UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

ANIMAL WELFARE INSTITUTE, et al.,	)	
Plaintiffs,	)	
v.	)	**Case No: 03-2006 (EGS/JMF)**
FELD ENTERTAINMENT, INC.,	)	
Defendant.	)	

DEFENDANT FELD ENTERTAINMENT, INC.'S PETITION FOR ATTORNEYS' AND EXPERT WITNESS FEES

FEE PETITION

EXHIBIT 8 (part 1)

(Pet., Ex. 8 (part 1))

CONFIDENTIAL

EXPERT REPORT

Civ. No. 03-2006 (D.D.C.)
Judge: Emmet G. Sullivan
Magistrate Judge: John M. Facciola

American Society For The Prevention Of Cruelty to Animals, et al.

v.

Ringling Brothers And Barnum & Bailey Circus, et al.

Prepared for:

The Plaintiffs

Prepared by:

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San Diego, CA 92104

Date: March 19, 2008

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Introduction

This report was written following a review of the evidence provided by plaintiffs, available references, my own personal expertise and experience with elephants, and two site visits to determine if the defendant is violating applicable laws and regulations with regard to treatment of Asian elephants in the case of American Society For The Prevention Of Cruelty To Animals, et al. v. Ringling Brothers And Barnum & Bailey Circus, et al. The Court has focused this case on seven elephants that were in captivity when the Asian elephant was listed as an endangered species under the Endangered Species Act (ESA), and with whom plaintiff Tom Rider formed a bond when he worked at the circus: Jewell, (or Jewel), Karen, Lutzi, Mysore, Nicole, Susan, and Zina.

Background and Qualifications

I have worked as a veterinarian in zoo and wild animal medicine for over thirty years. Following graduation from veterinary school at Tuskegee University, I served for two years in the US Army Veterinary Corps. I then completed an internship in small animal medicine and surgery at the Henry Bergh Memorial Hospital of the ASPCA in New York City. After completing a post doctoral training program in zoological medicine at the National Zoological Park, Smithsonian Institution in 1976, I became an associate veterinarian with the Zoological Society of San Diego, where I was employed for twenty-nine years. In that capacity I worked with Asian and African elephants in addition to a broad range of rare and endangered species of mammals, birds, amphibians and reptiles, at both the Zoo in Balboa Park and at the Wild Animal Park in Escondido. I worked in a group practice which gave me the opportunity to work with many excellent zoologists, behaviorists, conservationists, veterinarians and specialists in veterinary medicine.

I became a diplomat of the American College of Zoological Medicine in 1993. For three years I served on the credentials committee of the College and for three years I was

chairperson of the examination committee.

My further experience as a veterinarian and a list of my publications for the past ten years is included in my Curriculum Vitae (Appendix A). In the past four years, I testified at one preliminary hearing in court as an expert witness in the matter of The People Of The State Of California, County Of Riverside Vs. John Hans Weinhart/Marla Jean Smith, Court Number RIF 110175 (February 2005).

I am charging the plaintiffs in this case a nominal public interest fee of $50.00/hour for the time I have spent preparing this report and conducting inspections of defendant's elephants, facilities, and tools. In the event I am called for a deposition in this case I will charge my regular consultancy rate of $450.00/hour. I intend to charge my public interest fee if the plaintiffs call me to testify at trial.

Scope of Investigation

This lawsuit consists of two basic claims of "take" under the Endangered Species Act by Ringling Brothers:

1) The use of bullhooks and other instruments on Asian elephants, and

2) The confinement and chaining of the elephants for long periods of time.

It is the position of the plaintiffs that if Ringling Brothers (or any other circus) cannot force the elephants to perform in the circus without subjecting them to this illegal treatment, then it should not be able to have elephants in the circus.

The specific assignment for this expert witness was to prepare a report following a review of the evidence provided by plaintiffs, to include a review of the literature, and the documented experiences of others as well as my own to determine if the defendant engages in conduct with its Asian elephants that is wounding, injuring, harming, and/ or harassing the elephants.

List of Evidence Reviewed

I have reviewed evidence provided to me by plaintiffs. The documents, medical records, video footage, and other information that I considered in rendering my opinions in this report are included in Appendix B. Particular, records are discussed in detail throughout my report including:

- Video footage on a DVD compilation of Ringling Bros. And Barnum & Bailey Circus elephants.
- Objections And Responses To Defendants' First Set Of Interrogatories To Plaintiff Tom Rider (June 9, 2004).
- The Santa Clara Humane Society's Inspector's Reports on the conditions of Ringling Brothers' elephants, PL 5118.
- Accounts of a San Jose police officer and humane agent of elephant mistreament and accompanying narrative from the Enforcement Report.
- USDA reports of inspection of Ringling Brothers' Center for Elephant Conservation (including USDA reports on two 18-month-old elephants Doc and Angelica), PL 5118.
- Certain chapters from Government Sanctioned Abuse: How the United States Department of Agriculture Allows Ringling Brothers Circus to Systematically Mistreat Elephants (September, 2003) PL 5118.
- USDA Memorandum on the "Red Unit" of Ringling Brothers' Circus. FELD 1529-31.
- Ringling Brothers' "White Paper"- Hopping Egan, *Elephants Without Boarders* <www.ringling.com/cec/whitepaper12_11.pdf>.
- Lists of births at Ringling Brothers' "Center for Elephant Conservation" FELD 2207/additional births noted in more recent medical records.
- Ringling Brothers' Press Release on the Death of Ricardo (August 6, 2004).
- Medical records of Ringling Brothers' elephants, provided to the plaintiffs by the defendants.

- Photographs taken by a hired photographer and me from the inspection in the case of Karen and Nicole on the Blue Unit in Auburn Hills, Michigan on November 13, 2007: PL 14986, PL 15071, PL 15121, PL 15118, PL 14978, PL 14982, PL 14996, PL 14999, PL 15024, PL 15037, PL 14949, PL 14947, PL 15053, PL 15027, PL 15052, PL 15150, PL 15151, PL 15030, PKE 112, PKE 116, PKE 125, PKE 126, PKE 121, PKE 118, PKE 120, PKE 122, PKE 133, PKE 096, PKE 108, PKE 114, PKE 093, PKE 066.
- Video footage from the inspection in the case of Karen and Nicole on the Blue Unit in Auburn Hills, Michigan on November 13,2007.
- Photographs taken by a hired photographer from the inspection in the case of Jewell, Lutzi, Mysore, Susan, and Zina at the Center for Elephant Conservation in Polke City, Florida on November 29,2007: PL 17094, PL 15502, PL 15179, PL 15162, PL 15269, PL 15298, PL 15301, PL 15312, PL 15357, PL 15359, PL 15367, PL 15328, PL 15320, PL 15386, Pl., 15381, PL 15447, PL 15451, PL 15713, PL 15568, PL 15592, PL 15602, PL 15600, PL 15649, PL 15648, PL 15652, PL 15688.
- Video footage from the inspection in the case of Jewell, Lutzi, Mysore, Susan, and Zina at the Center for Elephant Conservation in Polke City, Florida on November 29, 2007.
- A recent compilation of video footage obtained by activists in California ("Ringling '05 + '0"6), PL 17095.
- An older compilation of video footage of Ringling elephants ("Pat Cuviello Compilation"), PL 07069.
- "CEC Birth Footage of Sara" FEl 45237.
- "7/26/99 Videotape of Benjamin" FEI 6356
- Excerpts from a public relations shoot ("Hershey Animal Care Shoot") FEI 45224.
- Compilation of Video Footage Received From Defendant (FEI 40979, FEl 45189, FEl 45221, FEl 45190, FEI 45191, FEl 40964, FEl 40973, FEI 45229, FEI 45233, FEl 45193, FEI 45204, FEI 45245), FEI45194,FEI45196,FEI45198, FEI45215,FEI45216, FEI40966).

- Compilation ofRBBB Performance Footage (FEl 45220, FEI 10353, FEI 0022, FEI 00024, FEl 0023, FEI 3241).
- Compilation ofFootage Received from PETA (PL 16717, API 7166).
- Compilation ofTraining & Rehearsal Footage from Defendant (FEI 40988, FEI 40976, FEI 40979, FEI 40959, FEI 004, FELD-VID 0004, FEl 0001, FEl 0022, FEI 40956, FEI 40981).

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Review of References With Summary of Findings

A search of the literature, was undertaken to review information available on the use of the bull hook (guide, or ankus, or elephant hook), and chaining (tethering) and confinement of elephants, and related issues and my observations of training, behavior, health, and lifestyle of elephants in captive environments in zoos and circuses, and in the wild. Additional topics include pain, and its relevance to animals, and American Veterinary Medical Association animal welfare principles. This information is applicable in interpreting the evidence, including the information gathered during two site visits to inspect the seven Asian elephants specific to this case. A review of this information will assist in determining if the defendant's use of the bull hook and other instruments and its practice of chaining and confining elephants has caused, and is causing wounds, injury, harm, and harassment of the elephants under review in this case.

References Reviewed:

In reviewing the book, *Elephant Tramp,* published in 1955, and the 1978 follow up second edition, *I Loved Rogues, The Life of an Elephant Tramp,* the author George Lewis describes the use of the bull hook and the use of chains in training and maintaining circus and zoo elephants. Excerpts from his books chronicle a career of handling elephants:[16]

> "What is true of training for performance is even more true of the basic discipline that must be established before an elephant can work or act. It isn't kept in a cage, and, while it is chained much of the time, there are many occasions when it walks at liberty, with only the respect it pays its handler to keep in check. It is absolutely essential, therefore, that the animal must have this respect for its handler; and, to get down to blunt facts, this quality begins with fear: fear of punishment and discomfort."

"Occasionally, the victim of an elephant's attack is a man who was hated for reasons of the elephant's own. Perhaps more persons, however, have been killed or injured by elephants for no obvious reason. The real cause was that the elephant had no fear of them."

"Love-- and there are many instances to show that this isn't too far-fetched a term for an elephant's emotions-- develops for the man who has proved he has good reason to be feared, but who uses no pain or abuse unless the animal has disobeyed. Once this relationship has been established, a good elephant will work for praise and affection. When a man tries to impose his will, through punishment on an elephant that has attacked him or anybody else, there is no turning back. The issue must be settled on the spot. If the man fails to teach the elephant fear, he had better stay out of its reach from then on. All he has done is work up anger and hatred which will explode against him if the chance comes."

"A dangerous elephant, especially a bull tusker, should be approached from the left side and from the rear, and whipped on the fleshy side of the head between the eye and the ear. A good stout stick should be used, and it should have a sharp prod on the end to keep the elephant from turning its head."

"When a frightened or angry elephant gets loose, it is impossible to punish it until it is chained. An elephant is as agile on its feet as a fighting cock, and no man, no matter how fast he may be,

would last five seconds in a battle with an enraged, unchained bull (male or female)."

"A nimble man might be able to conquer a dangerous elephant chained by only one front foot, not so much because its movements were slightly hampered as because of the feeling of restraint put upon it. The freer an elephant is, the more viciously it will fight to keep that freedom, just as men do."

"When the elephant is chained by both a front and hind foot, the odds are much more in favor of the man. The animal can't turn on him as easily, and, having less to fight for, it will give up more quickly."

"Sometimes it is possible, when the elephant is chained front and rear, to win without whipping it, provided the man has more patience than his elephant. It's done by gradually tightening the chain, a few inches at time, until the elephant is supporting its weight entirely on the front and hind legs that are free."

"It is very tiring for a bull to hold up its mass in this manner. When the handler sees it weakening, he gives the command, 'Down! Come on down.' "

"The command is repeated until the elephant obeys. Just before it gives in it will show signs of fear and defeat. Its eyes will bulge and its bowels become loose and watery as they are emptied several times."

"When the elephant finally surrenders and falls over on its side, it knows it is comparatively helpless and that it has lost a psychological battle. It gives a great sigh of resignation, acknowledging the man as its master."

"The test is over for the elephant, but not for the man. He has won the victory of the moment, but his next actions will decide whether he really wins the elephant."

"The real elephant man is concerned with more than asserting his own will. He is thinking of the elephant, too. So he doesn't stand over his defeated adversary like a master over a slave. He forgets his fear of the hereafter, and goes firmly up to the animal that a few minutes before gladly would have killed him. He sits on his haunches by the elephant's head, assures it with gentle words that they'll be friends from now on. He also gives the animal some delicacy it likes."

"Circus animals are performers, and training them depends on a certain amount of rough treatment. They are moved constantly, so their lighter cages can't be up to the safety standards of a zoo."

"Nowhere is the contrast between zoo and circus any more apparent than when it comes to an elephant. Although it is basically a wild animal, the circus elephant walks through crowds on public streets and around hippodrome tracks, stands within reach of visitors in the menagerie tent and performs unfettered in the ring, in the middle of thousands of spectators. As I said

before, fear of and respect for its trainer are therefore essential as the principal control over it."

"Although the zoo elephant generally is behind a fence, bars or a moat, when it is taught tricks or walked around the park, or taken for a swim, it must undergo at least part of the training treatment received by a circus elephant, and regardless of whether or not it is taught tricks it must be disciplined."

"When handling an elephant with a doubtful record, the handler should walk beside the elephant's left front leg. The animal can kick forward or backward, but not forcibly to the side. And any other attacking move requires it to turn its head. If the handler is alert he stands a chance of fending off the attack with his hook."

"Many people have the impression that the elephants enjoy performing but they don't. If left to themselves, elephants are naturally lazy animals, and performing is hard work. They may show off at times, but they never do any stunt that takes much effort when their performance is voluntary."

"Actually, to perform ring acts an elephant must develop muscles that the ordinary work elephant never uses, just as acrobats develop muscles that laborers and office workers don't know they have.

That's why an elephant doesn't especially like to learn an act, and why young ones who haven't developed much will of their own, nor enough weight to prevent being pushed around physically, are

much easier to train than adults."

"Performing elephants must respond quickly, and aside from making their bodies do things they wouldn't normally do, they must learn the routine of which trick follows which."

"Some elephants cannot or will not concentrate for long enough to learn an act. They may be retained by the circus for labor or they may wind up in a zoo, where they are kept for the naturalist to study and come to some conclusions on the intelligence of elephants in general."

"All well-trained performing elephants are well-scarred elephants, from being guided by the hook. When a hook cut or scratch is washed with an antiseptic, which should be done soon after it's inflicted, it may leave a white scar for several months."

"Our first tent show was in Brooklyn. The circus looked beautiful, with all the canvas new and white and the equipment freshly painted. After Brooklyn, we played Washington, D.C. for three days, and Boston for a two-week stand under the canvas on Sullivan Square, and a number of one-day stands throughout the New England states. This year we had four real bulls besides Albert, the male that had died at the Coliseum. Their names were John, Rio, Sammy and Joe, and three of the four were to die by execution."

"Dozens of elephants, most of them males, have been executed

> in the past twenty years because of a killing or simply because they were periodically unmanageable. Black Diamond, Major, Romano, Joe, Sammy and Teddy are only a few given death sentences for running away or attacking somebody."
>
> "The worst-dispositioned elephants in captivity generally are found in zoos. It always has been the habit of circus owners to get rid of animals they can't manage themselves. As a result, many males have finally gone to zoos only to be killed there eventually."

In the 1979 Animal Keeper's Forum, author Ed Roberts, a senior zoo keeper at the W.D. Stone Zoo in Massachusetts reports:[29]

> "But there is one unalterable fact, and all of them (elephant men) will agree on this--that discipline in the form of punishment is the force necessary to gain an elephant's respect."
>
> "So, to get down to basics, you gain an elephant's respect through fear of punishment. Never punish an elephant for no reason at all, only when it has done something it shouldn't have. Elephants are exceptionally inquisitive, and if they have access to wheel barrows, water hoses, rakes, shovels, buckets, water pipes, almost anything that their trunks can reach, they will, in their playful moods, proceed to become a demolition unit. If you happen to catch the brute doing something it shouldn't, discipline it immediately and not ten minutes later, for it will never understand what it is being punished for."

"Now, you ask, what do you do to discipline an elephant when it has done something it shouldn't have. All elephant men usually carry an elephant hook. A good elephant man never hits an elephant with the steel end part of the hook. You rap the animal smartly along the rib cage or the upper hind quarter with the wooden curved part of the hook which is shaped like a cane and shout 'no!' a couple of times. Don't worry, the elephant will get the meaning very quickly, for as large as the animal is, they do not like punishment. The keeper who knows when to mete out punishment when necessary and praises his elephant with kind words and a lump or two of sugar or carrots when the elephant is good, will gain the respect and love of the animal, and, in turn, will love the animal also."

"Once the keeper has gained this respect, he or she can start working the elephant from chain commands to doing some basic tricks like putting a foot on a wooden block if you wish to trim some toe-nails or work on the pads. To get an elephant to lay down may pose a problem, but I have found that by exerting pressure down with the hook on the elephant's top neck, it will get the idea you want it to lie down. The command, along with the hook, would be 'down' followed by the elephant's name. To keep the elephant down, exert light pressure with the blunt end of the hook on its neck repeating the word, 'steady' if it starts to rise up."

"Remember, if you have the slightest fear of working with elephants, it would be to your advantage to stay away from them. If you decide to work with them, then punish only when necessary."

> "If you let her get away something she shouldn't have, then you have lost control over your elephant." "The elephant must fear punishment and discomfort, and I repeat this, for if you don't chastise when necessary, then some day, she will get you. The reason would be that she did not respect you. More handlers have been maimed or killed by elephants than any other animal in the zoo (or in circuses without the attendant publicity) and the reason was, the elephant had no fear--fear of punishment-- from her handler and trainer." "This is how you gain an elephant's respect and love, and you, in turn, can find that you, too, can love and respect such a huge beast."

A second Animal Keepers' Forum article in 1980 by Crocker at the Dickerson Park Zoo in Memphis described the recent acquisition of a young elephant:[7]

> "Very recently, a 16-year-old bull was obtained from a circus trainer based near our zoo. This animal had come into musth and attacked and injured his owner and trainer. Initial attempts to place this animal in another zoo with suitable facilities failed, whereupon the owner decided to destroy it. Dickerson Park Zoo agreed to take the animal and from there proceeded to lay out plans for moving and handling the animal." "...when it was determined that the animal was out of the dangerous musth period, we began to work with it. The animal was chained up short to minimize its movement, and DPZ personnel began working with it. After a period of about one and a half hours, punctuated by a great deal of aggression on the part of the bull, followed by physical discipline from the people, the animal submitted and began responding well to commands."

In his 1981 book, *Wild Elephants In Captivity*, Adams describes the use of the bullhook in chapter 10, The Bull-Hook:[1]

> "The bull-hook is an indispensable instrument in the training and control of elephants. It is through the combination of spoken words and the effective use of the bull-hook that the trainer, handler or caretaker controls an elephant of any size. When not in use, the bull-hook should be always placed in the some conspicuous, convenient and accessible place where it can be readily obtained if necessary."

> "In using the bull-hook, the sharp points should not be deeply embedded into the elephant's skin, as it can readily produce wounds that may become infected and difficult to heal. The sharp point of the bull-hook should be repeatedly jabbed into various places of the skin in a given area and not in the same place continually. The skin of the elephant is relatively sensitive, so it does not require deep penetration to obtain a response. After a period of effective training, simply placing the bull-hook on the skin will bring about the desired behavior of the elephant."

> "Puncture wounds from excessive use of the bull-hook, or wounds incurred from loading and unloading elephants into vans or rail cars, or from other causes further predispose the skin to infection and cause abscesses and ulceration."

In the 1983 veterinary textbook, Diseases of Exotic Animals, authors Wallach and Boever

provide illustrations demonstrating the location of sensory points on an Asian elephant, and the locations where firm steady pressure is applied using the bull hook to indicate "back up," or applying steady pull to indicate "come forward." The authors indicate:[35]

> "Once the elephant willingly accepts night chaining, the remainder of the training may begin. The elephant is then introduced to the elephant hook, or 'bull' hook. The bull hook may be used to push or pull the elephant sufficiently to physically reinforce the voice command and should be applied to the rowdy elephant by the trainer as a father would use a hickory switch on a disobedient child. Care must be taken to avoid sharpening the hook or spike portion of the hook too much and also to avoid poking the elephant in the eye."

> "Easy behaviors include 'come up' (forward), back up, steady (stop), lifting the feet, trunk up, head down, and climbing onto tubs. All of these behaviors involve simple tugging or pushing at appropriate pressure points."

> "The more difficult behaviors, such as tub sitting, hind leg stands, and lie down require the use of additional chains and block and tackle. 'Raking' an elephant, which is the manual removal of feces from the rectum, is performed by trainers to prevent defecation during performances. A trained elephant is valuable and safe; a 'spoiled' elephant is dangerous and usually winds up being given euthanasia after it injures or kills a handler."

In the 1995 textbook, Restraint and Handling of Wild and Domestic Animals (2nd ed), Fowler, in the chapter on elephants, discusses physical restraint:[11]

> "The hook (bull hook or ankus) is an indispensable tool for working with elephants. The hook should not be so sharp that it will tear the skin. Its primary purpose is to exert pressure to sensitive spots on the body inducing the elephant to move away from the source of pressure."
>
> "The hook handle should not be used indiscriminately as a club; an elephant resents harsh discipline. Not only is it inhumane, but unless the person using this type of discipline is capable of establishing and maintaining complete fear-mastery over the individual, it is both unwise and ineffective as a means of restraint."
>
> "A whip is used in place of the hook by some handlers, particularly in circuses."
>
> "Elephants have become a cause célébre for animal activists who feel that elephants are being mistreated in captivity. Great exception is taken to chaining as a means of confinement and management of elephants. Sufficient pressures have been exerted on legislators in some states to result in the enactment of laws to define just how the elephant may be handled. Bowing to public pressures, the American Zoo and Aquarium Asociation has established an elephant management policy encouraging zoos that maintain elephants to have a restricted hands-off protocol for handling their animals. This may have far-reaching effects

> on the ability of veterinarians to provide adequate medical care without having to sedate or immobilize animals in order to perform minor procedures."

