Animals Are Human, Too

(Or Are Men Just Little Calculators?)

By John Terrell

A surprising number of biologists and social scientists these days are quarreling about an issue in psychology that must seem astonishingly simple-minded to anybody who owns a dog or cat, or to any parent who has raised a child through puberty to adulthood. What some of my colleagues are calling "The Great Scientific Debate of the 20th Century" is astounding because it often sounds like a repeat of the controversy set off in 1858 when Charles Darwin and Alfred Wallace shocked Victorian society by announcing their discovery of the theory of evolution by means of natural selection.

What is this 20th century fracas in the lofty world of science all about? Putting it simply, the issue is this one: *How like an animal is Man?* How much of human nature is dictated by our biology, by our animal nature? How extensively are human beings really governed by wisdom and social custom? Or are we, like other animals, driven deep down inside by instincts, blind passions, and ancient biochemical urges?

Until 1975, when Edward O. Wilson, a brilliant zoologist at Harvard, published a monumental book called *Sociobiology: The New Synthesis*, most social scientists and probably most biologists thought this Victorian issue touched off by Darwin and Wallace had long ago been put to rest. Conventional wisdom has taught for years that the human species is uniquely different from all other animal species. Fifteen years ago when I was an undergraduate studying anthropology at Harvard it was explained to me by my professors that evolution had given us a brain which was so large and powerful that the human species had been freed by evolution from the rigid grip of biological predestination. I was told that human beings ruled themselves culturally, not biologically. While my psychology teachers avoided the word like the plague, it was pretty clear, too, that animal behavior was different from human behavior because animals were controlled by something called *instincts*. If herring gulls, for example, were presented with a certain kind of stimulus, they had to behave in a fixed, stereotyped fashion. Somehow their behavior was in their genes and was passed down from one generation of gulls to the next by sexual reproduction.

What Wilson and other sociobiologists are trying to do is challenge the smug notion that man is innately different from other animals. These scientists are saying, in effect, that human beings are more animal than most of us care to admit. They define sociobiology as the systematic study of the biological basis of all social behavior. They claim that it is high time biologists began studying the biological foundations for human social behavior, too.

Many people—not just biologists and social scientists—believe that the human species is unique. It is not surprising that Wilson and other sociobiologists are being accused so widely of trying to destroy the dignity of mankind.

The trouble with Wilson and his colleagues, however, is they are taking matters too far in one direction. They are right when they insist that human beings are animals. But they seem afraid to admit that animals are human, too.

The late British biologist C. H. Waddington in a review of *Sociobiology: The New Synthesis* published in the *New York Review of Books* back in August 1975 had this to say:

> *Is it not surprising that in a book of 700 large pages about social behavior there is no explicit mention whatever of mentality? In the index, covering more than thirty pages of three columns each, there is no mention of mind, mentality, purpose, goal, aim, or any word of similar connotation.*

He went on to add that something very similar to mind or purpose is often implied in Wilson's text (I would

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myself point to Wilson's discussions, for instance, on learning and socialization). But he concluded that Wilson's failure to deal forthrightly with animal mentality is the weakest feature in the whole grand structure he has built for sociobiology. If sociobiologists are going to include human beings within their field of research, they have got to deal with the role played by goals, aims, purposes, and the total nature of experience felt both by mankind and by "lesser" animal species.

I suspect anyone who has a dog or cat knows exactly what Waddington was talking about. Nearly every pet owner can relate countless stories about how Rover or Zenobia is so human. While pet fanciers are liable to give their animals too much credit for being human, pets are often incredibly adept at manipulating their loving masters for their own pet purposes. Animals really can be more capable of conscious mental activity than some people give them credit for being.

On the other side of the fence, however, Wilson's critics have taken matters too far in the opposite direction. Wilson is obviously right in saying that people have not gotten away entirely from being animals. Ask any parent with a child old enough to have passed through most of the stages of childhood and adolescence. You don't have to tell *them* that biological changes during growth and maturation get involved in how children act. They know it all too well.

