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## ***Star Witness***

"Your Honor, this is *totally* outrageous! The prosecuting attorney is proposing something completely unprecedented."

Defense lawyer Kenny DeJohn stared expectantly at Judge Jean Loismead, who frowned and immediately shifted her gaze to the prosecution's table.

"Ms. Curtair, I must say that I find your motion highly irregular."

Deputy D.A. Alyson Curtair winced. She knew this was going to be a hard fight. But she was not about to let the defense persuade Judge Loismead to bar her star witness—her only eyewitness—from testifying.

"Your Honor, we can establish the credibility of our witness. Without his testimony we believe that we *can* win this case, but in the interests of justice we think that his testimony should be heard."

DeJohn started to speak, but before he could get a word out, Judge Loismead raised her hand.

"Mr. DeJohn, I know your position on this matter, and I am sympathetic. But this case is unusual in more than one respect."

"But, your Honor..."

"Mr. DeJohn, kindly allow me to finish. As I was saying, this case is unusual in a number of respects. And although I have severe reservations about this witness, I am prepared to adjourn this hearing until Friday to allow you both to prepare arguments. Until that time, the witness must be sequestered to prevent any coaching from the prosecuting team."

"The prosecution can live with that, your Honor, provided that he can remain in his usual living quarters."

"Agreed, Ms. Curtair. You will make arrangements with the bailiff."

Curtair smiled. She had gained almost a two-day reprieve. DeJohn, however, was in no mood to smile.

"Your Honor!"

"Mr. DeJohn, you will have your chance to present your arguments on Friday at 9 a.m. in this courtroom. I expect written briefs at my chambers by tomorrow, Thursday, at 5 p.m., with copies to opposing counsel. You will keep your briefs to less than 2,000 words. This session is adjourned!"

He couldn't believe it. He really couldn't believe it. This sentimental fool of a judge was seriously considering giving the prosecution a chance to hang his client on the testimony of a parrot!

Moments later, outside the courthouse, DeJohn was stating his disappointment for the benefit of the reporters and television crews who had been waiting there all day. Curtair was able to slip by unmolested. The judge did not allow cameras in her courtroom, which made the crews waiting outside desperate for something they could use on the evening news shows. The reporters knew that Curtair would of course say that she was pleased with the events today—hardly exciting television. So all attention was focused on DeJohn, who was struggling to avoid insulting the judge's intelligence.

The story, when it broke, had made live coverage on international cable news. Renowned psychologist Feba McFork had been found dead in her laboratory at the university. Her graduate student Jethro Tullstoy had entered the lab at about six on Sunday morning, intending to feed Chiapa, the 20-year old African Grey parrot, who had helped to establish McFork's fame for the past 15 years. Greys, like many other parrots, can live more than 50 years, and Chiapa continued to provide Tullstoy and McFork's other students with plenty of material for their research.

Entering the lab involved a tedious process of entering the proper code on the cipher-lock and then opening a second lock that required two complete revolutions of a

key once the light on the door had turned green. Chiapa's fame had made him a prime target for animal liberationists who felt that such an obviously intelligent animal deserved to be free. No matter that on the one occasion Feba had taken Chiapa home with her, Chiapa had spent the entire time saying 'Want home, want home!'—his way of asking to be returned to his room at the lab. The whole lab was being renovated that week, so there was no question of returning him to the lab. Feba had to spend several days listening to Chiapa's complaints. She never tried to take Chiapa out of the lab again.

When Jethro entered the lab that morning, the sound of Chiapa making a commotion was not unusual. 'It's OK, Chiapa!' he shouted in the direction of the parrot's room. But it wasn't okay. McFork, or what was left of her, was lying directly under Chiapa's perch. And the parrot, between ear-piercing shrieks, kept repeating 'Bad! Bad! Casey! Bad!'

Campus police sealed the area within ten minutes of Tullstoy's call. It was only another five minutes before the first press members arrived at the scene. McFork and Chiapa had both become famous well beyond academia because of their frequent appearances in science television programs and in national magazines. Their fame had really taken off when Chiapa appeared on the cover of a weekly news magazine prominently displayed at supermarket checkout stands. The mere mention of McFork's name on the police radio was sufficient to alert the local press, and when the cable networks arrived, the story went international. Footage of Chiapa the parrot being taken from the crime scene was shown from Bombay to Biarritz.

The police determined that there had been no forced entry into McFork's lab. The cipher-lock records showed that the code had been correctly entered at 8 p.m. and again at 11 p.m. on Saturday evening and that the correct key had been used in each case. The later entry was less than an hour before the estimated time of death. There were plenty of fingerprints in the lab, but all belonged to McFork, her students, or the maintenance workers, who would not normally be working on a Saturday night.

A quick check of the students who had access to McFork's lab revealed that only Casey Heile lacked an alibi for the time of the murder. Other pieces of evidence fell into

place and Heile was arrested the following Friday.

From the D.A.'s point of view, the case against Heile was good, but wholly circumstantial. Plus there was the problem of motive. It was known that Heile and McFork had had some serious disagreements, mostly over Heile's research. It wouldn't be the first time that a student had killed a faculty member over an academic dispute, but would a jury accept it as a motive in this case? McFork's killer had to be put away and the parrot's testimony could be the crucial element.

Curtair had read through Tullstoy's statement at least a hundred times. Each time, she was struck by the parrot's words—'Bad! Casey!' A call to Tullstoy confirmed that Chiapa knew and used the names of Jethro himself, Feba, and several of the other students working in the lab, including Casey. But what about the word 'bad'? Curtair knew what it meant in English, but did it mean the same thing in the mouth of a parrot? Do words mean anything at all in the mouth of a parrot? After all, in the English language, 'to parrot' something means to repeat it mindlessly.

Tullstoy told her that while the word 'bad' was sometimes used to scold Chiapa, he could not remember ever having heard Chiapa say 'bad' until the morning he had stumbled upon the murder scene. Tullstoy had also visited the bird with another student a few days after the murder. Chiapa had been basically calm and seemed pleased to see them. At one point during the visit, Tullstoy and the other student were talking to each other when one of them had mentioned the name 'Casey.' At that point Chiapa had 'gone ballistic', shrieking and saying 'No, no!' and 'Bad!' It had taken almost twenty minutes to get the animal calmed down again.

Even if Curtair could make the case that the parrot knew the meanings of the words 'bad' and 'Casey' independently, could she make the case that the combination of words meant what it seemed to mean? As an undergraduate, Curtair had taken a psycholinguistics course in which the professor had lectured on the so-called 'ape language studies.' In the early part of the twentieth century, behavioral scientists had first tried systematically to train apes to speak, but they soon realized that all the closest primate relatives of humans—chimpanzees, gorillas, and orang-utans—lack the

specialized vocal apparatus necessary to make human speech sounds. Although the animals seemed capable of responding to the human voice, they were unable to reproduce the sounds. Then, in the 1970s and '80s, there were a number of breakthroughs using plastic tokens, computerized keyboards, and American Sign Language instead of spoken language. Many comparative psychologists argued that they had been able to show that the animals could string words together to make sentences using these tools.

