative of the wide applicability he saw it to have. Nesse, for instance, had targeted both the H.F. Guggenheim Foundation and the Carnegie Corporation as potential funding bodies. He was especially hopeful that the Carnegie Corporation would support the society, as its president, David Hamburg, was a physician who was allegedly eager to see evolutionary biology play a larger part in medicine.[820] Although Nesse was the brains behind the operation, it was Hamilton, as figurehead, who contacted Hamburg on the society's behalf. In doing so, Hamilton noted the relevance of an evolutionary understanding of humankind to the creation of a new and better world, indicating both the "power and promise" of the science of social behaviour. Moreover, he drew upon the need for a forum in which the new insights of evolutionary theory could be harnessed. According to him, "The lack of such an organization has left many workers feeling isolated, has impeded not only collaborative work and the exchange of ideas, and has inhibited the mutual criticism that normally shapes scientific progress."[821]

The organizers behind the HBES hoped it would be a place where evolutionary ideas regarding human society could be exchanged. To meet this goal, their ambitions were interdisciplinary from the beginning: Nesse urged, "We will need to make special efforts to welcome all disciplines including anthropology, artificial intelligence, biology, ethology,

[818] 'Planning Meeting October 31, 1988', Hamilton archive, Z1X73/1/3.
[819] W.D. Hamilton to R. Nesse, 12 November 1988, Hamilton archive, Z1X73/1/4.
[820] R. Nesse to W.D. Hamilton, 20 March 1989, Hamilton archive, Z1X73/1/4.
[821] Hamilton to Hamburg, 4 April 1989.

history, law, psychology, psychiatry, philosophy, psychoanalysis, and sociology." But the society's policy of inclusion left it open to "people who are completely out in left field". Although he acknowledged this risk, Nesse recommended that membership nevertheless be offered to any interested party who completed "a simple form for application", and he further advised, "It might even be wise at this stage to specifically state that race, sex and political beliefs are inappropriate criteria for making membership decisions." In this way, he anticipated that complaints might be raised regarding particular ideologies the society was seen to represent. Combining these concerns, he saw the major problem facing the group to be "how to deal with issues of quality and politics", but of the two, he recognized the issue of politics to be more difficult. That the group would be "criticized by those from both the left and the right" was a given for Nesse. Amidst such criticism, he warned his colleagues how "tempting" it would be "to defend ourselves by taking political positions on one issue or another ranging from the environment, to racism, to human rights". This, however, "would quickly destroy the organization".[822] Having placed a checkmark in the margin of his copy of the letter, Hamilton seems to have agreed with Nesse on the importance of separating the group's 'science' from any outside politics.

This meant that the group would agree to take no political position on issues such as the "preservation of species, racism, protection of indigenous cultures, pollution and nuclear war". The purpose of the society was determined to be "the free exchange of scientific ideas", and it was agreed that care must be taken so that the organization did "not become bogged down in anything else". Underlining this point, Hamilton recognized the threat of political ideology to the success of a society concerned with human behaviour. In doing so,

[822] R. Nesse to R. Smuts, 3 March 1989, Hamilton archive, Z1X73/1/3.

he reaffirmed his longstanding belief that it was possible to keep one's politics separate from one's biological theories. Through careful planning and dedicated application of the scientific method, the HBES organizers believed they would "be able to take pride in our organization and to avoid being associated with proponents of political ideology we find repugnant."[823]

As it has already been mentioned, Hamilton's selection as president of the HBES was a surprise, even to him. He admitted that what little he had published on human behaviour to that point was "pretty wild and speculative even by my own standards". What is more, he was a reluctant president from the beginning, quick to say that although many other scholars would have been "much more suitable" for the position than he was, he could at least boast being well connected enough to help recruit those identified as "desirable attendees for the next meeting".[824]

In Hamilton's correspondence from this period, he repeatedly emphasized the fact that his position as president was due to his being a relatively less controversial candidate rather than the most appropriate candidate. For example, in response to being identified as a co-founder of modern human sociobiology by Soviet psychiatrist Vitaliy I. Egorov, Hamilton wrote, "While I follow from afar the interest that some of my ideas in social evolutionary theory seems to be generating among psychiatrists, I ought to explain that I am in no way a specialist on human sociobiology, still less on anything relating to psychiatry." Indeed, he claimed his selection was due "more to my being perhaps less quarrelsome than

[823] Nesse to Smuts, 3 March 1989.
[824] W.D. Hamilton to R. Dawkins, 12 November 1988, Hamilton archive, Z1X73/1/3.

some of my friends and peers in the field who otherwise would be much better choices for 1st President!"[825]

In a letter to Richard Alexander, he went as far as to refer to his position as "this ridiculous First Presidency". But any doubts he had about assuming the position need not mean he questioned the mission of the organization as a whole. Indeed, he believed the work of HBES was very much "worthwhile". It had the potential to stand apart from other places in which discussions of man and society occurred but failed to resolve important issues in understanding human behaviour. He claimed, "people want an environment where they can talk freely and talk *sense*!"[826] In this way, the new society promised to fill the gap left open by scholars who attempted to understand social behaviour without taking into account the parameters of evolution.

To do so, however, they would have to gather their troops. Acknowledging this, John Beckstrom, Professor of Law at Northwestern University, saw the upcoming HBES meeting as "an opportunity to get everyone together for the first time". He hoped that Hamilton, as president, would write to the prominent scholars in sociobiology individually, encouraging their attendance at the first conference.[827] Catching wind of Beckstrom's enthusiasm, Nesse wrote Hamilton to reaffirm he was under no obligation to indulge his request,[828] but Hamilton was indeed willing to make the effort. By 12 November 1988, a form letter was

[825] W.D. Hamilton to V.I. Egorov, 23 April 1990, Hamilton archive, Z1X64/1/14; This letter was written in response to Egorov's invitation to attend "the VI Crimean Tutorial 'Sociobiology and Society'" to be held 1-4 August 1990, in which Egorov refers to Hamilton as both a "prominent scientist and one of the co-founder [sic] of modern human sociobiology" (V.I. Egorov to W.D. Hamilton, 1 February 1990, Hamilton archive, Z1X64/1/14). Given his concern about the recent history of biology in the Soviet Union, Hamilton wrote to Nesse, asking, "Are Soviet psychiatrists respectable now?". He was worried that he might be being used by Soviet scientists "to acquire international respectability without reforming pseudopsychiatric practices" (W.D. Hamilton to R. Nesse, 13 February 1990, Hamilton archive, Z1X73/1/3).
[826] W.D. Hamilton to R.D. Alexander, 24 November 1988, Hamilton archive, Z1X73/1/4.
[827] J.H. Beckstrom to W.D. Hamilton, Hamilton archive, 3 November 1988, Z1X73/1/4.
[828] R. Nesse to W.D. Hamilton, Hamilton archive, 9 November 1988, Z1X73/1/4.

