I

In this article I am interested in exploring the general claim that work in computer science and artificial intelligence (AI) has or can shed some light on our understanding of human nature. This claim is sometimes expressed in the thought that in studying computers and human beings we are studying the same thing. The assumption behind this claim appears to be that there is some species or kind to which both human beings and computers belong, the species information processor, for instance. I will argue that we should be wary of these claims and suspicious of the supposed identity existing between computers and human beings. My argument rests on two general claims that I will discuss in sections two and three of this article. First, human nature, as an object of interest in computer or cognitive science, has been entirely obscured and marginalized; it represents the repressed of AI. For all the talk about what AI or cognitive science in general might reveal about human nature, there has been decidedly little said about human nature in the discourse of AI. In the metaphoric identification of human with machine, all eyes are on the machine and the human has been largely ignored. My second claim is that the repression of human nature in AI has led to a situation in which, when it does receive attention, usually only briefly and implicitly, the topic is addressed in terms of very traditional assumptions about what human nature is. Far from challenging traditional approaches to human nature and offering a new and revolutionary approach to an age old discussion, AI represents the
apotheosis of traditional western conceptions of human nature. In this article, I wish to awaken the dead in AI, to call for a return of the repressed of AI. ²

The absence of any discussion of human nature in the discourse of AI is an instance of our current general unwillingness to confront directly the issue of human nature. Any discussion of or about human nature has largely disappeared from the current intellectual scene. Man is dead and humanism and philosophical anthropology are obsolete. In an atmosphere defined by postmodernism, feminism, gay and lesbian studies, and racial and ethnic studies, considerations of human nature have become taboo. In such a highly charged politically correct atmosphere as we currently live in, no theory of human nature can survive scrutiny for evidence of bias: racist, sexist, classist, eurocentric. Such an atmosphere has made any discussion of human nature fraught with danger. As Charles Taylor notes, we've become very nervous and squeamish about “human nature”. “The very words ring alarm bells. We fear that we may be setting up some reified image, in face of the changing forms of human life in history, that we may be prisoners of some insidious ethnocentrism” (vii). Sounding a similar note, Calvin Schrag writes:

Even a casual observer of the current state of the arts and sciences is able to discern that humanism, both as a philosophical position and as a cultural attitude, is under suspicion. The project and language of humanism alike have fallen into disfavor and have become fashionable targets of critique. (197)

It is into this minefield that AI has wandered (or perhaps marched) filling a void left by philosophers and others eager to be done with this issue. This is one important reason why we ought to be wary of the claim that research in AI is finally going to settle this issue and tell us something significant about human nature. In an atmosphere in which so little attention is given to these issues, while any attention is deserving, it ought to be approached with caution. Given the lack of attention paid to the issue of human nature, AI researchers have had little recourse but to fall back on very traditional accounts of human nature, one reason why these accounts have achieved such widespread acceptance: they cohere so well with and do not challenge the largely Christian and Cartesian view of
human nature widespread in the west. Rather than representing a break in the way we have approached these issues, AI represents the fulfillment of this approach.  

AI and the traditional Western Cartesian view of human nature both emphasize reason as our distinctive characteristic, see mind as independent of body, view science as the source of truth and order, and strive for an immortal spiritual existence. AI is simply the next logical step in an unfolding cultural view that mostly got underway with Descartes. Descartes is the theory, AI the practice.

In the next two sections I wish to explore these claims. In section two I turn to the claim that the issue of human nature has been marginalized in discussions of AI, examining briefly Jack Copeland's *Artificial Intelligence: A Philosophical Introduction* followed by a more extended analysis of John Haugeland's *Artificial Intelligence: The Very Idea*. In the third section I examine the claim that the repression of human nature in AI has left researchers in the field largely free to exploit very traditional assumptions about human nature. This, I argue, can be very clearly seen in Hans Moravec's *Mind Children: The Future of Robot and Human Intelligence*. In the fourth section I will present an alternative view of human nature to the one implicitly presupposed by much work in AI. I believe that if we stop to explicitly focus on the issue of human nature we will not be so inclined to accept the claim that human beings and computers are in some significant sense identical. If we wish to know if a computational framework is adequate to understanding human nature, then we must openly and directly address this issue. If there has been no discussion of human nature, no attempt to take its measure independently of computational models, we are in no position to judge its adequacy.

II

In this section I wish to explore the way in which human nature is repressed in the discourse of AI. I will justify two claims. First, I claim that most accounts of work in this field seldom stop to focus on the issue of human nature. Secondly, I claim that when some
account of human nature is offered the mind is adopted as a stand in for human nature. This interest in the human mind rather than the whole of human nature, or the claim that the human mind exhausts the whole of human nature, is evident from even a cursory glance at book titles in this field: *Mind Design, The Science of the Mind, Matter and Consciousness, The Mind's I, Minds and Machines*. While many of these books purport to tell us something about human nature, their focus remains on the human mind. Implicit in all this is the identification of human nature with mind and thinking. This makes it much easier to later identify human beings with computers as both of them are symbol manipulators.