In the veterinary text, Medical Management Of The Elephant, by Mikota, the author discusses disorders of the musculoskeletal system within a study group of captive elephants:[19]

> "Disorders of the musculoskeletal system were common in the study population, comprising 1323 of the 5415 medical events. Events occurred at 65 of 69 zoos and affected 73% of the elephants studied. Of the 1323 events, 586 involved the feet, and these are evaluated separately from the other musculoskeletal disorders. Foot disorders affected 50% of the population; the other 737 musculoskeletal events affected 64% of the population. Included are deep trauma, movement disorders and generalized swellings, limb abnormalities, ventral edema, and all cases diagnosed as arthritis."

Further discussion of disorders, under disorders of and care of the feet in the text, Mikota indicates:

> "Although foot problems occur commonly in the captive population, they are infrequently reported in the literature. The types of problems seen in domestic and nondomestic ungulates may also be seen in elephants. These include penetrating injuries, sole cracks, nail cracks, overgrowth, and infection. Wet conditions and inadequate exercise are predisposing factors. Signs include lameness, reluctance to move, pain on palpation, and exudation."

In addition the author notes under disorders involving the feet:

> "Medical problems involving the feet affected 50% of the study population (189 animals). There were 586 events, 107 elephants had more than one episode. Events occurred at 63 of the 69 zoos. There were 0.89 events/African, and 2.15 events/Asian. It appears that foot disorders are most prevalent in Asian females, although these data, as discussed in the Methods chapter, must be interpreted cautiously."

Further discussion under clinical signs, diagnoses, and treatments revealed:

> "The most commonly recorded signs were cracks in the nail or cuticle; and non-specific lesions, injuries, or wounds. Lameness or other changes in limb use were reported in only 10% of the events. Other signs noted in 10% or less of the events included purulent discharge; swelling or myositis; and pain. The underlying etiology was unknown in the majority of cases. There were 131 trauma-related events. The most common source of trauma was stepping on objects such as stones, nails or screws, and pieces of wire; these types of objects were responsible for 40 events. The source of trauma was unknown in 69 events. A variety of organisms were isolated and multiple isolates were common."

Under a discussion of trauma associated with leg chains the author notes:

> "All trauma cases resulting from the use of leg chains are included here, regardless of whether the injuries were purely superficial or involved the muscles or skeleton. It is often difficult or impossible for the clinician to judge the extent of such injuries, which may combine superficial abrasions or lacerations with

myositis due to struggling or restricted movement."

"There were 105 injuries caused by leg chains. This prevalence can be compared to trauma due to other causes. In the study as a whole, there were 711 injuries of unknown source 263 caused by exhibit mates, 154 caused by bull hooks or ankus, and 67 due to accidental falls. Chain injuries occurred in 71 animals at 41 of 69 zoos. Twenty-two elephants had multiple events, ranging from two to five. Twenty-six zoos had multiple events, ranging from two to eight. The most common clinical sign associated with chain-induced trauma was abrasion (n = 28 events). Nineteen chain injuries abscessed, and nineteen were associated with edema, swelling or myositis. A change in limb use was seen in ten events."

"Of the 95 events that were treated, 84 (88.4%) resolved successfully with one course of treatment, three had an unknown outcome and eight failed. These eight were treated a second time, and seven resolved successfully. The remaining event was resolved with a third course of treatment. The most common treatment was the application of a non-antibiotic topical preparation such as providone iodine or hydrogen peroxide. These types of antiseptics were used in 39 events. Topical antibiotics were used in 33 events, and a management or handling change (usually moving the chain to another leg) was made in 27 events. Injuries caused by chains were generally minor, with 97 acute events, 2 chronic events, and 6 events of unknown duration."

In a discussion of causes of death, the author indicates:

> "There were 88 deaths in the study population. Although this represents 23% of the population, it should be viewed in the context of medical records dating from 1908 to 1992. The study included approximately 7.3 years of data per elephant (n = 379), or approximately 2754 'elephant years' of data. The 88 deaths can also be expressed as an incidence of approximately one death per year."

Following a review of the literature the author indicates:

> "Few attempts have been made to ascertain the more common causes of death in captive elephants. Griner (1983) discusses several elephant deaths in a review of necropsies conducted at the San Diego Zoo over a 14 year period. A 1987 report to the Asian Elephant Species Survival Plan of the American Zoo and Aquarium Association summarized the causes of death in 63 captive Asian elephants in North America that died between August 1977 and March 1987. (This survey included some animals that were privately owned). Sixteen animals were euthanized, nine because of severe pododermatitis and/or arthritis. Two elephants were shot after killing their trainers. Gastrointestinal disorders were responsible for 11 deaths. Cardiovascular disorders resulted in eight deaths. Tuberculosis was suspected but not confirmed in two cases. There were five neonatal deaths including two still births and one aborted fetus."

In the author's summary of the literature review it is noted that:

> "Pododermatitis and arthritis are serious conditions of captive

> elephants requiring intensive often unrewarding treatment for months to years and causing a great deal of discomfort to the animals. Although only 15 animals died, many more elephants in the living population are affected and may die. Further research is needed in this area to define underlying etiologies, formulate preventive strategies and investigate more effective therapeutic regimens."

The American Zoo and Aquarium Association (AZA) indicated in their Standards For Elephant Management And Care, Adopted 21 March 2001, Updated 5 May 2003:[2]

> "The following standards apply to the husbandry and management of both African (*Loxodonta africana*) and Asian (*Elaphas maximus*) elephants in AZA accredited institutions, AZA related facilities, and non-member participants in the AZA Elephant Species Survival Plan (SSP). The intelligence, strength, and social needs of these magnificent animals can pose many challenges for captive managers. Institutions desiring to hold elephants should therefore understand the substantial human, financial, and ethical commitments involved in appropriately maintaining these large and potentially dangerous species."
>
> "Because current standards are expected to change over time, it is recommended that members seeking to plan new elephant exhibits/care programs look to the vision, rather than the current standards, for guidance on where to go in the future."

"Failure to meet basic AZA standards for elephant management and care will be noted during accreditation inspections. Current non-member participants in the SSP will be given the same time schedule for compliance, but new non-member participants must meet all new standards prior to approval."

Recommendations or standards in part (See www.aza.org for the complete Standards For Elephant Management And Care):

1. Abiotic Environmental Variables:

1.1. Temperature

1.1.1. Elephants must be kept outside on natural substrates as much as possible. Institutions should consider designing exhibits that allow elephants outdoor access twenty-four hours a day -- weather, health, and safety permitting.

1.4. Space

1.4.1. Indoor space must provide room for animals to move about and lie down without restriction. A minimum of 400 sq. ft (37.2 sq. m) is required for a single animal, approximately 800 sq. ft (74.3 sq. m) for two animals, and so on. Because of their size and space requirements, bulls or cows with calves must have a minimum of at least 600 sq. ft (55.7 sq. m).

1.4.2. Outdoor yards must have at least 1,800 sq. ft (167.2 sq. m) for a single adult individual and an additional 900 sq. ft must be added for each additional animal. If this space is the only location for exercise, then it is recommended that the space per elephant should be even greater.

2. Biotic Variables:

2.2. Group Composition

2.2.1. The minimum age offspring must remain with their mothers is three years. Some flexibility is necessary in cases of maternal rejection and when infants cannot be reestablished in their social group.

5. Behavior management

5.1. Training

5.1.2. The AZA considers the following training tools/techniques to be inappropriate for use at member institutions:

a. Insertion of any implement into any body orifice, unless directed by a veterinarian specifically in connection with training for a medical or reproductive procedure.

b. Striking an elephant with anything more substantial than a guide.

c. Striking an elephant with any sharp object, including the hook of a guide.

d. Striking an elephant on or around any sensitive area, such as the eyes, mouth, ears, and genital region.

e. No tools used in training should be applied repeatedly and with such force that they cause any physical harm to the animal (i.e., breaking the skin, bleeding, bruising, etc.)

f. Withholding or reducing an animal's daily-recommended amount of food and or water.

g. Withholding veterinary care for any reason.

"If properly executed training procedures are ineffective in eliminating aggressive or inappropriate behavior in a given

> animal. Institutions should consider other alternatives, including transfer to a facility with more experienced staff or a different management system. Protracted and repeated use of corporal discipline in training is of serious ethical concern and the AZA considers abusive training practices to be unacceptable. Further, elephants that are untrained, unexercised, or unable to complete minimum behavioral requirements may be considered neglected and thereby abused."

5.5. Restraint

5.5.1. Chaining is acceptable as a method of temporary restraint. However, elephants must not be subjected to prolonged chaining (for the majority of a 24-hour period unless for veterinary treatment or transport. Institutions that regularly use chains for some portion of at day must alternate the chained foot on a daily basis. All new construction and major renovations must be constructed in a manner that minimizes or eliminated that need for chaining.

In the preface to the 2004 Elephant Husbndry Resource Guide, edited by Olson, it is noted that:[22]

> "A great deal of information was collected and a large number of people contributed to the preparation of this document. The authors accept that these guidelines are far from complete and encourage readers to seek more specific information that is available in the literature. The authors acknowledge that our attitudes on what elephants require may change with time.

> Elephant management is a dynamic process and will change as more is learned about elephants."
>
> "These guidelines recognize the established standards of the United States Department of Agriculture (USDA), Elephant Managers Association (EMA). American Association of Zoos and Aquariums (AZA), and the International Elephant Foundation (IEF) as they apply to elephants."

In addition to documenting the previously noted AZA guidelines regards temperature, space, group composition, behavior management, and restraint, the Elephant Husbandry Resource Guide notes with regards to elephant management where the handler is working immediately next to the elephant:

> "The handler carries a guide to cue and direct the elephant. Being in close contact with the elephant requires a high level of skill and ability from the handler. The elephant is trained not to push, strike, or displace the handler with any part of its body. In addition, the handler in this management system cannot ignore incorrect behaviors, or allow the elephant to walk away without being released through the trainer's command."
>
> "The elephant must be trained to be responsive to all commands given, and the handler must have the ability to obtain a reliable response from the elephant at all times. Due to the need for behavior control of the elephant, an elephant that is repeatedly noncompliant should not be handled in this manner."

> "It is unacceptable to the goals of training to use inappropriate training methods. Inappropriate training methods destroy the bond of trust between the handler and the elephant, and risk the general physical and psychological health of the elephant. At no time should the basic needs of the elephant be neglected, nor should the training risk permanent injury to the elephant."

In considering indoor housing the Elephant Husbandry Resource Guide indicates:

> "Typically indoor space for elephants is designed one of two basic ways. Indoor space can be designed as large community stalls in which the elephants live together as a group if they are socially compatible. Elephants housed in large community stalls may also be tethered if instances of aggression or serious competition between elephants are observed. In this situation, if one elephant must be tethered, then all of the elephants in the stall must be tethered. No elephant should be left untethered due to the potential of its injuring a tethered herd mate. The elephants are tethered side-by-side, close enough to interact but far enough apart that each elephant has sufficient space to lie down, and all can lie down at the same time. Indoor space can also be designed as individual stalls. Each stall should provide adequate room for the elephant to move about freely and lie down without restrictions."

> "It is recommended that all new elephant holding facilities are designed so that a single female elephant stall size be a minimum of 400 square feet (39.2 sq. meters), approximately 800 square feet (74.3 sq. meters) for two adult female elephants, and so on."

"Male elephant stalls are designed to be a minimum of 600 square feet (55.7 sq. meters)."

In considering outdoor housing the Elephant Husbandry Resource Guide indicates:

"Outside yards should be as large as possible. It is recommended by most elephant managers that a minimum space of 1,000 square feet (167.2 sq. meters) per elephant be provided, so the elephant can move about freely and allow individual elephants to separate themselves from the herd if they desire. Many elephant managers believe that unless the elephant is out of the enclosure for exercise on a daily basis, the space per elephant should be even greater."

"Elephants need access to mud wallows and dusting materials such as sand or dry soil, for skin health, protection from sun, insects, and to promote natural behaviors. The size of mud wallows and sand piles should be gauged by the number of elephants in the exhibit so as to allow ample room for multiple elephants to use the area at the same time."

"Care should be taken when a new calf is in an enclosure with a pool. Although many calves exhibit a natural ability to swim, consideration should be given to modifying or partially draining the pool until the calf is comfortable and experienced with swimming."

Regarding behavior management the Elephant Husbandry Resource Guide indicates:

"Less information is available on the Asian elephant, as their social behavior is much more difficult to observe due to their

fewer numbers and habitat of dense forests. Based upon limited existing data, indications are that the social behavior of the Asian elephant appears to be similar to that of the African elephant."

"Elephant facilities should make every reasonable attempt to replicate the natural social behavior of elephants in order to enhance compatibility, longevity, and reproduction and calf rearing success, especially in nulliparous females (females that have yet to have a calf)."

In Managing Elephants (Roocroft and Zoll, 1994), the authors state in the introduction:[30]

"Two conclusions emerge from this nearly two century experience: captivity in zoos produces aberrant behavior in elephants and elephants, as confined in zoos, pose a significant threat to the people assigned to care for them. From the beginning, zoos confronted a dual objective: to keep elephants in a manner tolerable to the animals confined and, additionally, to reduce the dangers to which zoo personnel were exposed. It is not hyperbole to say that a kind of 'state of war' has existed between elephants and zoos. There have been causalities on both sides--elephants destroyed as being 'unmanageable' and handlers killed by elephants. That grim situation continues to prevail even now."

"The zoo experience with elephants was paralleled by the keeping of elephants by circuses. In a sense, the circus is an ancient institution, but it became a firmly established amusement in the

> nineteenth century. Elephants in circuses also produced a frequently stormy relationship, despite the fact that the circus elephant was subjected to training from the inception of its employment and, trouble emerged in the circuses and indeed, many hundreds of circus elephants provided reliable and versatile services. A portion of the trouble that emerged in circuses resulted from the fact that many circuses exhibited male or 'bull' elephants on the strength of their public appeal, but these traveling shows usually lacked the facilities to properly control bulls, leading to numerous unfortunate public incidents. Since P.T. Barnum brought the huge 'Jumbo' to America in 1881, the public was fascinated by the awesome bulls, larger and more impressive than the 'cows,' and circuses sought to cash in on this attraction."

In an overview of elephant behavior the authors discuss seven characteristics that differentiate elephants from other trainable animals, four of which include:

> "Elephants are decidedly *individualistic* even prone to display idiosyncratic behavior. Their scale of likes and dislikes, as it were, is much wider than most animals; they have more variable 'personalities' than most other commonly trainable animals."

> "Elephants have pronounced *transient emotional volatilities or moods.* As elephants have a wide range of emotions, they also exhibit, on occasion, swings of mood, sudden behavioral shifts, usually of brief duration. These may or may not be related to immediate environmental causations."

> "The *testing phenomenon* is characteristic of elephants or the probing of the limits of hierarchical authority. While elephants are conditioned to hierarchical submissions, they are not above testing or determining these limits, particularly in artificial captive circumstances. These are not essentially aggressive acts, per se but are rather exploratory, but the size of elephants frequently makes these initiatives a matter of concern and reactive discipline."

> "Elephants possess both a *retaliatory cunning* and a *sense of outrage* that go far beyond the capabilities of other trainable species. Most animals are incapable of postponing retaliations against a supposed injustice, but the elephant can do this. Its intelligence enables it to harbor grudges and await propitious moments for retribution, whether or not such actions are really merited. Moreover, elephants appear to have a sense of 'outrage' uncommon in other species, intense wounded feelings that may prompt them to display indignation in various ways."

Additional behavioral observations by Roocroft and Zoll include:

> "One of the most common examples of neurotic behavior is rocking in place, on or off the chain tethers. This may develop in young animals and then become compulsive. It may have a variety of causes, some of them comparatively simple to deal with, as a indication of stress, rocking may be eliminated by a different stall arrangement, increasing the animal's sense of security. But its cause may lie deeper, too. Some elephants will hold the trunk in the mouth while rocking,

> reminiscent of 'thumb-sucking.' Other vices include hitting the head on walls and gates, tapping the tip of the trunk against nearby objects pulling on the mammaries, rubbing tusks along the chains, banging chains on the floor, lifting a rear leg and then touching it with the trunk and pulling on the skin under the chest. In general, an early warning sign of neurotic behavior is some evidence of increase in continuous apprehension following changes of location, being moved from place to place, from the yard back into the barn, for illustration. A dominant axiom bears repeating: the close confinement of the elephant requires vigorous and imaginative compensatory techniques of management in order to prevent the animal from suffering drastic psychological deterioration. The prevention of that deterioration and the establishment of consistent control over the animal are the dual goals of enlightened elephant management and these objectives are inextricably joined."

Notations by Roocroft and Zoll regards use of the bull hook include:

> "The hook should be reasonably sharp, as a dull hook will not create any sensation at all when applied to the folds of the skin, but a too sharp hook might actually puncture the skin and produce a small wound."

> "The hook is needed only because of the unusual thickness and texture of the elephant's hide and its basic purpose is to provide a tactile cue to the animal by creating a mild sensation against the folds of the skin."

"The elephant can feel the hook, but for no more painfully than a horse can sense the spurred heel of the rider. For this reason, the ankus is not used except as a hooking implement and one ought not to hit, swat or jab an elephant with it."

"It is probably a sound rule for everyone around elephants to carry an ankus at all times because it can be a quite a potent symbol and it can also reinforce authority by its tactile cueing."

"All ankus use must be discreet and not reckless, careless, or excessively vigorous. It should confirm a voice command and not proceed it. Elephants should never be wrenched around with the hook, as it were, but that is regrettably far too common. Tactile cues, with the training hook, form a secondary channel of communication and not a primary one. Even less is the hook an instrument of punishment, as against it being a communicative device, but the level of intensity of the communication can certainly be raised and conveyed by the ankus."

Regards the training and control of elephants:

"The training of the elephant, both theoretically and practically, commences with one objective: unwavering control of the animal must be established at the very beginning of the training process, balanced with intense displays and intimations of benevolent intent and generous reward."

"To be candid, a good deal of the difficulty encountered in

zoos with unruely or seemingly devious elephants arise from ill-considered attempts to gradually assert control, a control that, in fact, is really never achieved, the elephant retaining options, so to speak, about when and how it may choose to comply with authority. The recognition of that authority cannot be 'negotiated,' as it were. If control is imposed to start with, a brief episode of dominance, conflict is thereby reduced, even avoided, and the possibilities for the broadening effect a positive reinforcement are vitally enhanced."

"The issue of control, to repeat cannot be crept up upon during the first contact with the elephant; that encounter will serve as the basis of the relationship, of an authority or control that is firmly benevolent and supportive in effect."

"Failing to gain such initial and decisive control, the trainer will be in a regrettably defensive and adversarial posture, never really able to confidently handle the animal."

"The most risky animals to work with of any large species, are individuals whose management has been based only asking the animal what it preferred to do and when it preferred to do it, never requiring the animal to perform a task that it was really unenthusiastic about undertaking."

Regarding control and discipline Roocroft and Zoll offer these comments:

"Some past methods of asserting 'discipline' over elephants can only be described as brutal and wholly unacceptable.

These methods must be condemned not only as being inhumane and even sadistic, but also ineffective, except possibly, in the very short run. If, as an abstract premise, one needs to adopt these cruelties to train elephants, then elephants are best left untrained. Aside from the welfare of the elephant, the moral damage that ensues to human beings would be entirely intolerable. But the fact of the matter is that elephants have and can be trained without brutality and, in the long run, these barbarous methods are counterproductive, as in all real abuse of animals, because abuse triggers some final reckoning, some ultimate justice, but even when it does not the abused animal becomes but a sorry, grotesque, zombie-like approximation of its potential beauty and usefulness. Despite the elephant's size and power, no highly intelligent species can endure calculated abuse; it will become unmanageable, ineffect psychotic, or it will evolve into a numb or semi-comatose condition."

"If there is a real issue of elementary control involved, it may be necessary to shackle an elephant and deliver corporal punishment by subjecting the animal to some reasonably vigorous strokes with a rod solid enough to be felt. This is no license to injure the animal in any way or to vent one's emotions on a helpless animal; punishment, with any animal, must be delivered dispassionately and discreetly and always at a minimum level of severity to obtain a calculated result."

"A few elephants may actually be cunning and, after a time, will seek to out-smart the trainer and nearly all will explore the extent to which compliance is demanded. It is important to diagnose these demonstrations of independence, possibly putting them into two categories: temporary pouts in which the animal is reluctant to follow directions or cases in which there is a real challenge to the trainer's control. These provocations require different responses. Both imply the need for discipline, of course, but in the former instance this discipline can be brief and mild, even symbolic, anywhere from a verbal admonition to solid smack on the forehead or a reminder with the hook. The 'rebellion' is short and happy relations are reestablished, much as a dog very quickly recovers as amiable attitude after a chastisement with a rolled newspaper. On the other hand, the more serious challenge to control may demand more severe measures. These 'more severe measures' might entail a forceful reemphasis on the trainer's control, like a series of brief thrashings with a wand until the animal shows evidence of recognizing the trainer's authority. One would certainly hope to avoid these measures and the problem does not arise with a large proportion of elephants in training, but loss of control with an elephant is a dangerous condition and elephants, individually, can be willful and devious despite their other apparent virtues."

"With young, good-feeling animals, the best policy may be to not give much notice to trivial expressions of independence, even if they are of a 'testing' sort unless the animal persists

and then, the matter must be seriously confronted, before the invasion of the trainer's prerogatives becomes a real issue. Most animals including elephants, wish to avoid 'heavy' confrontations; they will bluff the trainer as the trainer may be disposed to bluff them. They cannot be allowed to run their bluffs, needless to say."