Curtair's professor had been skeptical about these alleged breakthroughs, because, he argued, they did not rule out the possibility that the chimpanzees and gorillas were simply copying, without any comprehension, signals they had previously seen their handlers use. Combinations of signals could arise in the same way. There was also the question of observer bias—the case of researchers seeing what they wanted to see rather than what was really there. Another problem was that the animals might have been responding to subtle cues provided quite unconsciously by the handlers. That was how, during the first decade of the twentieth century, a horse known as 'Clever Hans' had fooled many people into thinking he could do arithmetic problems. Hans could be asked to add two numbers, and he would tap a hoof the requisite number of times until he reached the correct answer. On investigation it was discovered that the horse was successful only if the person in front of him knew what the correct answer was. Hans was reacting to cues unconsciously provided by people around him. If prevented from seeing anyone who knew the right answer, Hans was no better than blind chance at producing the correct answer. But even those who knew that Hans was taking cues from subtle changes in body position found it next to impossible to hide their reactions. The label 'Clever Hans Phenomenon' came to be used to dismiss many claims about the mental abilities of trained animals.

One of Curtair's philosophy teachers had also argued pretty convincingly that there was simply no way to give an unequivocal interpretation to the behavior of animals. If a dog chases a squirrel up a tree and then stands barking at the bottom of the tree, it might at first seem reasonable to say that the animal thinks that there is a squirrel up the

tree. But how could we be sure that the dog is thinking that the furry animal it chased is a *squirrel*? After all, part of the concept of a squirrel is that it is a mammal, but the dog surely wouldn't know *that*. Even 'animal' or 'furry animal' would not do, as the concept of an animal implies a distinction between a biological entity and a clever mechanical copy. The professor had claimed that this uncertainty about the content of many mental states made it unlikely that there was any point for cognitive scientists to talk about mental content.

Curtair knew that DeJohn was a thorough enough lawyer to be able to track down the research that had supported these conclusions, and perhaps even bring in some of the authors as expert witnesses. She would have to call Tullstoy for help with finding research that supported the opposite conclusions.

At 5.30 on the following evening, Kenny DeJohn was in his office with Alyson Curtair's brief in hand. His own brief had been sent by courier to the judge and to the deputy D.A. just over half an hour earlier.

DeJohn had been something of an oddity at law school, having received an undergraduate degree in electrical engineering, whereas most of his classmates were trained in the liberal arts. Another oddity was DeJohn's interest in criminal law. Most lawyers with backgrounds in science or engineering had gone into patent law, a growing area with the boom in computer and biotech companies spinning out of university research. As an undergraduate engineer, DeJohn had been trained to think that rigor in science meant quantification. Science without numbers was soft science, hardly deserving of the name. In researching his brief he had read a number of arguments claiming to support the view that animals had minds, but they all seemed to him to lack any statistical rigor. As he settled down to look at Curtair's brief he expected nothing better.

Half an hour later, Judge Jean Loismead sat down to read the two briefs. Nothing in her background had prepared her for the scientific aspects of this case. She had majored in history as an undergraduate and flown through law school near the top of her class, worked as a trial lawyer, and made it to the bench in less than 10 years. Since

making it to the bench she had several times ruled on the fate of a dog that had chased one postal worker too many. She had also read that in medieval Europe there had been hundreds of cases of animals, from insects to mammals, being tried and publicly executed as criminals. But this was the first case she had encountered where an animal might be considered capable of testifying for the prosecution.

She settled down to read the two briefs, hoping that the issues would become clearer.

**Case of State v. Heile, Court of Judge Jean Loismead**

Prosecution brief prepared by Alyson Curtair, Deputy District Attorney, Representing the State

The issue facing the court is whether to allow the testimony of a language-trained parrot, an African Grey named 'Chiapa,' in the trial of Mr. Casey Heile for the murder of Dr. Feba McFork.

The state contends:

1. That humans are not unique in possessing the mental capacities required for reliable observation and reliable reporting of events that they experience.
2. That because of his special training with the English language, this animal is especially able to provide reliable testimony of events leading up to the murder of Dr. McFork.
3. That the parrot should not be disqualified because he cannot be subjected to the kind of detailed cross examination used for "normal" witnesses, because other witnesses, such as young children, cannot be subjected to detailed cross examinations.
4. That in light of the foregoing conditions, and because inevitably the disposition of any jury will be one of skepticism toward this animal, allowing the members of a jury to weigh the parrot's testimony for themselves would not constitute especial prejudice against the defendant.

1. Science supports the view that mental activity is a direct function of nervous tissue. Nervous tissue has evolved in response to specific selectional pressures arising from environmental complexity and variability. Perception, memory, and learning all represent general methods for dealing with environmental complexity. The precise relationships between brain states and mental states, such as belief and consciousness, remain unclear. However, it is clear

that the common-sense view of the human mind as a seamless unity is mistaken. Almost any aspect of mental experience or ability can be possessed independently from any other. One of the most dramatic examples is provided by the phenomenon of blindsight. Humans with certain kinds of damage to the visual cortex have a scotoma, or blind spot, within which they deny conscious awareness of sight. Yet if asked to guess what they might be seeing, they can correctly identify some patterns of light at levels well above chance.

Because different species have evolved under varying conditions, organisms show a wide variety of overlapping and nonoverlapping abilities. Humans show very advanced capacities, particularly with respect to language and mathematics. However, in other regards their abilities are often less advanced than those of other animals. Elephants can coordinate group activities over distances of greater than 15 kilometers, using very low frequency sounds. Many species of birds and mammals are capable of remembering the locations of dozens of separate food caches over periods of many months. Ethologists, who study the evolution of behavior, have identified many communicative capabilities once thought to be unique to humans. Vervet monkeys give different alarm calls that are specific to particular types of predators (e.g., snake, leopard, eagle) and which evoke different and appropriate evasive responses. Rhesus monkeys give calls that indicate the discovery of food and its quality. A similar set of alarm and food calls is used by chickens. Such abilities are not restricted to primates, mammals, or even vertebrates. Many species of bees perform dances that convey information about location and direction to food sources.

Thus, although we should not expect to find that other animals possess all of the abilities associated with the human mind, there are plenty of reasons to suppose that human mentality is not an isolated phenomenon. Evolutionary continuity between human minds and animal minds

may exist both in the form of homology (shared characteristics because of shared ancestry, as, for example, between humans and monkeys) and homomorphy or analogy (shared characteristics because of convergent evolution—that is—common responses to common problems as, for example, between the communicative abilities of humans and bees).