drafted. Wasting no time, Hamilton sent letters to the individuals Beckstrom had suggested as well as others who he felt to be "at least as important" and who might make the organization more international. He also hoped "some 'real' human geneticists" might attend.[829]

With a nod to their important legacy, the letter told recipients "that it would be really good to have everyone who has contributed to the new evolutionary approach to human nature (or the resumed approach -- resumed, roughly, from where left by Darwin) in one room together".[830] Within a couple of weeks, Hamilton had sent a copy to scholars in psychology, sociology, anthropology, ecology, genetics, statistics, medicine, environmental studies, and zoology. Recipient scholars worked not only in the United States and Britain but also in Israel, India, Canada, and West Germany.[831]

Beyond who would attend the first meeting, the organizers of HBES continued to be concerned with the standards that might be enforced for both membership and presentations. To this end, Nesse was adamant that the society was inclusive. He wrote to his committee, "Although maintaining high quality in the meeting is of great importance, people tend not to agree on what is and isn't of high quality, so I think we must be relatively lenient at this stage." According to Nesse, it was important that the society was welcoming, and he insisted that those doing basic biology as well as those running clinical studies and conducting

[829] W.D. Hamilton to J.H. Beckstrom, draft, [n.d., c. November 1988], Hamilton archive, Z1X73/1/4.
[830] W.D. Hamilton to R. Dawkins, 12 November 1988, Hamilton archive, Z1X73/1/4.
[831] W.D. Hamilton to various recipients, 24-28 November 1988, Hamilton archive, Z1X73/1/4, including Richard Alexander, David Barash, Pierre van den Berghe, Robert Boyd, Nancy Burley, L.L. Cavalli-Sforza, Napoleon Chagon, Richard Dawkins, Irven DeVore, Mildred Dickman, Lindon Eaves, Irenäus Eibl-Eibesfeldt, Ilan Eshel, Robin Fox, Madhav Gadgil, Kristen Hawkes, Robert Hinde, Joan Hinde, Melvin Konner, Charles Lumsden, Desmond Morris, Peter Richerson, Michael Ruse, Sandra Scarr, Joan Silk, Donald Symons, Lionel Tiger, Robert Trivers, Wolfgang Wickler, George C. Williams, E.O. Wilson, and Richard Wrangham.

"applied" research should be embraced. What is more, he felt the society must be open to both "tiny bits of data" and "broad speculation".[832]

To this, Hamilton added that there should be a female presence on the steering committee as a symbol of the group's inclusivity. This move was to some extent political: he claimed that because "one of the most gratifying aspects of the reception of the new ideas has been their seemingly equal appeal to both sexes, inspite [sic] of accusations of inherent sexism from critics, I feel that the organisation of the society should make an effort to reflect this acceptance". He had many suggestions for the position, including Nancy Burley, Mildred Dickeman, Sarah Hrdy, Nancy Thornhill, Monique Borgehoff Mulder, Margo Wilson, and Ledo Cosmides.[833] It seems that Nesse took this into account, but beyond inviting a woman, he was keen to stack the deck with big cards. Accordingly, he invited George Williams, E.O. Wilson, Richard Alexander, Nancy Burley, and Margo Wilson to join the steering committee and reported to Hamilton that all had agreed.[834]

By the final stages of planning, the extensive recruitment measures appeared to be paying off, and even more people would participate in the first meeting than had previously been anticipated. Moreover, four publishers were interested in affiliating themselves with the HBES, and the meeting had also caught the attention of several news organizations. Nesse nevertheless suggested that "a low media profile" should be encouraged and photography or video prohibited in sessions. The steering committee was also made aware

[832] R. Nesse to W.D. Hamilton, 12 December 1988,, Hamilton archive, Z1X73/1/3.
[833] W.D. Hamilton to R. Nesse, 12 November 1988, Hamilton archive, Z1X73/1/4.
[834] R. Nesse to W.D. Hamilton, 14 December 1988, Hamilton archive, Z1X73/1/3.

that the meeting was of interest to at least one graduate student who wished to collect data from participants.[835]

**A "possibly very important event in the advancement of human knowledge",[836] the First Meeting**

It was not Hamilton but John Beckstrom and Bill Irons who organized the first HBES meeting.[837] Nevertheless, Hamilton's presidential addresses indicate the extent to which the individuals involved felt that their work was necessary even if their 'science' would never be acknowledged by the wider world. Welcoming attendees, Hamilton noted that it was "a tremendous pleasure to see around me so many people whose writings have already helped me to understand my own species better than I once did". The turnout made him feel warmly "that there are many more like- minded to myself in the world than I thought, more people who do see evolution by n.s. [natural selection] as an important key to understanding man than once, in a seemingly endless mood of self-doubt and loneliness over this issue, I used to think". Reflecting on the loneliness he felt when first constructing his theories, he shared his belief that the HBES attendants were united by experiences of self-doubt and frustration. He claimed,

> "Most of us have probably experienced such a phase in our lives of learning about natural selection and realising suddenly that we were possessed of a tool of great power for understanding the living world and of course not least the world of man. And then when we try to explain our incipient new human insights of being met with stares of astonishment, restlessness, changing of subject, frowns of disapproval, or angry rebuttal on flimsy grounds – all this being shot at us

[835] R. Nesse to 'Steering Committee RE: August Meeting', 31 July 1989, Hamilton archive, Z1X73/1/4.
[836] W.D. Hamilton, 'Welcome to HBES first annual meeting', [n.d., 1989], Hamilton archive, Z1X73/1/4.
[837] Hamilton to Dawkins, 12 November 1988.

> from well known friends, family, colleagues and respected teachers. As I am sure that all of you have discovered there seems to be something intrinsically offensive and unbelievable to a large proportion of intelligent humanity in the sorts of ideas we like to discuss."