One can see both of these issues at work in Copeland's *Artificial Intelligence*. Following an extensive analysis of AI, Copeland turns, in Chapter 9 of his book, to the question "Are we computers?". As a preface to this chapter, he writes,

> By and large men and women of the Victorian age believed themselves to be embodied spirits whose nearest non human relatives were angels. A century later, our rough ride through the theories of Darwin, Marx, and Freud has left us collectively uncertain what we are; and an increasing number of people seem prepared to accept that our closest relatives may not be angels but the products of IBM and the Digital Equipment Corporation. Some brave citizens of the late twentieth century openly declare themselves to be computers and a great many more quietly entertain the suspicion that they could well be.

This new view of the human mind as a computer has taken root in popular culture with astonishing vigour. My aim is both to debunk the new image and to applaud it. As I explain, the image enjoys a popularity that far outstrips the scientific evidence—in fact there is currently no hard evidence either for or against the theory that the human brain is a computer. On the other hand, it seems to me that even if the theory should eventually turn out to be wrong in detail it is right in spirit. If we are not computers then we are physical machines of some other description. Last century's image of human nature had us uncomfortably straddling two realms, and we are well rid of it. (180)

A question is posed, "are we computers?" and, indeed, some reason is given to believe that this is the issue that Copeland will address. For he offers us reference to a Victorian view of human nature along with those masters of suspicion, so often addressed when the context is human nature, Darwin, Marx, and Freud. The issue posed is our collective
uncertainty about "what we are." And yet, almost as soon as this question is posed, it gives way to another issue, the "image" of the human mind as a computer. In the shift from one paragraph to another there is a shift from one issue to another, from talk about human nature to talk about the human mind. Almost as quickly, there is a still further shift to the "theory" that the human brain is a computer. By the end of the second paragraph, though, we are once again talking about human nature, a new image of human nature for the brave citizens of the twentieth century. From uncertainty about what we are, to an image of the human mind, to a theory about the brain, and returning to human nature, Copeland demonstrates the manner in which writers about AI easily affect an identification between human nature, mind, and brain, treating them as interchangeable and synonymous. That Copeland is able to effortlessly glide between these terms is indicative of the power of this metaphoric identification and, generally, of the AI paradigm. Equally indicative of the power of this paradigm is his assertion that the theory that the brain is a computer is "right in spirit" despite his obvious ambivalence. Suspicions are quietly entertained. Copeland wants to both debunk and applaud the new image. It is right in spirit even if "there is currently no hard evidence either for or against the theory…"

Indeed, Copeland's discussion of the theory that the brain is a computer is largely critical. As he summarizes this discussion, "…so far no persuasive reasons exist for believing that the human being is—or is partly—a computer. There is, as yet, no hard empirical evidence for the hypothesis; and nor is much corroboration forthcoming from the philosophical arguments we have examined" (206). Despite this, or perhaps because of it, Copeland can yet claim that "in spirit", the theory is right.

One can see similar issues at work in the very first paragraph of Haugeland's introduction to his Artificial Intelligence. Let me quote this in full as I believe it to be a telling passage. Under the heading “Minds: Artificial and Natural”, Haugeland writes:

What are minds? What is thinking? What sets people apart, in all the known universe? Such questions have tantalized philosophers for millennia, but (by scientific standards anyway) scant progress could be claimed…until
recently. For the current generation has seen a sudden and brilliant flowering in the philosophy/science of the mind; by now not only psychology but also a host of related disciplines are in the throes of a great intellectual revolution. And the epitome of the entire drama is *Artificial Intelligence*, the exciting new effort to make computers think. The fundamental goal of this research is not merely to mimic intelligence or produce some clever fake. Not at all. “AI” wants only the genuine article: *machines with minds*, in the full and literal sense. This is not science fiction, but real science, based on a theoretical conception as deep as it is daring: namely, we are, at root, *computers ourselves*. That idea--the idea that thinking and computing are radically the same--is the topic of this book. (2)

AI is described as exciting, new, daring, revolutionary. This is quite common in the literature on AI, especially popular accounts of the discipline. The revolutionary aspect of AI is often analogized to the work of Copernicus, Darwin, and Freud. AI, like its predecessors, provides us with a new and revolutionary way to think about human nature and our place in the universe. This, though, is largely myth, as I hope to show in this and the following section.

Axiomatic to much of contemporary philosophy and AI is the belief in the efficacy of science, said to represent the epitome of human achievement. *Cognitive science*, Haugeland tell us, is the name of a field defined by an imminent “grand interdisciplinary marriage” in which a number of enthusiasts have taken the vows (5). Indeed, in the opening paragraph Haugeland succeeds in literally conjoining philosophy and science (“philosophy/science”)—they become one, with philosophy being the better for the match. Philosophy by itself is no match for science. After all, philosophers have made no progress in addressing these issues, despite having millenia to deal with them. AI, unlike philosophy, is “real science” and the standard according to which we should measure progress in addressing those questions that philosophers have made scant progress in answering is a scientific standard. What that standard may be and why it is the only relevant standard in this debate remains unclear.