Little is known about the behavior of African Grey parrots in the wild. It is known that they are social birds who forage by day in small groups and roost at night in large colonies. In captivity they are known to mate for life monogamously and to develop special calls used only with their mates. Not enough is known for certain about the functions of their vocalizations in the wild, but the high degree of their sociality and the high degree of plasticity of their vocalizations suggest that these vocalizations are important to social communication.

2. Chiapa has been highly trained to use English to communicate his needs and to respond to questions by the victim and her colleagues. Chiapa was not the first parrot to be trained in this manner. The first is another African Grey named Alex, who is under the care of Dr. Irene Pepperberg, presently at the University of Arizona in Tucson. Pepperberg's innovative training methods employed human models for the behaviors Alex was to learn. Two humans first modeled a question and response for Alex and then presented him with the same situation. For example, Alex might be shown an object and asked 'What color?' For a correct response he was given the object to play with for a few moments. Alex was not rewarded with food unless the object of attention was specifically a food item. Attention from his trainers and access to the objects were the only rewards. Using such techniques, Pepperberg was able to show that Alex can answer a number of different questions about numerous objects, such as color (green, blue, etc.), composition (paper, wood, etc.), and shape (square, triangle, etc.), even for unfamiliar objects. Alex can make same/different judgements about these attributes. For instance, if he were shown a

green triangle and a green square and were asked ‘What same?’ he would respond ‘color’, but if asked ‘What different?’ he would respond ‘shape’. Alex is also able to answer questions such as ‘How many?’ when shown an array of objects, and even ‘How many blue?’ given an array of differently colored objects. Pepperberg is presently using Alex as a model for training other African Greys. She has also addressed the problem of subtle cuing by human trainers (known as the ‘Clever Hans’ phenomenon) by showing that parrots can answer questions correctly even when no humans are present. An African Grey who is alone in a room first hears the instruction ‘Listen up’ over an intercom and then he is given a series of audible clicks followed by the question ‘How many?’ to which he responds with the correct answer. The behavior of these animals is far more flexible than Clever Hans’ relatively inflexible responses to the cues provided by people around him.

It has been argued by many scientists and philosophers that nonhuman animals have conscious access only to very recent stimuli and lack long-term memory for specific events. Memory may be divided into semantic memory, which concerns mainly general associations between different types of stimuli, and episodic memory, which concerns memory of specific episodes or events. Scientists agree that animals have long-term semantic memory, meaning that they form long-term associations between certain types of stimuli. But long-term memory for specific episodes is more difficult to prove. Episodic memory is very important to the legal system because witnesses are called upon to recall specific details of events that may have occurred very far in the past. Anecdotal evidence suggests that animals other than humans do have long term episodic memories. Elephants in Africa, for example, return for many years to locations where group members died, and where they engage in behaviors which suggest that they are remembering their dead companions. For instance, they may manipulate the bones of the

deceased for considerable periods. Also suggestive is the fact that many animals show an aversion to something or someone on the basis of a single bad experience. Conversely, parrot trainers know that if a parrot shows a dislike for a particular person, then putting the parrot into a aversive situation where the disliked person can rescue it often improves the parrot's subsequent behavior toward that person. However, it is possible to regard single instance learning in terms of semantic memory.

While these anecdotes are suggestive, Dr. McFork believed that it was necessary to bring research into the laboratory to determine conclusively the existence of episodic memories in animals. She also believed that most skepticism about the existence of episodic memory was based on a failure to design suitable experiments. Thus, McFork had recently been working with Chiapa to show that Chiapa could provide reliable reports of events that had occurred hours, days, or weeks previously. Prior to McFork's death, this work had been going on for more than 18 months but it has not yet been reported in the scientific literature. Chiapa is shown a sequence of two colors drawn from four possibilities—red, green, blue, and yellow. There are 16 possible combinations, and each day, Chiapa is then shown a second sequence of two colors and is asked, 'What colors now?' and 'What colors before?' For the first question, Chiapa is successful 80% of the time, responding 'blue, yellow' if those were the two colors just shown. For the second question, Chiapa's performance depends on the interval between the two presentations of color sequences, but even at 36 hours it is still significantly above the 6% predicted by chance.

**3.** Chiapa lacks the vocabulary necessary for full description of the events surrounding the victim's murder. However, the state believes that by recreating in part those circumstances, it will be possible to elicit from the parrot responses that will provide information to the court. The process of reenactment is commonly used with witnesses, such as young children, who may not

be fully able to answer questions about their experiences. In such cases, it is assumed that the reenactment assists in the recall of episodic memories, and that witnesses' responses can therefore be taken as information about the actual events. Although it is unprecedented to place a parrot in the position of being a witness in a court of law, it is not unprecedented to use witnesses who are not fully capable of responding to questions about their testimony.

**4.** Members of the jury will naturally be incredulous about the testimony of a parrot. Thus there will be a heavy burden on the state to demonstrate the veracity of the witness. It should be up to the jury to decide whether the state has made its case. The state believes that the good sense of a jury may be trusted in this matter. Thus, to allow the parrot to testify would not be prejudicial to the defendant, Mr. Heile.

**Formal Brief in the case of State v. Heile, Court of Judge Jean Loismead**

Prepared by Kenneth DeJohn, Esq. representing the defendant Mr. Casey Heile

The state has petitioned the court to allow a parrot to appear as a witness in the trial of Mr. Casey Heile for the murder of Dr. Feba McFork. Not only is it unprecedented to allow an animal to take the stand in a court of law, there are both scientific and judicial reasons for disallowing such an occurrence. First, there is an inadequate scientific understanding of the mechanisms responsible for the parrot's so-called 'testimony'. Second, in the absence of such understanding, there is no basis for confidence in any interpretation of the noises that it makes, no matter how closely they may resemble English words. Third, there is no scientific or philosophical basis for holding that an animal has the concepts, beliefs, or knowledge required to provide sound testimony. Finally, the animal could not be effectively cross-examined, thus violating the right of the defendant to confront his accuser.

**Mechanisms**

Modern psychology has become a more rigorous science by moving the investigation of behavior into the laboratory, where it may be studied under carefully controlled conditions. Feba McFork's work on Chiapa itself represents an element of this strategy. However, the prosecution's proposal to place this parrot on the witness stand has little to do with the carefully controlled lab work that is the cornerstone of scientific psychology. Their proposal has more to do with the unconstrained and anecdotal anthropomorphizing common both to 19th Century comparative psychology and to modern cognitive ethology. Valid scientific theorizing must be based on repeatable experimentation, but, for obvious reasons, that cannot be achieved in this case. Many scientists

would testify that cognitive ethologists lack an adequate theoretical basis for their attributions of mental states to animals. Classical ethology is on much firmer ground because it restricts itself to the study of *behavior* within an evolutionary and comparative frame work . Despite what some cognitive ethologists would like to believe, it is not possible to make an adequate determination of consciousness and higher mental processing simply by watching animals behaving freely in their natural habitats. Only psychological experimentation under laboratory conditions can provide the necessary experimental controls. Because it is impossible to control field work adequately, cognitive ethologists are unable to rule out explanations of observed behaviors in terms of direct, automatic responses to stimuli.

