

## How Like Us Need They Be?

*The behavioral repertoire of nonhuman primates is highly evolved and includes advanced problem-solving capabilities, complex social relationships, and sensory acuity equal or superior to humans.*<sup>1</sup>

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Few individuals with more than a passing knowledge of who monkeys and apes are would argue with the assertion made by Burbacher and Grant. But such an understanding tends to segregate people into one of two groups. Either, like Burbacher and Grant, they see the close similarities between human and nonhuman primates as an opportunity for exploitation, or else, like a growing segment of society, they see the affinities between the primate species as cause for concern, especially in light of the ways that those in the first group are taking advantage of them.

When the philosopher Jeremy Bentham wrote:

The day may come, when the rest of the animal creation may acquire those rights which never could have been withholden from them but by the hand of tyranny. The French have already discovered that the blackness of the skin is no reason why a human being should be abandoned without redress to the caprice of a tormentor (see Lewis XIV's Code Noir). It may come one day to be recognized, that the number of the legs, the villosity of the skin, or the termination of the *os sacrum*, are reasons equally insufficient for abandoning a sensitive being to the same fate. What else is it that should trace the insuperable line? Is it the faculty of reason, or, perhaps, the faculty of discourse? But a full-grown horse or dog is beyond comparison a more rational, as well as a more conversable animal, than an infant of a day, or a week, or even a month, old. But suppose the case were otherwise, what would it avail? the question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?<sup>2</sup>

he meant that the similarities between species, even between races, are, in fact, the point on which decisions regarding our interactions with others should turn.

Burbacher and Grant are representative of the group that sees similarity as an opportunity to exploit without much pause for the ethical questions that, for others, spring so readily to the fore. Burbacher and Grant reinforce their position quite strongly:

Nonhuman primates are capable of advanced behaviors that share important and fundamental parallels with humans. These parallels include highly developed cognitive abilities and binding social relationships. The behavioral repertoire of these animals makes them valuable models for research on the functional effects of exposure to neurotoxic agents.<sup>3</sup>

Apparently, the “important and fundamental parallels” and the “highly developed cognitive abilities and binding social relationships” that many primate species share are insufficient, in the minds of Burbacher and Grant, to suggest, by way of Bentham, that these animals should not be “abandoned without redress to the caprice of a tormentor.” The neurotoxic agents considered by Burbacher and Grant include methylmercury, methanol, PCBs, lead, as well as other neuroactive agents such as cocaine, LSD, morphine, and PCP. They comment, “Drugs such as phencyclidine (PCP) produced an overall disruptive effect on all test measures.”

The cognitive abilities of monkeys and apes have increasingly been shown to be strikingly like the cognitive abilities of humans. Some of those uncovering these abilities have realized that there is an implication to such discovery. Fagot, Wasserman and Young, writing with regard to their own work on abstract conceptualization in baboons note: “To be sure, the stakes are high. What is at issue is no arcane point, but the very distinction between the minds of human beings and nonhuman animals.”<sup>4</sup>

As the distinction between the mind of a human and the mind of a monkey becomes more subtle and less easily defined, in all but terms of quantity, it becomes ever more obvious that the moral distinctions we make during our dealings with the two groups likewise must become more carefully considered. This, also, is no arcane point. Approximately sixty thousand nonhuman primates are used in the U.S. alone every year for various scientific and educational purposes.<sup>5</sup> The methods used to raise, house, and utilize these animals are inherently cruel.<sup>6</sup> These practices result in much mental duress and, not uncommonly, physical pain and death.

Harry Harlow used the similarity between rhesus monkey and human infants to study the nature of love. He understood clearly, even in 1958, that the two species’ similarities are such that what is learned about the emotions and psyches of one species informs us of the emotions and psyches of the other.

The macaque infant differs from the human infant in that the monkey is more mature at birth and grows more rapidly; but the basic responses relating to affection, including nursing, contact, clinging, and even visual and auditory exploration, exhibit no fundamental differences in the two species. Even the development of perception, fear, frustration, and learning capability follows very similar sequences in rhesus monkeys and human children.<sup>7</sup>

Harlow used these similarities to the detriment of the baby monkeys on whom he experimented. He showed that rhesus monkeys reared without contact with others – monkeys or humans – developed severe mental problems and behavioral aberrations. He apparently missed altogether, the most profound implication of his work – the moral implications raised by the similarity of emotional need between the species. He seems to have missed the implication implicit in the truth that what is learned about one of the primate species’ mind informs us of the minds of the other species. Thus, what would hurt us also hurts them in very similar and familiar ways.

