Chapter Twenty

Sociobiology and Evolutionary Psychology

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American scientists have made a number of important contributions to the field of sociobiology, which examines the evolution of social behavior among all living things, and the closely related field of evolutionary psychology, which focuses more explicitly on the social evolution of humans. To understand American contributions to these two fields, however, one must first understand the intellectual baggage that American scientists inherited from their forebears. For most of Western civilization, sociobiological research was stunted by the Judeo-Christian conviction that other species had been created distinct from humans and that God had not bothered to endow these other species with souls. It was simply taken for granted that nonhuman organisms did not possess psychic lives of their own. René Descartes famously reaffirmed this position in the early seventeenth century, when he wrote that nonhuman organisms were little more than machine-like automatons, and that they had no minds of which to speak (Merchant 2006). His opinion that other species were devoid of mental life carried considerable weight, and his ideas enjoyed paradigmatic status for the next several centuries.

As historians of science are well aware, the previously unbridgeable divide separating humans from other animals began to quickly disappear after Charles Darwin published *On the Origin of Species* in 1859. Darwin, of course, was English rather than American, but his work was quickly published in the United States, where enthusiastic champions like the professor of botany at Harvard, Asa Gray, promoted his ideas and defended him against critics. From our perspective, three points should be stressed in the adoption of a Darwinian worldview by Americans. First, a majority of American scientists converted to an evolutionary perspective rather quickly. Notwithstanding holdouts like the Swiss-born Harvard biologist Louis Agassiz, and the Princeton-based Presbyterian Charles Hodge, most Americans quickly accepted evolution as a biological phenomenon, including evolution extending to humankind (Bowler 1984; Ruse 1996). This was true among scientists, the general public, and even among church

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leaders (Roberts 1988). It is true that the more evangelical wing in the American South had, as it continues to have, strong negative sentiments about evolution. It is true also that, primarily because of political difficulties in Italy, Catholic reaction swung from cautious acceptance to a distrust and at times rejection of Darwinism (Artigas, Glick, and Martinez 2006).

Second, there was Darwin's mechanism of natural selection. Because more organisms are born than can survive and reproduce, there is a consequent struggle for existence that produces a winnowing process that is akin to the selection of animal and plant breeders. Since success in the struggle will on average be a function of the superior qualities of the survivors – the fitter organisms – over time, and since offspring tend to resemble their parents in many ways, there will be change and evolution. One should say that this mechanism had a somewhat mixed and low-key reception in the scientific world. No one wanted to deny that it can and does work, including on humans, and there were indeed some important empirical studies using natural selection, such as the work done by Henry Walter Bates (1863) on mimicry among brightly colored insects like butterflies. Nevertheless, even though they generally accepted evolution as a natural phenomenon in the years following the publication of *On the Origin of Species*, American scientists were not overly enthused by natural selection. They tended to support ideas like directed variation and the inheritance acquired characteristics, ideas that more readily allowed for purposive action and direction. Those for whom adaptation was insignificant tended to opt for large variation – what we today would call macromutations – this was the position of Darwin's great supporter, Thomas Henry Huxley.

What is interesting is that *outside* the American scientific community, one senses that natural selection found more acceptance in the United States than it did even in England. In particular, American philosophers who advanced the Pragmatisms showed a keener appreciation of selection than one finds even today among British thinkers (Ruse 2009). William James (1880) particularly made much of selective ideas in his thinking about culture and the nature of knowledge. This was a time when people like the English philosopher Henry Sidgwick (1876) were denying absolutely the significance of evolution itself to philosophical inquiry. In the twentieth century British philosophy conquered the United States and Pragmatism never made the gains that one might have anticipated. To this day, American philosophers lead the charge against the relevance of evolution, Darwinian or otherwise, to problems of epistemology or ethics. Recognizing that in these matters it is always difficult to keep separate the contributions of Darwin and Spencer, it is well known that toward the end of the nineteenth century, Americans – academics, businessmen, and others – showed great enthusiasm for what has been labeled Social Darwinism, basically a variant of laissez-faire economics (Bannister 1979). Life is a struggle for existence. Some will win. Some will lose. And that is how nature intended it, whether it be in the animal and plant world or in the world of commerce. Ideas like these were picked up by the novelists, particularly Jack London, whose *Call of the Wild* remains (at least for its rather thrilling writing) a deserved favorite.