Even though this parrot has been raised and trained in a laboratory, interpretation of its behavior in this case shares more in common with the field of cognitive ethology than with laboratory psychology, because the situation to which the parrot was exposed on the night of McFork's murder was completely uncontrolled. Thus, our attempts to interpret the response of the parrot has the status of attempts to interpret a single observation made under field conditions and cannot therefore be interpreted except in an anecdotal fashion. Even from the perspective of a strict stimulus-response approach to behavior, there is not sufficient information in the animal's response to make it possible to say what stimulus conditions were present at the time of the murder. Nor can neuroscience provide any assistance in this respect. Although computerized models of simple neural systems have been developed, these models typically involve fewer than  $10^5$  individual elements, at least four or five orders of magnitude less than the number of neurons in a parrot's brain. While neuroscientists have a very general understanding of the workings of simple neural networks, they are still a long way from an adequate understanding of complex nervous systems belonging to anything other than the simplest invertebrates. Furthermore, the

anatomical differences between birds and mammals are sufficiently great to make extrapolations from one class of organisms to the other extremely problematic.

We therefore conclude that neither psychology nor neuroscience can support any sufficiently strong claim in favor of the reliability of the connection between the parrot's behavior and its experiences.

### **Interpretation of animal behavior**

The state's petition presupposes that the parrot's utterances can be given a straightforward interpretation. The court should not, however, be misled by the parrot's use of English words into thinking that these words should be given their usual English interpretation. The prosecution intends to argue that the parrot can place the defendant at the scene of the alleged murder.

Suppose, contrary to fact and for the sake of argument only, that the animal could directly answer the question 'Whom did you see on the night of the attack?' by making a noise resembling the name of the defendant. Even then, it would not be reasonable to claim that the defendant had been named, because there are no grounds for assuming that the parrot uses a sound resembling 'Casey' to identify the defendant uniquely. We do not know, for instance, whether the parrot would also use this sound for an intruder who happened to resemble the defendant, and we cannot ask the parrot to distinguish this possibility. This point applies not only to names, but to any of the words that the parrot might appear to use. For example, it is alleged that the parrot can ask for specific things. But even if it says something we interpret as 'Want peanut' and ceases to say it if we give it peanuts, this does not guarantee that the parrot has the concept of peanut, for it might just as well have ceased vocalizing if it had been given cashew nuts instead of peanuts.

Additionally, for human beings, peanuts fall under the concept of nutritious food items. But it is

very doubtful indeed that parrot has the necessary concepts of food or nutrition, thus the meaning of the parrot's noise that sounds like 'peanut' is unclear. If we do not know what concept it is operating with, we really do not know what it is asking for.

Similar considerations apply to the interpretation of animal behavior even where mimicry of language is not involved. Predatory animals are selective about what they will prey on, but can it be said that a lion chasing a gazelle has the concept of a gazelle? Surely not, because it is part of the concept of a gazelle that it is a mammal and there is nothing to suggest that the lion has the concept of a mammal. And if it does not really know what a gazelle is, can it really be described as wanting to catch a *gazelle*? We must regard the attribution of concepts, beliefs, or desires with a specific content to animals as overinterpretation that is unavoidably indeterminate with respect to the observable behavior.

It is normal for human beings to interpret the behavior of animals in an anthropomorphic fashion—to assume that they have mental states similar to our own. But this anthropomorphism cannot be justified scientifically or philosophically. The dangers of anthropomorphism are much greater when the animal has been conditioned to mimic a human language. Careful analysis has shown that apparently spontaneous and intelligent responses of chimpanzees using sign language could be predicted from the gestures used just previously by human handlers. If the parrot were allowed to perform in front of a jury, it would be extremely difficult to prevent jurors from applying their normal, subconscious mechanisms of interpretation and hearing these words as if they had been uttered by a human witnesses, thus prejudicing them toward strong overinterpretation.

## **Truth and perjury**

Testifying before a court of law is a serious matter implying special duties and penalties for perjury. This is why witnesses are required to swear an oath to the truthfulness of their testimony. No witness should be allowed to testify who does not possess the concepts of truth and duty that are required to make the swearing of an oath a meaningful occurrence. The concept of truth also requires the concept of falsity, both of which in turn require understanding of the arbitrary and conventional relationships between symbols and what they symbolize. There is simply no evidence that supports the claim that any nonhuman organism possesses these concepts, and in particular there is no specific evidence to support this claim with respect to parrots. The mere ability to respond ‘correctly’ to a question does not show the possession of these concepts, since these responses may be seen as programmed or trained responses to the specific stimuli conditions provided by the external objects and the question. Turning to the concept of duty, this requires a concept of right and wrong, in a moral sense. While animals may expect punishment or retribution for certain of their actions, there is no evidence to suggest that they understand that their actions are right or wrong. Punishment can be unjust and therefore expectations of punishment cannot be taken as a measure of moral understanding. Once again, these expectations may be based on the ability of an animal to learn by forming associations between its actions and their unpleasant consequences, and thus may be seen as nothing more than stimulus-response conditioning.

### **The right to cross examination**

The procedure of cross examination is essential to the discovery of truth in the trial process. Whether a witness is willfully misleading a court, or merely confused about the details of an event, cross-examination allows inconsistencies or a lack of clarity in the testimony to be

exposed. An important tool in this process is the ability to ask essentially the same questions in various different forms. In the case of the 'language-trained" parrot, Chiapa, there is nothing like the redundancy of expression that is necessary to allow repeated questioning on any particular point. Thus, even if the risky assumption is allowed that the parrot's utterances are meaningful, the limited abilities of this animal do not allow for the kind of questioning that would establish confidence in the truth of the sentences it utters.

Shortly after 9 a.m. on Friday morning, Judge Loismead took her seat behind the bench.

"This evidence hearing is now in progress. Counsel, I have read your briefs, but I have not yet come to a decision on this matter. Ms. Curtair, given that the state is proposing such a radical departure from precedent, I regard you as having the larger burden to demonstrate the admissibility of your witness. In your brief you identify a number of points. You will present them in turn, and, Mr. DeJohn, you will be given a chance to rebut each point after Ms. Curtair has presented it. I expect also, Ms. Curtair, that you have prepared responses to the arguments presented by Mr. DeJohn in his brief, and once again I regard you as having the burden of demonstrating what is wrong with his arguments. You may proceed."