The opening lines implicitly draw a connection between three topics: (1) the issues that have tantalized philosophers for millenia, namely our place in the universe, (2) the nature
of mind and thinking, and (3) AI. This connection serves to underscore the philosophical significance of AI. Researchers in this field are working on the same problems that philosophers have always dealt with: the nature of mind and our place in the universe. Also implied is the claim that AI will replace or has already replaced philosophy in thinking about human nature. The claims that AI represents the new philosophy and that what researchers in AI are doing is similar to what philosophers have always done are commonly made. As Roger Schank notes, AI is “competing for the same role in the study of man. We are very much modern day philosophers. We're addressing the same questions that Aristotle addressed, and everybody else in between” (Qtd. in Turkle 359). This suggests that what researchers in AI take themselves to be doing is much the same as what philosophers have always done. 5

But the traditional philosophical issue, while it may have had something to do with thought and mind, was, in reality, connected more with human nature as a whole rather than just our mind. Haugeland implicitly connects this ancient philosophical concern with the more modern concern over the nature of the mind. Indeed, prior to Descartes, it's not clear that one could point to the existence of anything called the mind in Western thought. There has been a remarkable slippage here that takes a very modern concern and reads it back into the history of philosophy, obscuring close to two thousand years of philosophical history, replacing interest in the whole human being with interest in the mind, and resolving the whole human being into his mind. It is only this slippage that allows Haugeland to draw a connection between what philosophers did then and what AI is doing now.

What is perhaps most interesting about this implicit identification of human nature with mind and the claim that our distinctive nature is due to mind, is the completely casual way in which it is carried out, establishing the extent to which this is axiomatic in AI and contemporary philosophy of mind. Indeed, Richard Rorty notes that the identification of
mind with human nature is a hallmark of much contemporary philosophical and scientific thought.

The question as to the place of Mind in Nature is a reformulation of the question as to the place of human beings….Granted…that what we call “mind” came into the world by spatiotemporal mechanisms homogeneous with those which produced the rest of the world's contents, what is it that we call “mind”? (323)

There is, then, an implicit substitution of mind for human nature. While the topic of human nature is, on the surface, the ostensive subject matter of AI, the true object of interest is not human nature but thinking and mind. The topic of human nature is itself never really broached.

What one sees in this first paragraph, then, is a confusion of mind with human nature. It is precisely this confusion, this obscuring of the difference between thinking about the mind and thinking about human nature, that makes possible Haugeland's claim that “we are, at root, computers ourselves.” Computers think (or at least process symbols). Human beings are, essentially, thinkers. Therefore, we are at root computers. AI studies thinking. Therefore, AI is the science of computers as well as human beings. Haugeland reiterates this claim on page five. “…We're really interested in AI as part of the theory that people are computers—and we're all interested in people.” The claim, though, that we are at root computers is credible only if you are willing to buy into a particular view of human nature which emphasizes thinking as at the root of what we are. It is as if an account of mind exhausts all our interest in people. In section four I will argue against this view of human nature.

While Haugeland may see AI as a subdivision of the study of people, he shows remarkably little interest in people. Haugeland lists his ambitions in writing this book as threefold: to explain what AI is all about, to exhibit its philosophical and scientific credentials, and to look at what has and has not been accomplished (2). Not included in this list of ambitions is a reflection on human nature, the repressed of AI. While we are all interested in people, apparently some of us are less interested than others. It is as if human
nature is perfectly clear and transparent and all we need do is clarify the nature of computers and we will see that and in what way AI is applicable to human beings. We are the mere material made to fit the mold and metaphor of AI. While Haugeland cautions, “Remember, the real issue is whether, in the appropriate abstract sense, we are computers ourselves” (12), that “real issue” is never explicitly explored in any real sense.

Haugeland's implicit treatment of human nature is generally in terms of what it is not, what is not relevant to our interest in people as computers. Haugeland tells us, for instance, that there are many things with which AI need not concern itself. 6 Because intelligence depends only on a system's organization and functioning as a symbol manipulator, many low-level specifics, such as what the symbols are made of, can be ignored. “In other words, various ‘details,’ like whether the underlying structure is electronic or physiological (or hydraulic or fiber optic or whatever), are entirely beside the point” (5). Whether one is using the tools of computer science, experimental psychology, or traditional philosophy, it is the same subject in each case. Furthermore,

By accepting the Turing test (in spirit, if not the letter), scientists can concentrate almost entirely on the “cognitive” aspects of the problem: what internal structure and operations would enable a system to say the right thing at the right time. In other words, they can dispense with messy incidentals and get on with computational psychology. (9)

The “in other words” suggests how attenuated is the view of human nature that Haugeland implicitly assumes. Computational psychology can dispense with messy incidentals such as physiology and the human being's embodiment. The belief that the “underlying structure” is a messy incidental is widespread in the AI community. We will see this more clearly in the following section. Recently of course the popularity of connectionist models and neural networks has stimulated new interest in these messy incidentals. Even in this context, though, what matters is not biology per se, the biology of the human being, but the biology of the brain or the central nervous system, neurobiology. The fact that this brain is embodied in some particular body or other never registers. One
sees the same kind of substitution carried out by Haugeland at work here, replacing our study of the whole human being with a study of one part.