The third thing done by Darwin, of great importance to us here, was to tackle the issue of social behavior. Darwin always recognized that behavior was just as important in the struggle for existence as physical characteristics, and he knew that this extended to social behavior. Well before he put pen to paper, the activities of the social insects like ants and bees had long been a subject of much interest and discussion, often in a natural

theological context, as observers tried to show that hives and nests are paradigmatic examples of God's designing concern. The problem with social behavior of course is that it seems to fly in the face of the selfishness demanded by the struggle for existence. If you are off helping others – at your own expense – you can hardly expect to be one of the fitter progenitors of future generations. Indeed, what makes this problem so terribly challenging is that famously the social insects tend to be divided by castes and some, the workers, are sterile, devoting all of their attentions to the welfare of others. How can this be? In the *Origin*, Darwin solved this problem by thinking of the nest of the social insect as a kind of superorganism (Richards and Ruse 2015). Thus, workers and others, like the queen and the drones (the inactive males), are to be thought of as parts of the whole, rather than individuals in their own right. Just as let us say the hand and the eye are to be thought of as part of the body and not competing against the leg and the nose, so the workers are part of the whole and not competing against the queen and the drones. Inasmuch as the body succeeds, so the hand and the eye succeed. Inasmuch as the nest or hive succeeds, so the workers succeed. Darwin followed much the same line when addressing humans in the *Descent*. This was particularly so of our moral sense, which is the essence of sociality. Of course things are rather more complex, due to our powers of reasoning; but in the end it is a question of all for one and one for all, the tribe taking the place of the nest or hive (Darwin 1871: 1, 166).

It is significant that Darwin's evolutionary worldview was already pervasive by the time sociology and biology began coalescing into distinct professional guilds in late-nineteenth-century America (Calhoun 2007; Rainger, Benson, and Maienschein 1988). No less significant, the first generation of self-identifying sociologists insisted that *they*, rather than biologists, were best equipped to answer questions about the nature of sociality. They offered several explanations for the origin of the social impulse, including "social forces" (Hayes 1911) and "consciousness of kind" (Giddings 1896), but none of these explanations ever gained serious traction among academics. The most prolific writers paid terrific lip service to the evolutionary perspective, but they never seemed to grasp its full implications. For scholars like Lester F. Ward and Franklin Giddings, sociality remained an exclusively human phenomenon. They accepted that the evolutionary perspective implied physical and even psychical continuity among living things, but they could not shake the anthropocentric assumption that the mental and social lives of other species paled when compared to the mental and social lives of humans (Ward 1894).

Not everyone accepted such a limited view of sociality, though. Some Americans insisted that it was ludicrous to deny consciousness or cognition to other species, especially since the evolutionary perspective, and simple observation, suggested that other livings might have minds of their own. These researchers began promoting a new field of studies known as "comparative psychology," which, as its name suggests, compared mental phenomena in nonhumans in an effort to learn more about mental phenomena in humans. Sociologists like Edward Lee Thorndike (1898), John Watson (1903), and Albion Small (1905) were among the earliest in the United States to establish laboratories dedicated to experimental comparative psychology. These efforts notwithstanding, it was increasingly biologists and not sociologists who probed the origin of the social impulse. American biologists examined social and psychological behavior across a variety of taxa during the first few decades of the twentieth century. Herbert Spencer Jennings famously explored sociality at the microscopic level in his landmark book, *Behavior of*

the Lower Organisms (1906). Meanwhile, after displaying an early interest in the mental lives of rodents (1907), Robert Yerkes devoted the remainder of his career to studying "psychobiological" behavior in nonhuman apes (Yerkes 1916, 1925, 1929).

