



Minds and Brains: Angels, Humans, and Brutes

Mortimer J. Adler

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Editor's Introduction

As the review of recent books about artificial intelligence elsewhere in this volume will serve to indicate, that subject is very much with us at the moment, when we hear—not for the first time, it is true—that machines with the operational capacity of the human brain (or conceivably much more than that), and even perhaps with similar chemical constituents, are within the realm of possibility, will likely enough in time be made.

The question, supposing this in fact is done, is whether the resulting mechanism, having presumably the powers of a human brain, would in effect be one—whether the old dream of a thinking machine, the Faustian homunculus, can after all be realized. This is cousin to another question, of late not quite so insistently put as it was a few years ago, whether chimpanzees or dolphins can be taught some form of language, in which case it can be argued, as indeed it has been argued, that they are of the same order as ourselves, that the difference between their brains and ours however large, is but a matter of degree along the same continuum.

It was at any rate with these possibilities in mind that Mortimer J. Adler accepted the invitation of the American Association of Neurological Surgeons to give the Harvey Cushing Memorial Oration at the Association's annual meeting in Honolulu this year, in an effort to distinguish as clearly as possible the philosopher's view of such matters from that of the physician and the scientist. This lecture, which is reprinted here with minor changes, will recall, to those familiar with Mr. Adler's writings, his earlier book. *The Difference of Man and the Difference It Makes* (1967), as well as the "Symposium on Language and Communication" in *The Great Ideas Today 1975*, to which he was a contributor.

I am honored by your invitation to deliver the Harvey Cushing Memorial Address—or Oration, as it is referred to. An address I hope it will be; but an oration, I think not. More than honored, I am awed, coming as I do from the soft science of psychology and the even softer discipline known as philosophy, and standing before you who are leading representatives of a science that is hard down to its core.

When first approached, I was hesitant to accept such an assignment. I do not know whether it was the eloquence expected of an orator that frightened me, or the eminence of Harvey Cushing that made me hesitant. What overcame my scruples on these two counts were the many memories that soon crowded into my mind—not only the recollection of my great admiration for Dr. Cushing, but also the memory of how far back in my life and how deep in my intellectual interest lay the study of neurophysiology.

I recalled that while a young instructor in psychology at Columbia University in the early 1920s I went down to the College of Physicians and Surgeons, then located at 59th Street near 10th Avenue, to take a course in neuroanatomy with Professors Tilney and Elwyn.

Professor Elwyn was the anatomist who gave us most of the lectures and supervised our microscopic examination of slides of spinal sections. Dr. Tilney was one of the great neurologists of his day. I remember vividly his coming in a dinner jacket to an evening lecture to tell us about his diagnosis of brain pathology and about the surgical procedures involved in its therapy.

As a student and teacher of psychology, I could not help but be interested in the workings of the brain and central nervous system. The early chapters of William James's two-volume *Principles of Psychology* were filled with speculations about the relation of mind and brain, as were Ladd and Woodworth's *Elements of Physiological Psychology*. Both books, if you were to read them today, would greatly amuse you by the extent of the ignorance that then passed for scientific knowledge. In more recent years, my reading in this field included many books of much more recent vintage. Let me just mention a few in passing: C. S. Sherrington's *The Integrative Action of the Nervous System*; C. Judson Herrick's *The Brains of Rats and Men*; J. C. Eccles's *The Neurophysiological Basis of Mind*; Ward Halstead's *Brain and Intelligence*; Warren McCulloch's *Embodiments of Mind*; K. S. Lashley's *Brain Mechanisms and Intelligence*; Wilder Penfield's essay on "The Physiological Basis of the Mind," in *Control of the Mind*.

Even more recently, the rise of experimental researches and technological advances in the field of artificial intelligence has opened up another vein of interest in the physical basis of mind; and I have turned to such books as John von Neumann's *The Computer and the Brain*; *Minds and Machines*, a collection of papers edited by A. R. Anderson; A. M. Turing's essay "Computing Machinery and Intelligence"; J. Z. Young's *Programs of the Brain*; Daniel C. Dennett's very recent *Brainstorms*.

Please forgive me for what may appear to be pretension to some erudition in a field in which you are all experts. I mention my excursions into the literature of neurophysiology and of artificial intelligence in order to allay the suspicion that may arise in your minds when I proceed now to deal philosophically—even metaphysically—with the problem of the relation of mind to brain.

You might suspect that my philosophical speculations reflect ancient and venerable theories that no longer stand up in the light of the facts uncovered by the most advanced scientific research. You might even suspect that since I am going to talk to you as a philosopher, I might feel justified in doing so in cavalier ignorance of relevant scientific knowledge bearing on the matters to be considered. I would like to assure you that neither suspicion is justified. I may not be as well-informed with regard to the most recent advances in neurophysiology as I should be, but I hope you will find that my philosophical consideration of mind and brain does not fly in the face of facts that must be taken into account.

The two main questions that I would like to consider with you can be stated as follows: (1) Will our knowledge of the brain and nervous system both central and autonomic, either now or in the future, suffice to explain all aspects of animal behavior? (2) On the supposition that the answer to that question is affirmative, then the second question is: Does this mean that we will also succeed in explaining human behavior, especially human thought, in terms of what we know, now or in the future, about the human brain and nervous system?

You will observe at once, I am sure, that the answer to the second question, in the light of an affirmative answer to the first question, depends on one crucial point: whether the difference between human beings and brute animals is a difference in kind or in degree.