Many parents have also experienced an uncanny thing. Little Lucy or young Johnny—perhaps only for a year or two—reminded everybody of Aunt Mary or Uncle George who died years ago, long before Lucy or Johnny was born. Why? While it is true that, just like pet owners, parents are notorious for exaggeration when it comes to the kids, is it not possible for human beings to inherit some kinds of behavioral characteristics? Dog breeders can control selectively for the inheritance of some behavior traits in dogs. Is human behavior entirely divorced from biological inheritance?

It may surprise you to learn that scientists aren't doing a very effective job of answering questions like these. But it is important to understand why it is so difficult to come up with answers. To be sympathetic to the scientist's plight, you need to know how evolution can operate to make animals more intelligent over the course of millions of years. Seeing how difficult the job is for nature to perform suggests why human beings are unique in the animal world in being as flexibly adaptable and clever as they are. Evolution is the reason why we are such an uncommon kind of animal.

How to make a better thinking machine

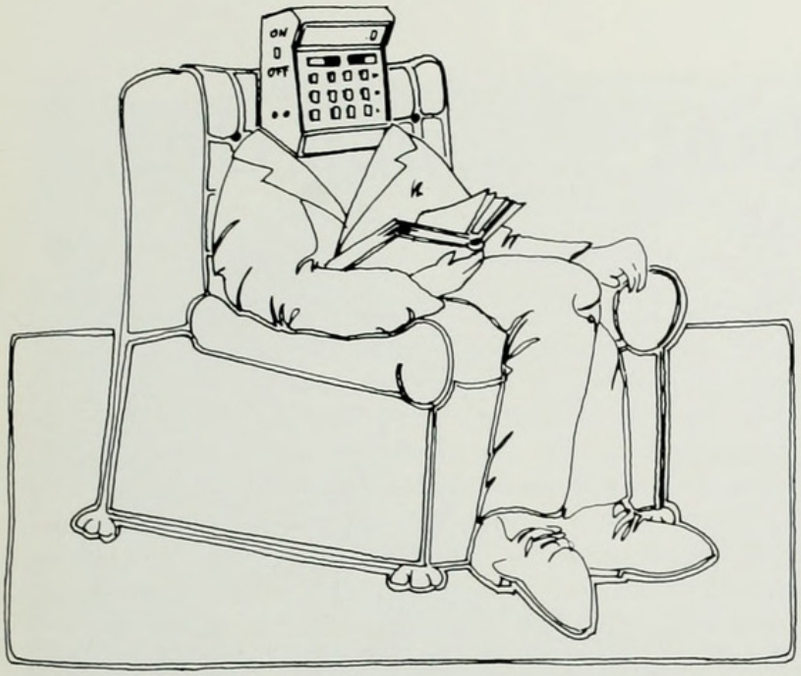
The easiest way to imagine how hard evolution has to work to make animals brighter over countless generations is to forget at first about animals. We humans are too prejudiced by our sense of superiority to give them a square deal. Think instead about little calculators like the one you can buy to add up your purchases at supermarket.

Why do the companies that make these calculators hire people to make better machines? Not because they like change for its own sake. If a calculator company has been making good, dependable, efficient, and economical machines for a long time, it isn't going to change its product fundamentally unless it has to do so. And when is that? When someone in top management has sensed that people are not buying as many company calculators as they used to. If there is any change in the needs, wants, and tastes of the consumer, a company had better follow suit or it will end up bankrupt. When a company neglects to keep pace with the market, it's a sure bet that some competitor will step in and take over. In short, companies (and evolution) don't play around with a good thing until it looks like it isn't such a good thing any more. Machines aren't changed, and animal species don't evolve in the direction of greater intelligence, unless there is good reason to do so.

In addition, few companies and no animal species try to do everything. A company may want to be No. 1 in some part of the market, but not in all parts. It's too much work and it costs too much to try to be best in everything you do. In the calculator business, for example, manufacturers of little calculators don't try to compete with General Motors. They make mini's and leave cars to the auto makers.