This similarity and familiarity with the minds of other primates is not surprising. Charles Darwin pointed out there should be a continuum of attributes throughout all species, with the most similar attributes being found in the nearest relatives. We should be able to recognize the emotions being experienced by chimpanzees and monkeys precisely because we are all so closely related. This close relationship means that much about us, about the way we perceive and feel, is the same.

Researchers studying the neurological basis of emotion have exploited our similarities in a manner that suggests that they too have missed the more profound implications of the familial relationship that exists within the primate order. David Amaral, at the University of California, Davis, and Ned Kalin, at the University of Wisconsin, Madison, experiment on the emotion centers of monkeys' brains. The techniques used by these scientists are similar.

The amygdala is the almond-shaped region of the brain involved in basic emotions such as fear, anger and aggression. There is an amygdala in each hemisphere of the brain. Amaral and Kalin destroy or otherwise damage these structures in monkeys' brains and then observe the changes in the monkeys' behavior.

The monkeys used by Kalin and Amaral are macaques. These monkeys have amygdalae relatively larger than human amygdalae<sup>8</sup>. Comparative neurophysiology suggests that the emotions experienced by these animals are more intense and central to their lives than are the emotions experienced by humans.<sup>9</sup> As relatively reduced as emotional experiences must be in humans, they are recognized as being a fundamental part of our innermost being.

Kalin provides a description of one facet of his work:

“In nonhuman primates, we are examining behavioral and physiological correlates of human anxiety. We have identified a fearful endophenotype that is characterized by high levels of trait anxiety, a specific pattern of prefrontal brain electrical activity, and increased levels of stress hormones in the blood and in the brain. We have developed new techniques to selectively lesion the primate amygdala and these studies have provided new insights into the role of the amygdala in mediating acute fearful responses as compared to states of long term anxiety.”<sup>10</sup>

Amaral et al. write:

The amygdaloid complex is a prominent temporal lobe region that is associated with "emotional" information processing. Studies in the rodent have also recently implicated the amygdala in the processing and modulation of pain sensation, the experience of which involves a considerable emotional component in humans. In the present study, we sought to establish the relevance of the amygdala to pain modulation in

humans by investigating the contribution of this region to antinociceptive processes in nonhuman primates. Using magnetic resonance imaging guidance, the amygdaloid complex was lesioned bilaterally in six rhesus monkeys (*Macaca mulatta*) through microinjection of the neurotoxin ibotenic acid. This procedure resulted in substantial neuronal cell loss in all nuclear subdivisions of this structure.<sup>11</sup>

Amaral writes to justify one federal grant with an implicit statement of the similarity between monkeys and humans:

[C]omplete amygdala lesions will be produced in neonatal macaque monkeys. The effects of these lesions on mother-infant and juvenile-juvenile interactions will be evaluated. Future studies (when the neonates have matured) will analyze dyadic and tetradic social interactions and thus allow comparisons of the severity of effects of neonatal or mature amygdala lesions on social behavior. During these experiments, the pituitary-adrenal activation of lesioned and control monkeys in response to social and restraint stressors will also be analyzed. These studies will provide important insights into the neurobiology of normal social behavior and may contribute to an understanding of pathologies of social communication in disorders such as autism.<sup>12</sup>

The similarities between the primate species' minds, emotions, and social behaviors are being relied on and used as justifications for modern experiments on the brains of awake, usually restrained, monkeys. Commonly, the monkeys are required to perform some cognitive task in order to receive a small food reward or a few drops of liquid. It is a standard procedure in these types of studies to deprive the monkeys of food and/or water in order to motivate them to perform for the vivisector. The clear recognition that monkeys and humans have minds and thought processes that are very similar motivates some scientists to utilize them as experimental subjects in these ways, as at the Massachusetts Institute of Technology:

The ability to abstract principles or rules from direct experience allows behaviour to extend beyond specific circumstances to general situations. For example, we learn the 'rules' for restaurant dining from specific experiences and can then apply them in new restaurants. The use of such rules is thought to depend on the prefrontal cortex (PFC) because its damage often results in difficulty in following rules. Here we explore its neural basis by recording from single neurons in the PFC of monkeys trained to use two abstract rules.<sup>13</sup>

Advances in technology are allowing scientists to make ever-finer measurements of physiological processes in alert monkeys engaging in cognitive acts. Much of what is known regarding the neurophysiologic similarities of the primates is a result of these technological advances, and an argument might be made that it is only in recent years that

the profundity of the discoveries has begun to amass into a noticeable body of evidence. But this is not the case at all.