"Thank you, your Honor. Your Honor, the state contends that there is sufficient scientific basis for our claim that when Chiapa responds to questions posed in English, he both understands those questions in much the same sense as you or I would, and he understands his responses in much the same way as you or I. We are prepared to call expert witnesses to testify to this claim. While we admit that Chiapa cannot be questioned as thoroughly as a normal adult human being, this is not sufficient grounds for barring him from the witness stand. Many offenders have been convicted on the basis of the evidence of young children who are limited in their ability to answer questions. To bar the evidence of Chiapa while allowing the evidence of young children would be anthropocentric, representing the speciesistic assumption that humans are inherently superior to other organisms. In our view, Darwin's theory of evolution implies continuity between humans and other animals in all respects, including the mind. Dr. McFork's work was aimed precisely at establishing such continuities. Thus, we have both general and specific scientific reasons for inferring that Chiapa is highly sophisticated, cognitively speaking, which in turn leads us to regard his testimony as an important source of evidence that should not be ignored in this case."

"Mr. DeJohn, do you wish to respond?"

"Yes, your honor. We plan to contest the prosecution's anthropomorphic

interpretations of specific scientific research results as they arise, but for now we object to the analogy between parrots and children. Parrots are not young children. Young children grow up to be adult humans, but to my knowledge there has never been a single instance of a parrot growing up in this way! This is relevant because a child's brain structure is close enough to an adult's to allow reasonable confidence that the output of the child's brain can meaningfully be compared to the adult's. A parrot, if you'll pardon the expression, has nothing but a bird brain. A bird brain is, at best, a walnut-sized thing that lacks many of the anatomical developments that are highly important to human intelligence. For example, birds lack the highly developed frontal lobes that have been proven essential to the human ability to formulate and carry out tasks that require forethought and planning—characteristics that are essential for an action to be considered intentional. Counsel's appeal to evolutionary continuity serves only to obscure the differences."

When DeJohn paused to look at his notes, Curtair seized the opportunity to speak.

"There are other kinds of continuity than anatomical continuity, your Honor. Of course, Chiapa's brain is organized differently from yours and mine, but what matters is its functional organization, not spatial organization. In birds the temporal parts of their brains are highly developed and can carry out many of the same functions as human frontal lobes. Also, the use of absolute brain size as a measure of cognitive ability is misleading. Parrots and many other birds have a very high brain-to-body weight ratio, comparable to and in some cases exceeding that of humans. A large part of the human brain is not concerned directly with cognitive function but with processing sensory input and motor output. Larger bodies have more nerve endings, which are reflected in increased brain circuitry. Furthermore, in absolute terms many animals have larger brains than humans, for example, elephants and whales, but we would not argue that this fact alone establishes their ability to provide credible testimony. Humans are not even at the top of the scale for relative brain size, since they are surpassed in this measure by many species of bird. No, your Honor, the only reasonable criteria are behavioral and psychological."

While she was speaking, Alyson Curtair closely monitored Judge Loismead's facial expressions. Judges are human, and like others they prefer short arguments. Many strong cases have been lost because a long-winded lawyer loses the attention and then the sympathy of both judge and jury. Loismead had nodded her head almost imperceptibly to Curtair's point about the importance of behavioral evidence. Curtair decided that it would be counterproductive to push the argument any further. Maybe Clever Hans couldn't do arithmetic, but he could still teach us a lot about body language.

"Mr. DeJohn, I am inclined to agree with Ms. Curtair about the irrelevance of brain anatomy. The issues here are the truth and reliability of the parrot's testimony. In any other case the court would not require knowledge of witnesses' brain structures in order to determine the admissibility of their evidence. We shall apply the same standard in this case."

"Your Honor, that prejudges this case in favor of Ms. Curtair and the parrot."

"Nonsense, Mr. DeJohn. Ms. Curtair is still required to establish that the parrot can meet reasonable behavioral criteria. I am simply disallowing considerations that would suggest a double standard with respect to this witness."

DeJohn snorted quietly, but said nothing. The defense had other arguments. It would have been simpler to bypass the behavioral evidence—behavioral science was notoriously soft compared to neuroscience—but the judge seemed to have made up her mind on this issue, and to press further could cause complications later on.

"Ms. Curtair, you may proceed with your arguments. But be warned that I expect you to focus on more specific arguments than the vague and general idea of evolutionary continuity, which seems to me to beg the question of how you know that such continuity exists."

Curtair glanced over at DeJohn, who seemed barely able to contain himself. The judge had just tossed him a bone, but not much of one. She knew that DeJohn had been hoping to get a ruling against her witness on the basis of anatomical differences. Loismead had ruled that whole strategy out of court, and then she had turned around and ruled part of the prosecution's strategy out too. But they were hardly comparable, and

Curtair knew it. She couldn't resist a slight smile.

"We will endeavor to stay within your guidelines, your Honor. The central issue dividing Mr. DeJohn and the D.A.'s office is that of how to interpret Chiapa's utterances in English. We argue that Chiapa has mastered a portion of the English language, whereas Mr. DeJohn is apparently inclined to regard the resemblance of Chiapa's utterances to the English language as some kind of fluke that has little to do with the normal meanings of those utterances."

"Is that a fair summary of your view, Mr. DeJohn?"

"Not quite. Of course it's no fluke that the parrot makes noises that sound like English—that's what he has been trained to do. But the interpretation that he is speaking English is entirely one-sided. A child's doll may be programmed to speak with a synthesized voice that we can all interpret, but no one thinks that this demonstrates any kind of understanding or intelligence in the doll—the interpretation is all one way. Similarly with this parrot."

"With all due respect, your Honor, Mr. DeJohn knows better than to compare Chiapa to a toy doll. There are big differences between the two: first, there is his ability to answer questions appropriately; second, his ability to learn new words; and third, his ability to combine learned words into novel phrases."

"Ms. Curtair, as the judge in this case I will from time to time interject questions. The question here seems to me to be one of the definition of a language. You just gave three criteria to support your claim that the parrot speaks a language. But perhaps you could explain to the court precisely what this animal can do that shows that it satisfies those criteria, and why these criteria should be taken to constitute language use."

Curtair had been dreading a question about defining language. Nevertheless she was prepared.

"I'd like to take the second question first, if I may. Attempts to define a language have divided psychologists and linguists. Linguists have generally dismissed psychologists' claims to have discovered language abilities in nonhuman animals. Many linguists regard language as a separate evolutionary development, uniquely human, and

housed in specially dedicated parts of the brain, typically in the left hemisphere. In contrast, many psychologists view language as an extension of basic cognitive skills that may be found in humans and other animals. Support for this view has also come from primatologists who have found that several species of monkeys have left hemisphere specialization for processing vocal calls from their own species, whereas arbitrary noises and vocalizations of other species are processed equally by either hemisphere."

"Your Honor, we would like to object to counsel's return to neurological arguments that you have ruled out. If they are to use such arguments, we believe we can provide stronger arguments supporting our view that the parrot does not belong in the courtroom."