Following the introduction to Artificial Intelligence we have chapters on the modern mind, automatic formal systems, semantics, computer architecture, and real machines. The sixth and last chapter is titled “Real People.” Perhaps our elusive quarry will show up in this chapter. And indeed we have reason to hope, for opposite the first page of the chapter we are greeted with a grainy black-and-white picture of a real human being. In this case we have a middle-aged white woman, her hair pulled back, little jewelry, no make-up, eyes circled, dark, and sunken, her life seems to be written on her face. She is wearing casual, perhaps working clothes. She seems to be staring pensively out a window or door, a slight smile on her face. We are to assume, I suppose, that this chapter is about real people like this woman, a woman whose very ordinariness, whose unremarkable nature, makes her seem all the more real. And yet our hopes are dashed and unfulfilled, for turning to the list of credits in the back of the book, we see that this woman remains unidentified, there is no attribution for this photo. Our woman then is everywoman, anonymous, a stand-in for real people, not in fact a real person, but a nameless, unidentified image—mere black-and-white dots, data and no substance. It is this anonymity that is the more remarkable, signifying once again the repressed of AI. Our quarry eludes us and this chapter on real people never delivers what its title promises. Haugeland writes:

Our aim is still to understand AI, but now, so to speak, from the other end. Instead of looking forward from its background and achievements, we will try to look backward from the goal, taking real people as its measure. The plan, in other words, is to scout around for omissions: phenomena that may be important to intelligence but have not been (perhaps cannot be) assimilated within the GOFAI (Good Old Fashion AI) tradition. (214)

The goal of AI is to understand people. We can understand AI by understanding human beings. But while Haugeland's goal is to take real people as the measure of AI, what he actually does is to assume that he understands real people well enough to talk about those things that might be omitted from AI. Taking real people as the measure of AI
gives way immediately to scouting around for omissions. Once again, the measure itself is never addressed. The assumption would seem to be that we have a clear view of “real people.” Yet, is this a credible assumption? If it were clear, philosophers and others would not have spent the past 2,500 years discussing it and we wouldn't today need computational models and metaphors to explain it to us.

Once again, then, the very subject of human nature, of real people, the topic of this chapter, is broached only to be ignored. Rather than a discussion of human nature, of “real people”, what we have in this chapter is a sample of isolated characteristics apparently descriptive of real people and apparently difficult for AI: semantics, mental imagery, feelings, ego involvement. Haugeland adopts what he terms a segregation strategy, wondering whether AI would really be hurt if it omitted these things.

Summing up, then, I have tried to show that while AI claims to be devoted to the same problems that philosophers have dealt with for millenia, the question of our nature and place in the universe, and claims to have a great impact on our understanding of real people, we never do get to the subject at hand. The topic of human nature is left untouched, unexplained. It remains the repressed in the discourse of AI. It is also the case that AI implicitly makes many very traditional assumptions about both human nature and that discipline which is best suited to studying it. Haugeland adopts the scientific standard according to which progress in studying human nature should be measure. Like Descartes, he identifies our essence as mind and thinking. And, again adopting a Cartesian stance, he suggests that many other aspects of human nature may be mere messy incidentals. It is to these latter points that I now wish to turn. In the following section I will argue that far from being new and revolutionary, the view of human nature implicit in AI is a very traditional Western European view that owes more to Christianity and Descartes than it does to bits and bytes.

III
Using Haugeland as a representative for AI, I have argued that the topic of human nature is never fully addressed in the discourse of AI. I believe that this lack has significant implications. Given the absence of any effort to understand human nature independently of its comparison to computers, we have no recourse but to fall back on traditional conceptions of human nature, conceptions which themselves may be inadequate. In this section I consider Hans Moravec's *Mind Children*, concentrating on his discussion of downloading the human mind into a computer. I argue that Moravec's assumptions about human nature mirror very traditional Western philosophical assumptions. I claim that Moravec's work does not represent a new approach to the study of human beings but, rather, embodies significant aspects of a Western, Christian, and Cartesian view of human nature. I want to establish that Moravec shares with Descartes an extreme dualism in which the mind is valorized over the body, the body is seen as limiting and in conflict with the mind, and it is the mind which is characterized as the source of culture and civilization. It is precisely these characteristics that are most commonly associated with a very traditional Western view of human nature, a view descended from the Greeks and Christians, refracted through the lens of Descartes.

One of Moravec's goals in *Mind Children* is to find a process that endows an individual with all the advantages of machines, without a loss of personal identity (109). Moravec describes the several stages in an evolutionary process in the not too distant future in which it should be possible to completely liberate the human mind from its confinement in a body. Moravec calls this process the downloading of a human mind into a machine. The first stage will probably involve transplanting the human *brain* into a specially designed robot body, a “shiny new body of the style, color, and material of your choice” (*Mind Children* 110). The next stage would entail liberating the human *mind* from its biological substratum, transplanting it, layer by layer, into a computer. “After downloading, our personality is a pattern impressed on electronic hardware, just as a computer program and its data can be copied from processor to processor” (“Pigs in
Cyberspace” 18). Moravec suggests that a person’s identity would be preserved in such a process because the essence of a person, their self-identity, is the pattern and the process going on in one’s head and body, and not the machinery supporting that process. “If the process is preserved, I am preserved. The rest is mere jelly” (Mind Children 116). Moravec dismisses the alternative point of view, which he calls the body-identity position, which suggests that a person is defined by the stuff of which a human body is made (Mind Children 117). It is the pattern rather than the substance that is important. The substance, in this case one’s body and brain, is mere jelly. Mind is an abstract mathematical property not tied to a particular body (Mind Children 121).