The close mental, emotional, and behavioral similarities between humans and other primate species has been well known for many years, while careful scientific observation and experimentation have been demonstrating these facts for nearly a century. Wolfgang Kohler, whose investigations Jane Goodall has cited<sup>14</sup> as among the most important in the literature, wrote in 1925 that: “The chimpanzees manifest intelligent behavior of the general kind familiar in human beings.”<sup>15</sup>

In the early 1960's scientists were subjecting monkeys, increasingly, to experiments that displayed the emotional vulnerability and cognitive depths of these animals. Harlow's decades-long career as well as his success at inspiring young experimental psychologists, resulted in an explosion of papers associated with maternal and social deprivation and stress, particularly in infants. These scientists were exploiting what they already believed to be true regarding the similarity between the emotional fragility of infant monkeys and humans.<sup>16</sup>

Masserman, Weckin, and Terris published the results of a study that underscores the fact that those who were experimenting on monkeys, even forty years ago, clearly expected them to behave as humans might in similar situations. Rhesus monkeys were trained to pull on one of two chains, depending on the color of a flashing light, in order to receive food. After training, another monkey was displayed through a one-way mirror.

By pulling the chains in the correct fashion, the first monkey would receive the food reward, but one of the chains now delivered a powerful and painful electric shock to the other monkey. It was discovered that most of the monkeys would not shock another monkey even if it meant not being able to eat. One of the animals went without food for twelve days rather than hurting his or her companion. Monkeys who had been shocked in previous experiments themselves were even less willing to pull the chain and subject others to such torment.<sup>17</sup> (The scientists who had seen monkeys shocked, however, continued to test more monkeys in the box.)

If evidence for the close similarity between a human's and a nonhuman's mind and sense of self was observed and published so long ago, and if continuing experimentation has contributed to and expanded that understanding throughout the century, why hasn't something been done to bring our treatment of these animals more in line with the guidelines we tend to employ when dealing with those in society less able to care for themselves and assert their own interests?

The answer to this question is moderately complex. Primate vivisection increased rapidly in the 1950's and 1960's. Prior to this time the availability of monkeys was more limited and many fewer researchers were using these exotic animals. This changed largely due to the importation of many thousands of monkeys for polio research<sup>18</sup> as well as the U.S. government's decision to keep pace or surpass the Soviet's primate-based biomedical research programs. In the early sixties the U.S. government began funding facilities for

the breeding, housing, and utilization of monkeys and apes for research purposes. Today, federally funded projects around the country maintain many thousands of monkeys and make them available to government-funded researchers.<sup>19</sup> A few large private primate suppliers and consumers of primates imported over sixty-four thousand monkeys between 1995 and 2000.<sup>20</sup>

Part of the answer to the question lies in the fact that the number and type of experiments on primates has increased to such a degree in such a short time. The public's awareness of the issue was less informed simply because many fewer experiments were being performed and much less information concerning the minds and emotions of these animals was being published. Now, more people are being exposed to, more people are being made aware of, and also more people are deciding to participate in these studies than only a few decades ago.

Another factor is the absence of checks and balances, no bureaucratic or regulatory mechanisms are in place to assess the information or consider the implications of the body of evidence and guide our policies in this area. Without such a mechanism, the federal government continues to promote primate research, provide animals to researchers, make funds available, and invent reasons to use primates in harmful experiments.<sup>21</sup> There is nothing built into the system to regulate it in any moral manner, to evaluate current knowledge and consider the implications for new proposals. Those in a position to raise any doubt are themselves financially and professionally interested in seeing the practice continue, and they work within a community of equally interested individuals.

Within the private sphere there are professional organizations that should be monitoring scientific endeavor and providing leadership to lawmakers and the public with regard to the discoveries that animals other than humans have minds and emotions so similar to our own that experimenting on them, that keeping them in concentration-like conditions,<sup>22</sup> that killing them and harming them to further our own real or perceived interests is as unthinkable immoral as it would be if humans were being treated in similar ways. These organizations include the American Veterinary Medical Association, the American Association for Laboratory Animal Science, and the American Society of Primatology. They each have members claiming to be primate experts.

