

INTELLECT: MIND OVER MATTER

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PART THREE: IS OUR INTELLECT UNIQUE?

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I have asserted that intellectual mind is exclusively human. Is that true? Do human beings differ from other animals in kind or only in degree? And if in kind, is man's possession of an intellect the basis for that difference in kind?

These two questions are inseparable. How we answer one determines our answer to the other. In a book I wrote some years ago, *The Difference of Man and the Difference It Makes* (1967), I had compelling reasons for concluding that man differed radically in kind from other animals, including those to which the human species is genealogically most closely related. Reviewing evidence that has come forward in the last twenty years, I have stronger reasons now for defending the same conclusion.

Man's difference in kind rests largely on the uniqueness of the human intellect as that manifests itself in behavior that is peculiarly human. There are certainly other anatomical and physiological differences between the human and other mammalian species. These may be either differences in kind or in degree. If they are differences in kind, they may be related to the behavioral differences with which we are immediately concerned.'

Before I come to what makes the intellect unique and the basis for a radical difference in kind between man and other animals, let me spend a moment on the distinction between difference in degree and difference in kind and on what makes a difference in kind radical rather than superficial.

Two things differ in degree when, with respect to a certain property that they have in common, one has more of it and the other less. In geometry, two triangles differ in degree with respect to their ar-

ea if one is larger and the other smaller. In the physical world, two runways on an airfield differ in degree if one is longer, the other shorter.

Two things differ in kind when one of them has characteristics or properties not possessed by the other. In geometry, a triangle and a circle differ in kind by virtue of the fact that one figure has angles and the other has none. In the physical world, invertebrates and vertebrates differ in kind. The latter have backbones lacked by the former.

A single property present in one thing and absent in another is sufficient to differentiate two things in kind. Additional respects that differentiate two things in kind by their presence in the one and their absence in the other do not increase the difference in kind. They merely give us greater assurance that we are correct in regarding the two things as different in kind.

That is the way things stand in the case of man in relation to other animals. Our assurance about that difference in kind arises from the substantial number of respects in which we find human beings behaving in ways that are totally missing from the behavior of other animals. In these respects we find nothing similar there, even in the slightest degree.

This is not to say that there are no similarities between human and animal behavior, just as there are many anatomical and physiological similarities between human and mammalian bodies. Differences in kind do not preclude differences in degree. Pointing out the many respects in which humans and other animals differ only in the degree to which they possess the same traits or manifest the same behavior does not constitute an argument against their also being different in kind.

One distinction remains to be considered, and it is of the greatest importance here: that is the distinction between a difference in kind that is radical and one that is superficial.

I attach the word “superficial” to a difference in kind if it exists on the surface but exists there only because of an underlying difference in degree. In other words, the difference in kind under observation is superficial if it can be attributed to a difference in degree that is its cause.

Three states of matter—solid, liquid, and gaseous—appear to differ in kind. We can walk on water that is frozen solid, swim in liquid water, and inhale the gaseous vapors that arise from boiling water.

The chemical constitution of the matter is the same in all three cases. The three different states of the same kind of matter result from differences of degree with regard to the character and velocity of molecular motion in the solid, liquid, and gaseous states. Hence, while the three states differ in kind, that difference in kind is superficial, not radical.

You and I would feel more comfortable if I could give you an example of a radical difference in kind drawn from the physical world or even from the world of living organisms. I hesitate to do so because with regard to any instance that I can think of in the realm of inorganic bodies or in the domain of living organisms below the level of man, I am relatively confident that someone would be able to show an underlying difference in degree in my example's physical constitution of the things that only makes it appear to be different in kind.

The reason why this may be disturbing to you and me is that a radical difference in kind between man and other animals, if it exists, would be the one and only breach in the continuity of nature. That would be a remarkable singularity, calling for an explanation that might or might not be forthcoming or satisfactory.

By analogy with the superficial difference in kind between the solid, liquid, and gaseous states of matter, it is possible that many differences in kind between the behavior of human beings and other animals arises solely from a difference in degree between the size and complexity of the human brain and central nervous system and that of other animals. Were that the case, were the behavioral differences in kind completely explained by underlying neurological differences in degree, then the difference in kind would be superficial, not radical.