Given Darwin's interest in the evolutionary peculiarities of social insects, it should come as no surprise that many of the United States' earliest and most ardent sociobiologists were entomologists. Among them, myrmecologist William Morton Wheeler proved the most influential. He was already the nation's foremost expert on social insects when he was named professor of economic entomology at Harvard in 1907, and he soon used his influence and his visibility to begin promoting a particular vision of nature. During a now-famous address at Woods Hole in 1910, Wheeler explained to his assembled colleagues why the ant colony was an organism. Not a metaphorical organism, he clarified, but rather a "true organism" (Wheeler 1911: 131). He reasoned that, like all organisms, ant colonies were reproductively differentiated, and that they developed along ontogenetic and phylogenetic lines. This vision inspired an entire generation of aspiring naturalists. Alfred Emerson was still just a grad student with a nascent interest in insects when he chanced to spend the summer of 1919 conducting fieldwork in British Guyana under Wheeler's tutelage. The experience had a profound influence on Emerson, who landed at the University of Chicago, and who resolved to study insect sociality the rest of his days. Although Emerson focused his attention on termites rather than ants, he was similarly convinced that the social-insect colony was a true organism in every sense (1939).

Emerson found a group of enthusiastic colleagues at the University of Chicago, and Warder Clyde Allee was perhaps the most influential among them. Allee graduated from the University of Chicago in 1912, and, nine years later, he returned to his alma mater as a professor. Over the next 30 years (1921 to 1950), Allee established his reputation as one of the most influential American ecologists of all time. He wrote extensively on the social dynamics of disparate species. *Animal Aggregations* (1931) provides a particularly illustrative summary of his research. Drawing on a wealth of research at both the microscopic and macroscopic level, Allee insisted that an individual's evolutionary success invariably depended on the presence of other individuals, and there was no such thing as a truly solitary organism. He wrote that the spatial arrangement of individuals in a restricted space, and the nature of their integration therein, could help explain the origin of "proto-cooperation." The Allee effect, as his observation became known, recognized that undercrowding could be just as lethal as overcrowding.

The 1930s also saw the coming of Mendelian genetics (a decade or two later to morph into molecular genetics) and in major respects this really did add the missing causal components needed to complete the Darwinian revolution (Provine 1971). Now, building on the theoretical insights of Ronald Fisher and J.B.S. Haldane in England and Sewall Wright in America, and thanks to the work of people like E.B. Ford in England and Theodosius Dobzhansky in the United States, natural selection could come into its own and much work was done showing its importance as the most significant causal factor in evolutionary change, at the same time boosting Darwin's insight that the key characteristic of organic life is it adaptedness (Ruse 2013a). The natural theologians were right – the world is as if designed. The only question is whether it is a hands-on Designer or the effects of ongoing unbroken law.

For fairly obvious reasons, the area of evolutionary biology covering social behavior rather lagged – it is hugely more difficult to measure the mating behavior of fruit flies

than their wing size. However on the continent a number of behavioral scientists – labeled the "ethologists" – were starting to take the evolution of behavior very seriously, and with the move of one of the leaders (Niko Tinbergen) to Oxford expectedly social behavior was going to come more and more within the view of (what were now generally called) the neo-Darwinian evolutionists. In an almost paradoxical way, it was one of the general assumptions of the ethologists, particularly of the leader Konrad Lorenz, that was to spark much of the discussion. Lorenz along with many others (including all of the Harvard and Chicago biologists) calmly assumed that natural selection can work at many levels – favoring the individual on one occasion, and the group up to and including the species on another occasion (Lorenz 1966). This set up a reaction, because increasingly neo-Darwinians felt that "group selection" so-called is at best very rare. The trouble with it is that it lays itself too open to cheating. An organism with adaptations for helping itself is going to be at a selective advantage over an organism with adaptations for helping the group. In this new age of genetics, where it could be seen how each individual has biological interests in furthering its own gene replication, Darwin's ploy of treating nests and hives as super-individuals was judged inadequate.

Establishing the Principles of Sociobiology

Undoubtedly the most significant breakthrough came from a young English graduate student, William Hamilton (1964a, b). He argued that hymenopteran (ants, bees, and wasps) sterility can be explained as a function of reproduction by proxy as it were. In evolution, from a neo-Darwinian perspective, it matters not how genes are passed on, just that they are passed on in greater proportions than those of competitors. Hamilton pointed out that in the hymenoptera, because of a funny reproductive system – females have both mothers and fathers whereas males have only mothers – sisters are more closely related than mothers and daughters. Hence it is in the biological interests of a female to raise fertile sisters rather than fertile daughters! Those sterile workers, always female, are not so very "altruistic." They are furthering their reproductive ends by looking to those females in the next generation, rather than by selflessly serving the nest.