"Mr. DeJohn is right, Ms. Curtair. Please confine your comments to behavioral criteria."

"Yes, your Honor. For many linguists, there are two crucial issues in defining language. The first is that language is made up of meaningful units—words—that can be recombined according to the rules of grammar, or syntax to form sentences. Secondly, the syntax of all human languages provides 'infinite expressive power', meaning that the syntactical rules allow an infinite number of grammatical sentences to be formed from a finite number of words. In English this is easy to illustrate with examples such as the sequence 'John ran'; 'John ran and then walked'; 'John ran and then walked and then ran', and so on. Each of these sentences describes a different sequence of events. An important behavioral criterion for demonstrating syntax is appropriate response to novel combinations of words. For instance, competent English speakers can understand the sentence 'The man carried the elephant' even if they have never encountered it before. This criterion has been met by parrots, as first shown by Dr. Irene Pepperberg with Alex, another African Grey. Dr. McFork adopted similar training techniques, and showed that Chiapa, like Alex, was capable of responding correctly to novel combinations of words."

"Your Honor, may I respond?"

"You may, Mr. DeJohn."

"The abilities of parrots, dolphins, apes, or monkeys to reproduce a few dozen

individual signs, and to produce short combinations of three or four such signs allows perhaps a couple of hundred of different combinations—still a long way short of infinity. So the results mentioned by Ms. Curtair hardly satisfy the criterion of infinite generative capacity."

"Infinite generative capacity, your Honor, is merely a theoretical ideal. In practice, humans are subject to memory constraints that make it impossible to for us to deal with arbitrarily long sentences. Many perfectly competent legal witnesses would have trouble making sense of many of the sentences in the novels of Marcel Proust, for example. In being limited to shorter sentences, parrots and other animals show only a quantitative difference in their capacity for decoding long sentences, rather than the qualitative difference that Mr. DeJohn is trying to urge on the court."

"This whole discussion, your Honor, is granting too much to the prosecution. It has been convincingly shown that claims on behalf of apes that they have mastered language are nonsense. For instance, the widely touted studies alleged to use American Sign Language turn out to show a high degree of observer bias. Deaf people shown films of these apes consistently identify many fewer 'signs' being made than the graduate students and other researchers whose academic careers depend on desperately seeking language."

"Your Honor, these studies are convincing only to those who wish to be convinced. Other studies have confirmed that the signs made by apes can be recognized by deaf observers. Although it is true that apes have difficulty reproducing some hand positions, this is because of differences in their anatomy, not their psychology. The fact that some deaf people have trouble interpreting the hand signals of some apes with whom they have no experience is no more surprising than the fact that some Texas would have trouble being understood in Brooklyn."

Both lawyers paused. Judge Loismead spoke next.

"The opinions of scientists and experts are extremely important in many phases of the trial procedure, from knowledge of ballistics to DNA testing. The courts have typically accepted things that are a matter of consensus among experts. Although there is often

dissent among experts, it is usually possible for the courts to judge the direction of preponderant opinion. With respect to this issue of animal 'language', I must say that I am skeptical, Ms. Curtair, that there is sufficient consensus to allow a clear legal ruling. Am I right?"

"The prosecution is confident that we can provide experts to support our claim about the linguistic abilities of Chiapa. And I might add that Chiapa's use of English words is quite recognizable by fully hearing English speakers."

"You haven't answered my question, counsel. I don't doubt that you can find experts to support your view. I am also fairly confident that Mr. DeJohn could find experts to support his. My worry is that this would result simply in a stalemate, with experts of opposing viewpoints and the jury unable to decide which group of experts to believe."

"Shouldn't the jury be allowed to make that decision, your Honor?"

"Only if I am reasonably satisfied that they could be provided with a sufficient basis for making the decision. However, I am not at all convinced of this. Even if you could convince a particular jury of your view, there would, in my opinion, be a very high chance that another jury could be convinced otherwise, which means that there is a good chance that a decision reached on the basis of accepting the parrot's testimony would be overturned on appeal."

Curtair was losing this argument; it was time to try a different tack.

"There is, in fact, no need, your Honor, to rule directly on the language issue, because even if it cannot be established that Chiapa meets the criteria for possessing a language, all that is really in question is whether there is a reliable connection between his testimony and the events on the night of Feba McFork's murder."

"Are you suggesting, Ms. Curtair, that the evidence provided by the parrot should be considered in the same light as perhaps a videotape of a crime might be allowed as evidence? If so, then I must ask why you have petitioned to allow the parrot into the witness stand...recorded evidence is not generally treated as a witness so perhaps the prosecution should amend its petition."

DeJohn preempted Curtair from replying to the judge.

"Your Honor? I must object on behalf of my client to your suggestion that the bird could be treated in the same manner as a tape recorder. A tape recorder is an artifact whose construction and operation can be attested by the designer, manufacturer, or qualified engineer. Thus it is possible to certain of the reliability of such a device as a recorder. Unfortunately for the prosecutor, even the D.A.'s office does not have the power to subpoena the great parrot designer in the sky, so no such information can be forthcoming."

"Ms. Curtair?"

"Your Honor, although it's ironic that Mr. DeJohn favors comparison with a talking doll, but not with a tape recorder. In fact, I agree with him on this point and that is why we have moved to admit Chiapa as a witness rather than a state's evidence."

"Then would you kindly explain your remark that the issue of language is not central to your petition."

"Certainly. We believe that the central issue is cognition, not language. Since Ancient Greek times many philosophers have argued that language is necessary for thought. But this anthropocentrism is hardly justified when one realizes that human language is just one form of communication system that has evolved. Communication is commonly defined as transfer of information, and cognition is commonly defined as information processing. Thus, although other forms of behavior are relevant to assessments of cognition, it is obvious why communication can provide especially compelling evidence for cognitive abilities. The real interest in the animal language studies has more to do with communication and cognition than with language per se."

"Your Honor?"

Yes, Mr. DeJohn."

"The prosecution is begging the question by assuming a connection between communication and cognition. Biologists have found systems of communication in many organisms, from mammals to insects and even trees. Surely the deputy D.A. is not seriously contending that whatever biologists determine as communicative behavior

automatically provides evidence of cognitive abilities. In fact, it is well known that animal communication can be explained in terms of simple stimulus-response mechanisms. Many scientific experts would argue that *any* cognitive explanation of a particular piece of animal behavior can always be matched by an equally good stimulus-response explanation. Also, fax machines transfer information, but that can hardly be taken as evidence of cognition."

"Mr. DeJohn, having read your brief I suppose that I am to understand that stimulus-response explanations are preferable to those that refer to mental or cognitive states in animals. Is that correct?"

"Yes, your Honor."

"And furthermore, that stimulus-response explanations are in some sense more scientific than mentalistic or cognitive explanations?"

"Yes."