"In fact, what the trainer wants is the elephant's attention foremost, he wants the animal to watch his every move, quite literally, to be 'on its toes,' anticipating some coming mode of action. To do this, the trainer must insist that the elephant rivet its attention upon him. He may tug on the trunk or ear or use the hook on the trunk or jaw, instilling an atmosphere of urgency and brisk discipline, encouraging the elephant to focus its gaze on the trainer, especially on the trainer's hands (used for cuing, rewarding and remonstrating)."

"The most common source of serious difficulty arises from an incomplete control of the animal in the initial stages of training. Some elephants may appear compliant for a number of years and then often suddenly, may turn disobedient or aggressive. This troubling advent represents the perils of the avoidance of initial total control and an elephant may then rebel against authority later on for a number of reasons, principally from a lack of respect for its handlers, also frequently exacerbated by a constant shifting of elephant staff personnel. Somewhere in the back of the elephant's mind there is an

awareness of an inadequacy of authority and while the animal may not contest this authority directly for long periods, it may ultimately overtly challenge authority, marginally or more decisively. Such defiance of authority rarely bursts forth without warning, however. It is a gradual insurrection, so to speak, and signs of intractability are unmistakable to the experienced eye." "What the intelligent trainer seeks to do is to re-establish control while avoiding a situation in which the immense physical power of the elephant is ranged against his own resources of power, even if the trainer may possess, finally, those resources. In most instances when working with problem elephants the task is to repair a past omission: to establish control by means of hopefully less direct means than the use of the original restraints. This often entails forms of punishment, but punishment carefully graduated in accordance with the elephant's intensity of resistance. Sometimes, over a time a few solid whacks with the ankus at a suitable moment will be enough to reassert control, provided that such punishment is augmented by carefully conceived training procedures and consistent firm handling. Some elephants learn to intimidate people, usually by not very forceful means, and a stricter discipline generally copes with this habit of, in effect, pushing people around without actually assaulting them. Some elephants are accomplished bluffers."

"The handling of problem elephants, in any event, is not a one-man operation, needless to say, and it requires a well-drilled team and considerable planning is indicated if forceful restraints are to be used. This team should represent adequate manpower

(too frequently such efforts are undermanned); restraining a potentially hostile elephant needs at least a crew of eight, preferably ten, in order to insure sufficient 'muscle' is available. Once immobilized, the elephant may be the object of punishment in the form of blows with a wooden rod. Such blows, by the way are mild forms of chastisement in comparison to the force used by elephants themselves in administering discipline in a herd situation. A herd matriarch can dispense some very powerful admonitions, even knocking over the offender and pummeling it with head and trunk. Such discipline is not common in the herd situation, but it does at times occur."

"With all punishment, a brief assertive session or application is always to be preferred to lengthy, on-going, half-hearted and indecisive efforts. Let the trauma of punishment be brief and hopefully conclusive. An elephant is far more likely to harbor a festering resentment, seeking, perhaps, a later retaliation, if punishment is prolonged and inconclusive, if the animal is, in sum, harassed by it. It should be repeated that actual punishment need not be an inevitable feature of training. Correction, in training, need not imply corporal punishment, but, here, reference has been made to problem situations in which punishment regrettably, may become indispensable for the re-establishment of control."

In the final chapter of Roocroft and Zoll's book the authors comment on the future of captive elephant management, elephants behavior in the wild, and conservation:

"The entire field of elephant management may be on the brink

of very significant change to altered objectives in maintaining elephants in captivity. The hoary notion that every zoo and circus is not complete without a resident elephant has given way to consideration of the conservation of elephants and also to a growing public demand to see animal species presented in increasingly natural conditions. These factors, the objectives of conservation and more naturalistic exhibition, do integrate to some degree and can stimulate imaginative options in regard to the institutional presentation and maintenance of elephants. But the realization of better reproductive environments and more naturalistic exhibitions are not without technical difficulties, especially as many contemplated projects in this regard involve the inauguration of untried and therefore untested managerial techniques."

"There is no doubt at all that improvements in the physical environmental of the captive elephant are warranted and over-due, but it is another matter what these improvements should be and whether improvements will necessarily feature changes in over-all managerial philosophy or policy. There are obvious theoretical advantages in shifting the modes of elephant captivity toward more naturalistic conditions, requiring, it should be added, very extensive alterations of the physical features of confinement. The physical and psychological health of the animals would be improved without any doubt. Reproduction might be made more consistent. From the public perspective, the educational and aesthetic benefits would seem obvious. These factors would appear to argue for some major changes in elephant-keeping."

"Elephants work for a living in the wild state, in a sense. Foraging and browsing takes time, labor and attention; wild elephants work at it for sixteen hours a day or more. The search for food is continual. If one removes this element from the elephant's existence, one radically alters its life history and, hence, its behavior. Unhappily, natural foraging is the least possible of all captive environmental replications. The closest achievable approximation may be the Asian practice of releasing work elephants into the forests at night for foraging or even granting semi-liberated 'vacations.' And it may be said that elephants generally prospered and reproduced better in this situation than anywhere else surely better than in zoological parks. If one cannot reproduce natural feeding conditions, the aim must be to approximate the benefits of natural feeding or, put simply, combine adequate nutrition with movement."

"The role of captive breeding as an element in the world conservation of the now officially 'endangered' elephant is frankly uncertain at best. If one entertains some apocalyptic scenario of outright devastation of elephant population in Asia and Africa, the admitted handful of captive elephants in America and Europe might take on some relevance, as in the present case, say, of the Siberian tiger or Sumatran rhino, but it is highly unlikely that either genus of elephant is headed toward that calamity. The potential holding capacity of protected reserves in Asia and Africa is adequate to sustain viable populations (perhaps 30,000 in Asia and 250,000 to 300,000 in Africa) and the problem is not the over-all population size of these genera, but rather the matter of local numbers as against habitat potentialities, creating, in essence, a managerial problem. Put bluntly, the future fate

of the elephant lies in Asia and Africa and not elsewhere and it is in these regions where resources are needed to be expended."

As a follow up to Roocroft and Zoll's discussion on control and discipline, in the 1999 text, Animal Training (Ramirez, ed.), Priest offers these comments regards elephant management and keeper safety at the San Diego Wild Animal Park:[26]

"Elephants are intelligent, social and potentially lethal animals. In the last 15 years 15 keepers have been killed by elephants Maintaining healthy elephants in captivity requires that keepers have total access to the animal. For 3000 years, elephant handlers accomplished this by exercising social dominance through occasional physical discipline. This control system was patterned after the wild elephant's own social behavior and hierarchical society. In India, where traditional control methods evolved, a mahout (Hindi word for elephant handler) is often associated with an elephant for a lifetime. The keeper's dominance is established early on in the relationship, and the need for physical dominance decreases as the social bonds develop between trainer and animal. Unfortunately, this control system also requires 100% compliance from the animal 100% of the time. There is no room for deviation, nor can the keeper safely allow any breakdown in control, as this can lead to catastrophic results."

"Although hundred's of elephant keepers have been killed as a result of the failures of this system, it has remained largely unchallenged and unchanged. No alternative has existed. The system was carried into this century and to zoos by many fine

> circus trainers. Now several fundamental societal shifts are causing us to rethink the traditional elephant management system."
>
> "Today's society is increasingly mobile. As a result, employment behavior has changed. We can no longer expect elephant keepers to remain with a single animal for a lifetime or, for that matter, even for a few years. By trying to maintain the old system in this new environment, relationships continue to grow less secure. Under these circumstances, challenges by elephants, and the need to use physical discipline to maintain control, will become more frequent. Zoological institutions have helped link animals with the environmental crisis. This new awareness has very naturally created a heightened sensibility toward animals. The traditional method of elephant management may come to be regarded by the public as offensive and inhumane."

In the first edition (1978) of the veterinary textbook series, Zoo and Wild Animal Medicine edited by Fowler, in the chapter on elephants, author Michael Schmidt discusses, restraint and handling, diseases of the feet such as split nails, abscesses of the foot, and musculoskeletal diseases such as degenerative joint disease:[32]

> "Elephant hooks are advisable for ensuring that even the most placid elephant does not constantly move away from, or crowd into, personnel who must enter the area. Other sharply-pointed objects, such as a beer can opener, sharp key, or pen knife, can suffice in an emergency."

"Those who must approach elephants that are not used to them must have an elephant hook or other implement handy, as elephants are prone to 'test' strangers by crowding them, stepping on their feet, or displaying minor aggressiveness."

"Split nails are most often caused by inadequate wear or trimming, combined with moist conditions. Moist conditions soften the nail and inadequate wear or trimming puts unusual pressure on the soften nail causing it to split. If the split is caught early--before the deep sensitive laminae are exposed--the nail should be trimmed to eliminate pressure on it and the feet kept dry, which should prevent deepening of the crack."

"Abscessation of the foot is a common sequela to injury or poor foot care. Due to the thickness and toughness of normal or overgrown sole, many abscesses of the foot are readily observable externally as a fluctuant swelling."

"Degenerative joint disease is apparently more common in captive than in wild elephants. Debate concerning the causes of degenerative joint disease in captive elephants has centered around husbandry. Some researchers believe that elephants forced to live out their lives on hard surfaces such as bare concrete, which produces a damp, cold, environment, most often develop degenerative joint disease. Another view is that both the uniform surface of hard, cold floors and the fact that many elephants are chained for the major part of the day in positions that restrict movement are responsible for the degenerative joint lesions seen in captive elephants."

> "Captive elephants can develop loss of joint function after even minor injury if they are not required to move that joint after the injury. It may be that the artificially induced, reduced joint use caused by chaining could contribute over the years to degenerative joint disease. Faulty conformation on individual elephants undoubtedly will predispose some elephants to develop more degenerative joint problems than elephants with normal conformation."

> "Actions that might be taken to prevent degenerative joint disease in elephants include providing a dirt exercise yard, providing concrete floors with a warm heat system built into them, padding the concrete surfaces on which the elephants are housed with artificial turf, foregoing chaining of elephants unless necessary as a temporary means of restraint, or combination of the above."

In the third edition (1993) of the veterinary textbook series, Zoo and Wild Animal Medicine, edited by Fowler, in the chapter, Veterinary Care of Performing Elephants, author Richard Houck discusses degenerative joint disease:[15]

> "Performing elephants are usually restricted to a picket line between performances, and movement is similarly restricted during transport. They are tethered by chains attached to one or more limbs. The question is often asked about the effects of chaining on the health and well-being of elephants, particularly as a predisposition to arthritis. I have been unable to correlate chaining with an increased incidence of arthritis. As in horses, DJD is more prevalent in the forelimbs, and this

> may be related to the heavier proportional weight borne by the front limbs."

> "Elephants experiencing arthritic pain are reluctant to lie down to sleep and rest, but continuous standing only enhances the arthritic process. Once analgesia has been attained, a performing elephant may be commanded to lie down in a comfortable area away from the threats of other elephants, thus providing needed relief and even re-established sleep patterns."

In the fourth edition (1999) of the veterinary textbook series, Zoo and Wild Animal Medicine edited by Fowler and Miller, in the chapter Radiographic Techniques of the Elephant Foot and Carpus, author Laurie Gage comments on foot disorders:[12]

> "An extensive review of the medical management of elephants indicated that foot disorders are one of the most common ailments observed in captive elephants. Cracks in the nail or cuticle and abscesses in the sole are common and may lead to deeper infection. Severe infections in the soft tissues and nails may spread to the adjacent bones and joints of the foot, causing osteomyelitis and suppurative arthritis."

In the fifth edition (2003) of the veterinary textbook series Zoo and Wild Animal Medicine edited by Fowler and Miller, in the chapter *Proboscidea* (Elephants), author Dennis L. Schmitt indicates in the section discussing noninfectious diseases:[33]

> "Foot problems comprise the most common ailment in the care of captive elephants and are seen in 50% of the elephants

> at some point in their lifetime. The types of foot problems affecting elephants include, penetrating injuries, sole cracks, cracks in the nail or cuticle, overgrowth, and abscesses. Most foot problems are treatable, but some can result in disability or death. Major contributors to foot problems in elephants are lack of exercise, standing on hard substrates, and contamination resulting from standing in their own excrement. Prevention of foot problems by changing the environment of the elephant to reduce contributing factors and daily foot care are essential for captive elephant husbandry."

In a section discussing special housing requirements, Schmitt indicates:

> "Floors should be impervious to water and should drain and dry adequately. The surface of the floor must be smooth, but not so smooth as to become slippery when wet. Roughed floors can cause excessive wear to footpads and skin abrasions as the elephant attempts to lie down. Elephants should be allowed to get off hard surfaces for as many hours each day as weather and husbandry protocols permit."

In Adams' 1981 book on the subject, conditions of elephants' feet and limbs from standing on hard surfaces, the author makes several observations:[1]

> "Elephants in captivity are frequently afflicted with arthritic and rheumatoid disorders which affect the bones and joints of the extremities. These diseases are attributed to confinement in damp and cold concrete floors, poorly ventilated housing facilities, and insufficient opportunity to walk for extended distances. These diseases are rarely reported in wild elephants

who generally walk a lot."

"Elephants in zoos and circuses frequently are made to get down on their knees and elbows onto solid surfaces such as concrete and asphalt pavements. These surfaces are hard and abrasive and they cause severe bruising and cuts of the skin. Also during loading and unloading of circus elephants, or during performance of circus acts, elephants frequently bump into sharp objects or steel cables and acquire skin wounds and abrasions."

"When elephants are chained up for long periods of time in one place, they frequently develop disorders of the skin on the inside of the rear legs and feet. Urine and fecal boluses dropping to the concrete or other hard surface splash onto the rear legs, seep into the fissures of the skin and cause irritation and infection. A symptom of this pathology is the frequent crossing and rubbing of the rear legs together by the elephant."

"Wild elephants seldom have foot problems because they usually walk long distances, they are careful where they step, they use their feet to dig in the soil, and they bathe regularly. The most common pathological conditions involving elephant feet include: fungus infections of the soles, overgrown nails, cracked nails, overgrown cuticles, and foreign bodies embedded in the sole."

"Split sole or heel and overworn sole are additional pathological

conditions of the feet resulting when elephants remain standing in water or in their own excrement for long periods of time. One may suspect these abnormalities if the elephant resists the usual commands such as 'move up, or move over,' is reluctant to have anyone palpate the soles, and is obviously lame when walking. The constant moisture causes the sole to soften, and since the foot expands as the elephant places its weight on it, the usually tough sole splits and the break in the tissues becomes infected causing the symptoms described."

"As mentioned for split sole and heel, standing in water or in its own excrement for long periods of time tends to soften the soles of elephants' feet. If the elephants are then made to walk long distances over coarse surfaces, the soles tend to wear more than usual and become tender. The result is lameness."

"Elephants' toenails also need attention. If unable to walk daily or to dig in the dirt, elephants develop overgrown toenails. The nails extend beyond the sole of the foot, resulting in unusual shape and sometimes cracking. A contributing factor to the cracking of nails is excessive moisture to the feet."

"A common foot problem of circus elephants is that foreign objects get embedded into the soles of the feet. The walking of elephants from railroad sidings to circus sites or from the 'picket-line' to the arena where the acts are presented predispose the elephants to step on pebbles or stones, glass, wire, nails, and other small debris."

> "A condition seldom seen in wild elephants is degenerative joint disease in the legs, but this disorder is frequently seen in captive elephants. The afflicted animal moves very slowly and appears to be in pain."

> "Improper nutrition may be an important predisposing factor. Some veterinarians attribute degenerative joint disease in elephants to inadequate housing facilities of captive elephants. They claim that elephants forced to stand on hard, moist and cold floors without an opportunity to exercise on a dirt surface, or an inability to use an injured joint, tend to develop degenerative joint disease."

> "This disease will have to be diagnosed by an experienced veterinarian and treated symptomatically. This disease is not common among captive elephants living in wild animal parks where they have large areas in which they can walk on soil."

In Wallach and Boever (1983), the authors write, concerning orthopedics in equids, tapirs, elephants and hippopotamus:[35]

> "Osteoarthritis occurs in the older equine, zebra, and pachyderm. The articular cartlage is usually destroyed, leaving a raw, painful bony surface. Diagnosis is usually made by clinical signs and a history of reoccurring lameness that becomes reduced as the animal 'warms up.' "

In the introduction to the veterinary text, The Elephant's Foot (2001), which is based upon information presented at The First North American Conference on Elephant Foot Care and Pathology held in March, 1998, it is stated that:[8]

> "Foot problems are seen in 50% of captive Asian and African elephants at some time in their lives."

> "There is general consensus that lack of exercise, long hours standing on hard substrates, and contamination resulting from standing in their own excreta are major contributors to elephant foot problems."

In the text's first chapter, An Overview Of Foot Conditions In Asian And African Elephants, Fowler indicates:

> "The following are suggestions of predisposing factors leading to foot problems based on the author's experience:
> 1. Lack of exercise.
> 2. Overgrowth of nail and/or sole.
> 3. Improper enclosure surface.
> 4. Excessive moisture.
> 5. Insufficient foot grooming.
> 6. Insanitary enclosures.
> 7. Inherited poor foot structure.
> 8. Malnutrition.
> 9. Skeletal disorders (arthritis)."

In the text's fifth chapter, Foot Care For Captive Elephants, authors Roocroft and Oosterhuis state:

> "We believe that no matter how good a foot care program

is, eventually foot problems will be seen because they are the result of keeping elephants in captivity."

Concerning husbandry practices necessary for healthy feet, Roocroft and Oosterhuis indicate:

"Healthy feet require exercise of all joints, tendons, and ligaments. Anything less predisposes an elephant to foot problems, especially later in an elephant's life. Too often, however, the need for adequate exercise is overlooked or ignored. As a consequence, captive elephants become overweight and are less likely to exercise or move at all."

"Elephants in the wild visit water holes twice a day to drink and socialize. During these hours they swim, roll in the mud, throw dirt on themselves, and rub their massive bodies against large objects. This process cleans and scrubs their bodies and rejuvenates their skin. Also, by digging with their feet in wet sand around the water source, they clean and scrub between their nails and around their cuticles. Although the wild elephants' feet are not typically considered pretty or well pedicured, they are healthy and functional."

"In captivity, elephants' feet are constantly exposed to their own feces and urine, which results from long hours of confinement in their stalls, up to 16 hours a day in some situations. Therefore, in order to reduce the corrosive nature of urine and the infective components of the feces that get on their feet and legs, proper hygiene practices must

be followed. This includes the daily scrubbing of feet and legs, using soap and water and a hard bristle brush."

"Unfortunately, most captive elephants spend the majority of their time standing on concrete or asphalt floors. Elephants should be housed for the majority of the day on resilient, interactive, yielding surfaces. Substrates allowing an elephant to dig will exercise and strengthen leg and foot muscles, tendons and joints. This exercise and activity directly supports healthy feet throughout the elephant's life."

"Captive African and Asian elephants generally have two distinctly different foot care needs, which probably result from differences between their natural environments and their relatively sedate lifestyles in captivity."

"African elephants need little nail care. Most foot care attention is directed towards pad trimming. Proliferate pad growth is probably an adaptation of the wild African elephant's daily need to travel many miles on relatively hard, dry surfaces looking for food and water. On the other hand, the Asian elephant, whose natural environment is generally more moist and lush, needs considerable nail and cuticle work and relatively little pad care."

"In general, both species need more foot care as they grow older, especially elephants in a nonworking environment. The consequences of captivity slowly catch up with an older

elephant, with the lack of exercise being the most important factor contributing to the need for increased foot care."

"African and Asian elephants occur in different types of habitat and have evolved different types of foraging habits. The African elephant has evolved as a browser, as indicated by the shape of its trunk tip which has opposing 'fingers,' and by its tremendous flexible trunk, which amazes so many circus visitors. The feet of African elephants are subject to less stress because of their predisposition to browsing and because they use their trunk more than their feet when foraging. It is commonly recognized that in captivity the African elephant needs less foot care than the Asian elephant, even among older elephants."

"In contrast, the Asian elephant has more a robust foot structure that is assumed to have evolved because of its methods of grazing. The trunk of the Asian elephant is less flexible than the African. The tip of the trunk possesses one finger and a large palm-like appendage that opposes it. The structure and strength of the trunk allows the Asian elephant to graze by grasping large clumps of grass and pulling them out of the earth, while making a raking motion with its foot. The large nails of Asian elephants' feet act like chisels, digging deep in the soil and assisting the trunk in excavating grass and roots."

"The Asian elephant will also browse when the opportunity arises, and the African elephant is frequently observed eating

grass on the savannah. But these are secondary feeding adaptations resulting from the destruction of their primary grazing habitat."

"Because many circus trainers have had bad experiences with elephants hitting their feet on tent posts or stakes, filing the face of the nail has been frowned upon for many years. Filing may weaken or compromise the strength of the nail. The excessive removal of pad would also be a mistake for circus elephants, considering the type of substrate they must negotiate when offloading at stony train sidings or when walking on hot asphalt in the summer. We tend to share the opinion of circus trainers; a little extra pad and nail thickness might save an elephant's feet from a lot of damage."

"An elephant in the wild traverses many different types of substrates and terrain. Most often the Asian elephant walks on soft, yielding surfaces like the leafy jungle floor, while the African elephant walks on the grass and sand of the savannah and the hard dry surfaces of semiarid deserts."

"The wild elephant, unlike its captive counterpart, can walk away from its own feces and urine. In most management situations, the captive elephant is housed on a concrete or asphalt floor in an indoor facility for up to 60 percent of its time. Inevitably it must stand and walk in its own feces and urine, which collects in the cracks of the pads and between the nails. Urine is corrosive and feces contain numerous organisms

that may cause infection if the feet are not washed daily."