This process, which became generalized and was christened "kin selection," was obviously a paradigmatic example of selection working for the individual rather than the group, something that in the next decade in a popular account, the Oxford biologist Richard Dawkins (1976) was to label the "selfish-gene" approach. At the same time, independently, it was bolstered by the work of a young American ichthyologist, George C. Williams (1966). Having spent time as a postdoctoral fellow at the University of Chicago, he became disgusted at what he took to be the unwarranted flabby thinking of his seniors, particularly Allee. He like Hamilton turned to an uncompromisingly individual-selection approach over group selection and in 1966 published a very influential and fiery polemic, *Adaptation and Natural Selection*. Like everyone, he did not want to deny absolutely the possibility of group selection, but like everyone he thought its prospects very dim.

Conceptually the major American contribution to the subject came at the beginning of the next decade, from another graduate student, Robert Trivers. In a stunning series of papers, Trivers turned among other topics to that of "reciprocal altruism," where

organisms help each other in expectation of help to be returned (Trivers 1971); to "parental investment," where parents put effort into their children's' well-being because they are now carrying the genes of the next generation (Trivers 1972); and to "parent–offspring conflict," where the biological interests of the parent (with several children) may conflict with the biological interests of the child (whose first concern is with self) (Trivers 1974). Whether or not these ideas were in the air – in the *Descent* Darwin certainly articulates the principle of reciprocal altruism – it was Trivers who gave them explicit articulation. (Perhaps a harbinger of what was to come, Hamilton was always an outsider and had trouble getting his dissertation to examination, and Trivers failed to get tenure at Harvard.)

Empirical work was now getting underway, and it is perhaps therefore no great surprise that Edward O. Wilson, on the faculty at Harvard, by the early 1970s the world authority on the ants (he was a student of Frank M. Carpenter who in turn was a student of William Morton Wheeler) and one who was doing major studies on pheromones (the chemicals used by insects for communication), should have had the idea and the ambition to draw all together. Thus was born *Sociobiology: The New Synthesis* (1975). (The first use of the term apparently dates from the 1940s, but it was Wilson who popularized it.) A massive work, copiously illustrated, it covers the theoretical work like that of Hamilton and Trivers, and then has a huge survey of the animal world, from the sponges, through the social insects, up through the vertebrates, ending with the great apes and finally with humankind. (The work was consciously modeled on an earlier survey of neo-Darwinism generally, *Evolution: The Modern Synthesis*, which appeared in 1942, authored by Thomas Henry Huxley's grandson, Julian Huxley.)

If 1859, the year of the publication of Darwin's *Origin of Species*, is the year when modern evolutionary thinking began, then 1975, when Edward O. Wilson published *Sociobiology*, marks the beginning of modern thinking about social behavior and its application to humankind, evolutionary psychology. The analogy may not be exact, however. Charles Darwin was not the first evolutionist (his grandfather, Erasmus, had endorsed the idea long before Charles was even born), but Charles Darwin did bring about a revolution. No one had gathered up the information as he had done and no one had made natural selection the main force for change. By comparison, the very subtitle of Wilson's book (*The New Synthesis*) indicates that he was primarily bringing together work, theoretical and empirical, that had already appeared elsewhere. Perhaps by making such a statement, one can think of the work as revolutionary, but even this in respect needs to be qualified, because one might with reason argue that Wilson and his coworkers were truly furthering the Darwinian revolution.

In any event, Wilson's *Sociobiology*, as well as Richard Dawkins' popular work, *The Selfish Gene*, which appeared a year later, caused massive controversy. Perhaps expectedly, many social scientists did not much like it. They expressed concern that biologists were ignoring or downplaying discoveries and clarifications that they had labored to make over the past century. Rather less expectedly, Wilson ran into great opposition from many of his fellow biologists, particularly people of the left, who felt that he was simply perpetuating vile myths about women and blacks and other traditionally downtrodden groups, myths that he was now trying to justify with the respectable cloak of neo-Darwinism (Allen et al. 1975).