"Do you consider this to be true also when it comes to human behavior?"

DeJohn recognized the trap and avoided it.

"No your Honor. Humans can talk about their mental states, which provides independent justification for attributing them. Essentially, however, mental states are private—not accessible to anyone except those who experience them—and science can deal only with observable phenomena. For languageless animals, the only observable phenomena are external stimuli and behavioral responses. Hence stimulus-response explanations are all that can reasonably be attempted."

"Isn't language just another form of behavior from which it is possible to determine mental states? So why is the situation much different with humans?"

"For two reasons. First, each of us knows how his or her mental states affects his or her behavior, and by analogy it is reasonable to believe that other humans who are similar to ourselves have the same mental states affecting behavior in the same ways. However, with nonhumans, the analogy breaks down and we cannot be certain of their mental states, or whether they have them at all. Second, language itself has a detailed structure. It is reasonable to assume that the internal structure necessary to explain

language production must be as detailed as the language that is produced. Thus it is reasonable to attribute mental states that have the same content as sentences. Nonlinguistic behavior is just not fine grained enough to force one to attribute complex mental states to explain it."

"Ms. Curtair?"

"Your Honor, a female vervet monkey will look toward her own infant if she hears the infant's distress call. All the other females who hear the the call will look towards *the mother*. This behavior is 'fine grained', if I understand Mr. DeJohn's use of the term, in that different infants elicit different responses depending on the relationship between the infant and the adult. It seems reasonable to say that the animals are aware of mother-infant relationships."

"This is just more anthropomorphism, your Honor! It is just as plausible to say that the monkeys are conditioned by the distress calls to attend to a particular individual because experience has taught them that this individual is most likely to respond to that particular call. It's not necessary to refer to awareness of relationships at all."

"What do you say to that, Ms. Curtair?"

"I believe that Mr. DeJohn and I are talking at cross purposes, your Honor. His oh-so-hard scientific attitude is based on what many experts agree is an outdated view of the mind and an outdated view of scientific theorizing. If any sense at all can be made of the notion of a mind, whether human or non-human, we must get away from the idea that the mind is a ghostly entity that is tucked away where no amount of experimental probing can discover it. In fact, we must get away from the idea that minds are *things* that one either possesses or lacks, at all. As explained in my brief submitted yesterday, we must look at various mental capacities individually.

"We must also get away from the idea that the only legitimate terms in a scientific theory are those that can be operationalized by equating them to specific procedures or operations that determine when they can be applied. Theorizing is a matter of finding the best framework for the available results, which entails looking beyond the simplest explanation for a *single* phenomenon. So, if you simply focus on the response to infant

vervet calls that I just described, you may get the mistaken impression that a story in terms of stimulus-response conditioning is the best. But add in the information that patterns of aggression between vervets tend to follow family lines, specifically mother-daughter relationships, and then I ask you whether it isn't more powerful to suppose that both kinds of interactions are explained by awareness of family relationships, rather than having to hypothesize entirely different conditioning histories in each case?"

"Suppose, Ms. Curtair, that the court agrees that we must focus on a specific ability for determining the admissibility of this parrot to the witness stand. What, in your view, is the ability in question?"

"Episodic memory, without a doubt. Witnesses are expected to report accurately about events in their past experience. But we believe that Chiapa can accurately recall past events and report them accurately in the present."

"And Mr. DeJohn, in his brief, contends that there is reasonable scientific doubt about the appropriateness of describing such memories, and, even if there were not, the parrot should still be disqualified as a witness on judicial grounds. Is that not so?"

Both lawyers nodded their agreement. Loismead continued.

"Very well then; we shall take a recess for lunch and when we return we will address these two questions."

Returning to the courthouse after lunch, both lawyers did their best to ignore the questions shouted at them by the reporters gathered there. DeJohn had spent his lunch period reviewing materials that he had prepared after reading the prosecution brief. He was generally satisfied with the burden of proof that the judge had placed on the prosecuting attorney. Curtair was uncertain how her case was going. The judge's attitude was very hard to read and she really had no idea what to expect from the afternoon session.

Back in her seat in the courtroom, Curtair found herself fidgeting nervously before the judge arrived. Over the previous couple of days she had read or skimmed hundreds of pages on animal behavior and cognition. She had found that quite ordinary

common-sense views about the mental states of animals had taken on the status of scientific bugaboos. Most ordinary folk would regard the attitudes of scientists to questions about animal minds as bizarre. But what did that show? In the battle between common sense and scientific opinion, common sense does not have an impressive record. On the other hand, would strict scientific standards of interpretation apply to normal judicial process? Jurors' interpretations of most testimony was hardly a matter of scientific precision. Why should the standard be any different for a nonhuman animal that appeared to be able to tell us something about the events surrounding a murder?

The call for the court to rise for Loismead's entrance snapped Curtair out of these thoughts. Loismead started to speak as she took her place behind the bench.

"Be seated. Mr. DeJohn, Ms. Curtair, the first issue I would like you to address this afternoon is the possibility of episodic memory in this parrot. Mr. DeJohn, you have raised some very general objections to interpreting mental states in animals, but do you think you could explain how these general issues relate to the possibility of specific memory of the events on the night of Dr. McFork's death?"

"Certainly. The parrot's testimony is being offered by the prosecution as evidence of a murder..."

"Objection, your Honor. We are not offering the testimony as evidence of a murder. To do that our witness would have to provide evidence of the defendant's state of mind. However, we do believe that Chiapa's testimony can provide evidence of the presence of the defendant at the time of the victim's death."

"You stand corrected, Mr. DeJohn."

"It makes no difference, your Honor. The allegation that this animal can provide evidence of a death requires us to attribute the memory of a death to this parrot. But even if the parrot could recall certain events from that evening, which we very much doubt, why should we take its reaction to be a reaction to a *death*. How can we know whether a parrot even has the concept of death? Could it distinguish a person dying from her merely falling asleep or unconscious? There is simply nothing about its behavior that could enable us to distinguish these alternatives."

"Your Honor, this is the same old tired argument that Mr. DeJohn has used in his brief. First, let me say about his brief that in fact Mr. DeJohn's idle speculation about Chiapa's willingness to accept a cashew nut instead of a peanut are not based in fact; Chiapa has been tested in just the way that Mr. DeJohn imagined and he does not stop asking for something when presented a similar but different object. But back to the issue of death. Of course it's true that under certain conditions a parrot might mistake a lapse into unconsciousness for a death, but the same is also true of any person. To say that a parrot could *never* make the distinction requires a leap of faith, or perhaps a failure of imagination, that is not supported by empirical evidence. Unfortunately, rather too little is known about the behavior of African Greys in the wild, but many species of animals treat dead animals differently from sleeping ones. Different animals show different species-typical responses to the death of another. But we should not interpret a difference in behavior as absence of a concept. Humans vary in their concept of death; some are convinced that it marks a transition to a different form of existence, while others consider it the absolute end of that individual's existence. Some mourn extensively and elaborately, others hardly at all. We would not use these differences to call into question the ability of a witness to testify about a death."