The final stage of this process comes when we move the mind into cyberspace itself, completely freed from any body-image, achieving the ideal of a “truly bodiless mind”, nothing but pure ego. “Ultimately our thinking procedures could be totally liberated from any traces of our original body, indeed of any body” (“Pigs in Cyberspace” 20). Such a move, Moravec suggests, would free our minds and their creation, culture, from the limitations of biology.

Like Haugeland and many others writing about AI, Moravec does not stop and explicitly consider the topic of human nature. It should be clear, though, that his account of downloading the human mind points to a very traditional view of human nature. It is, first of all, dualistic. Mind is conceived of as pattern and process independent of its physical constitution and human beings are conceived of as composed of parts. We are, he writes, half breeds, composed of various parts in tension with one another. “In the present condition we are uncomfortable halfbreeds, part biology, part culture, with many of our biological traits out of step with the inventions of our mind.”

Our minds and genes may share common goals during life, but there is a tension between time and energy spent acquiring, developing, and spreading ideas and effort expended toward maintaining our bodies and producing a new generation (as any parent of teenagers can observe). The uneasy truce between mind and body breaks down completely as life ends. (Mind Children 4)
It is also clear that Moravec associates culture and civilization with our minds, which are at odds with our body. Culture originated in our minds and once freed from biology and the limitations it imposes on it, will be able to pass directly from generation to generation. Biology, then, is a limitation to the evolution of our minds and culture. In order to evolve we need to rescue ourselves from the limitations our body imposes on us and our culture (Mind Children 5). The ultimate goal of downloading the human mind is to become pure immortal mind. Moravec longingly describes chess programs' consciousness as “pure chess, with no taint of the physical, or any other world” (“Pigs in Cyberspace 19). One can only imagine that Moravec's goal is a pure, transcendental, World Spirit that encompasses all—the world's true mathematical spirit living in a future in which human beings may or may not exist side by side with cyberspace superminds.

So, in one way or another, the immensities of cyberspace will be teeming with very unhuman disembodied superminds, engaged in affairs of the future that are to human concerns as ours are to bacteria. (PC 20)

In his disdain for the body, in valorizing mind over body and placing mind as the seat of reason, culture, and civilization, in his desire to achieve the immortality of a disembodied existence in which mind is free of the distraction of the body, free to contemplate the mathematical nature of the universe, Moravec reveals the length of his commitment to very traditional Christian and Cartesian beliefs. This is significant because AI is often heralded as a new and progressive science that is going to put our study of human nature and human kind back on the right track after thousands of years of hopeless philosophical confusion. AI represents a discipline that owes no allegiance to tradition or conservatism, that points its whithering scientific spotlight on the arm chair theorizings of philosophers, and establishes its own theories in the crucible of proof and program. And yet, I have argued, for all its seeming interest in human nature, the topic is seldom touched on in the work of AI theorists. Furthermore, when it is implicitly discussed, as in the work of Hans Moravec, it appears to make the same traditional assumptions that one can find in most western thought influenced by Plato, Christianity, and Descartes. In the next section
I will present a view of human nature very much at odds with this traditional view and suggest that if we start from this different ground, with an explicit commitment to consider human nature, we would be much less likely to identify computers and human beings as members of the same class.

IV

In this section I will present a view of human nature that is common to a number of different disciplines and perspectives. I do so because I feel that what has been missing from the debate on artificial intelligence and human nature is an explicit anthropological framework in which to address these issues, a framework in which to address the issue of the whole human being and his nature. I do not intend to develop a full-fledged view of human nature. I am not even sure that this is possible. What I will do is pull together some strands of thought from a variety of sources that add up, I think, to a persuasive account of what we as human beings are, a framework, if you will, in which to address these issues. I will then consider the implications of this view for AI's treatment of human nature.

The various strands I wish to pull together include (1) the movement called philosophical anthropology, associated with such representative figures as Max Scheler, Helmuth Plessner, Arnold Gehlen, Ernst Cassirer, and Michael Landmann; (2) the work of anthropologists such as Samuel Washburn and Clifford Geertz, whose views on human nature have been heavily influenced by developments in human palaeontology and physical anthropology; and (3) the work of socialist feminists who espouse an historical and dialectical view of human nature. Alison Jaggar's *Feminist Politics and Human Nature* is especially relevant here.

While there are many differences in the approaches these thinkers have adopted to their study of human nature, all of them are in agreement on a number of significant points which establishes a basic framework in which to address the issue of human nature. The
convergence of these thinkers from diverse disciplines and backgrounds upon an identical framework is highly suggestive of its fruitfulness. The elements of this framework include: (1) a critique of dualism and an emphasis on the historical and material development of human nature; (2) a dialectical approach to human nature encompassing the biological, cultural, and environmental forces on the development of human nature; (3) an account of the hiatus between instinct and action in human nature; and (4) an emphasis on the local and particular aspects of human nature. Let me develop these points further.