The American Veterinary Medical Association (AVMA) has not published a position specific to the use of primates in research. The AVMA lumps all animals together and states: "We oppose unnecessary restrictions on the use of animals in scientific research" but remains mute on what "unnecessary" might mean. Given the close similarity between the primate species, it is apparent that restrictions are necessary. Given the Association's claim that it is the authorized voice for the profession<sup>23</sup> and the claim that veterinarians have an ethical duty to: "[F]irst consider the needs of the patient: to relieve disease, suffering, or disability while minimizing pain or fear,"<sup>24</sup> it seems that this possible check on the use of these animals has failed completely. The public tends to view veterinarians as animal experts; the Association's silence in this area might be seen by policy-makers in Congress as support for the status quo, which it probably is.

The American Association for Laboratory Animal Science (AALAS) is the professional organization for animal technicians and veterinarians working in laboratory settings. The only reasons the organization might be expected to speak out for these animals is the intimacy that the members have with the many ways the animals are harmed and the fact that the public (mistakenly) expects veterinarians to be advocates for animals. But, the members are financially beholden to the institutions for which they work, and it is rare for anyone to speak out since doing so may jeopardize their livelihood. And, the members are generally willing and enthusiastic participants in the experiments themselves.

AALAS has no policy concerning the care of, or experimentation on, primates. AALAS defers to federal regulation in all matters dealing with animal care and use.<sup>25</sup> This is akin to the National Educational Association or the National Rifle Association allowing the federal government to decide what their policies concerning education or gun control should be. The public cannot look to AALAS for any leadership in this area.

The American Society of Primatology (ASP) should be the body speaking the loudest about the implications raised by the notable similarities between the species. The ASP counts among its members: Sarah Boysen (“The present findings demonstrate that chimpanzees can classify natural objects spontaneously and that such classifications may be similar to those that would be observed in human subjects.”)<sup>26</sup>; Frans de Waal (“It is really hard for me to imagine that they do not [have an imagination]. Chimpanzees are very innovative creatures - they deceive each other (and us!) all the time and invent many different games for themselves. All of these abilities require some degree of forethought to what might be the outcome of an action.”)<sup>27</sup>; Roger Fouts (“Humans and chimpanzees differ in their intelligence by degree, not in the *kind* of mental processes.”)<sup>28</sup>; Robert Ingersoll (“Nim’s last words to me were, ‘Out—Hurry—Key—There.... Key—Out’, very sad. Nim passed away March 10, 2000. I did not expect that he would die at a very young twenty-six years old since chimps usually live well beyond forty years quite regularly. It has taken me this entire year to be able to speak and now write about Nim. He was my friend. Maybe my closest friend. He taught me about right and good, and trust and certainty, and he taught me what true friends are. Life long friendship, and if you had ever seen us together you would know what I mean. I knew Nim for twenty-two of his twenty-six years.”)<sup>29</sup>; Vernon Reynolds (“There is no satisfactory way to convince ourselves of our separate nature, to be certain we feel or experience something they do not feel or experience; all the evidence points the other way, to commonality.”)<sup>30</sup>; Duane Rumbaugh (“Although nonhuman primates such as rhesus monkeys (*Macaca mulatta*) have been useful models of many aspects of cognition and performance, it has been argued that, unlike humans, they may lack the capacity to respond as predictor-operators. Data from the present series of experiments undermine this claim, suggesting instead a continuity of predictive competency between humans and nonhuman primates.”)<sup>31</sup>; and Shirley Strum (“I was constantly struck by how much more like humans the baboons now seemed. They learned through insight and observation, passing new behaviors from one to another both within a single lifetime and across many lifetimes. This is social tradition, the beginnings of what eventually became ‘culture.’”)<sup>32</sup>.

In spite of this thread of understanding within the ASP, the leadership is dominated by laboratory researchers intent on exploiting the similarities nonhuman primates share with us. Often, very often in fact, the leadership is involved in research of questionable value and blatant cruelty. At times, it seems that the leadership's understanding of the complexities of monkeys' minds, the emotional sensitivity of the animals, and the fragility of their developing psyches is cause for the scientists to devise the most absurd and deviant experiments. A paper published by a current and a past president of the Society is illustrative of this point.