Leading the charge were two of Wilson's colleagues in the organismic biology department at Harvard, the geneticist Richard Lewontin and the paleontologist Stephen Jay

Gould, the latter already on his way to becoming one of the best-known, popular-science figures in the world (Ruse 1979). Not entirely consistently, they accused Wilson of producing work that was both false and unfalsifiable! They argued that he was a racist, seeing certain groups of humans – no prizes for guessing which – as inherently inferior to others. They saw him as a sexist of the grossest kind, no matter that one of his students Sarah Hrdy (1978) was to do definitive work on the power of female monkeys in troops. Given the incandescent level of the critiques – at one meeting of the American Association for the Advancement of Science Wilson actually had water poured over his head ("You really are all wet Professor Wilson") – one suspects that there were emotional factors driving these charges. One certainly was ongoing rumblings in the aftermath of the Vietnam War. Several of Wilson's most prominent critics were politicized during that dreadful conflagration, and from thenceforth considered their bounden duty to oppose all kinds of oppression, real and apparent. Another was that many of Wilson's opponents were Jews and saw the kind of work he was doing as the thin end of a wedge that could only end in the kinds of events begun in the Third Reich of the 1930s and 1940s. Gould was much disturbed in this way and wrote a book, *The Mismeasure of Man* (1981),that made his feelings very clear.

Parenthetically, it is interesting to note that the philosophical community, with very few exceptions, from the start showed unremitting hostility to sociobiology, especially inasmuch as it applies to humans (see for instance Kitcher 1985.) This is perhaps not unconnected to the already-noted general fear that philosophers have of evolutionary theory, feeling that its successful application to our species would spell the end of the vaulted position of humankind on which so much of their work is predicated. Without denying the nonbelief of the average philosopher, it is interesting how they share the conviction with the evangelical Christian that we are special because we are made in the image of God, whether or not He exists.

Bloody but unbowed, Wilson followed his massive work with another explicitly on our species, *On Human Nature,* in 1978. He would have been less than human had he not taken a certain triumphant satisfaction in being awarded the Pulitzer Prize for this work. But less and less did he play a leading role in the science, starting to write books of a more popular and (as he would judge them) more philosophical nature. Turning therefore to others, what then can we say of the fate of sociobiology in the following four decades down to the present?

It is fair to say that, in the animal world, things settled down very quickly. Indeed, before Wilson, thanks to the new models of Hamilton and Trivers, together with some other innovative thinking – notably the use of game theory by the British biologist John Maynard Smith (1982) – evolutionary biologists had been doing both theoretical and empirical work on animal social behavior, and this continued full force in the years following. As indeed it continues today. The word "sociobiology" was considered contaminated by some and there were moves to find alternatives – "behavioral ecology" was one and others continued with the older term of "ethology" – but generally no one has felt the need for much of a name anyway, especially given that the whole point is that this work is and should be as being within the Darwinian paradigm (Ruse 2012). Other notable work would include the studies by Edward A. Herre and his associates in Central America on fig wasps (Herre, Machado, and West 2001; Ruse 2006).

In the human realm it is perhaps best to distinguish between studies about the past and studies about the present. The former belongs perhaps most prominently to the

field of anthropology, particularly to paleoanthropology, and here we find physical anthropologists (or as they often style themselves nowadays evolutionary anthropologists) making very significant forward strides. It is well known that DNA studies have recently produced some quite astounding findings, for instance that beyond doubt Europeans carry some (about 4%) of Neanderthal genes (Krings et al. 1997; Lohse and Frantz 2014). Behavioral studies are obviously a lot trickier, but here too advances are being made through studies of tool use and diet and so forth.

One major factor in the evolution of humans is obviously the much-increased brain size and since big brains require large amounts of protein, we can say that our ancestors must have had access to such protein, and this could have come only from the bodies of other animals. Twenty-first-century graduate students may adopt a vegan diet but this was not an option for *Australopithecus afarensis* or *Homo habilis*. Much study has gone into the ways in which such protein was obtained, whether through hunting or scavenging or what. The same holds true of other aspects of human nature, for instance our linguistic abilities. Obviously one cannot take a tape recorder back a million years, but one can do such things as look at the nature of skulls and the indentations inside as a guide to which parts of the brain evolved first and most significantly (Falk 2004).