Central to each of these approaches to human nature is the belief that we must begin by reflecting on the whole human being with the ultimate goal being a comprehensive account of human nature. As Douglas Browning explains in regard to philosophical anthropology, “It is the ultimate task of philosophical anthropology to provide a metaphysical explanation of man which is adequate to his full being” (85). An account of human nature should not narrow the human being down to mere consciousness, rationality, or mind but should deal with the whole human being. Nor should such an account result in a view of the human being as composed of parts. Central to the task of philosophical anthropology is overcoming the pervasive influence of dualism in our understanding of human nature.

Whatever explanation of man's nature is offered it must allow us an explanation of the individual man as a unity, such that there does not exist in his nature a multiplicity of elements or aspects which cannot be fitted together. It must not leave us with a duality in his nature which cannot be bridged. (Browning 94)

Along very similar lines, Clifford Geertz has critiqued what he calls the stratigraphic view which conceives of human nature as being composed of various levels (biological, psychological, social, and cultural), each level superimposed on those beneath it and underlying those above it (37). The difficulty with this view, Geertz argues, is that once we break the human being down into these various strata, conceived as separate, complete, and autonomous scientific levels, it is very hard if not impossible to bring them back together again (41).
Socialist feminists such as Jaggar have also criticized conceptions of human nature in which our biological or natural component is perceived to be at odds with the cultural and social aspect of human nature. Jaggar has criticized, in particular, the sex/gender distinction is which sex is taken to be biological and so natural while gender is conceived to be the product of social and cultural influences on the biological organism. Jaggar argues that we can neither identify a clear non-social sense of “biology” nor a clear non-biological sense of “society” (111).

As this last statement makes clear, common to these attempts to exorcise the demon of dualism is an approach to human nature which emphasizes the complex, interdependent nature of biology, culture, and our environment, as Jaggar makes clear in the following remark.

A historical and dialectical conception of human biology sees human nature and the forms of human social organization as determined not by our biology alone, but rather by a complex interplay between our forms of social organization, …between our biological constitution and the physical environment that we inhabit. It is impossible to isolate or quantify the relative influence of any one of these factors, because each is continually affected by as well as affecting the others. In other words, the factors are not only related to each other but are dialectically related. (110-111)

In philosophical anthropology this point is most often made by pointing to the correlative nature of biology and culture in human beings. Michael Landmann, for instance, refers to the simultaneity of mutual interdependence that exists between biology and culture (Philosophical Anthropology 261). One can understand the human being as a whole only by coming to see these two mutually interrelated sides.

The interdependence of the cultural and biological development of the human being has long been noted in both archaeological and anthropological research. Samuel Washburn argues that much of what we think of as human evolved after the use of tools. Tool use, according to Washburn, led to changes in the direction and evolution of the form of the hand, tripled the size of the brain, reduced the face, and modified many other structures of the body (Washburn and Howell 52-53). “It is probably more correct,”
Washburn notes, “to think of much of our structure as the result of culture than it is to think of men anatomically like ourselves slowly discovering culture” (21). Geertz, too, remarks that cultural and biological development go hand in hand. “Between the cultural pattern, the body, and the brain, a positive feedback system was created in which each shaped the progress of the other…” (48).

The interdependent and overlapping nature of biological and cultural development has had dramatic consequences for the evolution of human beings. It has left the human being unspecialized and unfinished in comparison to animals, open to the world. As Landmann notes, unlike animals, human beings have only remnants of instincts from which there result no behavioral patterns.

Not only the ape but the animal in general is much more specialized in its general constitution than is man. The animal's organs, sense organs, and instincts prescribe its behavior in every situation. Man's organs, however, are not only oriented one-sidedly for certain actions, but are archaically unspecialized. Man is also poor in instincts: nature does not prescribe to him what he should do or not do. (Philosophical Anthropology 176)

Geertz, too, argues that the human being is “incomplete.” “We live…in an information gap. Between what our body tells us and what we have to know in order to function there is a vacuum…” (50). That vacuum, Geertz argues, is filled by culture, no mere addition to human existence but an essential condition for it. As Geertz remarks, “What this means is that culture, rather than being added on, so to speak, to a finished or virtually finished animal, was ingredient, and centrally ingredient, in the production of that animal itself.” Lacking the genetic hardwiring of animals, Geertz argues human beings depend on cultural sources—“the accumulated fund of significant symbols”—to direct our behavior and organize our experience (49).

This bio-cultural framework leads to a greater awareness of the ways in which abstract theories of human nature can obscure the concrete differences among actual human beings. Because human beings require culture as part of their constitution, to understand human beings is to understand their particular cultural, social, and historical backgrounds,
all centrally ingredient to our constitution as human beings. Both Geertz and Jaggar in particular have been led by their work to focus on the particular, concrete, and local forms that human nature takes rather than merely on the universal, abstract, and general. Understanding human nature means understanding human beings in their particularity. Geertz has criticized Enlightenment views of human nature for emphasizing the constant, general, and universal in human nature at the expense of the vast variety of differences among human beings, both over time and from place to place (35). As he remarks,

> We are, in sum, incomplete or unfinished animals who complete or finish ourselves through culture—and not through culture in general but through highly particular forms of it: Dobuan and Javanese, Hopi and Italian, upper-class and lower-class, academic and commercial. (49)

Similarly, Jaggar notes that any view of human nature must take into consideration the influence on an individual of that individual's age, sex, socio-economic class, sexual orientation, race, and ethnicity. All are constitutive of our nature as human beings.