In a discussion of common problems associated with elephant feet the authors continue:

"Abscesses are commonly seen in many captive elephants, and their cause are usually not obvious. It our opinion that they are rarely the result of a puncture or some other outside insult to the foot. Rather they are caused by internal blood supply disruption, which is a sign or symptom of the multitude of problems associated with keeping elephants in captivity. We feel that the elephant is not genetically programmed to withstand the constant gravitational pressure of living on hard surfaces and carrying the excessive weight typical of most captive elephants. Elephants certainly didn't evolve to stand motionless for long periods of time."

"The inactive, overfed, overweight, out of shape, captive elephant, which may or may not have some abnormal behavioral activities, is predisposed to foot problems like abscesses and cracks. We feel that the lack of exercise decreases the overall vitality of the structure of the captive elephant's foot. This lack of vitality is further exacerbated by the added weight most elephants carry and by the fact that the majority of their time is spent on hard unyielding surfaces."

"It is our opinion that when these factors are combined with abnormal behavioral movement, poor conformation, or previous injuries, the foot is destined to develop abscesses. Any

abnormal pressure on the nails as is seen on the lateral nails of the stereotypical 'rocking' elephant, will result in a disruption of the blood supply to the sensitive tissue behind the nail. When this tissue is subject constant or intermittent abnormal pressure, it will bruise and then form a sterile nail abscess. This abscess then follows the path of least resistance as the body tries to get rid of it. It usually ruptures toward the surface at the cuticle line or at the interface between the bottom of the nail and the pad. As soon as it ruptures it becomes an infected abscess."

"The bottom line is that abscess prevention is the best course of action. Prevention of abscesses requires: 1) exercise to strengthen foot structures and maintain good blood flow to the foot; 2) reduction in weight to reduce pressure on the foot; 3) allowing the elephant to live on soft, yielding surfaces; 4) elimination of behavioral motions that cause abnormal stress on the foot; 5) attention to good hygiene practices to minimize surface contamination; and 6) regular, compete, and correct pedicures."

The authors discuss further the occurrence and cause of nail cracks indicating:

"Cracks are normal in the pads of an elephant's foot, but not in their nails. When cracks occur in the nails, they demand attention to prevent the development of serious problems. And even though cracks are normal in the pad, without proper care these too can lead to problems."

"Nail cracks are usually the result of a repetitive movement

that puts abnormal pressure on the nail. The environment of the elephant's enclosure can exacerbate this pressure. An example is the stereotypical 'rocking' elephant, where an elephant stands in one place on a hard surface and rocks back and forth. This puts abnormal pressure on the lateral toes of the front feet, eventually leading to nail cracks. This problem will be compounded in an extremely arid climate, which will dry out the nails so they become hard and lose their flexibility."

Finally the authors identify the conditions that can lead to foot problems:

"**Conformation** Elephants with poor leg conformation will walk with an abnormal gait. This will then lead to the foot touching the ground in an abnormal manner and will result in an excess of pressure being exerted on the toes. This excess pressure will result in increased wear and possible cracks and abscesses."

"**Abnormal Behaviors** Repetitive or 'stereotypical' behaviors can have the same effect as poor conformation on an elephant's feet."

"**Trauma** When an elephant injures a leg, it will refuse to flex the joints and walk with a stiff leg. The end result in many cases is a permanently stiff leg, regardless of the original problem. When the elephant walks on this stiff leg, it will cause abnormal wear on the medial edge of the pad of that foot."

> "**Arthritis** Another condition that can lead to foot problems is arthritis. The soreness in an elephant's joints will result in decreased joint flexibility. This will lead to an altering of the elephant's gait and, as mentioned before, abnormal pressure on the nails and pads."

> "**Environment** Environmental conditions are so important to the health of an elephant's feet that we are mentioning them again. When comparing the conditions of a captive elephant's environment to its counterpart in the wild, it is easy to see the multitude of insults we impose on their feet. Some conditions can cause problems rather quickly, like sharp metal objects that an elephant accidentally hits with its feet. Others, including lack of movement, take years of accumulation to manifest into problems."

In the final chapter of the text, The Elephant's Foot, it was noted that there was general consensus of the conference attendees on six items, one being:

> "Each elephant facility should minimize the amount of time elephants spend on hard, unyielding surfaces."

In the recent veterinary text, Biology, Medicine, and Surgery of Elephants, (Fowler and Mikota, eds. 2006) there are references from several authors that cite the use of the bull hook (guide, or ankus), and chaining practices as they relate to the health of elephants:[10]

Regarding wounds, abrasions, and lacerations, Mikota comments:

> "Both free-ranging and captive elephants have ample

opportunity to sustain injuries from sharp objects (thorns, nails) or from the improper use of guide devices (ankus or hook)."

Regarding wounds, authors Cheeran and Chandrasekharan, from India indicate:

"Puncture wounds are common in captive elephants and result from spiked hobbles; sharp, metal-tipped sticks used for prodding; and elephant hooks. Chain injuries to legs occur from protracted tethering during musth, which may last 3 weeks to 3 months. Pressure sores that may form abscesses occur on the shoulder and hip from lying on hard surfaces and are also common."

From Sri Lanka, authors Silva and Dangolla write:

"A recent study revealed that 25% of observed wounds were caused by the misuse of the ankus (goad) by unskilled keepers. Leg chains were responsible for another 25%. Other causes were gunshots, prolonged recumbency, and traffic accidents."

"Working elephants are more prone to develop pododermatitis from walking long distances on rough surfaces and tarred roads. Standing in dirty stables throughout the night, especially during the festival seasons, is another risk factor. Aged females are more likely to have their feet soiled with dribbling urine compared to males."

"Arthritis is common among old captive elephants and often results from physical injuries to the joints caused by keepers."

Pododermatitis is discussed by Fowler under infectious diseases of the skin of feet as follows:

> "The term pododermatitis is used to describe any infectious process of the foot, which may be as simple as a localized abscess or as complex as a generalized infection in and around the nails or in pockets within and beneath the sole. A severe infection may spread to involve the bones and joints of the foot, producing septic osteitis and arthritis. A serious consequence is infection of the digital cushion."

> "Predisposing factors include neglect of regular nail and sole trimming, constant exposure to filth and moisture and lack of routine inspection of the undersurface of the foot. Sedentary elephants are more likely to develop foot infections than active elephants. Elephants with conformational faults tend to develop foot problems as they begin to age (30-40 years) because they walk in such a manner that unequal weight is distributed to unaffected limbs."

Reporting from Indochina and Bangladesh, author Martelli indicates:

> "Wounds on the head and ears are caused by the ankus or ear ropes (ropes, sometimes combined with a metal hook that are placed in or around the ear to control the elephant). Tail wounds may be inflicted by other elephants."

Regarding trauma associated with leg chains author Subramanian, from Malaysia reports:

> "Chains are a source of trauma for both captive and wild elephants. It was a common practice to chain captive elephants

at night. This caused wounds, abscesses, and arthritis. It is now recommended in Malaysia not not to chain elephants during day or night. The use of electric fencing to prevent escape is highly encouraged. This practice is followed at the Singapore Zoo. The author recommends the adoption of this practice for all elephants in captivity."

Regarding wounds and abscesses, Subramanian indicates:

"Superficial skin wounds in captive elephants may result from social fights, hooks, self-inflicted enclosure features, accidental falls and foreign bodies."

Regarding toenails and toenail cracks, Fowler notes:

"Elephant toenails require constant attention from caretakers to prevent hidden infection from progressing to untreatable osteomyelitis."

"Horizontal and vertical cracks may occur, but vertical cracks are more common. Cracks may begin at the cuticle and extend distally to the tip, or they may begin at the bottom and extend proximally. Cracks may be superficial, being confined to the keratinized nail, or extend into the corium, which causes more discomfort for the elephant."

"The etiology of toenail cracks is unknown, but it may include factors such as nutrition, genetics, overgrowth, and trauma. When a crack develops, it is exacerbated by the expansion and contraction of the foot during ambulation."

In discussing foot conditions authors Fowler and Mikota indicate:

> "The nails may overgrow in captive conditions and regular trimming is important. If neglected, cracking of the nails may cause lameness or infection."

In discussing degenerative joint disease (DJD, osteoarthritis) noted previously by Adams (1981), and Wallach and Boever (1983), authors Fowler and Mikota (2006) indicate:

> "Osteoarthritis may be considered as a group of disorders characterized by a common end stage, which is a progressive deterioration of the articular cartilage, accompanied by changes in the bone and soft tissues of the joint. DJD is a major cause of disability in captive elephants and thought by some to be the result of poor management practices with captive elephants. However, arthritis has been identified in prehistoric mastodon skeletons. As in horses, DJD in elephants is not likely a single specific disease, but different conditions that have the same conclusion, DJD may affect any of the limb joints, but in this section emphasis is given to foot joints."

The authors discuss predisposing factors indicating:

> "This is a controversial subject. Lack of exercise, housing on hard surfaces, and tethering are frequently brought forward as causes of DJD, but aging and wear and tear (trauma from performing repetitive actions) may have a bearing on the development of articular cartilage deterioration. The elephant's bulk and lack of angulation on the limb bones promote concussion of articular cartilage. Concurrent conformation defects or injuries that cause an elephant to alter its normal

gait and change the pressure patterns within joint surfaces may have an influence. Certainly this has been shown to be a factor in human DJD."

In discussing ankylosis authors Fowler and Mikota indicate:

"Arthritic joints may become fused when the articular cartilage is destroyed and periarticular and articular bone proliferation bridges the contiguous bones. Foot bone articulations may develop ankylosis because movement is minimal. In the early stages of DJD, pain and discomfort accompany movement of the joint. When ankylosis is compete, no pain may be associated with the joint, but stiffness may alter the gait and wearing pattern of the slipper and toenails. An altered gait may predispose the foot to other conditions."

Concerning the use of leg restraint and tethering Fowler writes:

"The use of tethers for confinement of elephants is often maligned by those who do not understand the training and management for animals (companion animals, livestock, horses, elephants). Unfortunately tethers have a negative connotation because of the public perception of chains being used for enslavement. Pictures of chain gangs of prisoners working on roads or railroads come to mind, or of dangerous prisoners entering a courtroom in chains. Some states have legislated the length of time that an elephant may remain tethered. It is desirable to have an elephant free of tethers as much as possible. Many facilities no longer tether, but should maintain the elephant training and human skills to do so when necessary."

Regarding swaying, and stereotypic behavior Fowler indicates:

> "When standing and not otherwise engaged in some activity, both captive and free-ranging Asian and African elephants rock back and forth. This is called *swaying* or *weaving*, and some people equate this with undesirable stereotypic behavior. Although exaggerated swaying may be stereotypic, it is also normal behavior, and in the process of swaying back and forth the elephant is facilitating the circulation of blood from the distal extremities to the heart."

In discussing foot disorders involving the sole of the elephant, Fowler makes further reference to stereotypic behavior:

> "If thinning of the sole is noticed watch the elephant's behavior. If closely observed, it may be determined that the elephant constantly turns in a specific location and in the same direction (stereotypic behavior). This causes excessive wear on a specific area of the sole."

> "Another predisposing factor is conformational fault or an injury that causes the elephant to walk in such a manner as to produce excessive wear on a segment of the slipper. An elephant may become habituated to pawing with one foot, which may wear a toenail and the sole excessively. A shuffling gait brought about by arthritis may also produce uneven wear."

In discussing elephants in captivity in Myanmar, author Khyne U Mar makes this observation on stereotypic behavior:

> "There are two major elephant keeping systems in Asia, which may be defined as *extensive* and *intensive.* Working elephants in forest camps of Myanmar, Assam, and south India live in extensive keeping systems, and elephants kept by temples or private owners live under intensive keeping systems. Under intensive keeping systems, elephants are kept more-or-less individually, fed prepared fodder, and tethered at night."

> "Extensive keeping is the traditional management system in Asia that dates back many centuries. Under this system the daily species-specific activities are high. Elephants are hobbled and released into the forest at night to forage and interact with tame and wild conspecifics. Stereotypies are absent or rare."

In discussing the prevention of foot problems, authors Fowler and Mikota indicate:

> "Elephant foot care involves daily inspection of the feet (stiff-bristled brush and hoof pick), exercise, training, sound nutrition, sanitation, spending as much time as possible on dirt or grass, and periodic pedicures."

In further consideration of preventive health care, author Mikota writes:

> "Health is a state of physical and psychological well being. Numerous biological, physiological, and environmental variables determine whether health or disease will prevail. Proper nutrition and housing, an appropriate social environment, sound disease control measures, and other positive husbandry

practices support health. Poor hygiene or diet, lack of exercise (or overwork), and stress predispose to disease. The characteristics of a potential pathogen (virulence, infecting dose) and the status of the individual animal (age, sex, immune competence) are additional determinants."

In the introduction to the chapter on foot disorders, Fowler indicates:

"Elephants' foot health would be enhanced if they lived in a natural habitat which is defined as a large space with diverse topography and natural substrate."

"It is not possible to provide the foregoing for captive elephants, except in rare situations. However, if elephant managers understand and appreciate the benefits of natural habitat to foot health, they might be better able to approximate natural habitat."

In a chapter on multisystem disorders Fowler discusses stress:

"Stress is the cumulative response of an animal to interaction with its environment via receptors or, as another author defines it, 'stress is the biological response elicited when an animal perceives a threat to its homeostasis.' " "The threat is a *stressor* (stress-producing factor), and it is important to recognize that a psychological perception of a threat may be as important as the response to a physical stressor." "The biological responses brought about by stress are adaptive, directed at coping with environmental change, and every animal is subject to stress, whether free-ranging or in captivity. Intense or prolonged stimulation may induce detrimental

responses (*distress*)."

"We cannot be complacent and assume that elephants don't become distressed."

In a study by J. Schmid in 1995, which included 19 Asian elephants and 10 African elephants in four circuses located in Germany and Switzerland, the author noted:[31]

"Elephants have been kept shackled in stable tents since they have been presented in circuses. Today there are 305 elephants in European circuses. Most of them are kept shackled. The chains of circus elephants are attached diagonally to one foreleg and one hind leg on the opposite side. This kind of fixation strongly restricts the freedom of movement to such a degree that these animals are not able to exhibit most of their species-typical behaviour."

"Results (of this study) showed that paddocks offered more freedom for comfort, social and play behaviour since such activities were observed more frequently in paddocks than in shackled keeping. Also stereotyped movements were nearly absent in paddocks and very frequent in shackled keeping. In comparison to shackled keeping, paddocks were more suitable for the needs of elephants."

In a 1999 study by Brockett, et. al. at Zoo Atlanta concerning nocturnal behavior in a group of unchained female African elephants, the authors note:[5]

"The use of chains to tether captive elephants became a standard procedure in nineteenth century circuses and remains a common form of night restraint in a majority of zoos."

"For institutions that did restrain their animals, chaining generally occurred during the hours the keepers were absent, and thus the animals spent approximately 16 hours chained. Animals were generally chained in a row, limiting social interactions to the individuals immediately proximate."

"Despite the many reasons for chaining elephants, much of the literature suggests that chaining limits activity, prevents natural interactions between animals, and may be detrimental to both psychological and physical health."

"Many of the common reasons for chaining elephants, such as the likelihood of increased injuries or inadequate feeding and sleeping time for subordinates in unrestrained animals, were not observed in this group."

"Given that the behavioral profiles suggest that none of the animals was prevented from eating, sleeping, or interacting socially, the management policy at the zoo seems to benefit the animals."

"As more zoos renovate antiquated elephant exhibits, it is important that elephant managers and zoo architects think progressively and design buildings that eliminate the need

for chaining at night."

The 2004 paper, Low Environmental Temperature Causes An Increase In Stereotypic Behavior In Captive Asian elephants (*Elephas maximus*), appeared in the Journal of Thermal Biology, in which the author Paul A. Rees notes:[28]

"There was no evidence that stereotypic behaviour developed in response to exposure to cold."

"Although this study is based on a very small sample of elephants kept at a single facility the results may have husbandry implications for some zoos. Exposing elephants to cold weather results in an increase in the frequency of stereotypic behaviour in animals prone to stereotypy, but whether or not this is an indicator of poor welfare is unclear. Individual animals are known to adopt different coping styles, so the degree of stereotypy may not necessarily reflect poorer or better welfare. However, some visitors generally perceive stereotypic behaviour as abnormal and the result of poor husbandry. Careful control of the temperatures to which the elephants are exposed may reduce the frequency of this behaviour and hence have a beneficial effect on visitors' perceptions. It is possible that this could be achieved by the simple expedient of allowing elephants access to indoor quarters on cold days. However, this would need to be balanced against unnecessary confinement as this may cause an increase in stereotypic behaviour in some individuals."

In a 2006 study by Wilson, M.L., et. al., Nocturnal Behavior in a Group of Female

African Elephants, the authors noted:[37]

> "The hour of night affected elephant activity: significant relationships were found between hour of night and percent of time they spent feeding, laying, and standing. The overall activity budgets of the elephants were similar to the activity budgets reported in a previous study (nocturnal behavior of same group had previously been studied in 1992 and 1994), although differences were evident in lying, stereotypic, and social behaviors. These differences might be a function of age. Affiliative behaviors accounted for 57% of the elephants' social behaviors, and agonistic behaviors accounted infrequently and caused no injuries. Additionally, the elephants used all areas to which they had access. These findings provide compelling evidence that unrestricted social access during the night is the appropriate management strategy for these elephants. The result from the present study also highlight the importance of replicating existing studies and using multiple behavioral measures to make decisions regarding the welfare and management of stable groups of captive elephants."

In the study presented in 2006 by Ball and Fad, Serum Cortisol In Captive Asian Elephants (*Elaphas maximus*) In Different Management Systems At Bush Gardens Tampa Bay, the authors state in the introduction:[4]

> "Cortisol is a widely accepted measure of stress in wild and captive animals. In the past, captive elephant management systems have been criticized as potential stress inducers. The analysis of fecal cortisols is non-invasive and has been used

> to give long term evaluations of social and ecologic pressures in elephants and other species. Salivary cortisols have also been used as a minimally invasive technique to measure social stress in captive elephants. The herd of Asian elephants at Bush Gardens Tampa Bay (BGT) changed from a traditional contact management (free contact, FC) to a protected contact (PC) system utilizing positive-reinforcement based operant conditioning in 2004. Serum cortisols were measured after the change and evaluated along with banked samples from before. Long term sampling will be utilized to measure this transition but evaluating a single process will hopefully reflect the overall changes that can be expected with this change in management. While the individual variations are notable and other issues potentially confound the issue, it appears that this transition has lowered the serum cortisols in this herd. In addition to serum cortisol measurements, the actual process of collecting the samples appears to be less stressful behaviorally. Pathologic processes should not be discounted when considering cortisol levels in evaluating stress in captive elephants."

In one final paper, Stereotypical Behavior of a Female Elephant (*Elaphas maximus*) in a Zoo, authors Elzanowski and Sergiel reported in their abstract:[9]

> "This study recorded daytime behavior of a female Asiatic elephant at the Municipal Zoo, Wroclaw, Poland, in both a indoor pen and an outdoor paddock as continuous scan sampling for 140 hr, over 35 days in 1 year. Stereotypic

> sequences involved bouts of highly repetitive stereotypic movements and much more variable interbout behavior. The study found both stereotypic movements, nodding and body (corpus) swaying were asymmetric, accompanied by protraction of the right hind leg and to-and-fro swinging of the trunk. The elephant spent 52% of the daytime in stereotypic movements, 3.5 times the level reported for females in other zoos' groups. The share of time devoted to stereotypic behavior was lowest in the summer when the elephant was regularly released to the paddock and highest in the late fall after she had stayed in the pen after months of days outside. This suggests that changes in the management routine enhance stereotypies. Comparing the summer and winter stable management periods, stereotypies were much more frequent in the indoor pen than the outdoor paddock, suggesting that the confinement to a baron pen contributed to the observed levels of stereotypies."

Returning to the topic of the musculoskeletal system, in the chapter on the musculoskeletal system in Biology, Medicine, and Surgery of Elephants (Fowler and Mikota) author West discusses examination of an elephant herd:[36]

> "Evaluation of the husbandry practices of an elephant herd is a critical part of the initial examination, and a comprehensive medical history is an important part of this initial assessment. A variety of questions regarding the herd medical history and husbandry practices should be asked, including the following. What is the incidence of lameness in the herd? Is the herd in a

breeding situation? How are the animal's housed and restrained? What are the exhibit substrates? Do the animals participate in demonstrations or shows? Are there opportunities for appropriate amounts of exercise or digging behavior? What is the size of the exhibit? What are the animals being fed? What are the body weights of individuals? And what are the ages of the individuals?"

Additional comments by West concerning degenerative joint disease/osteoarthritis include:

"Degenerative joint disease (DJD) is one of the most common musculoskeletal diseases in captive elephants. There is no single cause for the development of DJD. DJD may result from an imbalance of the integrity of the joint and the extrinsic forces placed upon it. Typically, there are mechanical insults that contribute to the development of joint disease, but biological factors may also play a role. Mechanical trauma due to repetitive loading stress on hard surfaces is probably a major factor in the development of joint disease. Lack of sufficient exercise, excessive body weight, and poor conformation are other potential underlying factors. Conformation may concentrate stress and mechanical failure may result in the joint."

"Traumatic events including hyperextension of joints may cause damage to joint margins, and this may lead to the development of joint disease. Performance of certain behaviors may put excessive stresses on joints. Chaining elephants for prolonged periods limits their movement and may also contribute to the development of DJD. Animals that constantly pull or resist chaining may cause joint

damage."

"Decreased range of motion develops as a result of chronic inflammation and fibrosis of soft tissue structures. Advanced DJD may result in changes to the subchondral bone, which may lead to chronic bone pain. Bone pain may cause lameness even with anti-inflammatory treatment."