To probe and ponder the answers to these two questions, I propose to proceed as follows. First, briefly to explain the distinction between difference in kind and difference in degree, and especially the two modes of differences in kind—radical and superficial. Second, to illustrate a radical difference in kind by considering

humans in relation to angels and to eliminate what I hope you will agree is an erroneous view of the relation of mind to brain. Third, to consider humans in relation to brutes and also in relation to machines devised to represent artificial intelligence. And, finally, to propose what I hold to be the correct view of the relation of the human mind to the human brain—correct, that is, until future experimental research in neurophysiology and in the sphere of artificial intelligence succeeds in refuting it.

Differences in kind and in degree

A difference in degree exists between two things when one is more and the other is less in a given specified respect. Thus, for example, two lines of unequal length differ only in degree. Similarly, two brains of unequal weight or complexity differ only in degree.

A difference in kind exists between two things when one possesses a property or attribute that the other totally lacks. Thus, for example, a rectangle and a circle differ in kind for one has interior angles and the other totally lacks them. So, too, a vertebrate organism that has a brain and central nervous system differs in kind from organisms that totally lack these organs.

A difference in kind is superficial if it is based upon and can be explained by an underlying difference in degree. Thus, for example, the apparent difference in kind between water and ice (you can walk on one and not on the other) can be explained by the rate of motion of their component molecules, which is an underlying difference in degree. Similarly, the apparent difference in kind between humans and other animals (things that human beings can do that other animals cannot do at all) may be explainable in terms of the degree of complexity of their brains. If that is so, then the apparent difference in kind is superficial.

A difference in kind is radical if it cannot be explained in terms of any underlying difference in degree, but only by the presence of a factor in one that is totally absent in the other. Consider the difference between plants and the higher animals. This appears to be a difference in kind, for the animals perform operations totally absent in plants. If this difference in kind can be explained only in terms of the presence in animals and the absence in plants of brains and nervous systems, then it is a radical, not a superficial, difference in kind.

Angels and human beings

Let me begin by saying that I wish you to consider angels only as possible beings—as purely hypothetical entities. Whether or not there is any truth in the religious belief that angels really exist need

not concern us. As possible beings, angels are purely spiritual. Our interest in them here arises from the fact that they are conceived as minds *without* bodies. As minds without bodies, angels know and will and love, but not in the same manner that we do. Their lack of bodies has a number of striking consequences. They do not learn from experience. They do not think discursively, for they have no imaginations or memories. Their knowledge, which is intuitive, derives from innate ideas implanted in them at the moment of their creation. They speak to one another telepathically without the use of any medium of communication. Their minds, which are infallible, never go to sleep.

In all these respects, minds without bodies differ from the human mind precisely because the latter is associated with a body and depends upon that body for some if not all of its functions.

You may question the possibility of angels—of minds without bodies, minds without brains. If so, let me defend the possibility of angels against the materialists who think they have grounds for denying that angels are possible. I do so because, as you will see presently, the error of the materialists has a critical bearing on of my treatment of the problem of minds and brains.


The argument of the materialists runs as follows. They assert that nothing exists in reality except corporeal things, from elementary particles up to the most complex organisms, from atoms to stars and galaxies. But angels are said to be incorporeal. Therefore, they conclude, angels are impossible, as inconceivable and impossible as are round squares.

The argument is weak in one respect and faulty in another. Its initial premise (that nothing except corporeal things exist) is an unproved and unprovable assumption. It may be true, but we have no grounds for asserting, its truth, neither with certitude nor even beyond a reasonable doubt. It is as much a matter of faith as the religious belief in the reality of angels. Even if we were to grant the truth of that initial premise, the argument is faulty, because the conclusion does not follow. If the premise assumed were true, the valid conclusion to be drawn from it is that angels—incorporeal beings—do not exist in reality. But the conclusion that angels cannot exist—that they are impossible—does not follow at all.

In fact, there are many positive arguments to support the conceivability and possibility of angels, though I am not going to take the time to set them before you. For our present purposes, let it suffice for us to recognize that the exponents of materialism cannot validly deny the possibility of angels. This being so, neither can they deny that the human mind may be a spiritual—an immaterial—factor associated with the brain as a corporeal factor, both of which are

needed to explain human thought.

This brings us to a view at the opposite extreme from materialism, a view that looks upon the human mind as an immaterial substance, an immaterial power, that does not need a brain for its unique activity, which is rational thought. This is the view taken by Plato in antiquity and by Descartes at the beginning of modern times. It commits what I have called an angelistic fallacy, for it regards the rational soul or human intellect as if it were an incarnate angel—a mind that, in humans, may be associated with a body, but one that does not depend upon or need a body for its intellectual operations.

I do not have to persuade you, in the light of all you know about the dependence of human mental operations upon brain functions and processes, and all you know about the effects of brain pathology upon human thought, that this Platonic and Cartesian view of the human mind as an incarnate angel flies in the face of well-attested evidence and must therefore be rejected. I wish only to add that, on purely philosophical grounds, the dualism of mind or soul and body does not stand up. It denies the unity of the human being. It makes us a duality of two independent substances—as independent as a boat and the person who is rowing it. Either of these can cease to exist without the other ceasing to exist. They are existentially distinct and separable, as our own mind and body are not. If they were, we should be left with the inexplicable mystery of why they were combined—why the human mind should have any association with a human body. 

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