> …All human beings in contemporary society belong not only to a specific class; they all have a specific sex and they are at a specific stage in the life cycle from infancy to death. In addition…all humans in modern industrial society have specific racial, ethnic and national backgrounds. Contemporary society thus consists of groups of individuals, defined simultaneously by age, sex, class, nationality and by racial and ethnic origin, and these groups differ markedly from each other, both physically and psychologically. (126-127)

This reflection on philosophical anthropology, human palaeontology, physical and cultural anthropology, and socialist feminism discloses a common framework for the study of human nature which seeks to overcome dualism by emphasizing the bio-cultural development of human life. An adequate understanding of the human being must begin from a standpoint that incorporates in a dialectical fashion both our biological and our cultural heritage, central ingredients in the production of the human being. What are the implications of this framework for AI?

First, I believe that by beginning with a well defined framework in which to address the issue of human nature, we will be much less likely to draw lines of similarity between
human beings and computers. The identity between human beings and computers is sustained, first of all, by overworked computational metaphors and, secondly, and more significantly, the lack of any real consideration of human nature, the repressed of AI. Once we consider human nature independently of these computational metaphors, we are much less likely to see human beings and computers as members of the same kind or species.

The significance of our biological constitution, the important place given to our social and cultural environment, the role that being embodied in a particular body has on human life, are aspects of human nature obscured by computational metaphors and models that emphasize mind and symbolic processing at the expense of everything else. Focusing on those aspects of human nature repressed in AI serves to undermine any facile identity between human beings and computers. We cannot understand human nature without some awareness of its biological, social, cultural, and environmental background and development. To date, this has not been true of computers. And because theorists in AI have been so negligent in their study of human nature it will probably remain a neglected aspect of AI. Let me consider this claim in greater detail in relation to some of the points made in the previous two sections.

Let us return, for instance, to the claim that we are, at root, computers ourselves. I previously suggested that the logic underlying this claim proceeds from the assumption that because we are minds and minds process symbols, that is, think, then we are at root computers, as computers too process symbols. What is never questioned here is the assumption that we are at root minds that think. The framework developed in this section suggests that this claim is not credible. While thinking is surely something human beings do, we are not at root minds that think. Such a view narrows down our conception of human nature to a single aspect, mind, and ignores the significance of all those other aspects of human nature.

This view also suggests that we can ignore the underlying constitution of human beings and computers, what Haugeland refers to as the messy incidentals. Moravec refers
to the body as “mere jelly” and looks forward to that time when mind and culture can be
liberated from human biology. The framework developed in this section, though, suggests
that biology is centrally ingredient to what we as human beings are, that one cannot isolate
some pure biological substratum independent of mind or culture, indeed, that our very
nature as cultural beings is enabled by our biological constitution. There is no war here
between our various parts, no tension between culture and biology. Nor can we conceive
biology as a source of limitations, for it is our biological constitution, developed in unison
with our cultural evolution, that enables the development of culture and civilization.
Indeed, no clear distinction between biology and culture can be made. The two are
interdependent. We are not halfbreeds, part biology, part culture. Nor can we assume, as
does Moravec, that culture originated in the mind, that mind and culture can be liberated
from the body and biology, and that the two are “out of step.” Beginning with a bio-
cultural framework for understanding human nature rather than a computational
framework renders these claims and assumptions meaningless.

Common to Haugeland and Moravec’s approach to human nature is the assumption
that human beings are some how composed of parts which can be broken down into
isolated, discrete units and dealt with independently of one another. Such an assumption is
disclosed in Haugeland’s segregation strategy for dealing with mental imagery and various
emotions. Of mental imagery, for instance, he says, “Thus intelligence is one thing,
imagery another—and GOFAI concerns only the former. That’s not to say that imagery is
unreal or unimportant, but just that it’s somebody else’s problem” (228). In regard to
feelings, Haugeland suggests that some kinds of feelings (sensations, passions, emotions)
can also be safely segregated from intelligence. This, he suggests, follows a prejudice
common to both AI and the history of philosophy of separating thought and feeling (“it
goes at least as far back as Plato and is well articulated in Hobbes and Descartes” (230)).
Cognitive and noncognitive components are segregated and interact only through suitable
input/output channels (236). What is never questioned here is the wisdom of adopting
such a strategy. AI is so firmly committed to the common prejudices of Descartes and Hobbes that it fails to raise the possibility that this strategy is ill-founded. The bio-cultural framework, on the other hand, suggests that the organism must be taken as a whole rather than as a mere aggregate of parts.

Finally, central to Moravec's account of downloading the human mind into a computer is his pattern theory of personal identity. We now have some reason to think that this theory of personal identity is inadequate. Concentrating on pattern and process to the exclusion of substance merely reproduces in a different guise the dualistic split between mind and body pervasive in western philosophical thought. A bio-cultural framework for the study of human nature gives significance to the fact that we have a particular body, sex, and race. These things, too, are constitutive of our personal identity. The contrast between a body criterion and a mind criterion of personal identity sets up a false dilemma. We are neither bodies nor minds but human beings. As Elizabeth Spelman puts it, “Selves are not made up of separable units of identity strung together to constitute a whole person” (158). We are not divisible into parts and any analysis that suggests so is seriously flawed.