To say “completely explained” may be going too far, in view of the fact that there appear to be certain anatomical differences in kind between the human brain and nervous apparatus and that of man's closest biological relatives, the anthropoid apes. In the human brain, there is an area, Broca's motor center for speech, not found in other animals. The functional asymmetry of the two hemispheres of the human cerebral cortex is also uniquely human.

Do these two anatomical differences enter into the explanation of the behavioral differences in kind? Do they make that difference in kind radical rather than superficial, in spite of the fact that it may also be an effect of differences in degree between the nervous apparatus in man and in other animals? I am not prepared to answer this question, but it should be kept in mind as we turn now to another approach to the radical character of the difference in kind between man and other animals.

That difference would be radical if it arose from something in the human constitution that is not present in the constitution of comparable species. Brains and other nervous apparatus are present in both, differing in degree certainly and perhaps also in kind. But if the human mind is unique as compared with the minds of all other animals, and if its uniqueness is the cause of the manifest difference in kind between human behavior and the behavior of other animals, then we are justified in regarding that difference in kind as radical rather than superficial. It is difference rooted in a property of human nature not present in any other species.

We can be clear about the respects in which the human mind is not unique. Like us, other animals have sensory organs that together with their brains function in acts of sense perception. I would go further and say that, in light of evidence drawn from elaborate experimentation with animals, perceptual thought can also be attributed to them—abstraction of a certain sort and also generalization. They may have, in rudimentary degrees, memory and imagination. Without any doubt, they as well as we have appetitive impulses, desires that motivate and drive them into action, and they certainly have emotions that we, too, share—anger and fear.

With regard to most of the similarities just mentioned, human beings and other animals differ in degree. But there are two exceptions and these go to the heart of the matter. They give us the clue to the human mind's uniqueness, which consists in its having intellectual powers not possessed by the minds of other animals.

While thought is present in both man and the higher animals, animal thought is perceptual thought; only human thought is conceptual. While motivating appetites or desires are present in both man and other animals, only man has an intellectual appetite, a will that is able to make free choices.

I have just made a series of assertions that I am prepared to and will presently defend. But before I do, I must add that man's possession of intellectual powers, which are not present in other ani-

mals, does not suffice to make man's difference in kind radical. It might still be superficial if the operation of those intellectual powers can be adequately explained neurologically in a way that ultimately involves differences in degree between man and other animals.

This means that the questions raised at the opening of this chapter cannot be fully answered here. What remains to be done, then, serves as preparation for the arguments to come. Let me enumerate, first of all, those things that are distinctive about human behavior.

Other animals live entirely in the present. Only human individuals are time binders, connecting the perceived present with the remembered past and the imaginable future. Only man is a historical animal with a historical tradition and a historical development. In the case of other species, the life of succeeding generations remains the same as long as no genetic changes occur. Human life, however, changes from one generation to another with the transmission of cultural novelties and with accretion of accumulated cultural changes and institutional innovations. Nothing like these innovations and changes can be found in any other species.

Other animals make things, such as hives, nests, dams, and, in the case of birds, songs. It may even be that in doing so, other animals use rudimentary tools as well as their own appendages. But only man makes machines, which are not hand tools, for the purpose of making products that cannot be produced in any other way.

It is not enough to say that man is the only manufacturing animal. We must add that he is the only machinofacturing animal. The kind of thought that is involved in designing and building a machine betokens the presence of an intellect in a way that the use of hand tools does not.

Among the things that man makes are works of art that we regard as fine rather than useful, because they are made for the pleasure or enjoyment they afford rather than to serve some further purpose. Are the songs made by birds comparable?

No, because even if the songs birds make serve no biological purpose and are simply made to be enjoyed, the songs made by a given species of bird remain the same for all members of that species generation after generation.

In contrast, in the making of drawings or paintings, from the sketches drawn on the walls of the Cro-Magnon caves down to the present day, the extraordinary variety in human works of art shows that human artistry is not instinctive, and therefore not the same for all members of the species from one generation to the other. To say that human artistry is creative, not instinctive, is to say that it consists of acts voluntarily done, involving both thought and choice on the part of the individual artist.