The current (as of 2001) president of the ASP is John Capitanio, a researcher at the California Regional Primate Research Center (CRPRC) at the University of California, Davis. His colleague, also at CRPRC, William Mason, is a past president of the Society and also a past student of Harry Harlow.

The authors write:

Cognitive style, reflected in the generation of novel solutions and the use of identifiable response strategies in problem-solving situations, was contrasted in rhesus monkeys (*Macaca mulatta*) reared individually with either canine companions or inanimate surrogate mothers. Four experiments were conducted over a 5-year period, examining problem solving in relatively unstructured as well as more formal situations. Results indicated that whereas the 2 rearing groups did not differ on most measures of performance, consistent response strategies were identified for the dog-raised monkeys. The results were compared with previously published data from the same monkeys demonstrating rearing group differences in abilities to engage in complex social interaction. The animate nature of the early rearing environment may facilitate the development of a cognitive style that influences problem-solving abilities in both the social and nonsocial realms.<sup>33</sup>

The ASP leadership is comprised of those who conduct harmful experiments on primates themselves or are employed in the support of such experiments.<sup>34</sup> Many members are similarly employed.<sup>35</sup>

So, a second part of the answer to the question of why our treatment of these animals is not more in line with the guidelines we tend to employ when dealing with those in society less able to care for themselves and assert their own interests, is the fact that there is not a regulatory mechanism in place that would cause or encourage an evaluation of current policies, nor is there a professional organization acting on behalf of the animals – due to a vested interest – such as AALAC or the ASP, or else for some other, less clear reason, as the AVMA.

These two factors – the relatively recent mounting of evidence and experiments, and the lack of checks or balances – reinforce the tendency in society to discount the interests of others. This is a third part of the answer. We tend not to notice those who have no voice

when no voice of protest nor assertion of their rights has been raised. When a voice does arise, those in power tend to work to discount and marginalize it. When the issue of rights has arisen, whether involving race, gender, mental faculty, sexual orientation, nationality, religion or any other category, history is clear that the group in power has resisted the extension of protected status to other groups. Simply, prejudice against others, bigotry, the perceived protection of one's own interests, is a fundamental aspect of human behavior.

How like us do they have to be before the evil we do to them should be termed criminal?

This question deserves an answer. Historically, the segregation of nonhuman animals has been based on premises that have evaporated in step with discoveries concerning the animals' capabilities and characteristics. None of the reasons have been able to withstand close investigation and observation. Whether the claim has been that only humans use tools, make tools, can communicate with language, are altruistic, engage in war, have beliefs, engage in ritual, possess a culture, are capable of abstraction, of humor, of courage, of deceit, or of responsibility to others, the claims have all failed. And they have failed with regard to other primates precisely because, as we attempt to describe ourselves, we also describe those with whom we share such close and intimate ancestry.

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This question deserves an answer, and those with the greatest access to these animals should be required to answer it. And until they are willing and able to do so to the satisfaction of society at large, they should be compelled, legally, to cease their manipulations of these animals.

A common concern of the vivisectors is that if primates are acknowledged to be so like us that we should stop our experiments on them, then where will it all stop? If chimpanzees are given the simplest rights today, and monkeys tomorrow, then how long will it be before dogs, cats, rabbits, rats, mice and flies are similarly protected? The answer must lie in the question: How like us do they have to be before the evil we do to them should be termed criminal?

Those wishing to maintain a sharp distinction between humans and all other species must explain what it is that keeps us apart. Why are compassion, sympathy, concern, and justice concepts we should reserve for humans alone? Why should each of these terms be redefined when speaking of humans or other animals? When we speak of humane care, why should this term be differently applied to human children and monkeys?

How like us do they have to be before the evil we do to them should be termed criminal?  
How like us need they be?

The public's awareness of the ethically significant similarities between the species is increasing. More people are becoming alarmed and are demanding that the government act to protect these animals from those who are abusing them. Over 200 organizations –

including large national organizations and small grass roots groups – have added their names to a demand for an immediate moratorium on primate experimentation:

#### A Call for an Immediate Moratorium on Primate Research

During the last 35 years, exploitative primate research has consumed billions in American tax dollars while it has contributed very little to human welfare.

It has diverted funding from non-animal research technology that could have been more productive and from social programs – such as drug rehabilitation, prenatal care, and nutrition education – that could have benefited, directly and indirectly, the majority of the population.