In this essay I have tried to demonstrate several claims. First, I have claimed that human nature represents the repressed of AI. Despite widespread claims that AI reveals something significant about human beings, that in studying computers and human beings we are really studying the same kind of thing, and that a computational framework will be able to resolve many age-old philosophical problems, I have suggested that the topic of human nature is itself never adequately raised in the discourse of AI. Secondly, I have suggested that one consequence of this fact is an implicit reliance on a very traditional conception of human nature. Because researchers in this field have failed to adequately address the topic of human nature, they inevitably incorporate into their theories traditional Christian and Cartesian assumptions about human nature: a dualism of mind and body, the valorization of mind over body, mind as the source of culture and
civilization, the desire for an immortal spiritual existence. Thirdly, I have suggested that a more adequate framework for the study of human nature is a bio-cultural framework that recognizes the interdependent nature of biology, culture, and environment in human life. Taking the time to develop an explicit framework for talking about human nature serves to substantially weaken the hold that computational metaphors and models have on our understanding of human nature. These reflections suggest that we ought to approach with caution any framework that deals in an oversimplified way with the important topic of human nature. Minimally, we must make a more concerted effort to reflect on human nature in light of the suggestion that our closest brethren in the world may be PCs, Macs, and Crays.

NOTES

1 I would like to dedicate this essay to my friend and dissertation advisor, Douglas Browning, in honor of his sixty-fifth birthday. I would also like to thank Sherryl Kuhlman and two blind reviewers for helpful comments on an earlier draft of this paper.

2 It has been frequently pointed out that cognitive science, computer science, and artificial intelligence are not the same things. See, for instance, the essays collected in Graubard, ed., The Artificial Intelligence Debate. Even within the field of AI there are many different competing paradigms. I have no wish to obscure this fact. Indeed, I am not interested in AI, computer science, or cognitive science per se. Rather, my real interest is in what Sherry Turkle in The Second Self: Computers and the Human Spirit has called the computer culture, those beliefs and sustaining myths that seem to be shared by workers, theorizers, and writers in this culture. I am interested in the cultural phenomenon that underlies and undergirds the identification of human and machine, the sustaining myths that permit us to see the human being as a computer and the computer as a human being. Referring to the proponents of this culture as "Turing's men", David Bolter attributes to them the belief that the computer gives us a new definition of man as "information processor," and of nature as "information to be processed" (13). While, then, I am
aware of the complexities of this field, for the purposes of this paper I will refer to what I will loosely construe as research in AI or simply AI.

Whatever postmodern tendencies AI may exhibit, such as the decentering of subjectivity and the blurring of traditional boundaries between human being and machine, it is decidedly in the modern camp in its understanding of human nature. The conservative nature of AI can be further seen in the construction of what Jean-Francois Lyotard in *The Postmodern Condition* has called metanarratives. Accounts of AI are often preceded by long historical narratives that seek to place AI in its proper scientific and philosophical context, legitimating AI by establishing that Plato, Hobbes, Descartes, and Kant were computer scientists all along. See for instance, Chapter One of Haugeland’s *Artificial Intelligence*, “The Saga of the Modern Mind.” Additionally, implicit in much AI is the belief in a global, unified theory of the type often criticized by theorists in the name of the postmodern. AI represents a theory or program, a grand narrative, that unites the history of thought and accounts for all things. Everything becomes computable. In these respects, AI discloses its reliance on the discourse of modernity.

I am not as interested in constructing an explicit argument against AI as, for instance, John Searle does, as I am in examining a particular way of thinking about and conceptualizing human nature. My intent is to paint a picture of one currently popular approach to human nature and human mentality that I think is inadequate. This explains, in part, my focus on such non-traditional figures in AI as Haugeland and Moravec. They represent an "ideal type" that I think most clearly and interestingly exemplifies a particular approach to thinking about human nature present in much of the AI community.

Related to this is the idea, presented by many in the AI field, that while philosophers do mere armchair theorizing, researchers in AI do experiments that support their theories. See, for instance, Daniel Dennett’s “When Philosophers Encounter Artificial Intelligence.” It is the building and testing of models that sets off research in AI from the mere handwaving and armchair theorizing of philosophy. For more than two thousand years philosophers and other humanists have been grappling with what has been one of the most persistent and fundamental questions to plague and perplex humankind: what is human nature and what is the human being’s place in the universe? After all the missteps taken by philosophers and
their ilk, the scientists of the machine are here to demystify the whole topic, cutting with the rapier of science through the failed projects of philosophers and theologians to offer us, finally, a new, scientifically grounded theory of human nature.

This is an indication of the functioning of an implicit view of human nature in the discourse of AI. How are we to determine what may or may not be relevant to understanding human intelligence without having some model or theory of human nature to guide our decisions? While the topic of human nature is never explicitly touched on, then, there is an implicit understanding of what is important to human nature, intelligence, and what is necessary to understanding it. It is this account of human nature that must be brought to light.

This point is equally applicable to much work in so-called Anglo-American Analytic philosophy of mind. The Cartesian influences at work in AI have been equally tenacious in discussions of the nature of mind, the mind-body problem, personal identity, and philosophy of psychology.

WORKS CITED