The comparison of man as a social animal with other social animals runs parallel to the comparison just made between man's artistry and animal productivity. The other social animals are instinctively gregarious, not voluntarily or inventively so. Being instinctive, the pattern of their social behavior remains the same from generation to generation and wherever we find individuals that are members of the species.

Human societies are extraordinarily various, though the members of them are all individuals of the same species. They are governed by rules or laws and customs that are handed down from generation to generation as well as altered from time to time. Passing beyond family and tribal groups, which are immensely diverse in their organization and customs, and coming to the larger and more inclusive association that we call a state, we are justified in regarding man as the only political animal the only animal that, either by the voluntary establishment of a constitution or by entering voluntarily into a social contract, brings the state, the political community or civil society, into existence.

As I see it, all the differences in kind so far mentioned cannot be explained except by reference to man's exclusive possession of an intellect, with its power of conceptual thought and with the power of free choice. When we consider man's syntactical speech and the variety of human languages, and compare them with such use of symbols as human experimenters have managed to confer upon chimpanzees, we reach the same conclusion. The difference is one of kind and it can be explained only by the uniqueness of the human mind because of its intellectual powers conceptual thought and free choice.

The observable behavioral differences between human and other animals to which I have called attention cannot be denied, but the fact that they must be acknowledged does not settle the matter. Those who, since Darwin's day, are more and more insistent that only a difference in degree prevails try to explain away the observed facts.

The two things to which they appeal in order to do so are (1) the experimental evidence of what they regard as linguistic behavior on the part of chimpanzees, admittedly vastly different in degree from human speech; and (2) laboratory findings with regard to thinking and problem-solving on the part of animals much lower in the scale than apes. It is necessary, therefore, for me to point out why these efforts fail to change the picture.

1. *With regard to the linguistic behavior of chimpanzees.* In the first place, such linguistic behavior as has been observed occurs under laboratory conditions, not in the wild. There is much evidence that animals in the wild do communicate with one another by cries or sounds of various sorts and by bodily gestures, including facial grimaces. But all these animal expressions function as signals, communicating emotional states, desires, or purposes. None is a designative sign functioning, as a word does in human language, to name something.

However, this is precisely what those who have worked with chimpanzees claim behavioral scientists are able to do: namely, teach (or perhaps a better word would be “train”) the chimpanzees to use symbols in a designative fashion to name things. They appear to have succeeded in doing this, at least to the extent of the chimp’s acquiring several hundred different symbols.

The symbols, it should be noted at once, are not like words in human language, for they are not related to one another as different parts of speech. It should also be noted that no older chimpanzee, having acquired a rudimentary vocabulary of the sort indicated, ever transmits that vocabulary to a younger chimpanzee. In other words, whereas in the human world a language is transmitted from one generation to another, nothing like that occurs in the world of the chimpanzee.

In the third place, the set of symbols that appears to function for chimpanzees as name-words function in human language are strictly limited to the designation of perceptible objects that are also actually perceived. None ever designates a perceptible object that has not been actually perceived by the animal. None ever designates a totally imperceptible object. In sharp contrast, human language contains a vast number of words that function designatively in both these ways: not only to name objects that, though perceptible, have not been perceived, but also to name objects that are imperceptible.

This last point brings us, finally, to the most critical difference between humans and chimpanzees with regard to linguistic behavior. Let us compare scientists training chimpanzees in the use of symbols and parents teaching their children the use of words. In the latter case, the learning process takes two forms. Children learn the meaning of a word by having it repeatedly applied to an object that is perceptually present—the dog in front of them, the spoon in their hands. But children can acquire significant words in a quite different way, not by direct perceptual acquaintance with the object named, but by a verbal description of the object designated.

For example, a child hears the word “kindergarten” for the first time and asks what it means. When told that a kindergarten is a place where children play with one another and also learn, the word “kindergarten” has acquired sufficient meaning for that child to be used significantly before he or she ever goes to kindergarten.

Although the first words that children learn to use significantly are all words the meanings of which have been learned by perceptual acquaintance with the objects named, somewhat later in the growth of the child’s vocabulary, a much larger number of new words become meaningful in the other way—by verbal description of objects signified rather than by direct perceptual acquaintance with them. This second way of acquiring meaningful designations has never occurred in the linguistic training of chimpanzees. Though “never” is a daring word to use about the future, I dare to say it never will.