While over three decades of primate-based research has not produced the promised cures for human diseases, it has taught us about the sensitivity of the nonhuman primate subjects. We now know that nonhuman primates have emotional responses remarkably similar to human emotional responses.

Apes who have learned American Sign Language have used this human language to clearly communicate frustration, grief, and other emotions. There are convincing indications that nonhuman primates in experiments suffer as intensely, both physically and emotionally, as humans would suffer in the same experiments. Recognizing this, we are ethically compelled to stop using them in experiments.

We are calling for the creation of a presidential advisory committee composed of primate experts and informed lay people – a panel agreed upon by both pro-animal and pro-research advocates – to critically examine the evidence and make a recommendation to the president and the nation regarding the ethical implications of continuing exploitative primate research.

Until the committee's report is finalized, federal funding for primate research should cease.<sup>36</sup>

Rick Bogle  
January, 2002

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<sup>1</sup> Burbacher TM, Grant KS. 2000. Methods for studying nonhuman primates in neurobehavioral toxicology and teratology. *Neurotoxicology and Teratology*. Jul-Aug; 22(4): 475-86. Review.

<sup>2</sup> Bentham, J. 1823. *An Introduction to the Principles of Morals and Legislation*, Chapter XVII, note.

<sup>3</sup> See note 1.

<sup>4</sup> Fagot J, Wasserman EA, Young ME. 2001. Discriminating the relation between relations: the role of entropy in abstract conceptualization by baboons (*Papio papio*) and humans (*Homo sapiens*). *Journal of Experimental Psychology and Animal Behavioral Processes*. Oct; 27(4): 316-28.

<sup>5</sup> United States Department of Agriculture, Animal and Plant Health Inspection Service. 1998. *Animal Welfare Report, Fiscal Year 1998*. Table 6. "Number of Animals Used by Research from First Reporting Year (1973) to the Present."

<sup>6</sup> Normal social bonding in primates begins nearly at birth between the mother and infant. Normal social situations allow monkeys to interact with mothers, siblings, and peers almost constantly. This is critical to normal social and mental development. Repetitive motions such as twirling, pacing, and flipping are termed stereopathies, and are a recognized result of social deprivation in monkeys. Self-mutilation, or self-injurious behavior, is a recognized result of individual housing and social deprivation in monkeys. At the Washington Regional Primate Research Center (WaRPRC) infants are routinely removed from their mothers at birth and nursery reared. There, infants have contact with other infants for one hour a day, five days a week. At the Tulane Regional Primate Research Center infants are removed from their mothers within three days of birth. It is estimated by the New England Regional Primate Research Center that at least ten percent of the monkeys there self-mutilate themselves to such a serious degree that veterinary intervention is required. At the Oregon Regional Primate Research Center, at least one thousand monkeys are individually housed; self-mutilation is not uncommon there or at the California Regional Primate Research Center. A veterinarian, who worked at the Wisconsin Regional Primate Research Center a decade ago, claims to have achieved pair housing of seventy percent of that facility's primate population. After leaving, he believes that the percentage has fallen to no more than thirty percent pair or group housed. This is the norm throughout the industry.

<sup>7</sup> Harlow H. 1958. The nature of love. Address of the President at the sixty-sixth Annual Convention of the American Psychological Association, Washington, D. C., August 31, 1958. First published in *American Psychologist*, 13, 573-685.

<sup>8</sup> Amaral DG, Corbett BA. The amygdala, autism and anxiety. *Novartis Found Symp*. 2003;251:177-87.

<sup>9</sup> Comparative neurophysiology teaches that the relative size of the regions or structures of an animal's brain explains much concerning their abilities and behavior. Cats possess a better sense of balance than humans because their cerebellum is relatively larger. Dogs have better senses of smell because their olfactory lobes are much larger. That humans are so much better problem solvers is related to our own large cerebral cortex.

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<sup>10</sup> Kalin N. 2001. "Brain Mechanisms Underlying Fear, Anxiety and Depression." Neuroscience Training Program, University of Wisconsin, < <http://ntp.neuroscience.wisc.edu/faculty/kalin.html> > (as of) December.

<sup>11</sup> Manning BH, Merin NM, Meng ID, Amaral DG. 2001. Reduction in opioid- and cannabinoid-induced antinociception in rhesus monkeys after bilateral lesions of the amygdaloid complex. *Journal of Neuroscience*. Oct 15;21(20):8238-46.