To Hamilton, conceptions of human behaviour as evolved seemed to be "simple extensions of common sense", but the unreasonableness with which such ideas were usually met, Hamilton feared, could cause theorists to feel intimidated. If his own experience was in any way representative, he was sure that those concerned with understanding human behaviour from an evolutionary perspective begin to "think the insights they thought they had must be wrong […] and they at first reluctantly but then more naturally begin to take the lines of avoidance and denial already in use by their peers". Combatting this tendency, the formation of the HBES seemed to him to communicate "the fact that there exists an environment where if you think it you can dare to say it; […] someone will at least listen to it. […] In fact I hope that, at least in conversations of this meeting, some really bizarre possibilities about human behaviour can be aired."[838]

In private correspondence, Hamilton divulged more about his experience combatting the accepted beliefs of the general public. He claimed, "some of my own strongly held opinions have been battered into oblivion by peers and yet have proved in the end well founded. […] I also think there have been situations where I may have eased off on one 'outrageous' claim' just so that I could press another with more hope of it being effective".[839] As the conference events went on, Hamilton continued to outline the "common popular antagonisms" to evolutionary theory and, in particular, its sociobiological aspects. In fact, he sought to explain this phenomenon through appeals to evolutionary theory.

[838] Hamilton, 'Welcome to HBES first annual meeting'.
[839] W.D. Hamilton to E. Garcia, 4 September 1989, Hamilton archive, Z1X73/1/3.

Accordingly, he claimed that the divide between those who had faith in what the theory of evolution could accomplish and those who did not made it appear "as if there were an actual dimorphism in the human population". Hamilton and the HBES meeting attendees, of course, represented the "rare minority morph", which had "a gift for being objective about matters relating to human sociability – or perhaps not a gift, perhaps just a naivety or an inability to lie".[840]

But, in fact, it was not a simple binary. Rather, Hamilton posited, there were "Various degrees of objectivity – some people can't be objective on any issue of n.s. [natural selection]; some can be objective about all living things except man; and some can be objective about [all living things] & man included". Giving well-known biologists as examples, he proposed Stephen Jay Gould, whose work will be discussed in greater detail below, as someone "who can be objective about animal and plants but who goes off the rails in what seems to me obvious ways when it comes to man". Another biologist who we have seen fiercely and publicly oppose sociobiology, Richard Lewontin, was given both more and less credit. According to Hamilton, he was "even more deeply unobjective than Gould, possible just because he is actually a deeper thinker and sees that he can't admit that this process works in animals without being forced logically to admit things he doesn't want to admit for man". Though scholars who opposed sociobiology were otherwise "extremely clever", to Hamilton, they seemed "unable to use their usually precise and merciless reasoning properly when it comes to evolution – or who waste them on the same issue in what seems to me destructive, nit picking ways".[841]

[840] W.D. Hamilton, 'HBES Banquet 26/8/89', Hamilton archive, Z1X74/1/4.
[841] Ibid.

Why is it so? Hamilton pondered the possibility that there truly was a human dimorphism separating "clearheaded social seers and critics" from those unable to see the light. Evolution may select for the existence of a few seers and critics in each community. Having too many, however, "plunges a community into an orgy of such clever social manoevering [sic] by everyone that the group as a whole goes downhill". As a check against such destruction, "communities have to become hostile to their seers if these show signs of becoming too numerous."[842]

**Post-Meeting Plans: The Relationship with Ethology**

After the first meeting, Irenaus Eibl-Eibesfeldt, an ethologist who had been criticized by Dawkins for his adherence to group selection,[843] inquired to see whether HBES was interested in jointly holding a meeting with the International Society for Human Ethology (ISHE).[844] Like HBES, the ISHE aimed "toward a better understanding of man's conduct", emphasizing the importance of an interdisciplinary approach.[845]

Despite fears amongst his colleagues that the goals of HBES may be diluted or disoriented through alignment with external societies,[846] Nesse committed to a joint meeting. It was his opinion that HBES should "bend over backwards to cooperate with ISHE", especially since it could help them to fill the gap in membership of individuals working in

[842] Hamilton, 'HBES Banquet 26/8/89'.
[843] Dawkins, *The Selfish Gene*, p. 2.
[844] M. Wilson and M. Daly to R. Nesse. 6 September 1989, Hamilton archive, Z1X73/1/3. In 1988, approximately 400 scholars were members of IBES; see, J.R. Feierman to 'Colleague', 7 November 1988, Hamilton archive, Z1X73/1/2.
[845] I. Eibl-Eibesfeldt, 'On the Aims of Our Organization', *Human Ethology Newsletter*, (September 1985), Hamilton archive, Z1X73/1/2.
[846] Wilson and Daly to Nesse, 6 September 1989.

animal behaviour.[847] Margo Wilson, however, was concerned that the ISHE's foundations in ethology were a disadvantage rather than an advantage. Seeing as ethologists had failed to incorporate new models of selection into their research, she doubted both the strength and prestige of the ISHE.[848]

Hamilton did not seem to share Margo Wilson's fears about associating with the ISHE.[849] In fact, reiterating what we have already seen in his initial responses to the work of Konrad Lorenz, Hamilton seems to have looked upon ethologists with a degree of sympathy. Moreover, throughout the 1970s he had favourable things to say of ethologists. When he was notified in 1978 that he would give the Tinbergen Lecture in December 1980, Hamilton quickly allayed Patrick Bateson's fears that he had had a greater influence on ethology than it had had on him.[850] He reassured Bateson that it would not at all be difficult to positively refer to Tinbergen's work in his talk. What is more, Hamilton conceded that he had "always been a very enthusiastic follower of writings by Lorenz and Tinbergen, finding them permanent sources of novelty and fresh ideas, even if I kept also an opinion that there was somewhere a serious wobbly piece in their evolutionary scaffolding". Moreover, he claimed that if he could fault Tinbergen for anything, it was "that he did not seem to focus on what were for me the crucially interesting issues – about who benefits, 'altruism', and the like."[851]

Hamilton reiterated this point in his correspondence with Tinbergen. Although Tinbergen's ill health meant he would be unable to attend the lecture, Hamilton assured him personally that the foundations laid by ethology had been "more crucial to the new outlook

[847] R. Nesse to M. Wilson, 18 September 1989, Hamilton archive, Z1X73/1/3.
[848] M. Wilson to R. Nesse, 16 October 1989, Hamilton archive, Z1X73/1/3.
[849] W.D. Hamilton to R. Nesse, 13 February 1990, Hamilton archive, Z1X73/1/3.
[850] P. Bateson to W.D. Hamilton, 11 December 1978, Hamilton archive, Z1X64/1/19.
[851] W.D. Hamilton to P. Bateson, 23 December 1978, Hamilton archive, Z1X64/1/19.