"Radiographic images of DJD may show specific signs depending on the joint involved and severity of the disease. Characteristic changes may include proliferate changes, lytic change, sclerosis, and decreased joint space. An important point is that radiographic changes are not always directly correlated to clinical signs and joint pathology. Additionally, radiographs may not be particularly helpful in identifying cartilaginous and soft tissue problems."

"Nonsteroidal anti-inflammatory (NSAIDS) drugs are widely used to treat joint inflammation. These drugs interrupt the synthesis of prostaglandins. Prostaglandins are important mediators of inflammation and pain. Chronic use of NSAIDS may, however, suppress proteoglycan synthesis, which is an important constituent of cartilage. Therefore, NSAIDS are useful in acute inflammation but chronic use could contribute to cartilage loss."

"Exercise should be included in a treatment plan for elephants with musculoskeletal disease. Before extensive exercise is allowed, structural damage to soft tissue or bone should be

ruled out. Access to large exhibits after an acute injury should be gradual because excessive activity could result in reinjury. During initial recovery periods exercise levels should be gradually increased."

West discussed evaluating husbandry practices and the health history of the elephant herd. The concept of herd health, or herd health management evolved from the economics of food animal production, or production oriented medicine, or performance medicine. In the veterinary text Herd Health, the editor Radostits, in a discussion of the objectives of herd health management indicates:[27]

"The primary objective of a health and production management program for herds of food-producing animals is the maintenance of animal health and production at the most efficient level that provides competitive economic returns to the animal owner."

In discussing targets of animal health and production performances Radostits indicates:

"A target of performance is the level of animal health and production considered to be optimum and to yield the best economic returns on investments."

Radostits further indicates:

"The veterinary profession has been remarkably inactive in the field of animal welfare. This is ironic and unfortunate because the promotion of improved health (a major welfare consideration) is the greatest single contribution that veterinarians can make in livestock production. The reluctance of the profession to address the concerns of humane societies has impeded progress toward a

> greater understanding of animal welfare issues, as has its ability to communicate the positive welfare implications of veterinary contributions to reduced animal disease and stress. Clearly, a reassessment of attitudes toward manipulations of animals for human use is necessary."

> "The veterinarian must also be a vigilant guardian, denouncing inhumane practices and encouraging sound animal welfare management."

Regarding pain in farm animals, the International Veterinary Academy of Pain Management indicates:[14]

> "Traditionally, pain management for the food animal species has received little attention, probably because of economic consideration combined with the generally stoic nature of the animals. However, as we learn more about the deleterious effects of pain and stress in people and companion animals, it makes sense that, aside from the obvious humane considerations, improving comfort in food animals will improve their productivity."

Veterinarians have applied the principles of herd health to small animal medicine as noted in the text Shelter Medicine For Veterinarians And Staff (Miller and Zawistowski). In chapter eight author Miller notes:[20]

> "Traditional large animal practice involves herd health management of sizeable numbers of agricultural animals. Final decisions about the delivery of health care services are

determined primarily by the economic value of the animals. The shift in focus at many veterinary colleges to small companion animals medicine has led to an emphasis on the delivery of individualized treatment protocols that have in no relationship to the actual economic value of the animal, which often is viewed as a member of the family. One of the main dilemmas for veterinarians working for and with animal shelters is to find a means of manipulating principles of herd health management to deliver high-quality health care to individual dogs and cats housed together in relatively confined areas in which disease outbreaks are fairly inevitable."

The author also discusses stress and the types of stress:

"Programs for stress reduction are an essential component of a comprehensive health care program. Stress is defined as 'the sum of the biological reactions to any adverse stimulus, physical, mental or emotional, internal or external, that tends to disturb the homeostasis of an organism.' "

"Stress can be physical, emotional, or environmental. Not all shelter stressors can be controlled. Animals that are malnourished, pregnant, lactating, or injured are stressed and at a higher risk for contracting disease or further debilitation. These states of physical stress should be addressed as soon as possible for the health and well being of all the animals in the shelter."

"Every animal that enters a shelter for the first time is subject to emotional stress. Stress occurs when the animal encounters

> unfamiliar surroundings, new human and animal companions, changes in routine, diet and exercise, new noises, and odors, and so on. Pain, fear, excitement, boredom, and depression may precipitate behavioral problems in the form of stereotypies (such as spinning or leaping up and down in repetitive motion), withdrawal or aggression, excessive barking, excessive grooming, cessation of normal grooming habits, and so on."

In the 2000 paper by J.S. Church, Understanding Pain And Its Relevance To Animals, Information resources on elephants, AWIC Resource Series No. 18, Updated June 2006, http://www.nal.usda.gov/awic/pubs/elephants/elephants2006.htm, the author discusses issues in defining pain:[6]

> "The standard definition of pain, as developed by the International Association for the Study of Pain is as follows: 'An unpleasant sensory and emotional experience normally associated with tissue damage or described in terms of such damage.' "

> "Many hold the anachronistic overly simple idea that pain is merely an aversive sensation. The normal therapeutic solution to an aversive sensation is to turn it off in one of the following ways: remove the origin of the noxious signaling, gait signal transmission from the peripheral tissues with opiod or other drugs, prevent such transmission with temporary nerve blocks, or introduce destructive lesions within the nervous system that prevent such transmission. This conception, while not completely inaccurate, is clearly incomplete. Pain can exist without

evidence of tissue trauma, can be notoriously unresponsive to therapies that target its putative cause, and can interfere with normal living, functional capacity and sleep. Chapman and Stillman defined pathological pain as 'severe persisting pain or moderate pain of long duration that disrupts sleep and normal living, ceases to serve a protective function, and instead degrades health and functional capability.' "

With regards to acute vs. chronic pain:

"Pain is considered acute when it accompanies tissue injury or pathology. The pain associated with athletic injury, pain following surgery, or headaches are all examples of acute pain. Medically acute pain can have a diagnostic value because it can help identify a pathological condition. Chronic pain typically lasts beyond the normal time required for healing following tissue trauma and is often associated with a pathological condition that does not heal. Examples of chronic pain include low back pain, phantom limb pain, fibromyalgia syndrome, and arthritis."

"Any thorough discussion of pain in the context of animal use must address philosophical issues concerning the concept of pain, and ethical issues concerning the causing of pain to animal subjects. Because pain is assumed to be unpleasant, causing pain to animals raises many ethical issues."

Regarding considerations for pain relief:

"Aside from measures directed towards alleviating or preventing pain, it is important to consider the overall care of the animal in

> the prevention of distress and suffering. Distress and suffering are used in this context to describe conditions which are not in themselves painful, but which are unpleasant and which many animals would chose to avoid. For example, recovering from anesthesia on wet, uncomfortable bedding in a cold environment may be distressful to animals. Good husbandry and housing which strives to meet the animals' behavioral needs, careful and gentle handling, competence in carrying out surgical and non surgical procedures, and the alleviation of negative side-effects, are all of paramount importance in reducing animal pain, distress and suffering."

In a 2003 issue of the Journal of the American Veterinary Medical Association (JAVMA) a commentary was published by veterinarian F.D. McMillan on the topic of pain, and emotional pain:[17]

> "The approach to pain has recently undergone revolutionary changes in human and veterinary medicine. In what could be regarded as a period of enlightenment, the past two decades have seen a rapid increase in awareness of and intensified efforts to treat pain. After decades of being undervalued, undertreated, and in many ways ignored, pain is now regarded as a critically important factor in the quality of life of humans and other animals. Articles on pain management are commonplace in veterinary journals an textbooks, and pain management has become a popular continuing education topic. National veterinary organizations, such as the AVMA and the American College of Veterinary Anesthesiologists, have recently developed formal position

statements on pain and its importance to well-being. The American Animal Hospital Association is proposing the inclusion of pain management requirements within its hospital accreditation standards, a step similar to that taken recently in human medicine, when the Joint Commission on Accreditation of Healthcare Organizations mandated that human hospitals measure pain in their patients and take steps to manage it. The AVMA's Twelfth Annual Animal Welfare Forum was devoted exclusively to pain management, and the proceedings from that meeting were published in the July 15, (2003) JAVMA."

"The discomfort of unpleasant emotional states has been regarded as a form of pain in standard and medical dictionaries. Pain has been defined as physical or mental suffering caused by injury, disease, grief, anxiety, and an awareness of acute or of chronic discomfort occurring in varying degrees of severity and resulting from injury, disease, or emotional distress, as evidenced by biological or behavioral changes or both. The various physical and emotional pains have the capacity to induce suffering in animals."

"Contrary to the prevailing view, there is evidence that emotional pain may induce greater suffering than physical pain. Studies have shown that emotional factors weigh more strongly in animals' behavioral choices than physical pain. In one study, an electrified grid was placed between puppies and persons to whom they had formed a social attachment. The puppies crossed the grid, receiving shocks the entire way, to reestablish contact with the person. In

another study, infant rats were taken from their mothers and placed on the opposite side of an electrified grid. The mother rats could hear their pups' distress vocalizations but would have to walk across the grid to reach them. The mother rats crossed the grid, picked up the pups, and carried them back across the grid to their nest, receiving constant electric shocks in both directions. One mother rat retrieved her pups 58 times before the experimenters terminated the testing. Anecdotal stories provide further evidence for the greater distress potential for emotional pain. In a well-publicized news story out of Brooklyn, New York, a mother cat was nursing a litter of 4-week-old kittens in an abandoned building that caught fire. The mother cat reentered the blazing building five times to retrieve each of her five kittens. In the process, the mother cat received severe burns to her face and head so damaging that her eyes were swollen tightly shut, her whiskers and facial hair were burned off, and her face badly disfigured from the burned skin. Many experiments in mammals have shown that the infant's call of distress is highly arousing and motivating for the mother, and it has been proposed that the sounds of an infant's distress vocalizations arouse distress circuits in the parents that parallel the separation distress of the infant. Experimentally and anecdotally, it is clear that some emotional distresses outweigh the suffering of physical pain."

"Because some emotional pains may induce more suffering than physical pain, the veterinary profession should stop viewing emotional pains as less important and less worthy of diligent treatment efforts. Animals with unalleviated fear, anxiety, isolation distress, and boredom should be regarded as inadequately treated as we now view animals

with inadequately treated physical pain."

In a 2007 issue of the JAVMA, the American Veterinary Medical Medical Association's AVMA Animal Welfare Principles were published:[3]

"The AVMA, as a medical authority for the health and welfare of animals, offers the following eight integrated principles for developing and evaluating animal welfare policies, resolutions, and actions.

- The responsible use of animals for human purposes, such as companionship, food, fiber, recreation, exhibition, and research conducted for the benefit of both humans and animals, is consistent with the Veterinarian's Oath.
- Decisions regarding animal care, use, and welfare shall be made by balancing scientific knowledge and professional judgment with consideration of ethical and societal values.
- Animals must be provided water, food, proper handling, health care, and an environment appropriate to their care and use, with their species-typical biology and behavior.
- Animals should be cared for in ways that minimize fear, pain, stress, and suffering.
- Procedures related to animal housing, management, care, and use should be continuously evaluated, and when indicated, refined or replaced.
- Conservation and management of animal populations should be humane, socially responsible, and scientifically prudent.
- Animals shall be treated with respect and dignity throughout their lives and, when necessary, provided a humane death.
- The veterinary profession shall continually strive to improve animal health and welfare through scientific research, education, collaboration, advocacy, and the development of legislation and regulations.

Radostits, in the veterinary text Herd Health, comments on ethology:[27]

> "It behooves veterinarians who provide health management services to livestock producers to be aware of the animal welfare aspects of the production process and to incorporate management changes that can meet the welfare standards being developed. Veterinarians should feel morally obliged to make livestock producers aware of infringements of practices of acceptable animal welfare. Veterinary colleges are now including animal ethology in the curriculum, ethologists are being appointed to faculty positions at universities, and research projects in animal behavior designed to answer some of the questions about intensive livestock production are under way."

In the 1988 book, *Elephant Memories* by C. Moss, in chapter one, Amboseli Day, the author describes African elephant behavior in the wild:[21]

> "Slowly, one by one, the adults stopped feeding and moved away from the trees. They stood at the edge of the small grove orienting south. Once again they waited until the old female rumbled before setting off. Then they formed a line and headed toward the mountain. The younger calves joined their mothers, but several older calves continued to play. Suddenly finding themselves abandoned, they broke off from sparring to catch up with the others. They ran with a loose, floppy gait, shaking their heads from side to side, letting their ears flap against their necks, and curling their tails up high over their backs, all the while trumpeting with a loud, pulsating, nasal sound. As they neared the group one of the young males whirled and playfully attacked

another and they began a new sparring match. Once again they got left behind and once again they ran trumpeting to catch up. The young animals ran and played, and ran and played all across the pan. When they reached thicker vegetation they started to bash through bushes, beating them with their heads and tusks. Even some of the young adults joined in this game and the sounds of their trumpets and screams rent the otherwise quiet evening."

"Suddenly, all together, as if by signal, the elephants were quiet and still. They cautiously lifted their trunks, smelled the air, and then took off at a very fast run, in tight formation, with the calves close to their mothers and the larger adults at the front and rear. They ran fast and silently with no trumpets or screams. Nearly a half a mile away, silhouetted against the lst light in the western sky, three Maasai warriors moved across the plain with their characteristic ground-eating, loping gait. Over their shoulders they carried six-foot-long spears."

"The elephants ran for three quarters of a mile before slowing to a walk. They stopped, still bunched together, turned, and faced in the direction from which they had come, smelling the wind. One or two gave a sharp toss of the head, which made their ears crack like canvas sails. Several of them extended trunks toward each other, and most of the mothers reached for their babies and felt them with their trunks. After a while they relaxed."

In the 1997 book *Elephants,* the author J. Poole writes:[25]

I have had the privilege of spending 14 years in Amboseli National Park in southern Kenya studying the sexual behavior and vocal communication of African elephants. Now (2001) in its 29th year, the Amboseli Elephant Research Project, directed by Cynthia Moss, is the longest and most detailed study of wild elephants anywhere in the world. The population's 1120 elephants are each known individually, and their family histories and relationships are recorded in detail. Along with my colleagues, I have had the unusual opportunity to know elephants as individuals with unique characters."

"It is not only their size that sets elephants apart from most other animals, but their social complexity, intelligence, range and intensity of expression, and their understanding of death. After all this time, I still find myself with so many unanswered questions about these amazing creatures. On many occasions I have watched the excited greeting ceremony of related elephants: massive bodies spinning around urinating and defecating, temporal glands streaming, and a cacophony of ear-splitting trumpets, roars, screams and rumbles. Each time I wonder whether this display is simply a message to other elephants that the family is, once more, a force to be reckoned with or whether the elephants are actually expressing their joy at being together again. I have witnessed the intense excitement displays by elephants at the birth of a baby, as ten, perhaps 20 elephants vocalize in chorus, their calls extraordinary powerful, some well below the level of human hearing, reaching over 106 decibels, and traveling 3 to 6 miles (5 to 10 km). These scenes are typical of elephants during moments of social excitement; a greeting, a birth, a mating, for example.

What is the function of this phenomenal chorus of calls? Are specific messages being transmitted to other elephants, or are they, as humans would be, simply overcome by the excitement of the occasion?"

In Delia and Mark Owens' 1992 book, *The Eye Of The Elephant,* the authors write of their research in Zambia:[24]

"Groups of female elephants are not haphazard formations that simply bump into one another in the bush. They are close-knit families of relatives whose kin lines are generations old. They communicate with a variety of vocalizations - rumbles, trumpets, screams - except that in North Luangwa they rarely trumpet apparently afraid that they will betray themselves to poachers. Odors in the secretions of their temporal glands contain important social messages, but they may communicate most by touching. They usually stay within thirty yards of one another and often reach out their trunks to stroke, caress, or sniff their kin mate."

"One Tusk gives a loud rumble and the two groups move a short distance into a thicket of miombo woodlands, where they calm down and stand napping in the midday heat. The elephants are quiet and still. Now and then a tail swishes at a fly; now and then a trunk is lifted and sniffs gently along the face of a sister."

In Mark and Delia Owens' 2006 book, *Secrets of the Savanna,* the authors comment further on elephant behavior:[23]

"And, as with humans, adult elephants keep some sense of order

and peace within their strongly bonded families. In elephant populations that have not been devastated by poachers, three quarters of the family units are led by a matriarch older than thirty years - a real grownup. Group members are seldom aggressive toward each other; even battles between gigantic males over courtship rights rarely end in serious injuries. In all social species, families designed by nature buffer youngsters against trauma and stresses that would otherwise lead to enhanced violence and poor maternal behavior in the next generation."

Summary of Findings From Review of References

Following a review of the references, which document the experience of maintaining, handling and studying elephants in captivity and in the wild, and the implications of pain management, both physical and emotional, and my experience, it is my opinion that:

- In the wild elephants live in complex social family groups.
- Captivity forces upon the elephant a reduced space.
- Elephants in captivity are unable to live in historic family groups and use their superior intelligence, leading to aberrant social behavior.
- The chaining and confining of elephants in a reduced space in captivity is a cause of stereotypic behavior.
- Working in direct contact with elephants in captivity is dangerous work which can result in injury or death.
- Working in direct contact with elephants requires handlers to maintain complete control of the elephants.

- In captivity to maintain elephants in a free contact husbandry system, such as in a circus, for human safety purposes, recognition of authority by the elephant of the handler cannot be compromised or negotiated.
- The bull hook has been used historically, and is currently used to train, guide and control elephants. The use of this training aide can cause tissue damage by blunt force trauma, penetrating skin wounds, lacerations, sores, and abscesses. These injuries cause pain, and discomfort, both physical and emotional.
- The bull hook has been used to control, punish and discipline elephants.
- Chaining and maintaining elephants in captivity in limited space on hard, unyielding, or unnatural surfaces has been a common practice which is recognized to cause foot, and musculoskeletal disease.
- Veterinarians have a professional obligation to be responsible advocates for improved care of elephants, and to be aware that both physical and emotional pain have the ability to cause suffering in animals.

Review of Evidence

A complete list of all the evidence I have considered is included in Appendix B to this report and a review of some of the medical records of the elephants is provided below.

- **Video footage on a DVD compilation of Ringling Bros. And Barnum & Bailey Circus elephants**.

-Amazing Elephants Public Relations Video:

Unnatural behaviors shown with elephants wearing head harnesses and body covers/blankets standing on platforms with front feet upon another elephant, elephants circling while standing on two rear feet, and elephants sitting on another elephant.

-Treatment Behind Scenes 1986-1987:

Mr. Williams slapping an elephant with the shaft of an ankus, and cracking a whip close to the elephant.

Handler slapping an elephant with the hook end of an ankus.

Elephants lined up in front of a train with handler smacking an elephant with the shaft of an ankus.

Handler hooking and grabbing the corner of an elephant's mouth with an ankus.

-Ringling Bros. Circus, Oakland, CA 1989:

Elephants near train slapped by hook end of ankus.

Elephants coming off train being pulled by hook end of ankus inserted into the mouth of an elephant.

Handler inserting hook end of ankus into an elephant's mouth.

-Ringling Bros. Circus Oakland, CA 1994:

Elephant enclosed on a train pulling against a chain on its left front leg.

-Ringling Bros. Circus September 2, 1997 Sacramento, CA:

Handler pulling an elephant with the hook end of an ankus at the base of its trunk, and making an abrupt pull with the ankus hooked on the elephant.

-Ringling Bros. Circus San Jose, CA 1998:

Elephants in a line wearing head harness with performers sitting on the elephants while a handler jabbed one elephant with an ankus.

Handler pulling at the base of the left ear of an elephant with an ankus.

Two young elephants by a trailer, under an awning, standing on carpet material, chained by front and rear feet. One elephant was pulling against its left front chain.

-Ringling Bros. Circus San Francisco, CA 1998:

Elephants on picket line chained front and rear standing on wet concrete wearing head harness.

Handler poking with an ankus to have an elephant lift its trunk.

Hander applying a head harness with elephant standing on wet concrete chained front and rear with little room to move.

Handler jabbing with the ankus on two occasions. A second elephant in the line was slapped with an ankus. An elephant was jabbed while the harness was being adjusted.

-Ringling Bros. Circus San Jose, CA 1999:

Elephants chained front and rear on a picket line with no room to move on an asphalt surface.

-Ringling Bros. Circus San Francisco, CA 1999:

Elephants walking in line from the train holding tails in trunks.

Asphalt surface pen containing three elephants. Two of these elephants were exhibiting stereotypic swaying behavior.

-Ringling Bros. Circus Sacramento, CA 1999:

Elephants being unloaded from a train were poked with an ankus.

-Ringling Bros. Circus San Francisco, CA 2000:

Handler making head harness adjustment slapping elephant's chin with an ankus handle.

Handler slapping an elephant's trunk with an ankus handle.

Handler rehearsing an elephant forcing hind leg stands, using an ankus.

Handler appears to be using a set of pliers in prodding an elephant in an asphalt surface pen.

Handler pulling an elephant with an ankus.

Handler slaps the right front leg of an elephant with an ankus shaft.

Handler holding an ankus up in a threatening and intimidating manner to an elephant.

Handler pulling an elephant with an ankus.

Handler pulling an elephant using an ankus, and pinching the elephant with a pair of pliers.

-Ringling Bros. Circus San Jose, CA 2000:

Elephants in line on asphalt surface chained front and rear wearing head harness by trailers.

One of two elephants seen displaying head bobbing and stereotypic swaying behavior.

Another elephant on asphalt surface chained showing stereotypic swaying and head bobbing behavior, while chained by left front and left rear, pulling on chains.

-Ringling Bros. Circus San Francisco, CA 2001:

Elephants by train with a handler poking the elephants twice with the metal tip of an ankus.

Elephant in barn chained front and rear displaying stereotypic swaying and head bobbing behavior.