<sup>12</sup> Amaral D. Neurobiology of Primate Social Behavior. Grant no. 5R01MH057502 National Institute of Mental Health: 1998-2003. CRISP (Computer Retrieval of Information on Scientific Projects) database <http://crisp.cit.nih.gov/>.

<sup>13</sup> Wallis JD, Anderson KC, Miller EK. 2001. Single neurons in prefrontal cortex encode abstract rules. *Nature*. Jun 21; 411(6840): 953-6.

<sup>14</sup> Goodall J. 1986. *The Chimpanzees of Gombe: Patterns of Behavior* (p 7). Boston: Belknap Press of Harvard University Press.

<sup>15</sup> Kohler W. 1925 (2<sup>nd</sup> edition, 1951, p 265) *The Mentality of Apes* Routledge & Kegan Paul LTD.

<sup>16</sup> For an overview of these experiments up until 1986 see Stevens ML 1986 *Maternal Deprivation Experiments in Psychology: A Critique of Animal Models*. Published jointly by the American, National, and New England Antivivisection Societies. But maternal and social deprivation experiments continue to be funded by the National Institutes of Health today throughout the country.

<sup>17</sup> Masserman J, Wechkin S, Terris W. 1964. 'Altruistic' behavior in rhesus monkeys. *American Journal of Psychiatry* vol. 121: 584-5.

<sup>18</sup> "Before the race for the polio vaccine, there were an estimated 5 to 10 million rhesus macaques in India. During the height of the vaccine work, in the late 1950s and early 1960s, the United States alone was importing more than 200,000 monkeys a year, mostly from India. By the late 1970s, there were fewer than 200,000 rhesus macaques in India," (p. 250). Blum D. 1994. *The Monkey Wars*. Oxford University Press.

<sup>19</sup> See note 5. Of these animals, many are held in National Institutes of Health (NIH) sponsored facilities. The eight Regional Primate Research Centers have approximately twenty thousands monkeys on hand at any one time. Outside the RPRC system, other universities such as Wake Forest and the University of South Alabama have large populations, also sponsored directly by the NIH. NIH maintains approximately one thousand monkeys itself at the National Animal Center in Poolesville, Maryland. The Food and Drug Administration (FDA) has a large population at the National Center for Toxicological Research just outside Little Rock, Arkansas, and owns another 3000 monkeys kept on Morgan Island off the coast of South Carolina. The Department of Defense maintains monkey colonies at various facilities. Of the nearly sixty thousand primates being used every year, a very large percentage must be paid for directly with tax dollars.

<sup>20</sup> U.S. Fish & Wildlife Service LEMIS [Law Enforcement Management Information Service]. Data tabulated and itemized at the Coalition to End Primate Experimentation (CEPE) website: [http://cepe.enviroweb.org/imports\\_chart.html](http://cepe.enviroweb.org/imports_chart.html)

<sup>21</sup> As a single example among many: NONHUMAN PRIMATE MODELS OF NEUROBIOLOGICAL MECHANISMS OF ADOLESCENT ALCOHOL ABUSE AND ALCOHOLISM Release Date: October 4, 2001 RFA: RFA-AA-02-006 National Institute on Alcohol Abuse and Alcoholism (<http://www.niaaa.nih.gov/>) Letter of Intent Receipt Date: January 21, 2002 Application Receipt Date: February 19, 2002 "PURPOSE: The National Institute on Alcohol Abuse and Alcoholism (NIAAA) invites applications using nonhuman primate models to focus on the following areas: 1) neurobiological mechanisms and risk factors for alcoholism during late childhood through adolescence; 2) the relative contribution and/or interaction of genetic, environmental, and social factors (e.g., stress, peer influences)

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with neurobiological mechanisms in the development of adolescent alcohol abuse; 3) evaluation of the immediate and long-term consequences of heavy drinking during adolescence on cognitive/brain functioning; and 4) the contribution of early alcohol exposure (juvenile and adolescent periods) to excessive drinking and abnormal cognitive and social functioning during subsequent developmental stages.... FUNDS AVAILABLE: The NIAAA intends to commit approximately \$2.5 million in FY 2002 to fund approximately 6 to 8 new and/or competitive continuation grants in response to this RFA....” (Viewable at <http://grants.nih.gov/grants/guide/rfa-files/RFA-AA-02-006.html> as of January 1, 2002.)