This second point brings me to the conclusion of my story. There are all sorts of ways you can design a mini-calculator. Separate designs sell best in different markets. Most people, for instance, may only want a fairly simple machine to take to the food market; they would be wasting their money if they bought a mini-calculator that did more than add, subtract, multiply, and divide. The mechanism of such a simple calculator is quite basic. The buttons you push on its face activate it to perform standard functions, like adding and dividing. The ability for a mini-calculator to do something at the touch of a button is created during manufacturing by "hard-wiring" in a fixed set of things to do when each button is pushed. Hard-wired functions can't be changed. Push the appropriate button and the machine has to do what it has been fixed to do. In short, hard-wired functions such as adding and subtracting are a calculator's "instincts."

While most people may only want a fairly simple calculator to do basic arithmetic, brainy mathematicians may want to buy more sophisticated calculators that can do all sorts of difficult mathematical formulas. Since it would be very expensive to make machines with separate buttons to do every possible calculation that a brilliant mathematician might want to do, it is a wise idea to sell these scholars special calculators which are intelligent enough to learn how to do complex things when shown



how to do them. The ability for calculators to learn how to do something is called "programmability."

While companies make mini-calculators that can't learn anything and which operate entirely by hard-wired "instincts," no company makes a little machine which has to be taught everything from scratch—i.e., completely programmed—every time you turn it on. Really sophisticated calculators are made with a combination of hard-wired functions, like adding and dividing, *and* programmability. Jobs that must be done over and over again by anyone using even a "bright" calculator are hard-wired. Peculiar jobs that aren't done very often are left up to the user to program when needed.

How nature makes a better animal

It may be evident how this discussion of calculators translates into biological terms. The "companies" equal particular species to which different kinds of animals belong. The consumer market is the same thing, more or less, as the natural world to which all species must adapt if they are to survive. The designer is the creative force of evolution. The calculators are, of course, animal brains with different levels of intelligence.

A clam or an oyster is like a fairly simple calculator made to be taken to the supermarket. A dog or a cat is like a sophisticated machine that does simple tasks at the touch of a button, because of hard-wired instincts, and also complex tasks, such as rolling over and playing dead or manipulating its owner, because of hard-wired basic functions and a lot of programmed learning. People, in keeping with such an analogy, are even more sophisticated calculators than dogs and cats. And like all intelligent animals, people are like calculators with extensive memory stores so that they can learn a lot of things.

It may be clear why evolution took so many millions of years to come up with the human species. We are extremely complex organisms. We are expensive for nature to manufacture, because we use a lot of materials and food energy, we are intricate to assemble, and we take a long time to mature. In truth, we may not even be all that durable or dependable once we have been assembled. But —and this is what matters—once evolution got to the point where it was useful and feasible to invest so heavily in intelligence, we proved to be an exceptionally flexible animal which could perform all kinds of tasks and which could solve all kinds of problems, from simple to sophisticated, because of our remarkable program learning ability.

So we're all sort of human

It's not difficult so see why many people find the Great Scientific Debate of the 20th Century a little simple-minded. The sociobiologists are looking for the genetically-inherited, "hard-wired," biologically-controlled behavior patterns which undoubtedly exist in every species of animal. Even in human beings. But when they are talking about intelligent species including the human species, I am tempted to ask them: So what?

Of course our species is not entirely different from the rest of the animal world. But we are an immensely complex, incredibly "programmable" kind of animal. Our human nature may not be entirely free from our basic biological hard-wiring, but what difference does that make? This 20th century debate seems to be a quibble over nothing important.

Sociobiologists would retort that we are really terribly ignorant about how much hard-wiring there is in our species. That we surely are. But I'd like to take the side of the other animals. As Donald R. Griffin of Rockefeller University wrote recently in the *American Scientist*:

> *Only extreme skeptics deny the reality of human mental experiences, such as images of objects and events that may be remote in time and space from the immediate flux of sensations. But the possibility that something similar might occur in animals has been subject to such an effective taboo that, for half a century, the question has been strenuously evaded. Recent advances in ethnology call into question the rigidity of these inhibitions and suggest that it may be time to reopen the question of mental continuity between animals and men.*

In short, let's not forget that animals are human, too. Writing about the inventiveness of chimpanzees, Wilson remarks in *Sociobiology* that it is "of surpassing interest to know all of the many ways they use tools and form traditions. Each scrap of information on this subject obtained in future field and laboratory studies, however loosely connected to previous information, should be regarded as potentially important." Why stop with the chimpanzees? □