that now mostly goes by the name of sociobiology than any of the genetical theorizing in which I took part."[852] Tinbergen disagreed. He thought the pivotal force was mathematics: "the new views developed when you and others began to quantify what we had never carried beyond the qualitative stage".[853]

When Hamilton gave the lecture in 1980, he reflected on the personal impact ethology had on his thinking, saying that Tinbergen's comparative method, showing as it did the conceptual uniformity of behaviour "between invertebrate sand wasps and vertebrate herring gulls", had encouraged him to think "that a plausible theory that would link the honey bee's suicidal defence of its colony with Horatius's defence of the bridge to save Rome would be better than none at all". While Hamilton admitted that "such plausible linkage between honeybee and Horatius really has any validity is of course still a matter of fierce debate", he argued that most biologists would go as far as to extend the linkage to "hunting dogs and even non-human primates". As Hamilton saw it, "Whether one allows the remaining step is, it seems to me, a matter of one's religion rather than of one's science."[854]

But on at least one occasion, Hamilton seems to have gone along with the idea that the relationship between sociobiology and ethology was problematic. After he partook in a discussion on the subject of "Open questions in evolutionary biology" at the Institute for Advanced Study in Berlin in 1988, a note summarizing "some of the chief topics that seemed to be on our minds in conversation last night" identified the relationship between sociobiology and ethology as problematic.[855]

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[852] W.D. Hamilton to N. Tinbergen, 23 October 1980, Hamilton archive, Z1X64/1/19.
[853] N. Tinbergen to W.D. Hamilton, 29 October 1980, Hamilton archive, Z1X64/1/19.
[854] W.D. Hamilton, 'Being Selfish and Social', December 1980, Hamilton archive, Z1X64/1/19.
[855] 'Open Questions in Evolutionary Biology', 27 June 1988, Hamilton archive, Z1X64/1/12.

**One More Controversy as Outgoing President**

Hamilton did not plan to attend the 1990 HBES meeting in Los Angeles, at which he was the outgoing president. Instead, he intended to travel to New Zealand to visit his brother and sister-in-law, whose "people [...] live in the Kelabit long house in the interior of Sarawak". Nesse worried that Hamilton's absence would have a negative effect on the nascent society, but Hamilton could not be swayed into attending. Rather than fading away or breaking up, Hamilton believed the more serious problem facing HBES was "how not to grow too big and not to become debased by weaker more wishy-washy theorising."[856]

Having made his decision to miss the meeting, Hamilton attached a letter that he hoped Nesse would read in his absence. He urged, "My very strong hope is that the Society will continue long and always succeed in retaining the spirit in which it is born – a spirit of free interdisciplinary discussion of all the probabilities of human nature." Still, he could not hope for longevity if it meant the society must subsist in some watered down form: "I would prefer that our course to be [sic] brilliant and productive up to the time when we make no headway or we fall apart of our own accord, or, as I think most likely of all, that we are suppressed or broken up by political or religious forces of our time." Moreover, he claimed, "Obviously what is at issue with us is not faith, dogma, nature or sacred ceremonies […] but rather how daring we are prepared to be in discussing socially taboo subjects such as sex, race and religion." To delay such an end as long as possible, he advised, "we should be willing to discuss everything but should somehow keep facts, speculation, boringness and controversiality all so mixed that it will be hard for any sensation-hungry reporter to decide what is serious or what talks he or she should be listening to or reporting." The other option

[856] W.D. Hamilton to R. Nesse, 10 May 1990, Hamilton archive, Z1X73/1/3.

was to invent jargon and render discussions incomprehensible to outsiders, but "the idea of doing that goes very much against the grain with me : I prefer that any controversial truth be plainly stated for all to read, or hear." Still, as a shrouding method of intermediate effect, he proposed keeping the most controversial points out of the main text, hiding them in footnotes, and at the very least, not highlighting them in paper titles. He continued,

> "Our world view is undoubtedly giving us access to truths that can be useful to many professions – medicine, psychiatry, social planning, etc. However, there is justifiable concern in the world at large that the truths also teach cynicism and antisocial attitudes in places where myths have hitherto managed better. Hence, I still think that the clash of our truths with current myths and religions are inevitable for a very long time".[857]

As far as his hopes for the future of the society beyond its continued existence, Hamilton wished that it become increasingly "bisexual, international and multiracial". Indeed, he felt it was the fact that Darwin was British rather than the appeal of natural selection to ideologies relying on a "master-race" that caused the historical acceptance of evolutionary thinking to be regionally specific.[858] In this way, he indicated his confidence that support for the theory of natural selection was a consequence of rational thinking rather than political or cultural belief.

Moreover, he acknowledged the political relevance of the society, writing, "we face difficulties of a kind certain never to trouble a new Society discussing, say, the modern problems of non-linear dynamics." But he remained unwilling to see that the scientific theories created by himself and his colleagues could, in themselves, have political meaning. Regarding his own ability to escape major controversy, he wrote, "From my experiences as

[857] Hamilton to Nesse, 10 May 1990.
[858] Ibid.

a graduate student when I was more keen and less cautious in applying my ideas of natural selection to humans, I feel that I foresaw correctly the controversy that would arise when the ideas bout humans were brought to the surface, as happened in.Wilson's [sic] 'Sociobiology'". He admitted that he had "generally kept clear of human statements and in fact of most of the matters which are now the focus of our Society […] mainly not out of lack of interest but out of cowardice". It was his hope that at HBES meetings "all people while they are with us should dare at least to try out ideas which might estrange colleagues and ruin careers elsewhere. Among us let all ideas be critically and courteously discussed; let us watch for the poor stranger among these ideas who may be a king in disguise; let no idea be simply 'put down' because it seems odd or heretical." What is more, he acknowledged the special ability of HBES members to objectively view human behaviour while still maintaining a fear that individuals whose actions were based on ideology rather than biology would outmanoeuvre them still: "Perhaps our society alone is able to understand the forces ranged against it working both from inside and out – even if, as I suspect, it is other groups, such as of politicians, that may sense the nature of such forces better."[859]