<sup>22</sup> For instance: On December 15-18, 1998, during an inspection of the Oregon Regional Primate Research Center, the USDA inspector, Dr. Isis Johnson-Brown, DVM, noted in her written report that “the area in front of the feeding pads in corral 3 that the animals have to cross to enter the inside feeding area is excessively wet, composed of a mixture of mud, algae, urine and feces, and the same conditions exist in the corners of corrals 4 and 6.”

<sup>23</sup> American Veterinary Medical Association Constitution 2000 Revision. Article II.

<sup>24</sup> Principles of Veterinary Medical Ethics of the American Veterinary Medical Association (AVMA), (1999 Revision). Part II, Professional Behavior, paragraph A.

<sup>25</sup> American Association for Laboratory Animal Science. Policy on Humane Care and Use of Laboratory Animals. "The American Association for Laboratory Animal Science (AALAS) endorses the United States Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training."

<sup>26</sup> Brown DA, Boysen ST. 2000 Spontaneous discrimination of natural stimuli by chimpanzees (Pan troglodytes). . Journal of Comparative Psychology Dec; 114(4): 392-400.

<sup>27</sup> DeWaal responding to a PBS broadcasted *Scientific American Frontiers* viewer’s online question: “Do chimpanzees have emotions?” April 17, 2001. <http://www.pbs.org/saf/1108/hotline/hdewaal.htm>

<sup>28</sup> Fouts R. 1997. *Next of Kin: What Chimpanzees have Taught Me about Who We Are*, p 350 (emphasis in original). William Morrow and Company, Inc.

<sup>29</sup> Ingersol B. 2000. (unpublished manuscript) Chimp Friends: Nim Chimpsky 1973-2000.

<sup>30</sup> Reynolds V, Reynolds J. 1993. Riding on the backs of apes. In *Ape, Man, Apeman: Changing Views Since 1600. Evaluative Proceedings of the Symposium Ape, Man, Apeman: Changing Views Since 1600*, a part of the Pithecanthropus Centennial (1893-1993) Congress “Human Evolution in its Ecological Context.” Leiden, The Netherlands, 1993.

<sup>31</sup> Washburn DA, Rumbaugh DM. 1991. Rhesus monkey (*Macaca mulatta*) complex learning skills reassessed. *International Journal of Primatology*. Aug; 12(4): 377-88.

<sup>32</sup> Srrum SC, 1987. *Almost Human: A Journey into the World of Baboons*, p 153. Random House.

<sup>33</sup> Capitanio JP, Mason WA. 2000. Cognitive style: problem solving by rhesus macaques (*Macaca mulatta*) reared with living or inanimate substitute mothers. *Journal of Comparative Psychology*. Jun; 114(2):115-25.

<sup>34</sup> Besides Capitanio, a recent past president, Melinda Novak, the current treasurer, Steven Shapiro, and the current executive secretary, Janette Wallis, are all affiliated with primate vivisection. Novak works with the primate colony at the University of Massachusetts, Amherst, and is a frequent research collaborator of Steven Suomi’s, another of Harlow’s students. Steven Shapiro is a primate veterinarian at the M.D. Anderson Cancer Center in Houston. Janette Wallis works in direct support of the Baboon Research Resource Program at the University of Oklahoma, a supplier of baboons to “three colleges of the Health

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Sciences Center, two non-profit research institutions on the Oklahoma Health Center Campus, the three main university medical teaching and research institutions in the State of Oklahoma, and 10 medical centers located throughout the United States,” (from CRISP entry for grant# 5P40RR012317).

<sup>35</sup> Of the 797 members listed in the ASP’s 1999 Directory, 101 were either known by name to this author as primate vivisectors or listed themselves as affiliated with institutions such as the NIH Regional Primate Research Centers dedicated to the experimental use of primates. Many others were listed as affiliated with institutions known to be involved in primate experimentation, but not exclusively so. Persons from this latter group are not included among the 101. The percentage of ASP members directly involved with the primate experimentation industry is likely significant with regard to ASP policy decisions.

<sup>36</sup> Bogle R. 1997. “A Call for an Immediate Moratorium on Primate Research.” Coalition to End Primate Experimentation. The current list of signatories is available on the Primate Freedom Project website: <http://www.primateliberty.com/moratorium/index.html>.