Developments in Evolutionary Psychology

As far as the present is concerned, generally students in this field have adopted the term "evolutionary psychology," and in fact one as often as not finds that research is going on in departments of psychology rather than departments of biology. In part, this obviously reflects the fact that psychology itself has moved in many respects closer to biology, with much attention now being paid to the physical underpinnings of our psychology as to the thought processes and behaviors of human beings. For all of the controversies of the 1970s, many saw bright prospects in the application of Darwinian principles to human nature and before long major studies were being performed and reported on (Daly and Wilson 1998; Hrdy 1999).

Some of the most interesting work applicable to all humans – John Toby and Leida Cosmides are prominent here – has been done on reasoning processes (Cosmides 1989; Cosmides and Toby 1996). There are some fairly standard psychological illusion tricks one can play on people, where if they are given real-life examples – young people in a bar drinking or not drinking alcohol – they solve the problems easily, but where if they are given the same problems in a theoretical form – turn over a card with an even number or not and that sort of thing – most people fail them almost all of the time. The evolutionary psychologists argue that evolution has fitted us to solve real-life problems and that it has done nothing on our abilities for solving theoretical problems that would not have been encountered in the Stone Age.

This has all led to major controversy about the extent to which our minds are still caught in the past (Ruse 2012). All agree that the mind/brain is a product of natural selection and that we have our features because they are adaptive, but does this mean that they are adaptive now or that they were adaptive once but now are not necessarily adaptive? A popular example is our fear of snakes but our too-ready acceptance of hand guns. In America today far more people are killed each year by hand guns than by snakes. Does this mean that we are out of adaptive kilter? We have adaptations to avoid

snakes but not guns? Clearly culture comes into this somewhat, but how much? Would it be fair to say that most features today are adaptive, if not all? After all, we know that human evolution can take place very rapidly. There is no more obvious characteristic separating humans than skin color, but it seems that it is a very recent phenomenon. Perhaps it took only 15,000 years to develop. Likewise lactose tolerance; most adult humans cannot tolerate milk products, but with the coming of agriculture milk products became readily available and there was strong selection pressure to produce humans who could digest and use them.

Despite the opposition of philosophers, some of the most significant recent work has been on the evolution of morality (Ruse 2009). It is clear that our moral sense is an important adaptation. Humans are highly social beings with many of the features needed for such an adaptive strategy – for instance, our immunity to many diseases and parasites. Morality is clearly part of our tool bag. If we have to interact with people many times each day, then we need ways of getting along. More than that, we need quick and dirty ways of getting along. We cannot calculate self-interest every time we have an interaction with a fellow human. We need abilities to make quick decisions, even if later we may come to rue them. Morality helps here – I feel I should help you so I do, and later you feel you should help me and so you do. No arguments needed. Much recent work has gone into tracing the roots and nature of morality, looking at the great apes, looking at our past, looking at our current psychology and much more. Whether this all solves the problems of moral philosophers, whether for instance it tells us much about the foundations of morality, are much-discussed questions (Ruse and Richards 2016). But everyone seems to agree that it does tell us something.

Finally, we must not forget culture. Obviously a major distinguishing feature of human beings is our rich culture, whether or not you think it unique or that other animals also have their cultures. How do biology and culture interact? One much-respected hypothesis makes much of imitation. When in Rome, do as the Romans do, or, more precisely, do as the successful Romans do. "By imitating the successful, you have a chance of acquiring the behaviors that cause success, even if you do not know anything about which characteristics of the successful are responsible for their success," write Richerson and Boyd (2005: 120). You can see how bad ideas can hitchhike as parasites on the back of a system like this. Whether or not you think religion a bad idea, Richard Dawkins (2006) has made much of the ways in which religious beliefs come about through imitation and how they get themselves thoroughly engrained before anyone realizes how bad and dangerous they are. Perhaps here is a point where one might need to distinguish ideas that are bad in the sense of being false and ideas that are bad in the sense of being counter-reproductive in a Darwinian sense. It is by no means obvious that a true idea will necessarily lead to larger families than a false idea. Think of some of the silly things said about contraception.