And indeed there was a faction within scholars working on human sociobiology that was already displeased with the society. Just as Hamilton's obligations to HBES were coming to an end, J. Philippe Rushton,[860] Professor of Psychology at the University of Western Ontario, wrote him "to raise the disturbing question of whether censorship (inadvertent or otherwise) is occurring within our Society". Rushton's recently rejected

[859] Hamilton to Nesse, 10 May 1990.
[860] The Pioneer Fund, an openly racist organization, would fund Rushton's work from 2002 through 2012, and his work is generously cited in the controversial book by Richard Herrnstein and Charles Murray, *The Bell Curve* (1994). For more on Rushton, see Yudell, *Race Unmasked*, pp. 187-9.

contribution to the Los Angeles meeting, titled 'Genetic Similarities and Genetic Differences: Disconcerting Realities for Human Sociobiology', was just one in a string of three submissions to which the response of the society had been overwhelmingly negative. Rushton was particularly interested in racial differences, and he had been asked to withdraw his first paper for the meeting in Ann Arbor in 1988.[861] According to Nesse, this was because "racial activists had taken over the Dean's office and were searching for other targets for their wrath. In this volatile climate, there was no predicting what might happen except for the certainty that your paper would not receive a fair hearing."[862] The following year, however, Rushton's proposal was rejected for another reason; it had allegedly been submitted after the deadline. After polling others who he felt may be in a similar position, it came to his attention that "Seymour Itzkoff at Smith College […] heard of people saying at the Evanston Meeting they would like to keep he and I off the program."[863] Nancy Burley, Professor at the University of Illinois at Urbana-Champaign, urged Hamilton to take Rushton's claim seriously. Though she acknowledged that "Rushton's views are likely to be quite unpopular", she felt that the issue of academic freedom was at stake: "Our fledgling society will not thrive unless we permit all relevant scholarly viewpoints to be heard!"[864]

Because Hamilton had nearly finished his term as president of the HBES, Nesse answered Rushton. Still, there is evidence that Hamilton spent some time looking into Rushton's concern, despite the fact that it was not his professional obligation to do so. There is no copy of Hamilton's letter to Rushton, but its thoroughness is indicated by Rushton's reply, in which Rushton thanked Hamilton for his "long, concerned letter […] on the issue

[861] J.P. Rushton to W.D. Hamilton, 3 August 1990, Hamilton archive, Z1X73/1/3.
[862] R. Nesse to J.P. Rushton, 10 August 1990, Hamilton archive, Z1X73/1/3.
[863] Rushton to Hamilton, 3 August 1990.
[864] N. Burley to W.D. Hamilton, 13 August 1990, Hamilton archive, Z1X73/1/3.

of HBES and the rejection of my paper for inclusion at the recent meeting". Moreover, Rushton registered his concern that the "fractiousness" of the society would "lead the hosting chair and program committees to exclude papers with which they strongly disagree". To correct this, he suggested that all full members be guaranteed at least one paper at annual meetings. Juxtaposing state control, the new villain of economic prosperity, with the free exchange of ideas, he wrote, "If 50% of the posters really are 'rubbish', I ask, 'so what?' Let the marketplace of ideas decide, but let's not have a monopoly or state control of what gets into the marketplace!"[865]

In the abstract submitted for the Los Angeles meeting, Rushton's position on the genetic differences between racial groups was unambiguous: his goal was to "review some of the evidence that both ethnic-narcissism and population differences in behavior are not only genetic but are deeply embedded in evolutionary processes".[866] Hamilton went to the committee to ascertain the reason behind its rejection and was told, "As you surmised, we rejected his paper on scientific grounds." Anthropologist Robert Boyd, a member of the committee, admitted he agreed "that there must be genetic differences among human groups that effect behavior and cognition", but he believed that "it is an empirical question how important these differences are. My own conjecture is that they are smaller in magnitude than the differences among groups due to environment or culture." He rejected the idea that the decision had been a result of bias: "I like to think that I would have no difficulty accepting good research that contradicted this conjecture. It just seems to me that Rushton's work is not very good."[867]

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[865] J.P. Rushton to W.D. Hamilton, 25 September 1990, Hamilton archive, Z1X73/1/3.
[866] Rushton to Hamilton, 3 August 1990.
[867] R. Boyd to Hamilton, [n.d., 1990], Hamilton archive, Z1X73/1/3.

Where Rushton did find outlets to publish his research, he proved equally controversial. In the *Journal of Research in Personality*, for example, he engaged with Michael Lynn of the Department of Psychology at the University of Missouri, Columbia. Lynn had been critical of an article published by Rushton and Anthony Bogaert in 1987 in which they proposed not only that genetic races existed but also that genetic differences accounted for differences in social behaviours, particularly as they related to sexual pairing and reproductive strategies. The idea involved what is known as the r/K selection theory. The theory proposes that environmental pressures shape reproductive strategies towards either producing a high number of low quality offspring (r-selected species) or a low number of high quality offspring (K-selected species). Rushton and Bogart had proposed that human races fell on a continuum in which "blacks are more *r* than whites who are more *r* than Orientals".[868] According to Lynn, this meant that Rushton and Bogaert proposed that black populations had evolved to be "characterized by higher birth rates, less parental care, greater sexual permissiveness and precocity, larger genitalia, lower intelligence, shorter life spans, and less altruism".[869] He argued that the article should not have been published because it failed to establish why such differences would have been favoured or how observed differences would significantly affect reproductive rates. Furthermore, it had not ruled out environmental differences.[870]

Replying to Lynn, Rushton underlined the more popular forms this debate had taken. In 1978, Stephen Jay Gould published *The Mismeasure of Man*, and it was republished

[868] M. Lynn, 'Race Differences in Sexual Behavior: A Critique of Rushton and Bogaert's Evolutionary Hypothesis', *Journal of Research in Personality*, 23 (March 1989), Hamilton archive, WVJ14/1/2.
[869] M. Lynn, 'Criticisms of an Evolutionary Hypothesis about Race Differences: A Rebuttal to Rushton's Reply', *Journal of Research in Personality*, 23 (March 1989), Hamilton archive, WVJ14/1/2.
[870] Lynn, 'Race Differences in Sexual Behavior'.