-Ringling Bros. Circus Tulsa. OK 2001:

Elephant by train being abruptly pulled with the hook of an ankus in its mouth.

-Ringling Bros. Circus Oakland, CA 2002:

Elephant in line wearing head harness forced to stand on rear legs with front feet on another elephant's hind quarters.

Young elephant with tusks chained by right rear and left front, by short chains demonstrating stereotypic swaying behavior pulling on the chains.

Elephants chained on a wooden surface being unchained beneath an awning released to walk on an asphalt surface.

-Ringling Bros. Circus San Jose, CA 2002:

Three elephants wearing head harness when handler placed the hook end of the ankus in its mouth.

August 21, 2002: elephant shown poked with an ankus.

-Ringling Bros. Circus San Francisco, CA 2002:

Young elephant with a head harness and a handler using the hook end of an ankus in its mouth.

-Ringling Bros. Circus Fresno, CA 2003:

Several elephants wearing head harness.

-Ringling Bros Circus Oakland, CA 2003:

Several elephants walking in line when a handler steps on the tip of an elephant's trunk.

-Ringling Bros. Circus San Francisco, CA 2003:

Elephants chained on a picket line standing on an asphalt surface, as one elephant urinates and is standing in its waste.

-Ringling Bros. Circus MCI Center 2004:

Elephants chained front and rear in line inside a building on a concrete surface. A time lapse camera reveals that their only movement is from side to side.

-Ringling Bros. Circus:

Brief video clip of the Center For Elephant Conservation.

- **Objections And Responses To Defendants' First Set Of Interrogatories To Plaintiff Tom Rider (June 9, 2004).**

Tom Rider indicated in response to interrogatory No. 3 that he was told by Joan Galvin, an official for Ringling:

"stay away from Karen because she will kill you."

Tom Rider indicated in response to interrogatory No. 3:

"What I learned at Ringling, by observing the other handlers, was that you were supposed to use an ankus to hook elephants up behind the ears, on the legs, you hit them on the trunks, you smack up along side the head. The ankus is what the handlers used to dominate the elephants."

Tom Rider indicated in response to interrogatory No. 3:

"...what Ringling told me to say - we never hit our animals, and we take good care of our animals."

Tom Rider indicated in response to interrogatory No. 9:

"...Pat Harned would come out and start yelling at Benjamin to stop and sometimes Benjamin would stop and sometimes he would not and the next thing you know, Pat Harned would start hitting Benjamin with a bull hook, yelling and screaming at him, basically every single day. Because it happened just about every day between then and when Benjamin died in July, 1999, the incidents are too numerous to describe. An example occurred in New Haven, Connecticut in May, 1998. We were backstage and Benjamin was out there playing with Shirley, and Pat Harned came out and started hitting Benjamin with a bull hook and yelling at him. Karen, an older elephant, started rattling her chain because Harned was yelling at the baby, and Harned came over to Karen, and for the next 23 minutes he started hooking and hitting her and making her raise her trunk and yelling at her, making her lay down and get up, and just all because she rattled her chain. Benjamin was always being poked, stabbed, hit by Harned - it was just about every single day. Benjamin was also chained most of the day, each

day, which is also mistreatment, especially for a baby who needs to play and run around."

Tom Rider indicated in response to interrogatory No. 10:

"...I contend that Ringling handlers routinely hit the elephants with bull hooks and other instruments, keep them chained for most of the day, and forcibly separate baby elephants from their mothers."

Tom Rider indicated in response to interrogatory No. 11:

"The first time I became aware that the elephants were being mistreated at Ringling Brothers was actually June 4, 1997, my first full day on the job, in Austin, Texas. I saw them starting to use the hook on the elephants in Austin, saw them poke and stab the elephants."

Tom Rider in continuing his response to interrogatory No. 11 documented occasions too numerous to count from June 1997 in Austin, Texas thru October, 1999, in Pittsburgh, PA, episodes where elephants were "poked," "stabbed," "hooked," "hit," "chained up 24/7," "yelled at," "jabbed," "grabbed," "pulled," and "smacked around."

Additional responses by Tom Rider to interrogatory No. 11:

-October 22-26, 1997, Pittsburgh, PA. "Alex Vargas came back and the elephants were not doing the public walk right and so Vargas and the other handlers got them inside, closed the curtain, and started hitting the elephants, and the elephants were screaming."

-January 28-February, 1998, Asheville, NC. "We didn't unload them when we got there, instead we waited until next morning and we had 8 inches of snow. We had to walk the elephants in the snow. Getting them off the train, the elephants were repeatedly hooked to make them move faster in the snow."

-February 18-22, 1998, Richmond, VA. "We were inside. This is where Zina and Rebecca were being laid down by Andy Weller and Jeff Pettigrew, who beat them severely. When they were done, I had to go get the wonder dust and had to cover up about 30 hook wounds on Zina, and 20 on Rebecca. Kenneth Feld showed up that night when the elephants were screaming, and he did not pay any attention to it."

-March 10-15, 1998, East Rutherford, NJ. "The elephants were inside the whole time. The elephants were chained up under the brand new overhang and the elephants kept reaching up and pulling it down with their trunks. I said we have to move them but we were told instead just to hit the elephants and smack them on their trunks to make them stop pulling down the overhang. Randy Peterson beat the elephants Minnie and Kamala with a bull hook."

-June 18-21, 1998, Lubbock, TX. "I remember Tony Rodriquez smacking an elephant, I remember Randy Peterson coming out there and doing the same thing, hooking and hitting, giving them commands. Sometimes they hit them and then gave them commands."

-July 8, -12,1998, Fresno, CA. "We were outside in Fresno. It was 100 degrees. Very hot. There was lots of hitting and hooking of the elephants on and off the train."

-October 23-November 1, 1998 Cleveland, OH. "After we left Cleveland, it was cold on the train because there were no heaters, and I decided to shove hay in between the doors to keep the snow out because it was too cold for the elephants."

-November 4-15, 1998, Rosemont, IL. "Randy Peterson got mad at his wife, this is just one of the times he did this, he got mad at her and come out and started beating the elephant Nicole. It happened another time in Winter Quarters, he beat Nicole because he

was mad at his wife. A lot of these guys that would come in, they'd be mad about something and take it out on the elephants."

-December 3-6, 1998, Huntsville, AL. "Adam Hill hit Karen and Sophie with a bull hook."

-Winter Quarters, 1998, Tampa, FL. "They may have got 15 hours chained and maybe 9 hours out of the chain during this time. But this is the only time when they are not on the road performing."

-March 3-7, 1999, Cincinnati, OH. "Again the elephants were hooked as they came off the train, and as they were walked down and put in tents; Randy Peterson hit the elephant Nicole on the head with a bull hook."

-March 24-28, 1999, Washington, DC. "As soon as we got the elephants inside, it was constant hooking and hitting inside the arena. Pat Harned beat Benjamin."

-March 30-13, 1999, Washington, DC at the Amory. "The Armory is where we got five new employees from Puerto Rico. The first thing they were told was to get a bull hook, go see Adam Hill, he'll make you a bull hook, charge you about $150.00-200 for a bull hook, made of stainless steel, sharp as can be."

-April, 1999, Chattanooga, TN. "Handlers beat elephants named Sophie and Karen; Nicole was also severely beaten."

-June 23-27, 1999, Ottawa, Ontario, Canada. "Five elephants started fighting and broke down the fence. The next thing I knew, Adam came running, grabbed his bull hook, ran in and started hitting every elephant. Pat Harned grabbed his bull hook, ran in and did the

same. Randy Peterson joined and hit the elephants: all three of them were hooking, hitting and yanking on those elephants, smacking them to get them back in that pen."

-July 16-25, 1999, Houston, TX. "Harned beat Benjamin the whole time he was with him."

-September 15-19, 1999, Indianapolis, IN. "Again, the elephants were hit and hooked; the handlers would close the flaps so the public couldn't see them hit the elephants."

-October 15-24, 1999, Boston, MA. "James, who came up from the Ringling breeding farm in Florida, was hitting an elephant. There were five baby elephants there, and I saw Gary Jacobson and Dave Whaley hitting and hooking the baby elephants."

-Cow Palace Daley City, CA. 2000 "Dave Whaley used a leatherman/knife to clip a baby elephant on her side; elephants were chained most of the time.

-Tulsa, OK. 2000. Robert Ridley ("Sonny") got a bull hook stuck in elephants mouth.

-Oakland, CA. August 18, 2002. Troy Metzler hit elephants with bull hooks; A baby elephant named Doc was chained exhibiting stereotypic behavior.

-Daly City, CA. Jeff Pettigrew stuck a bull hook in an elephant's mouth and twisted it.

-San Jose, CA. August 25, 2002. Troy Metzler used a bull hook in the mouth of an elephant and hooked a baby elephant named Doc.

- **The Santa Clara Humane Society's Inspector's Reports on the conditions of Ringling Brothers' elephants and chapter from Government Sanctioned Abuse: How the United States Department of Agriculture Allows Ringling Brothers Circus to Systematically Mistreat Elephants (September, 2003) PL 5118.**

As noted in the Report of Humane Officer Franco dated 9/8/99: "Upon arrival at the animal compound we were asked to wait while the elephants were placed on chains inside the tent. _____ was present and was available to answer our questions. As he escorted us into the elephant tent, Reeve observed what appeared to be blood behind the left ear of the elephant named Toby. I inspected the site as well and also saw blood streaming from two separate lacerations behind Toby's left ear. As these lacerations were evidence of possible violations of PC 596.5, I immediately asked Mayeda to bring both my 35-mm camera and video camera so I could document the findings."

"Seven of the elephants had injuries behind or back of their left ears. Some of the elephants had scars behind their left ears. Almost all of the injuries appeared to be fresh, with bright red blood present at the two wound sites. One of the elephants had a larger laceration with what appeared to be dried blood. None of the elephants appeared to have any injuries or scaring behind their right ears. One of the elephants, named Mary, had two lacerations on her lower left flank. Another elephant named Assan had lacerations and scars on both her trunk and forehead. An elephant named Baby had abrasions on the back of the left ear. She also had a laceration on her left foreleg and on the back of her left ear."

"All of the injured elephants belonged to Ringling Brothers Circus. None of the three contracted elephants had any injuries, however they were constantly swaying from side to side"

"I asked _____ if he knew where these injuries could have come from. _____

stated they possibly were caused by the other elephants. I overheard Williams ask Lindsey if he thought Toby's injuries might have come from an ankus. Lindsey stated that he could not deny that they were caused by ankuses."

"At this point Lindsey questioned me as to what I was doing, and expressed concern for my observations. Lindsey asked me to tell him how I chose to categorize injuries as lacerations, rather than abrasions. Lindsey told me he categorized the injuries as abrasions, not lacerations. He told me he considers lacerations to be wounds that require sutures. Lindsey stated that the injuries on these elephants did not require suturing, although they were bleeding and the skin was punctured and torn. Lindsey stated he would classify these injuries as abrasions."

"I did inform them that these injuries appeared to be consistent to those of what an ankus would cause and there was a possibility they might be in violation of the California State Penal Code."

"On 8-28-99 during the second performance and while the elephants were being dressed, I noticed that Baby was reluctant to obey. _____ repeatedly asked Baby to 'Go down.' " "_____ asked Baby approximately four times. Baby just stood still and _____ appeared to become angered. He murmured what sounded like threatening language near the elephant's left ear. I saw _____ raise his ankus in Baby's line of sight. Baby then complied with _____ verbal commands."

"There were several elephants with fresh wounds on their bodies that required closer inspection. However, due to _____ animosity and the fact that he was our main contact for the circus, I felt it was most appropriate to develop an alternative option for communications. I telephoned Mayeda and expressed my concerns, telling her that both the circus and Arena management had become hostile. I told her that several elephants

had new injuries and needed to be examined. I told her I had planned to look at the elephants one more time, on Sunday, before they left San Jose. However, due to the circumstances, I asked her if she would be lead contact for the final inspection of the elephants. I told her I believed her presence could diffuse their animosity and keep the interactions on a workable level. Mayeda agreed."

Sunday, 8-29-99

"Finally, _____ brought us to look at the elephants. Mayeda and Williams examined the elephants while I took photographs of wounds. Reeve prepared the photo ID cards. Mayeda only asked to see Banco, Toby, Banana, Tonka, and Siam - the elephants we had seen fresh wounds on. Siam had dried blood behind her left ear. Toby had five lacerations behind her left ear. Two were approximately one inch long, and three were approximately ½ inch long. Tonka had fresh blood behind her left ear. I photographed the wounds."

"Due to the darkness, animosity from the circus and Arena Management, and their hurry to leave, we were unable to perform through examinations on these elephants. We were unable to look at the other elephants at all."

- **Accounts of a San Jose police officer and humane agent of elephant mistreatment and chapter from Government Sanctioned Abuse: How the United States Department of Agriculture Allows Ringling Brothers Circus to Systematically Mistreat Elephants (September, 2003) PL 5118.**

Supplemental Report, Date Of Original Incident: 8/23,25, 27, 28, 29, 1999

Report Number: A99-015840 by Teri S. Reeve Badge No.1434:

"This is a supplemental report per the request of the Santa Clara County District Attorney's Office. Based on my observations while present at the Ringling Brothers Circus during the week of 8/23 through 8/29/99. I observed a few of the elephant

handlers using their ankus' on the elephants."

"During the time I was present and observing the animals, I noticed several different elephant handlers using their ankus' to poke and prod the elephants. This occurred when an elephant did not respond to verbal commands. The handler would ask the elephant to do an action and when the elephant failed to do so the handler would use the ankus to direct it. The handlers would poke the elephant on the feet or legs to move it backwards. The younger handlers would use the pointed end of the ankus and push on the elephant while using harsh verbal commands. Sometimes after the elephants had already complied a _____ named _____ would still yell at the elephant for no apparent reason. He never appeared to be happy with the elephant even though it was just standing there."

"The handlers would ask an elephant to do something such as 'Go Down' and if the elephant wasn't moving fast enough they would smack it with the side of the ankus to hurry it up. One _____ in particular named _____ tried to never use his ankus in front of me and appeared very tense. I was concerned about his actions and watched him closely. _____ would use verbal commands and if the elephant did not respond he would become angry and tolerate it, not always using his ankus. I saw _____ come over two times and use his ankus to move the elephant for _____."

"I saw _____ use his ankus, which appeared to be sharper than some of the others, multiple times when the elephants would not comply and even sometimes when they were already in compliance. His actions seemed habitual. _____ would use the ankus mostly on the legs. However, I did see him use it several times on the elephants' trunks and a few times on their mouth and behind their ears. _____ and the _____ would poke the elephants with the sharpened end of the ankus and guide

them in the direction they wanted them to move. On the last day when they were tearing down the tent I saw _____ use his ankus to make one of the elephants move. Using his body weight _____ forcefully yanked on the elephants' ear. Due to the hostile environment on that day I could not see if this action had caused injury, nor could I determine what elephant it was."

"I knew most of the handlers were uncomfortable with the presence of the officers, more noticeably the younger gentlemen. They always appeared to be in angry moods and did not make eye contact with me. They would look in all directions before they would interact with the animals. Sometimes they would slap the elephants with the side of the ankus to get it to move quicker or to obey. They would also verbally command the elephants in an angry tone with the exception of _____ appeared to act more compassionately towards his three elephants. I never saw if the handlers would cause injury to the elephants, but over the course of the week I noticed several different elephants had new injuries (some bleeding) other than the ones we had originally seen on the first day. I did not notice any injuries on _____ elephants at any time."

"The younger aged elephant handlers appeared to be the ones who did not seem comfortable touching the elephants with their ankus in my presence. However, _____ and a gentleman who wore _____ seemed very comfortable using their ankus in my presence. This is referring to the use of the ankus in a harsher manner such as using the ankus accompanied with stern verbal commands."

"On or about 8-27-99, while walking with the horse handlers to the arena for a performance I engaged in a conversation with one of the handlers. Although, I do not recall his name he seemed to be friendly. I asked him how he was doing and he replied by stating they were all stressed out that we were there, referring to Animal Control. He also stated that if the horses started 'acting up' that they could not control them. They

were stressed because they felt they could not do what they normally do. I told him that was not true and there was a certain degree of force that was acceptable to control the animals. I also told him that if he were to beat the horses that would be unacceptable. That was the end of the conversation because the horses were called to perform."

USDA reports of inspection of Ringling Brothers' Center for Elephant Conservation (including USDA reports on two 18-month-old elephants Doc and Angelica) and chapter from Government Sanctioned Abuse: How the United States Department of Agriculture Allows Ringling Brothers Circus to Systematically Mistreat Elephants (September, 2003) PL 5118.

These documents reveal an inspection, with documentation, along with subsequent unsuccessful application and enforcement of an alleged violation of the Animal Welfare Act that occurred during the separation process of two 18-month-old Asian elephants from their mothers in 1999. The USDA report findings indicate, "There were large visible lesions on the rear legs of both Doc and Angelica." FELD 20081

- **USDA Memorandum on the "Red Unit" of Ringling Brothers' Circus.**

  This is a memorandum (FELD 0001529-0001531) from S. Taylor to R. Willems that documented an informal visit on 12/22/98 to RBBB, Red Unit at the Fairgrounds in Tampa, Florida. Findings applicable to this case include noting elephants tethered on short chains in a line on a concrete surface. Taylor noted that,

  > "The chains on some were so short and taut, that they could not have turned 180, or take a single step forward or backward, much less a few steps, as would be more appropriate." "I don't think any two adjacent animals could lie down simultaneously, and I'm not sure that some animals could have lied down at all, if they had wanted."

- **Ringling Brothers' "White Paper"- Hopping Egan, *Elephants Without Boarders* <www.ringling.com/cec/whitepaper12_11.pdf>.**

  This document is a public relations information release from Ringling Brothers' and Barnum & Bailey Circus.

- **Lists of births at Ringling Brothers' "Center for Elephant Conservation"/additional births noted in the medical records.**

  List of 15 elephants born in Ringling Bros. breeding program from Juliette (12/30/92) thru P.T. (5/21/02).

- **Ringling Brothers' Press Release on the Death of Riccardo.**

  August 6, 2004 Press Release concerning the loss of 8 month old elephant, Riccardo after sustaining factures in both hind legs.

- **Synopsis of agency reports and narrative regarding Ringling Brothers' elephants who have tested positive for Tuberculosis and review reports from Government Sanctioned Abuse: How the United States Department of Agriculture Allows Ringling Brothers to Systematically Mistreat Elephants (September, 2003) PL 5118.**

  To be evaluated under medical records of the seven elephants being focused upon in this case

- **Medical records of Ringling Brothers' elephants, provided by the plaintiffs' attorneys.**

  To be evaluated under medical records of the seven elephants being focused upon in this case and in BASIS OF OPINION/CONCLUSIONS.

- **Photographs from the inspection in the case of Karen and Nicole on the Blue**

- **Unit in Auburn Hills, Michigan on November 13, 2007.** Photographs and video confirm observations of the expert witness in this report. See photographs in Appendix C

- **Video footage from the inspection in the case of Karen and Nicole on the Blue Unit in Auburn Hills, Michigan on November 13, 2007.** Photographs and video confirm observations of the expert witness in this report.

- **Photographs from the inspection in the case of Jewell, Lutzi, Mysore, Susan, and Zina at the Center for Elephant Conservation in Polk City, Florida on November 29, 2007.** Photographs and video confirm observations of the expert witness in this report. See photographs in Appendix C.

- **Video footage from the inspection in the case of Jewell, Lutzi, Mysore, Susan, and Zina at the Center for Elephant Conservation in Polk City, Florida on November 29, 2007.** Photographs and video confirm observations of the expert witness in this report.

- **A recent compilation of video footage obtained by activists in California (Ringling '05 + '06), PL 17095.**
  -Off loading elephants from a train guided with the use of an ankus.
  -Elephants walking on unnatural surfaces.
  -Elephants with head harnesses walking on unnatural surfaces with performers into a building.
  -Elephants under a tent guided by using an ankus.
  -Elephants dismounting performers guided by use of an ankus.
  -Elephants being guided by use of an ankus back into a barn onto a concrete surface.
  -August 8, 2006: walking elephants on a road.

- **An older compilation of video footage of Ringling elephants ("Pat Cuviello Compilation"), PL 07069.**

  -David Kiser, Assoc. Production Manager, stating elephants were never hit, and that the guide was a tool.

  -Video shows an elephant slapped by an ankus.

  -Tom Rider interview.

  -Many video segments reviewed previously, and some new unseen segments showing several elephants in a line, chained front and rear demonstrating stereotypic swaying behavior standing on unnatural concrete or an asphalt surface.

  -Elephant shown being pulled using an ankus.

  -Elephants on a picket line standing on concrete.

  -Elephants in a training session encouraged with an ankus to mount another elephant while one elephant stands on a stool.

  -Elephant balanced/standing on its two front legs.

  -Elephants on a picket line standing on concrete.

  -Elephant having a head harness applied while standing on concrete.

  -Zebras, goats, llamas, camels, tigers, horses.

  -Two zebras running on road away from handlers.

- **"CEC Birth Footage of Sara" FEI 45237.**

  Video of elephant birth, mother is chained on three legs and handled with a bull hook.

- **"7/26/99 Videotape of Benjamin" FEI 6356.**

  -Tigers wheeled in cages.

  -Elephants being walked.

  -Lamas.

  -Elephants being walked.

-Two young elephants unloaded from a semi trailer and walked to a pond.

-Two young elephants in pond, one exits and one dies.

- **Excerpts from a public relations shoot ("Hershey Animal Care Shoot") FEI 45224.**

-Husbandry demonstration with narration by trainer with elephant standing on asphalt surface.

-Elephant, eight year old (Kelly?), was confused on command: "kneel vs. switch legs."

-Stock car narration indicating elephants stand in these cars for up to three days while in transit.

-Elephant walk to venue on unnatural surface.