Why do we find these differences between the linguistic training of chimpanzees and the learning of a language by human beings? Because the mind of the chimpanzee, like the minds of all other animals, consists solely of sensory powers and so cannot rise above the level of sense-perception, whereas the human mind has intellectual as well as sensory powers and can operate on the level of conceptual thought as well as on the level of sense-perception. Far from providing evidence against the uniqueness of the human mind, all the experimental work that has been done with the use of symbols by chimpanzees confirms it.

2. With regard to thinking and problem-solving by animals. A vast amount of experimental work has been done on animal learning. I will confine myself here to laboratory experiments in which animals learn to discriminate between one type of object and another, and to rise above particulars, achieving what looks like generalizations. In these experiments, animals react to a particular stimulus in a particular way, then transfer that response to other stimuli that are

like it in type, though not like it in all respects. For example, animals finding their food placed on square mats rather than round ones will later go to square mats for their food even if the squares are larger or smaller than the original ones and are of a different color.

The amount of variation in the set of stimuli that can still elicit the same response measures the degree of similarity required in order for the differing stimuli to function as equivalent. Some, though not all, of the psychologists who have performed such experiments infer that because animals can discriminate between different types of objects, they are engaged in concept-formation and have some ability to generalize from their experiences. If that conclusion were justified by the experimental evidence, it would undermine the view that concept formation and generalization require intellectual powers that are uniquely human.

It has been pointed out by an eminent neurologist, Professor K. S. Lashley, that when human beings recognize the letter A, even though it appears to them in a wide variety of visible shapes, they show themselves capable of perceptual abstraction. But when they are able to recognize that an English and a German sentence have the same meaning, they rise above the perceptual level, for what is grasped by the human mind here is something common to the two sentences even though they have no sensible resemblance to one another.

Another commentator on the laboratory evidence, this time a philosopher, Peter Geach, writes:

Many psychologists, wishing to use the word “concept” far more widely than I do . . . would say that an animal has acquired a concept if it has learned a discriminative response to some feature of its environment. If a rat or dog is trained to react in a certain way whenever it has a triangle shown to it (rather than some other shape), then they would say it has acquired the concept of triangle. . . . What is at issue here is not just the way the term “concept” is used, but the desirability of comparing these achievements of rats and dogs with the performances of human beings who possess a concept of triangle. . . . The life of brutes lacks so much that is integral to human life that it can only be misleading to say that they have concepts like us as misleading as it would be to say that men have tails and that

women lay eggs. . . . Experience in training dogs to “recognize” triangles can be no guide in (let us say) teaching geometry.

At the risk of belaboring this point unduly, I wish to take a moment to be as precise as possible about the difference between perceptual and conceptual thought.

Two things must be said about concepts. The first is that concepts are (a) acquired dispositions to recognize perceived objects as being of this or that kind and at the same time (b) to understand what this kind or that kind of object is like, with the result (c) that the individual having formed a concept is able to perceive a number of sensible particulars as being of the same kind and to discriminate between them and other sensible particulars that are different in kind.

The second thing that must be said about concepts is that they are acquired dispositions to understand what certain types of objects are like, both when they are not actually perceived and also when they are not perceptible.

What the experimental work done on animal discrimination shows is that animals acquire dispositions to perceive a number of sensible particulars as being of the same kind and to distinguish between them and other perceived particulars that are different in kind. Such acts of perceptual abstraction by animals coincide with just one of the many aspects of concept-formation. Concept formation by human beings enables them to perceive a number of sensible particulars as being of the same kind and to discriminate between them and other sensible particulars that are different in kind. In this respect, it does for human beings what perceptual abstraction does for other animals.

But perceptual abstraction does not enable animals to do any of the other things that concept-formation enables human beings to do. It does not provide an understanding of certain types of objects both when they are not actually perceived and also when they are imperceptible, nor does it provide any understanding of what this or that kind of object is like quite apart from the perception of it.”*

*We know something that is true of all perceptible and imaginable triangles, triangles of every shape and size: namely, that all are three sided figures with three angles between which no diagonals can be drawn. The object so defined is an intelligible object of thought and gives general significance to the word “triangle.”