several times throughout the following decades. In part, *Mismeasure* was a critique of sociobiology, the rise of which Gould saw as a reaction to economic instability, and he recounted the historical tendency to use biological claims to justify reduced welfare measures and more generally blame disenfranchised groups for their plight. But more specifically, *Mismeasure* had addressed the complicated history of intelligence testing. Gould was an experienced popular science writer, and his ideas were convincing to many. He claimed that calculated differences in intelligence based on racial categories had been historically constructed to serve political ends, and Rushton and others lamented the wide acceptance of Gould's claims that racial differences in intelligence were not a biological reality. Against Gould's argument that one's socioeconomic conditions were more responsible for personal outcomes than sociobiologists would like to admit, Rushton, citing for the most part himself, claimed, "Much evidence implies a genetic basis for both SES [socioeconomic status] and group differences".[871]

Rushton's complaint, however, went well beyond Gould;[872] indeed, it reiterated the long history of conflict between biologists and social scientists regarding the issue of race. According to Rushton,

> "Many of the differences observed here are not counterintuitive and spring readily to the eyes of the layperson. Psychologists are to be faulted for not studying them more scientifically. While it is understood that racial group differences are generalizable to individuals only in

[871] J.P. Rushton, 'Race Differences in Sexuality and Their Correlates: Another Look and Physiological Models', *Journal of Research in Personality*, 23 (March 1989), Hamilton archive, WVJ14/1/2.
[872] He nevertheless continued to publicly disagree with Gould in particular. In 1996, for example, he reviewed the revised edition of Gould's book for *Personality and Individual Differences*, sending a copy to Hamilton while it was still in press; J.P. Rushton, 'Special Review: Race, Intelligence, and the Brain: The Errors and Omissions of the "Revised" Edition of S.J. Gould's The Mismeasure of Man', Hamilton archive, WVJ14/1/2. Here, he identified Gould's book as a "political polemic" and examined "the extent to which Gould's political ideology has affected his scientific work".

> imperfect ways, average group differences do exist and should be more worthy of study than they currently are."

For Rushton, much was at stake if scientists failed to ask the right questions: "The exploration of all sources of genetic variance within the human species, and the analysis of the causes of this variance, are of crucial importance to a full understanding of Homo sapiens."[873] In further exchange, Rushton identified the debate as, at heart, ideological. Racial differences had become the new taboo subject, meaning that "Focusing on population differences is considered by many to constitute an affront to the universal search for brotherhood, democracy, and equality." Still, Rushton argued, "Intellectual curiosity […] does not readily bow to the moralistic guidelines".[874]

To some extent, it seems, Hamilton sympathized with Rushton, and annotations indicate he read Rushton's exchange with Lynn carefully. As already demonstrated through his remarks at the 1989 HBES meeting, Hamilton appears to have been equally frustrated with the fact that Gould vilified scientists who were concerned with quantifying intelligence, and further evidence from his archive suggests this to be the case. While it seems that Hamilton only exchanged one letter with Gould, where the two appeared to be on friendly terms,[875] Gould's name appears several times throughout the archive, often amidst disparaging terms. Drafting a positive review of "noted racist and eugenicist" Richard Lynn's *Dysgenics* (1996),[876] for example, Hamilton wrote, "Neodarwinism is just too ruthless in its realism to please a majority of people: even a faint implication that an attained

[873] J.P. Rushton, 'The Evolution of Racial Differences: A Response to M. Lynn', *Journal of Research in Personality*, 23 (March 1989), Hamilton archive, WVJ14/1/2.
[874] J.P. Rushton, 'Race Differences in Sexuality and Their Correlates: Another Look and Physiological Models', Hamilton archive, WVJ14/1/2.
[875] W.D. Hamilton to S.J. Gould, 16 March 1979, Hamilton archive, Z1X89/1/16.
[876] Lynn is identified this way in Yudell, *Race Unmasked*, pp. 194-5.

low station in life or education has been inevitable is too much for that hope that we all must have, the simple wish to be higher". Referring to those who opposed his science as demagogues, he claimed they "by definition have to be popular; almost equally they have to paint all those who speak out against them as deluded doom-sayers, scheming or fearful rightists, and the like." According to Hamilton, Richard Lynn was "brave, thick-skinned, and very persistent", qualities necessary for anyone "to swim against such popular anti-realistic currents". What is more, Hamilton referred to critiques that Cyril Burt manipulated data to serve racist aims, such as Gould's, as "cowardly".[877]

In 1998, both Hamilton and Gould were invited to give a lecture at the Vatican. By then, Gould had reissued *Mismeasure of Man*, largely unedited, in response to Richard Herrnstein and Charles Murray's *The Bell Curve* (1996). Reflecting on the opportunity to speak at the Vatican, Hamilton wrote that his lecture must "be very carefully designed because in one hour it must tell the Pope, Steven Gould and Steven Rose […] why they all completely misunderstand evolution as well as what is going to be the nature of nature and human ideas about it in the third millennium".[878] Because Gould's position as a Marxist was very public, it is difficult to determine the extent to which Hamilton, Rushton, and others opposed Gould's position as a biologist and the extent to which they opposed it as an ideologue and, in their minds, an idealist. Whatever the case, Hamilton did not feel his Vatican talk was successful in achieving what he hoped it would. He told mathematical biologist Akira Sasaki that the visit had been "pretty wieird [sic] and frustrating".[879]

[877] W.D. Hamilton, 'Review of *Dysgenics* by Richard Lynn (1996)', Hamilton archive, WVJ14/1/6.
[878] W.D. Hamilton to 'Judy', 17 October 1998, Hamilton archive, Z1X69/1/11.
[879] W.D. Hamilton to A. Sasaki, 12 November 1998, Hamilton archive, WVJ14/1/4.

**Conclusion**

The perceived pervasiveness of particular political ideologies had influenced Hamilton's choice of topics from the 1950s, and it remained a point of concern for Hamilton throughout the 1980s. Drafting a 1989 talk, for example, he wrote that the reality of group selection flew in the face of what those who were motivated by extra-scientific reasons to advance it would have liked. He claimed, "It is as if you can be Communist but to become one you have to embrace Fascism also." This meant "you can have a community where everyone works for the common good but it is only evolutionarily stable if it rejects outsiders immigrants and indeed competes fiercely, perhaps genocidally, against outside groups."[880] Reiterating the position he had held strongly since the 1950s, Hamilton committed himself to the idea that global brotherhood was an illusory goal.