-Ankus and the use of the ankus described.

-Farrier videoed working on an equine.

- **Compilation of Video Footage Received From Defendant (FEI 40979, FEI 45189, FEI 45221, FEI 45190, FEI 45191, FEI 40964, FEI 40973, FEI 45229, FEI 45233, FEI 45193, FEI 45204, #157), FEI 45194, FEI 45196, FEI 45198, FEI 45215, FEI 45216, FEI 40966).**

Confidential- Compilation of Video Footage Received From Ringling Brothers.

Excerpt #1 "Animal Handling St. Petersburg, FL Tape 1 of 2 1/11/1996" FEI 40979

-Video of ankus being held in hands.

Excerpt #2 "Ringling Bros. Winter Quarters, 11-25-1997, Behind the Scenes, Tape #6, Tampa, FL, Blue 128th" FEI 45189

-Four elephants circling counterclockwise holding the tail of the elephant in front with their trunks with ponies in ring.

-Elephants circling in place counterclockwise.

-Four elephants on tubs, three mounting the elephant in front standing on their rear legs, with ponies going thru their legs.

-Three elephants on tubs. Then elephants perform sit ups on the tubs.

-Elephants circling in place.

-One elephant stands on rear legs.

-One juvenile elephant plays cymbals, and two play on drums.

-Two elephants play harmonicas and shake heads.

-Two elephants kick balls with their left front feet.

-Elephants circle counterclockwise.

-Elephants place balls thru overhead hoops.

-Elephants stand up on wooden spools, one comes off prematurely, than both repeat the procedure.

-Elephants wave bandanas.

-Elephants circle counterclockwise.

-One elephant rides a bike/trike.

Excerpt #3 "Nov. 1997, Blue Unit Animals, Winter Quarters- Tampa, FL" FEI 45221

-Asian elephants, Benjamin and Shirley, one holding the other's tail enter ring and exit.

-Elephants circle in ring counterclockwise, skipping as they run.

-Two elephants play cymbals with left front feet, play on drums with a drumsticks and then circle counterclockwise.

-Two elephants play harmonicas and shake heads.

-Two elephants kick balls with their left front feet.

-Two elephants pick up and place balls in an over head hoop.

-Two elephants walk on wooden spools.

Excerpt #4 "Ringling Bros. Winter Quarters Behind the Scenes, 11-25-1997, Tape #5, Tampa, FL, Blue 128th, RB 128-031-01" FEI 45190

-Elephant standing on rear feet with performer on the elephant's right front leg on unnatural surface.

Excerpt #5 "Ringling Bros., Winter Quarters, Behind the Scenes, 11-25 1997, Tampa, FL. Blue 128th" FEI 45191

-Clip #1 from Excerpt #5 FEI 45191

-Two young elephants on concrete, walking.

-Clip #2 from Excerpt #5 FEI 45191

-Five to six elephants walking counterclockwise in ring.

-Elephants in line, one mounted behind the other, standing on their rear legs mounted on the one in front.

-Five elephants on concrete fed apples. One elephant in background with head harness.

-One elephant with head harness standing on concrete walks into ring.

-Elephant stands on rear legs.

Excerpt #6 "Red 129: Animal Care B- Roll Raw Footage Sacramento, Tape 8 of 11 9/7/99" FEI 40964

-Five elephants with performers on their backs stand on rear legs in a row with front feet on the elephant in front on unnatural surface.

-Public relations photography.

-Five elephants walking on concrete surface holding the tail of the elephant in front with their trunks wearing a head harness.

-Five elephants standing on a concrete surface wearing head harnesses.

-Four elephants standing on tubs in grassy field.

-Four elephants sitting upon tubs in a grassy field.

-Publicity photography at the Arco Arena.

-Four elephants on tubs sitting up.

-Publicity photography, one handler slaps the trunk on one elephant with a bull hook.

Excerpt #7 "Blue 128: New baby Elephant Act Pittsburgh Tape #1" FEI 40973

-Five young elephants run in ring in counterclockwise direction.

-Five elephants climb on to tubs, two on each side of a fifth elephant standing on tub with the four elephants placing their front legs on the elephant in front.

-Two elephants do head stands.

-Elephants circle counterclockwise, one holding the tail of the one in front with its trunk.

-Two elephants on tubs, and two other elephants circle the ones on tubs counterclockwise with the front legs of the two on the tubs on the back of the elephants circling the tubs.

-One elephant with the right foot on a pivot stand circles counterclockwise.

-Two elephants lie down on their left side, one elephants sits on the one laying down while one sits up on a tub.

-Five elephants, four using their front legs standing up placing their front legs on the one in front.

-Five elephants in sternal recumbncy, all lay down on their left side, all sit up and with their front legs mount the one in front.

-Elephants circling counterclockwise holding the tail of the one in front with their trunks. The elephants stop and mount the one in front, and walk on their rear feet in line, counterclockwise.

Excerpt #8 "Red 131st Animal Care B Roll Video; Raw Footage of Animals and Animal Care Winter Quarters/Tampa, Tape 9 of 12 12/9/2000" FEI 45229

-Three elephants in a ring, one advances to a spring board and propels an acrobat to another elephant's back. This is repeated several times.

-Excerpt #9 "Red 131 Animal Care B- Roll Video; Raw Footage of Animals and Animal Care, Winter Quarters/Tampa, tape 6 of 9" FEI 45233 2001

-Two lines of six or seven elephants walking on an asphalt surface or concrete surface into an events center.

Excerpt #10 "RBBBC 132nd, Blue, WQ, 12/12/01, Sylvia & White Horses, Washing Goats and alpacas, Elephants with Sara, Raw Footage, Winter Quarters- Rehearsal and Animal Care- Tape 9 of 10" FEI 45193

-Five elephants walk into ring, three climb on to tubs, sit up on the tubs, one does front legs head stand, one places right front foot on a turn stool and turns as does the second elephant on a pivot stool

Excerpt #11 "Feld Entertainment, RBBBC, 132nd Blue, B- roll Rehearsals, Clowns, Elephants, Wardrobe Juggling, Clow Alley; 12/10/2001 Tape 1 of 10" FEI 45204

-Elephant circling counterclockwise in ring, some climb up on tubs, some mount others standing on their hind legs, two sit up on stools, place a front foot on a turning stool while standing on a wet unyielding surface. One does a head stand.

-Two elephants lay down on their left side.

-Two elephants walk across the two laying down and sit up on the down elephants.

-Two elephants do sit ups and run counterclockwise, one stands on its hind legs and mounts the other elephant.

-Nine or ten elephants in a row stand on their rear legs and mount the one in front on an unnatural surface.

-Three elephants run counterclockwise in a ring, and do rear leg stands.

-Three elephants climb up on stools, two mount one in front, and the three sit up on stools.

-One elephant sits up on a stool.

-One elephant on a stool mounts another as it circles the stool counterclockwise.

-One elephant lays down on its left side, while another climbs over it and sits up on the down elephant.

-Three elephants circle counterclockwise in place.

-Two elephants mount an elephant while standing on its rear legs.

-Three elephants lay down on their left side, three elephants sit up and mount the one in front with their front feet.

-Three elephants walk counterclockwise and two mount the one in front while walking on their rear feet.

-Elephants walk out with others in a line and do standing mounts on the one in front.

Excerpt #12 "RBBBC 132nd Blue Winter Quarters, Elephants int. Cart, Elephants Sway, Baby Elephants Washing, 3 Thru 5 B- Roll; Raw Footage, Winter Quarters, Rehearsals and Animal Care- Tape 10 of 10" FEI 45245 2002

-Elephants in ring lay down on their left side.

-Elephants in a line, standing on their rear legs with front feet mounted on the one in front.

-Elephants in a line standing on concrete holding the tail of the one in front with their trunks.

-Elephants in two rings.

-Two elephants climb up on stools, circle on the stool and one mounts the other.

-Two elephants sit on stools, than sit up on the stools.

-Two elephants do head and front leg stands.

-One elephant on a stool mounts one below with its front feet while the one below is circling the stool counterclockwise.

-One elephant lays down, and one walks across it and sits up on the one laying down.

-Two elephants circle in place, one mounts the other standing on its rear legs.

-Two elephants are in sternal recumbancy.

-Two elephants do sit ups with one placing its front feet up on the other.

-One elephant walking with the another mounted and walking behind on its rear feet.

-Two elephants join a line of six or seven others walking on unnatural surface holding the tail of the one in front with their trunk.

Excerpt #13 "RBBBC 134th Blue Winter Quarters, Baby Lion Zulu, then single lion Shasha (m), then 3 lions together, than at 15' Interior Hall, B- Roll. Elephants

12/9/03, 12/10/03; Tape 8 of 24" FEI 45194

-Nine or ten plus elephants in a line holding the tail of the elephant in front with their trunk walking into a facility on an unnatural surface to approach a ring, walking counterclockwise around an arena floor.

-Four elephants on stools then climb down from the stools.

-Four elephants sit up on the stools.

-One elephant sits up on a stool and then does a head stand using front feet for balance.

-Two elephants on stools with their front feet on another elephant walking counterclockwise around the stools.

-One elephant places its right front foot on a pivot stool circling counterclockwise.

-Four elephants in a ring circling counterclockwise in place.

-One elephant sits up on a stool, another lays down, another walks over an elephant laying down. The elephants turn circles to their left.

-Four elephants lie down on their left side than sit up.

-Nine to ten elephants walk around an arena floor.

-Four elephants on tubs and three stand on hind feet and mount the one in front.

-One elephant is forced to stand on rear legs after hestating than does a head stand.

-Four elephants circle counterclockwise.

-One elephant on a stool mounts another with its front feet than the elephant below circles counterclockwise.

-One elephant places its right front foot on a pivot stool and circles counterclockwise.

-One elephant climbs on a stool and sits up.

-Two elephants lay down on their left side and one walks across a down elephant and sits up.

-Two elephants move up and spin in place counterclockwise.

-Elephants circle in a ring counterclockwise and turn in a circle in place.

-Four elephants lay down on their left side, all then sit up, all then circle counterclockwise.

-Three elephants stand on hind legs and mount the back of the elephant in front.

Excerpt #14 "12/15/03 B- Roll Rehearsals, Arena, Winter Quarters Tampa, FL, Opening Rehearsal; Blue 134th Tape 17 of 24" FEI 45196 2003

-Several elephants enter an arena and stand on their rear legs mounting the elephant in front.

-One elephant standing on its rear legs.

-Elephants walk in a line around an arena counterclockwise.

Excerpt #15 "Blue 134th Winter Quarters, Tape 12 of 24" FEI 45189 2003

Clip #1 from Excerpt #15 FEI 45198

-Elephants walk in a line into an arena.

-Elephants stand on their rear legs to mount the elephant in front.

-Elephants circle arena and exit.

Clip #2 from Excerpt #15 FEI 45198

-Elephants enter arena and stand on their rear legs and mount the one in front, circling the arena counterclockwise.

Excerpt #16 "Feld Entertainment Behind the Scenes, Tape #2, Boston, MA, 10/14/03; Behind the Scenes, Dannete, Tape 1 of 2" FEI 45215

-Performer climbs on elephant and climbs off.

-Public relations photographs with elephants and performers.

Excerpt #17 "Feld Entertainment, RBBBC, Red 135th, WQ Rehearsals Animals, Rings, Tape 2 of 6, 12/21/2004" FEI 45216

Clip #1 from Excerpt #17 FEI 45216

-Elephant walks across several performers laying on ground.

Clip #2 from Excerpt #17 FEI 45216

-Elephant in ring on stool and climbs off.

-Elephant walks across 6 performers laying down.

-Elephant walks counterclockwise around ring joined by three others and circle counterclockwise in place and then circles the ring counterclockwise with ponies in the ring.

-Four elephants on stools with ponies in ring.

-Four elephants circle ring counterclockwise and climb up on stools and circle counterclockwise on stools.

-Four elephants up on stools that circle ring side by side counterclockwise with ponies in ring.

-One elephant with rope in trunk is led by pony from the arena.

Clip #3 from Excerpt #17 FEI 45216

-Several elephants climb on to stools and circle counterclockwise on stools, than sit up on the stools.

-Five elephants on stools in line and place their front feet on the elephant in front while standing on their rear feet.

Excerpt #18 "CEC- Asha, Rudy, and PT in Yard 3 of 3- 11/20/2004" FEI 40966

-Two elephants on stools, do sit ups on stools, one stands on its rear feet while on the stool and mounts another that circles the stool counterclockwise.

-One elephant lies down on its left side and another walks across it and sits up on the down elephant.

-Two elephants circle in place counterclockwise and one stands on it rear feet and mounts the other circling the ring counterclockwise.

-Two elephants stretch out in sternal position and lay on their left side, than both sit up, one with its front legs against the back of the other.

-Two elephants play cymbals with their left front feet.

-One elephant climbs on an "uneven" spool, than slides off and repeats the procedure, walking the spool in an arc forward, climbing on to a stool.

-Two elephants climb on stools and one mounts the other while standing on its rear legs.

-Two elephants sit up on stools.

-One elephant lays down on its left side.

-One elephant climbs up on a stool and another elephant circles the stool counterclockwise with the front feet of the elephant on the stool on its back.

-One elephant lays on its left side.

-One elephant walks over the down elephant and sits up on this down elephant.

-The elephants circle the the ring counterclockwise and circle in place and one stands up and places its front feet on the back of the other elephant.

-Two elephants lay down on their left side, then sit up with one placing its front feet on the back of the other elephant.

-Two elephants circle counterclockwise and play cymbals with their left front feet.

-One elephant on an uneven wooden spool and climbs off.

-Two elephants kick rubber balls, one with its right foot and the other with its left front foot.

- Both elephants "take bows" and circle the ring counterclockwise.

- **Compilation of RBBB Performance Footage (FEI 45220, FEI 10353, FEI 0022, FEI 00024, FEI 0023, FEI 3241).**

Excerpt #1 "Raleigh, NC- Blue Unit Menage- David Polke Ring 1" FEI 45220

-Five adult Asian elephants in a ring moving counterclockwise. Three are on tubs and two do hind leg stands and mount the ones on tubs with the second two elephants mounting the center elephant with their front feet, then do sit ups on the tubs.

-One elephant walks on its hind legs with a performer standing on a front leg while walking.

-One elephant is noted on a tub with its front feet on another with a performer on its back.

-One elephants is noted standing on a tub with its front feet on the back of an elephant walking around the tub.

-There are three additional elephants with one foot on a post with a turning wheel walking counterclockwise in circles.

-One elephant stands on its hind feet with a performer in its mouth.

-Two elephants walk over two elephants laying down and sit up on these elephants, followed by standing up and circling in the ring in a counterclockwise direction.

-One elephant stands on its rear feet with a performer standing on a front leg.

-Three elephants lay down on their left sides and then do sit ups.

-Elephants with performers riding, and joining with other elephants in a line standing on rear legs mounting the elephant in front.

Excerpt #2 "Red 127th Footage- Kenny the Baby Elephant" FEI 10353 (date unknown)

Clip #1 from Excerpt #2 FEI 10353

-Three young elephants circling counterclockwise.

-One elephants climbs up on a stool.

-One elephant kicks a ball with its left front foot; one kicks a ball with its right front foot.

-One elephant is sitting on a tub, picks up a numbered card from a box.

-One elephant is shaking its head.

-One elephant is skipping as it walks.

Clip #2 from Excerpt #2 FEI 10353

-There are three baby elephants, one rings a bell, two lay down, then circle counterclockwise.

-One elephant kicks a ball with its right front foot.

-One stands on a stool and two sit up on stools.

Excerpt #3 "RB & BB Red 130th Edition Animal Care- B-Roll Package, 7/21/00" FEI 0022

-Three elephants on tubs, two mounting one in front of the other.

Excerpt #4 "RB & BB 131 Animal Video Press Kit, 6/22/01"

-One elephant walking on rear legs with a performer on its back.

Clip #1 from Excerpt #5 FEI 00023

-One elephant skipping in arena, spinning, skipping, and does a head stand.

Menage The Gautier Family

-Three rings with elephants walking counterclockwise in rings with performers on their backs.

-Six elephants perform hind leg stands.

-One elephant on a tub and the other stands on its hind legs with its front feet on the other elephant's back. Elephants perform hind leg stands sitting on a tub.

-One elephant on a tub doing a hind leg stand with its front legs mounting another elephant.

-Elephants do sit ups.

-Elephants walk on hind legs with a performer on its back and holding a performer in its mouth.

-Several elephants spin in a circle in place counterclockwise.

-Elephants lay down on left side and then do sit ups.

-One elephant on a tub mounting another elephant circling beneath the tub.

-Six or more elephants standing on rear legs with front feet up on the one in front, with performers on their backs.

-Elephant on a balance beam.

Amazing Elephants

-Three elephants sitting on tubs.

-The three elephants on tubs mounting the center elephant.

- Elephants performing head stands.

-Elephants spinning in place counterclockwise.

- Elephants sitting on other elephants.

-Line of elephants each doing a hind leg stand with its front legs up on the one in front.

Excerpt #6 "Gold Unit- Act II Mexico City 3/25/05- 2nd" FEI 3241

-Two juvenile elephants circling counterclockwise.

-Two elephants with right front foot on a stool turning in place.

-Two elephants on tubs, one on its rear feet mounting the other.

-Elephants sitting on tubs.

-One elephant lays down, and the second mounts the down elephant and then sits up on the down elephant.

-Two elephants spin around in place, one mounts the other.

-Two elephants lie down and then the two sit up.

-Elephants circle counterclockwise.

-Two elephants climb on tubs, then perform front leg stands.

-One elephant walks on a spool with four feet.

-Two elephants play cymbals with their left front feet.

-One elephant walks on a narrow plank placed up between two tubs.

-Two elephants circling counterclockwise.

-Two elephants put balls thru overhead hoops with their trunks.

- **Compilation of Footage Received from PETA (PL 16717, API 7166).**

"PETA Alleged Animal Welfare Act violations By Ringling Bros. February- March 2006"

Excerpt #1 Clip 1 February-March 2006 PL 16717 Greenville, South Carolina 2006

-Ringling Bull Hook Abuse -Elephant being walked quickly and pulled and slapped with a bull hook.

Clip 2 from Excerpt #1 2006 Footage -Ringling's Lame Elephant (Blue Unit)

-Elephant noted with a stiff left front leg, walking on an asphalt surface.

-Pressure Wounds On Hip And Cheek Areas (Both Red & Blue Units)

-One elephant noted with pressure sore scar tissue on skin of right hip and elbow and right facial area.

-Second elephant with scar tissue noted on left hip and shoulder and left facial area.

-Third elephant shown with two others with scar tissue on left hip.

-Two elephants walking with scar tissue on left hips.

-Two elephants, one facing camera with the second elephant having scar tissue on the left face and mandible region.

Excerpt #2 API 7166 Texas July 2, 2006 Red Unit Ringling Bros. Bull Hook Abuse "PETA footage of Austin, Texas, July 2, 2006" Red Unit Camera 1

-Elephant walking on asphalt road hooked behind left ear causing a skin puncture wound to bleed.

-A second elephant walking on an asphalt road hooked at the base of the trunk while standing on a road.

- **Compilation of Training & Rehearsal Footage from Defendant (FEI 40988, FEI 40976, FEI 40979, 65/FEI 40959, FEI 004, FELD-VID 0004, FEI 0001, FEI 0022, FEI 40956, FEI 40981).**

Compilation of excerpts of training and rehearsal footage produced by Ringling Brothers.

Excerpt #1 "Introduction To Animal Training, January 29, 1996" FEI 40988 1996 During this video segment elephants are shown on asphalt surfaces. One elephant is shown standing on its rear feet. A line of elephants are seen standing on their rear feet with their front feet on the one in front.

Narratives or training messages during the video regards use of the elephant hook:

-"It's no big accomplishment to make an elephant feel pain."

-"When an elephant sees a handler with a hook, the elephant pays attention to the most gentle touch of guidance."

-"The elephants are trained to recognize the elephant hook as a sign of authority."

Excerpt #2 "Elephant Farm Footage, Tape 9 of 10, November 1995" FEI 40976 1995

This video shows a one year old Asian elephant (Kenny) in training with an older male, Smokey. There are repetitive sits and mounts to the back of Smokey who is laying down in sternal recumbancy. The young elephant climbs on to a tub and then sits on the tub. The trainer indicates to the film crew, he does not know if it matters the elephant likes it or not. The trainer goes on to indicate the elephant is imprinted to people, and that the young elephants are touched by humans before their moms. Another employee talks about the Center For Elephant Conservation. He indicates at the CEC there are four new babies, and that emphasis is placed on an early bond with humans until separation.

Excerpt #3 "Animal Handling, St. Petersburg, FL 1/11/1996" FEI 40979 1996

Clip #1 & Clip #2 from Excerpt 3 A trainer is shown working with several elephants chained on an asphalt surface under a tented enclosure. He is working with an Asian elephant named Siam, demonstrating chaining procedures for the camera. The elephant, Siam, is given commands such as, "foot," "trunk," and "head down."

Excerpt #4 "Center For Elephant Conservation, Benjamin and Shirley Rehearsals-Tape #1 of 2 8/4/97" FEI 40959 1997

Clip #1 from Excerpt 4 A trainer and his assistants are working with two young Asian elephants. The elephants are run counterclockwise around a ring, stopping

quickly on their marks to mount tubs, perform mounts on each other, perform sit ups on the tubs, do headstands, pivot on hind legs during mounts, perform lay downs, mount each other from on top of a tub while the lower elephant circles and with one elephant laying down the other walks across and sits on the flank and back of the recumbent elephant. The elephants spin in place and performs stretch outs on their sternums, stand on their hind limbs, and stand on one another while walking. These procedures are non stop and in repetitive succession of one another.