The experimentally observed behavior of animals can be adequately explained in terms of perceptual abstractions and by reference to processes of perceptual generalization and discrimination that give rise to perceptual abstractions. Concepts (understood as quite distinct from perceptual abstractions) and concept-formation (understood as quite distinct from perceptual generalization and discrimination) are not needed to explain the observed behavior of animals.

I cannot resist digressing for a moment to comment on a peculiarly human neurological malady known as agnosia. A wonderfully interesting account of it has been written by Dr. Oliver Sachs in his book, *The Man Who Mistook His Wife for a Hat*.

Agnosia occurs in individuals whose sensory powers are in no way impaired but who have suddenly become conceptually, not perceptually, blind. Dr. Sacks's patient, who mistook his wife for a hat, could give a good verbal description of the visible appearance of a certain object, but he could not tell that it was a glove until he touched it and put it on. He could vividly describe the visible appearance of a rose, but he could not recognize it as a rose until he smelled it.

His conceptual blindness occurred only in the field of vision, not in that of any other sense. I shall return to the neurological significance of this in the next chapter. Here I wish only to point out that if I am right in denying the presence of intellect and concept-formation in animals other than man, other animals always have agnosia, whereas in man it is an abnormality.

I think that what has been said so far suffices to tip the scales heavily on the side of man's differing in kind from other animals, rather than just differing in degree. But it does not resolve the issue fully if it can still be said that that difference in kind is superficial rather than radical because it rests solely on a difference in degree between the human brain and nervous apparatus and that of other animals.

It is generally acknowledged that there are great and striking differences in degree, with regard to size, weight, and structural complexity, between human and animal brains. What is not generally agreed upon, however, is how the operations of the human mind, even granted that it has intellectual as well as sensory powers, stand in relation to the functioning of the human brain and other nervous apparatus. On the contrary, that question is a matter of intense and elaborate dispute to which I shall turn in the next chapter.

Regardless of how the issue about mind and brain is re- solved, we cannot ignore or forget the remarkable differences between human and animal behavior that betoken the uniqueness of the human mind by virtue of its intellectual powers.

Only human beings live with the awareness of death and with the certain knowledge that they are going to die.

Only human beings use their minds to become artists, scientists, historians, philosophers, priests, teachers, lawyers, physicians, engineers, accountants, inventors, traders, bankers, and statesmen. Only among human beings is there a distinction between those who behave ethically and those who are knaves, scoundrels, villains, and criminals.


Only among human beings is there any distinction between those who have mental health and those who suffer mental disease or have mental disabilities of one sort or another.

Only in the sphere of human life are there such institutions as schools, libraries, hospitals, churches, temples, factories, theaters, museums, prisons, cemeteries, and so on.

I mentioned at the beginning of this chapter a book I wrote entitled *The Difference of Man and the Difference It Makes*. The bibliography in that book includes two groups of authors with whom I took issue at that time and with whom I undertook to argue. One group consisted of professors in the behavioral sciences who assert that man's mind differs only in degree, not in kind, from the mind of other animals, especially the higher mammals such as the anthropoid apes and the bottle nosed dolphins. The other group consisted of computer technologists engaged in research on intelligent machines or what is called artificial intelligence (AI). I challenged their overconfident claim that they would be able to produce in the future machines capable of intelligent behavior that would equal or exceed the performances of the human mind.*

*If the reader is interested in a more up-to-date bibliography of the books with which I disagree, it can be found in Patricia Smith Churchland's *Neurophilosophy, Toward a Unified Science of the Mind Brain* (1986). That bibliography, in very small type, runs to over thirty-three pages.

One point established clearly and forcefully in another book I wrote, *Ten Philosophical Mistakes* (1985), bears re- petition here because it completes the answer to the question we have been con-

sidering. I have given many reasons for concluding that animals other than humans do not have intellects. I have also indicated many of the distinctive features of human life and behavior that it would be difficult to explain without reference to man's intellectual powers. But I have not so far mentioned one aspect of human behavior that simply cannot be explained without attributing intellect to man—a power that is radically distinct from and superior to all of our sensitive powers, our powers of sense perception, sensitive memory, and imagination. 

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