Hamilton retained little connection to the HBES through the last decade of his life, but the group itself continued to battle controversy into the 1990s. What is more, individuals involved with its organization continued to worry about the presence of low quality work at meetings. Speaking of a recent meeting in 1991, for example, Margo Wilson told Hamilton, "The program was full of great talks and peppered with a few flakey zealots. [...] People want to eliminate the flakes, but haven't come up with an ideal democratic solution yet."[881] Hamilton's reply was not overly concerned, and he indicated his preference for a natural weeding out process rather than any institutional guards.[882]

By 1993, there were external as well as internal problems for the society, leading to the cancellation of a conference on 'Genetic Factors in Crime: Findings, Uses, and

[880] W.D. Hamilton, 'Adaptations of Genes and Ecosystems: What Natural Selection and Biology Can and Can't Evolve', 25 May 1989, Hamilton archive, Z1X64/1/13.
[881] M. Wilson to W.D. Hamilton, 27 August 1991, Hamilton archive, Z1X73/1/3.
[882] W.D. Hamilton to M. Wilson, 27 September 1991, Hamilton archive, Z1X73/1/3.

Implications'. The conference had been organized by attorney David Wasserman but called off due to political pressures. Elizabeth Hill specified that the NIH had withdrawn funding, allegedly after "African-American groups such as the Congressional Black Caucus and the National Association for the Advancement of Colored People" criticized the proposed conference.[883]

By 1996, steps had been taken to distance work on human behaviour from the ideological reputation of sociobiology. In that year, the council members of *Ethology and Sociobiology*[884] voted to change its title to *Evolution and Human Behavior*. As Sarah Hrdy reported, she had been the "lone Council vote against the title change for all the same reasons – believe its intellectual cowardice to retreat from the term sociobiology rather than taking a stand and educating people what sociobiology means to its practitioners rather than letting its critics define it; don't want to cut the journal off from its roots animal ethology; etc.". Moreover, Hrdy reported that the HBES was "still a very long way from being able to demand the kind of standards routinely found at the Animal Behavior meetings". The recent HBES meeting "was the usual incredibly mixed bag," with "a lot of perilous issues swirling about."[885]

Thus, by the end of the 1990s, even the most celebrated theorists in sociobiology, who continued to genuinely believe in its aims, could not retain control of the discipline. It needed to be abandoned for its political connotations, real or constructed, at least in name, by those who wished to be considered serious. Moreover, any potential advances in the

[883] Hamilton archive, Z1X73/1/3.
[884] The journal began to be published in 1979, and Hamilton and other early members of the HBES sat on its first editorial board. It endeavoured to be a forum in which evolutionary ideas concerning behaviour, especially those relating to man, could be discussed.
[885] S. Hrdy to W.D. Hamilton, 8 July 1996, Hamilton archive, Z1X67/1/13.

discipline, regardless of the label attributed to it, were hindered by the inability of the society to police the methodological standards of its members; the sheer number of popular and speculative books and articles on sociobiological topics made this task nearly impossible. Inclusive fitness remained a fruitful foundation of research, but it had altogether failed to prove relevant to man in the way Hamilton had envisioned in 1963.

# Conclusion

We have already seen that many scientists regard Hamilton's earliest theorizing to be his best, and we have also seen that his election to the Royal Society in 1980 came in light of the esteem granted to his theory of inclusive fitness. There is even reason to believe that Hamilton himself saw his work on altruism to represent his most central and persistent scientific concern. Having read a memorial lecture for Karl Popper in 1997, Hamilton could relate to Popper's having had "an intellectual problem on your mind which you can't leave. […] it pursues you almost like a demon". While Popper's question had arguably been "What is science?", Hamilton admitted his was "How can evolution explain altruism?"[886]

This question had occupied him from his undergraduate days, but as we have seen, self-sacrifice had struck him as important in light of his personal experiences in a particularly turbulent time. From his youth, he had been specifically concerned with the idea that the allure of communism, and increased welfare provisions in his own country, threatened not only individual freedom but also the very future of humankind. In Hamilton's mind, these threats were of a compounding nature, and he was convinced, sometimes desperately, that something must be done to combat them. What is reiterated again and again throughout Hamilton's record is the fact that his interest in social behaviour was deeply tied to his hope that new insights in biology could be used to solve complex social problems.

This thesis has highlighted the extent to which an examination of Bill Hamilton's life, work, and impact, especially in relation to his theory of inclusive fitness, ultimately

[886] W.D. Hamilton to K. Inamori, 28 April 1997, Hamilton archive, Z1X67/1/9.

reflects not only the concerns of an era but also its tools, especially those found in genetics research. At mid-century point, the idea that social behaviours such as altruism and selfishness were determined to a large extent by our genes was only possible due to a faith in genetics and a belief in its ability to revolutionize our understanding of both humans and the societies they build. In the age of biology, science was to finally and definitively answer timeless philosophical and political debates concerning what it meant to be human and to whom do we have social obligations.

In contrast to previous discussions of Hamilton, such an understanding allows us to see that far from an isolated genius more at home with insects than people, Hamilton engaged with many of the most important social and political issues of his time. Thus, we are able to thread his concern for human evolution through the letters he exchanged with family members in the 1950s to his explicitly eugenic arguments in the autobiographical introductions he published from 1996. While Alan Grafen has identified the latter as having had the tendency to shock readers,[887] this thesis has revealed the consistency with which Hamilton advanced eugenic arguments from his secondary school days. In fact, he did not need Fisher to introduce him to the threat posed by so-called inverted birth rates. He had understood that the welfare state might be encouraging the 'wrong' groups of people to reproduce since 1956.

Hamilton's later writing is therefore only shocking because advocates of Hamilton's ideas have distanced his work from its original context. In failing to see a more complete picture of Hamilton, however, they also risk perpetuating a narrative of how science works that contradicts evidence provided by historians. What histories of science elucidate is the

[887] A. Grafen, 'William Donald Hamilton', *Narrow Roads of Gene Land*, iii, (Oxford: Oxford University Press, 2005), 447.

extent to which scientists operate within a particular place, time, and culture, and although Hamilton is often seen to have been ahead of his time, he was, in the end, very much of his time. Far from diminishing the significance of his work, such an understanding provides us with a meaningful example of the bidirectional relationship between science and society.

There is no doubt that a traditional narrative surrounding Bill Hamilton's life and work exists. The construction of this narrative began within Hamilton's lifetime, and in the case of Bob Trivers, we have seen how allegiance to a certain history of inclusive fitness served both personal and professional purposes. In positioning Hamilton as the Darwin of the twentieth century, however, the traditional narrative has not surprisingly incorporated mythical aspects of the scientific hero, ever embattled against the distorted, irrational illusions of a given culture. Archival evidence has brought into question various aspects of the often-repeated history.