There are still controversies. Almost all scientists today accept the predominance of individual selection over group selection. Interestingly and almost paradoxically, one who goes against the flow is none other than Edward O Wilson! Recently he has started arguing strongly for a more holistic approach to biological mechanisms including endorsing group selection (Wilson and Wilson 2007). Expectedly he brought on himself the wrath of the biological community, with no fewer than 150 people signing letters to *Nature* in disagreement. Perhaps, at this point, we have come full circle. Wilson was the student of Carpenter, who in turn was the student of Wheeler. Wheeler,

along with his fellow scientists at Harvard – notably L.J. Henderson – always had a weakness for the thinking of Herbert Spencer, a man who notably endorsed an organicist view of society (Ruse 2013b). Are we hearing today faint echoes of those ideas that so engrossed thinkers 150 years ago when evolutionary thinking was just coming into its own?

Bibliographic Essay

Thanks to the far-reaching influence British naturalist Charles Darwin and British philosopher Herbert Spencer, a majority of American scientists had already converted to an evolutionary worldview by the late nineteenth century. As a result, the first generation of self-identifying sociologists and psychologists accepted that mental activity, human or otherwise, was a product of the evolutionary process. Early practitioners like Edward Lee Thorndike (1898) at Columbia University, John B. Watson (1903) at the University of Chicago, and Albion Small (1905) at Clark University all placed an early emphasis on the value of experimental studies. For more information on the development of American sociology in the late nineteenth and early twentieth centuries, consult Craig Calhoun's authoritative history (Calhoun 2007).

During the early twentieth century, biologists began to cast a much wider net, studying increasingly diverse kingdoms of life in an effort to understand the laws of social evolution. To learn more about Johns Hopkins biologist Herbert Spencer Jennings and his use of unicellular organisms in psychological research (Jennings 1906), one should consult the excellent work by Judy Johns Schloegel and Henning Schmidgen (2002). To learn more about Harvard biologist William Morton Wheeler's "superorganism" hypothesis (1911) and its influence on American sociobiology, read Charlotte Sleigh's masterful work on the topic (Sleigh 2002, 2007). Anyone interested in learning about Warder Clyde Allee's research on proto-cooperation (1931) and Alfred Emerson's unique marriage of natural selection and "emergent evolution" (1939) should read Greg Mitman's *State of Nature* (1992).

Support for holistic concepts like "emergence" and "superorganisms" evaporated in the wake of World War II. Biologists like W.D. Hamilton (1964a,b), John Maynard Smith (1964), and George C. Williams (1966) disputed the notion that natural selection could operate on groups, insisting that selection instead acted solely on individuals or the genes of which they are comprised. For an excellent summary of this contentious history, read Mark Borrello's *Evolutionary Restraints* (2010). One should also read *The Price of Altruism* (2010), Oren Harman's stirring biography of George Price, the American theoretician whose ideas on altruism changed the course of sociobiological thought on two continents.

Darwin's *Origin* notwithstanding, there is more perhaps no text in the history of sociobiological thought that has aroused as much passion as Edward O. Wilson's *Sociobiology* (1975). With breathtaking scope, Wilson examined the origins and nature of sociality across all branches of life and determined that four systems qualified as "pinnacles" of sociality: colonial invertebrates, social insects, nonhuman mammals, and, ahem, humans. Wilson's overt attempt to "biologicize" the social sciences touched off a major controversy across the academic spectrum (Alcock 2001; Allen et al. 1975; Lewontin 1978; Ruse 1979, Segerstrale 2000). Owing in part to this controversy, many

researchers who were interested in mental and social evolution found it prudent to labor under a different banner, evolutionary psychology. To learn more, read *The Adapted Mind* (1992), by Jerome H. Barkow, Leda Cosmides, and John Tooby, as well as *The Moral Animal*, by Robert Wright (1994). And finally, it is altogether fitting that E.O. Wilson continues to rock the boat. While he placed kin selection at the center of sociobiology in 1975, he has since very publicly revoked that endorsement, insisting instead that natural selection, and not kin selection, provides the initial impetus for sociality (Wilson 2012, 2014; Wilson and Wilson 2007). His reversal has sent shockwaves across the academic landscape, indicating that the field of sociobiology remains as controversial, and as vibrant, as ever