DeJohn jumped in as soon as Curtair paused.

"The deputy D.A. has proposed an incredibly weak criterion for possessing the concept of death, your Honor. By her account, even ants, who selectively remove dead nestmates from their nests, possess a concept of death."

"What do you say to this Ms. Curtair?"

"I was hoping to avoid the issue of defining concepts, your Honor. I think that such issues are not usually discussed in the case of human witnesses, and I see no reason why they should be brought up here."

Loismead's retort was brisk.

"Well, I do, counsel. I would like you to tell me why you think it is reasonable to talk about a concept of death in this parrot, and whether you think it is reasonable, also, in the

case of ants."

Curtair sighed. This was not going as well as she hoped. But she had something to say about concepts nonetheless.

"Your Honor, the behavior of ants is extremely stereotyped. Yes it is true that they remove dead nestmates, but that is only part of the story. A typical decay product of a dead ant is oleic acid. It turns out that ants assiduously remove pieces of paper coated with oleic acid. In fact, they will carry out other *live* ants if experimenters treat them with oleic acid. The live ant will return to the nest only to be removed again. Thus the ants show no recognition of the distinction between a dead ant and an ant that merely appears to be dead by one criterion, but not by other criteria. In genuinely concept-mediated behavior, there is a distinction between evidence and actuality. For instance, if you were to run across someone who you thought was dead, because you detected no breathing, etc., if that person suddenly stirred you would be more wary of jumping to the conclusion that you had found someone dead the next time you found someone in a similar condition. Possessing a concept of death allows you to weigh evidence and recognize a distinction between the way things are and the way they seem to be."

"And what makes you think that a parrot is capable of 'weighing evidence', as you put it? Are you suggesting that the parrot knows the difference between the way things appear and the way they really are?"

"Admittedly this is indirect, but there is behavior relevant to this question. Chiapa is quite capable of deliberately providing false responses to a given question. For example, a favorite way for him to be uncooperative is to give a succession of wrong answers when shown a tray of objects and asked 'How many?' If the correct answer is 'five', he is quite liable to say 'three...six...two...four...', indeed everything except 'five.' This capacity for deception shows an understanding of the distinction between accurate reports and inaccurate reports, which in turn shows an appreciation of the distinction between the way things really are and the relationship of his own utterances as evidence for actual state of affairs."

"I object, your Honor. Counsel is lapsing into anecdote once again. There is no

reason why we should take it seriously."

"And might I respond, your Honor, that the fear of anecdote is another bugaboo of behavioral science. Repeatability is easy to achieve with stereotyped behaviors, but it leaves out the vast majority of interesting behaviors that might be used to argue for cognition in animals. This attitude is visible in Mr. DeJohn's unsympathetic dismissal of the entire field of cognitive ethology in his written brief. There has been much careful experimental work in cognitive ethology, and freed from the artificial constraints of laboratory work, it has much to tell us about animal cognition. The artificial and arbitrary standards of behavioristic psychology are not consistently applied in assessing the testimony of human witnesses, and it is self-serving for the defense to require it in this instance."

Loismead frowned at both attorneys.

"I have heard your arguments, and they will be considered when I deliver my judgement. I would like now to proceed to the judicial issues raised by Mr. DeJohn. In particular, Mr. DeJohn, you have argued that the parrot does not have the necessary concept of truth essential to the judicial process. Yet it appears that Ms. Curtair has just argued that the parrot does indeed know the difference between truth and falsity. How do you respond?"

"I have already objected to the use of anecdote."

It was DeJohn's turn to receive a sharp response from the judge.

"I am not interested in namecalling, Mr. DeJohn. What is the argument?"

"Your Honor, truth was only one part of the third point in my brief. If I may refresh the court's memory, it was also argued that an understanding of perjury, and its penalties, was essential element for any witness. We argue that this bird is incapable of understanding the serious responsibility entailed in accusing someone of murder."

"Objection, your Honor. We do not intend that Chiapa should make such an accusation. Only that he be allowed to place the defendant at the scene of the crime and engaging in suspicious behavior."

"Your Honor, whether or not a witness is making an accusation directly is irrelevant

to this point. To provide any evidence that may result in a conviction for murder entails an extremely serious responsibility, that we believe this animal is incapable of appreciating. Indeed, Dr. Irene Pepperberg is on record as admitting that her African Grey parrot Alex bites, says 'sorry,' and then bites again, showing no contrition for his actions. Such a basic lack of understanding of moral relationships is an extremely serious defect when this animal's 'testimony' may result in the conviction of my client."

"Nothing Mr. DeJohn has said, your Honor, could not also be said about small children, who have been used in case after to case to testify and help convict many criminals. Such cases have stood up on appeal against just the kind of challenge that Mr. DeJohn is mounting here. Humans are not apart from the rest of nature, and there is no justification for drawing an arbitrary line around our own species and refusing to treat other-than-human animals in the same way."

"An impassioned statement Ms. Curtair. I take it under advisement. Mr. DeJohn, do you have any final comment before I adjourn to make my decision?"

"Yes, your Honor. Although we allow much to pass unquestioned with respect to other humans, there is considerable precedent for doing so. In this case, which is completely unprecedented, we must err on the side of caution. We must demand scientific rigor in the interpretation of this parrot's so-called testimony. I urge you to reject the prosecutor's contention that we can perfectly well make sense of the splutterings of this performing parrot."

"Thank you Mr. DeJohn. Likewise, Ms. Curtair. I will deliver my decision after the weekend on the basis of your briefs and the transcript of this session, which is now adjourned."

### **Reader assignment**

You now have read the briefs and the transcripts. Your assignment, as a law clerk for Judge Loismead, is to draft her legal opinion on the prosecutor's motion to allow Chiapa to testify against Casey Heile.

### **Author's note**

The characters involved directly in this trial story are entirely fictional. However, the idea that a parrot might provide evidence in a murder trial is based on a real case. In 1994, a pet African Grey parrot named Max witnessed a murder in Santa Rosa, California. Max seemed to name someone other than the person who was charged with the crime. The defendant's lawyers prepared expert witnesses to support the use of Max's testimony, but the case was never argued in front of a judge.

All the scientific research mentioned can be found in published articles or is currently in progress, with one exception, which is that the procedure for assessing episodic memory that is described in the prosecution brief is only a thought experiment. However, Irene Pepperberg is currently working on a similar idea with Alex. Some suggested further reading follows. I wish to thank Lynn Allen, Joel Feinberg, Irene Pepperberg, and friends and colleagues at Texas A&M University and the University of Colorado, Boulder, for their comments and help with this story.

### **Suggested additional reading**

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