For this reason, I dedicated a significant amount of space to carefully following Hamilton's life as a student and an early career researcher. Through attention to his journals, letters, and early essays, we have seen that Hamilton was deeply interested in human society. We have also seen that far from showing early signs of genius, Hamilton struggled through aspects of both his biology and mathematics coursework. In light of this, we may understand that he did not understand Fisher's arduous mathematics when he first recognized *The Genetical Theory of Natural Selection* (1930) as important and worthy of in depth study. He had reciprocated Fisher's eugenic fears, and he was interested in Fisher's theories because they spoke to his own concern for the future of man. Through such an understanding, we may see that Hamilton's original research agenda was drawn not from observations of insects but from his intuition regarding human nature. He merely used the

case of social insects as the best non-human example to illustrate that relatedness mattered in the proper understanding of evolved social behaviours. In his own words, Hamilton "always regarded the implications of the particular patterns of relatedness that apply to male haploids as a rather trivial part of […] my early papers".[888]

Some may argue that it does not matter that Hamilton's theory of inclusive fitness was developed in light of his personal (though he would call them scientific) beliefs concerning man. Indeed, Darwin's theory of natural selection depended on Thomas Malthus's treatise on human populations, and still, it remains the cornerstone of biology today. Likewise, we have seen the extent to which Fisher's mathematical achievements developed in conjunction with his efforts to support his eugenic beliefs. It is perhaps not surprising that with Darwin and Fisher as his scientific ideals, Hamilton did not distinguish the conclusions he drew from nature about man and those he drew from man about nature. Acknowledging this, it is nevertheless important to note that the sociobiology debates, ranking as they do among the most heated scientific debates of the twentieth century, were primarily not a critique of the underlying theory, that is to say, of inclusive fitness, but of Wilson's application of sociobiological principles to humankind. With this in mind, I argue that the cultural assumptions tied to Hamilton's theory deserve close attention.

Archival evidence also allows us to fathom that Hamilton's frustrations were not tied to 'benefit of the species' claims so much as they were to collectivist visions more generally. This is supported by the fact that Hamilton was not immediately dismissive of those purporting what came to be known as group selection theories, including Robert Ardrey, Konrad Lorenz, and V.C. Wynne-Edwards. While some have argued that Hamilton's

[888] W.D. Hamilton to E.O. Wilson, 15 August 1991, Hamilton archive, Z1X69/1/16.

understanding of Fisher allowed him to see through the ideological biases of such scholars, archival evidence has shown that inclusive fitness did not only entail a mathematical conclusion regarding the nature of sociality but also a political conclusion about the instability of collectivist states.

The traditional narrative, of course, is not wholly incorrect in its depiction of Hamilton. For example, archival evidence strengthens the idea that Hamilton was at heart a nonconformist. His tendency toward maintaining an outsider status is reflected throughout his archive, from his journal entries in the 1950s to his support for an underdog theory of AIDS in the 1990s. It also manifests through less well-known battles he fought, such as his appeal to remove the smoking ban at the Royal Society because he saw it as very unlikely that breathing smoke could be truly harmful to humans. Their ancestors had, of course, likely spent much of their time near campfire smoke.[889]

Still, we can understand Hamilton better through a recognition of at least four periods in his life where his interest in human evolution manifested in different ways, and we can further understand shifts in his habits based on the changing social and political context of the worlds he inhabited as well as the changing esteem of he was granted as biologist. In the first period, lasting from his school days until approximately 1969, man played a central role in determining both the problems he approached and the solutions at which he arrived. In the second, from approximately 1969 until 1977, Hamilton spent the majority of his professional time answering questions that did not necessarily correlate directly to human problems, but he made use of public and course lectures to continue to highlight the relevance of inclusive fitness to human society.

[889] W.D. Hamilton to P. Warren, 23 May 1990, Hamilton archive, Z1X88/2/4.

In the third period, from 1977, Hamilton moved away from speaking his mind so publicly, and privately he downplayed the extent to which he had kept up to date with current research on inclusive fitness. I argue that this was at least in part a response to the clashes he had with sociobiology's opponents after moving to America. This environment can be contrasted with the fourth period, from the late-1980s, in which Hamilton's place in history was secure, and he was confidant that little could be lost from 'talking sense'. Still, as a lifelong nonconformist, he did not feel the need to band strongly together with others working in human sociobiology, and he also did not return to publicly advocating his biological vision of appropriate political policies. The major exception to this stance at the end of his life, aside from his autobiographical account, was a talk he gave at the Vatican. With the opportunity to speak to his major Marxist opponent, Stephen Jay Gould, as well as the man at the head of his second major frustration, organized religion, he broadcast what he believed was a truly scientific understanding of human society, untouched by dogma. Thus, although Hamilton was successful in becoming a 'great' scientist, his impact has been distanced from his early and longstanding goal to protect the evolutionary future of man. Far from a peripheral interest, however, Hamilton's concerns regarding society were integral to his theory of inclusive fitness, and attention to archival materials allows us to better understand why an evolutionary account of social behaviour was, in his mind, such a worthy research subject.

In conclusion, I would like to highlight what looking at Hamilton's early work in its social and political context might mean. That man played a more fundamental role in Hamilton's early research than current histories would have us believe might at first appear insignificant. I argue that the revision is important for two reasons. First, it reflects the larger

underlying conflict between the social sciences and the natural sciences in the 1950s and 1960s, a struggle in which Hamilton found himself caught. Second, it gives us an indication that the identity of biology as a science in the postwar decades was not yet secure. If the biological research underway in the 1950s and 1960s could be unequivocally branded 'scientific', there would be no reason for current biologists to underline the mathematical aspects of Hamilton's theory and qualify or outright ignore the less rigorous influences on Hamilton's work.

For the above reasons, a reconsideration of the context in which Hamilton's identity as a biologist developed is significant because it shows that the relationship between biology, society, and politics cannot be easily dismissed. This relationship continued to be as fundamental to biological research undertaken in the second half of the twentieth century, as it was in the first, and rewriting the social and political context out of disciplinary histories risks the continuation of incorrect assumptions or biases of the past by overlaying them with an image of objectivity.

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