Clip #2 from Excerpt 4 This training procedure is performed on a wet concrete surface. Two yearling Asian elephants are brought out and each climbs on to and balances on a round wooden spool. The elephants, while balancing on the spools, walk the spools forward before chalked in place by an assistant. One elephant, Benjamin, falls off the spool on to the wet concrete. He climbs back on the spool. When the elephants dismount the spools they climb down placing their weight first on their front limbs. The elephants stand up on their hind legs on the wet concrete surface. These elephants either run or walk quickly to perform mounts on each other or sit ups on the concrete surface.

Clip #3 from Excerpt 4 A young Asian elephant calf pounds on a drum holding a drum stick in its trunk. The elephant plays a cymbal with its left front foot, and waves a bandana. The elephant plays a harmonica with its trunk while shaking its head. The elephant repetitively kicks a rubber ball rolled to it with its left front foot while standing on wet concrete.

Clip #4 from Excerpt 4 A young Asian elephant rides a bike/trike on a wet concrete surface. A young Asian elephant repetitively places a rubber ball in an overhead basket while standing up on its hind legs.

Excerpt #5 "RBBB Animal Care- Elephants, B- Roll, 12/14/99" FEI 004 1999

Training statement on tape: "...ensures the elephants' health and well-being."

Training statement: "...designed to showcase natural behaviors..." Video sequence

shows Asian elephant standing up hind legs on an asphalt surface doing a head stand. Trainer indicates on tape the elephants' favorite command is, "eat, sleep." Elephants in a line walking on a grassy surface. An employee (Roy Wells?) demonstrates a bullhook or ankus. There is a video sequence of a show with two adults on tubs mounting a third elephant on a tub with a performer on the third elephant's back, than one elephant on a tub mounts an elephant circling the tub. Other elephants turn on rear feet with an elephant in front with one front foot on a pivot stand. There is a video sequence showing foot care on an elephant standing on 4 stools, one stool beneath each stool.

Excerpt #6 "RBBB- Caring for Animals at the Greatest Show on Earth. 6/1/00" Feld- VID 0004 2000

Training sequence with employees (Dave Whaley, Troy Metzler?) explaining training procedures. There is an elephant that stands up on an asphalt surface.

Excerpt #7 "CEC Raw Footage Tape 3 of 4 (11/29/00)" FEI 0001

Two young elephants are shown in a ring doing head stands, standing on stools, spinning on pivot stools and sitting up on stools. These behaviors are done in rapid repetitious sequences in a ring with an unnatural surface. An elephant is shown placing one front foot on a stool and circles counterclockwise around the stool on its hind legs. An elephant is shown running or quickly walking counterclockwise around the ring and climbing onto a tub. The elephant does a hind leg stand on the tub and mounts another elephant with its front feet while the elephant being mounted circles counterclockwise around the tub. One elephant lays down on its left side while another elephant climbs across it and then sits up on the elephant laying down. The elephants are shown running, spinning in place and stretching out in sternal body position, doing lay downs and sit ups. A four year old Asian elephant named Fish sits up and walks with its front feet on the back of another elephant. This Elephant is shown catching sticks with its trunk. The elephants rings a bell and then rings a second "alarm type" bell. The elephant does sit ups and kicks a plastic ball

rolled to it repeatedly, always with its left front foot. The left front leg is cued with a bull hook. The elephant stands on a tub, does a head stand, sits on a tub, and does a sit up. One elephants lays down on its left side and another elephants walks across it and does a sit up on the down elephant.

Excerpt #8 "RB & BB 130th Edition Animal Care, B-Roll Package, 7/21/00" FEI 0022

Three Asian elephants, are seen circling a ring in counterclockwise direction. Bonnie and Kelly are noted on tubs, with both mounting another with their front feet.

Excerpt #9 "CEC Vet Workshop 9/18/01 Tape 4 of 4" FEI 40956

Clip #1 from Excerpt #9 Ultrasound procedure is demonstrated.

Clip #2 from Excerpt #9 Trunk wash procedure is demonstrated. Oral exam, eye exam, and venipuncture procedures are demonstrated.

Excerpt #10 "CEC John Kirkland Interacting With Elephants Tape 3 of 4, 9/17/02" FEI 40981

Clip #1 from Excerpt #10 Statement on video, "We start training the babies right from the day they are born."

Clip #2 from Excerpt #10 The function of the bullhook is discussed, "You would have to exert tremendous pressure to break the skin and draw blood."

Clip #3 from Excerpt 10 A blood sample is taken from an ear vein using a vacutainer type venipuncture blood collection technique.

Review of Medical Records of the Seven Elephants: Karen, Nicole, Lutzi, Jewell, Zina, Susan, and Mysore

Review Methodology-

The medical records for all of the defendant's elephants were reviewed. In addition, I particularly focused on the seven elephants specific to this case. The ages of each of the seven elephants were documented from entries in each elephant's file. Entries in the records relating to injuries associated with use of the bull hook (guide or ankus) and other instruments, and chaining (tethering) and confinement were documented. Injuries or health related problems associated with chaining or the cumulative effect of prolonged chaining, and prolonged standing on unnatural, solid or unyielding surfaces were documented. Entries were documented where there was reference to unnatural behavior, or behavior associated with prolonged housing on unnatural surfaces that effected the health of the seven elephants. Entries were documented where a health or behavior related problem was noted in other elephants that would have application to the seven elephants in this case. Geographical locations where events took place were documented when noted in the medical records. Following a review of the medical records of each elephant is a brief annotated summary listing of conditions applicable to this case.

In documenting the medial records every effort was made to correctly record dates of entries and Bates numbers. Misspellings where noted in medical record entries were corrected where applicable; however, some pharmaceuticals or names of unfamiliar products or abbreviated language may be incorrectly recorded in this report.

The summary of findings from a review of references, (Pages 94-95) will be applied to the information gathered from a review of the medical records, evidence and two site inspections. In forming an opinion, a determination will be made as to whether the defendant is engaging in practices that wound, injure, harm, and harass the Asian elephants in its care.

Karen Female Asian Elephant: Date of Birth 1969 Age: 39 yrs

***Date of Acquisition/Origin: 1969 Trefflich, NY; Thailand**

01/1994 on Blue Unit

04/17/1997: transferred from Blue Unit to CEC

06/04/1997: transferred from CEC to Blue Unit

02/18/2000: transferred from Blue Unit to CEC

06/10/2000: transferred from CEC to Blue Unit

Currently on Blue Unit FEI 1250

***Per Donna Gautier affidavit 1/16/95- FEI 1378**

& Tim J. Holst affidavit 11/14/ 96- FEI 1360 Karen joined Ringling in 1969

Medical Record Entries:

12/30/96: Inflammation RR thigh. Treatment with antibiotics for 7 days and Banamine for 3 days, and Ibuprofen for 3 days. FELD 0018713

1/21/97: Severe lameness RR, muscle seems swollen, treatment with Banamine for 2 days. FELD 0018713

1/23/97: Walking normal, keep separated and unchained. FELD 0018713

7/17/97: No hind leg stands. FELD 0018713

8/23/98: History- came to RB as a wild caught 6 month calf about 1969. Bottle fed by Sonny for 1.5 years. Has a bad habit of slapping people with her trunk. Mention of previous hind leg injury, possibly a muscle, that was treated and resolved. FELD 0018713

9/2/98: Exam feet, RR over-grown sole. FELD 0018713

8/-/98: Blue Unit: Comment/Daily Animal Records: Karen bit Sophie's ear during the night. FEI 36248

1/8/99: Affidavit: Robert Castillo: "I have seen injuries on elephants, but those injuries were inflicted by the elephants themselves. The bull hook is used properly by all personnel that handle the elephants. I stay away from Karen because she has been known to knock people around." FELD 0023387

1/8/99: Affidavit: Hugh Patrick Harned: "I am not aware of abusive use of the ankus with elephants." "There is no abuse of any of the elephants. I treat these elephants as my children. I care for them very much, and I direct them with verbal communication and with the ankus to support my verbal communication only if necessary. I use the ankus by touching cue spots on the elephant. I do not use the ankus on the ears." "I have not seen any beating of the Blue Unit elephants. The use of the ankus is not done in an aggressive manner." FELD 0025202 "I have never seen any injuries inflicted with the ankus on any of the elephants. Karen can be aggressive against a person who she does not know." FELD 0025203

1/8/99: Affidavit: Jeffrey Steele: "Karen has been with us for years. I have never seen her be aggressive. We have been using her for years in the performance. Senior trainers have always advised that new barn employees should keep their distance from Karen until she gets aquatinted with them." "I have no knowledge of any beating of Nicole or any of the circus elephants." FELD 0025204

1/8/99: Affidavit: Randy Peterson: I have never used an ankus to beat any of the elephants. I have never seen any of my colleagues beat or abuse any of the circus elephants." "Karen likes her space and does not like strangers. We advise new employees without any experience to stay away from her to avoid getting hurt. She is a

very intelligent elephant. She is not aggressive but will push you away. I do not consider Karen to be dangerous to the general public." FELD 0025206 "The elephants are not exercised during the movement on the train. They do have enough room to lay down in the stock car." FELD 0025207

1/8/99: Affidavit: Robert Lee Ridley: "I am the Veterinary Technician of the Blue Unit, FELD ENTERTAINMENT INC DBA RINGLING BROS AND BARNUM & BAILEY CIRCUS. I have been in this position about 18 years. I have been in this organization for about 32 years." "I have not seen any abuse of any of the elephants in the circus. The ankus is used properly in the circus. I have seen hook boils on some of the elephants. I have seen them on the side of the trunks and on the underside of the legs. I would not consider them to be major injuries. They would heal in a few days. I would treat them with Betadine solution or Wonder Dust. I probably treated the last hook boil in November 1998. I do not know how the boil occurred. I do not recall which of the elephants I treated on this last occasion. I recall a small boil and about 3 or 4 drops of blood. I see hook boils twice a week on an average. Hook boils are common in elephants." "Karen could be dangerous only to new people and when chained." FELD 0025209

1/31/99: History- chronic healing NBA (nail bed abscess) left #4. FELD 0007116

8/31/99: Wichita, KS. Blue Unit: Routine exam. Caudal heal of both hind feet are worn down to pink tissue. No lameness noted. She tends to drag her feet when she walks. Monitor FELD 0021891

9/12/99: Observed during walk out. Foot care LF #3 small crack, LF slightly swollen between #4 & 5 RF, #3 overgrown cuticle. FELD 0018712

9/12/99: Kansas City, Blue Unit: Caudal heal of both hind feet worn down to pink tissue. No lameness noted. LF# 3 small crack. LF between #4-5 the interdigital tissue is mildly swollen. RF #3 overgrown cuticle. She tends to drag her feet when she walks. Plan: monitor. FELD 0021892

10/20/99: Boston, MA, Routine exam, PE LF #3 small, vertical crack, minor foot problems. FELD 0018712

2/15/00: Slipped during rehearsal, RH hamstring very swollen, very lame, Dr. Sangenario gives Banamine, not eating or drinking. FELD 0018712

2/15/00: Blue Unit/Daily Animal Record: Karen stiff in RH leg, showing discomfort out of show. FEI 23197

2/16/00: Still lame, Banamine given. FELD 0018712

2/16/00: Blue Unit/Daily Animal Record: Karen out of show. FEI 23198

2/17/00: Still lame, Banamine given. FELD 0018712

2/17/00: Blue Unit/ Daily Animal Report: Karen out of show. FEI 23199

2/18/00: AM, Banamine, transferred to CEC by road FELD 0018712

2/18/00: Blue Unit/Daily Animal record: Karen left for CEC. FEI 23200

3/9/00: US Karen / not too cooperative. FEI 21526

6/8/00: Lexington. Blue Unit: Karen arrived from Florida around 12:30 am. FEI 36482

06/09/00: Lexington, Blue Unit: Comment/Daily Animal Record: "Karen practice in act/ did good/ a little weak put her in show/ everything but manage. Rebecca only did manage." FEI 36481

6/10/00: Lexington, Blue Unit: Comment/Daily Animal Record: "Karen practice in act/ did good/ a little weak put her in show. Rebecca loaded in truck at 7:00am and left to Florida." FEI 36480

6/11/00: Lexington, Blue Unit: Comment/Daily Animal Record: "Karen loaded good." FEI 36479

7/19/00: Long Beach, CA. Blue Unit: Back on the unit after rest at the CEC. Sonny reports occasional lameness after she is asked to stretch out. Also reluctant to perform some tricks that require hind limb strength. Normal exam. Suspect residual pain from previous injury. Consider Adequan injections. FELD 0021822

7/31/00: Anaheim, Blue Unit: Comment/Daily Animal Record: "Karen: Rx 10 pills Ibuprofen in morning for sore left hind leg." FEI 36429

8/10/00: San Diego, CA Blue Unit: History: Sonny reports occasional RH lameness after she is asked to stretch out. Also reluctant to perform some tricks that require hind limb strength. Normal exam. Suspect residual pain from previous injury. Consider Adequan injections. FELD 00221791

8/24/00: Memo from S. Taylor to R. Brandes, R. Dehaven, E. Goldentyer, B. Kohn: "Another cow, Karen, was transferred to the Blue Unit on 6/7/00. She may be the one

who has a reputation for being dangerous." FELD: no Bates number noted.

12/3/00: Sonny reports occasional RH lameness after she is asked to stretch out. FELD 0002866. Normal Exam-Sonny suspects residual pain from previous injury. FELD 0002867

12/13/00: Orlando, FL. Blue Unit. Sonny reports occasional RH lameness after she is asked to stretch out. Normal exam. Shed the upper right molar a few days ago. Cuticles need trimming. Suspect residual pain from previous injury. Consider Adequan injections. FELD 0021806

12/22/00: Cuticles of forefeet overgrown, and mild overgrowth of soles of hind feet. Feet trimmed. Note: Elephant has intermittent lameness problems in right rear leg, assumed to be pulled muscle. FELD 0002867

1/18/01: History- Has chronic intermittent lameness right hind, assumed to be arthritis. Noted last week during performance to be making bizarre "hitching" movement with right hind, only when show blanket on. Trainer feels that the elephant was trying to use blanket to scratch superficial abrasions on dorsal rump (sustained when getting in or out of train or truck last week). Exam: Observed elephant in rehearsal where she lays down, stretches out, etc., and during opening of show when walking with blanket on. Possibly abducts her right stifle a bit when walking, but is subtle and no obvious limp. Abrasion over rump is small, superficial and healing OK. Right hind lameness not obvious today, but will monitor closely, since problem seems to be intermittent. FELD 0002867

01/25/01: Note: Unusual "jaunty" sort of hind end gait observed tonight when elephant wearing blanket for show. She exaggerates the swaying of her hind end, particularly the raising of her right hind leg. Not really a lameness, and elephant is not bearing less

weight on this leg. May be an attempt to scratch healing wound on back (elephant also scratches this area with her tail, evidenced by the absence of hair for a large region surrounding the wound). The wound is a 10 cm area of superficially ulcerated recently re-epithelialized skin. FELD 0002867

2/18/01: During the third show after spec she started acting uncomfortable like she had cramps. She was stretching out, but the end of the show she would not drink and would not touch her food, she laid down right away and kept switching sides. We watched all night. Colicky. Treated with Banamine. FELD 0002867

2/18/01: Atlanta, GA, Blue Unit: Comment/Daily Animal Record: "During the third show after spec Karen started acting uncomfortable like she had cramps she was stretching out, by the end of the show she would not drink and would not touch her food she laid down right away and kept switching sides. We gave her 40 ml. of Banamen and watched her all night." FEI 36887

2/19/01: Better. Treated with Banamine FELD 0002867

2/19/01: Atlanta, GA, Blue Unit: Comment/Daily Animal Record: "Karen was much better this morning she drank some and was eating some we gave her 20ml. of bana. before the first show and she improved from there." FEI 36886

3/21/01: Washington, DC. Blue Unit: Occasional RH lameness. Passing undigested hay. Cuticles need trimming. Karen has two upper molars that are new and not being worn. Lower molars were not easy to examine. Suspect residual pain from previous injury. Karen is not effectively grinding with either of her upper molars. FELD 0021828

3/21/01: History, mild RH lameness. Passing undigested hay. Normal examination. Cuticles need trimming. Karen has two upper molars that are new and not being worn.

Lower molars were not easy to examine. Normal foot exam. Suspect residual pain from previous injury. Karen is not effectively grinding with either of her upper molars. Consider Adequan injections for lameness. FELD 0002868

4/19/01: Elephant colicky and inappetent after show yesterday. Feces normal. Ate following Banamine administration . Still not "herself" next AM, therefore given Banamine. Fine after this. Elephant has had a few bouts of acute colic lately which quickly resolves with Banamine. Perhaps has to do with poor digestion of food due to tooth problem. Handler will start her on bran mashes to see if this helps. FELD 0002868

7/17/01: Houston, TX. Blue Unit: Passing undigested hay. Cuticles need trimming. Upper molars are abnormal, preventing chewing. Karen is not effectively grinding with her upper molars. FELD 0020178

8/23/01: Colorado Springs, CO. Eating better, with more normal feces. Teeth may be growing into place and starting normal wear. FELD 0021901

2/7/02: History- Horizontal crack in middle of LF 4th nail 5mm distal to cuticle. Exam: In addition to the horizontal crack in proximal nail, there is a 1cm soft, black spot on the sole associated with this nail. Both lesions trimmed to facilitate drainage of underlying fetid, caseous material (likely necrotic epithelial tissue).

2/14/02: History: Nail bed abscess LF #4 reported by trainer. Active NBA LF #4. Has been trimmed so that it is open dorsally and ventrally. Active NBA, being treated with trimming. (Norfolk, VA FELD 0021810)

2/14/02: Norfolk, VA. Blue Unit: NBA LF #4. Has been trimmed so that it is open dorsally and ventrally. Active NBA, being treated with trimming. FELD 0021810

2/28/02: Hampton, VA Blue Unit: recheck NBA LF #4. Has been trimmed again. Not lame. Active NBA, but healing well. FELD 0021812

3/27/02: Healing NBA LF #4. Not lame. FELD 0002869

3/27/02: New York City, NY Blue Unit: Recheck NBA LF #4. Healing NBA LF #4. Not lame. FELD 0021827

8/10/02: San Diego, CA Blue Unit: Small healing abrasion on left axillary area. Normal exam. FELD 0021897

9/17/03: Blue Unit: Swollen right eye. Keeper reports that eye was very swollen yesterday; no swelling present when she came off the train. Moderate swelling of the right upper and lower lids; trainer states that there is 80% resolution today; no epiphora present.; no treatment at this time; continue to monitor. FEI 3294

11/5/03: Pittsburgh, PA Blue Unit: Routine exam. Possible malocclusion of right upper molar. FELD 0021839

11/5/03: Exam- LH #2 small, vertical crack. FELD 0002864

1/20/04: Blue Unit: Exam-elephant physical: Karen has avulsed a superficial skin flap at the back of her LF; at the heel-pad junction. No treatment needed. FEI 3294

1/28/05: Memo, From: Bruce Read, To: Ellen Wiedner. FYI "Last night during the show Karen (Elephant) stepped on a bolt from the stair coming off finale. She cut herself good on her back foot. She is alright and not hobbling." FEI 13162

2/8-2/9/05: Raleigh, NC Blue Unit: FEI 40054. Stepped on a bolt last week, RH. Not lame. No puncture hole visible. Doing well. No treatment. FEI 40055.

Summer 2005: Dallas. TX Blue Unit: Opacity in left eye. Healing stromal abscess. Atropine until dilated, continue with topical abx since healing, vaseline for tearing. FELD 0008356

7/16/05: Blue Unit: Opacity in left eye. Healing stromal abscess. FEI 212796

11/12/05: Auburn Hills, MI Blue Unit: Nickel-sized swelling on palmar surface of LF where leg joins the pad. Not painful on palpation, fluctuant, not hot. Abscess or seroma or hematoma. Observe. FELD 0028942

10/28/06: Memo, From: Ellen Wiedner, To: Santiago, Anita; Schmitt, Dennis; Jacobson, Gary; Williams, Trudy; Jones, Kayleen. Note about Karen: "Troy Metzler called me to say that Karen Elephant appeared sore in her right hip. He noticed no significant lameness, but she appeared to be uncomfortable. I authorized him to administer 25cc banamine SID IM today and tomorrow." FEI 44456

1/9/07: Miami, FL Blue Unit: Vertical crack RF/D4. Vertical crack LH/D2. Normal elephant. No treatment. FEI 44482

UNDATED COPIES OF PHOTOGRAPHS: foot toe cracks
FEI 7962, FEI 8028, FEI 8030, FEI 8061, FEI 8118, FEI 8165, FEI 8166, FEI 8200, FEI 8201, FEI 8204, FEI 8247

<u>Karen-Summary of medical and/or behavioral events:</u>
(Little or no medical records available prior to 1989)

1996-Inflammation of RR thigh.

1997-Severe lameness RR, restricted from hind leg stands.

1998-Bad habit of slapping people.

-Karen bit Sophie's ear.

-Per Tom Rider response to an interrogatory: …"Pat Harned, came over to Karen and for the next 23 minutes he started hooking and hitting her and making her raise her trunk and yelling at her, making her lay down and get up, and just all because she rattled her chain."

-Per Tom Rider response to an interrogatory: "Adam Hill hit Karen and Sophie with a bull hook."

1999-Karen has been known to knock people around.

-Karen can be aggressive against a person she does not know

-Karen could be dangerous only to new people and when chained.

-Left #4 chronic healing nail bed abscess.

-Caudal heal of both hind feet are worn down to pink tissue.

-She tends to drag her feet when she walks.

-LF #3 small crack, LF slightly swollen between #4-5, RF #3 overgrown cuticle.

-LF #3 small vertical crack.

-Per Tom Rider deposition: "Handlers beat elephants named Sophie and Karen: Nicole was also severely beaten."

2000-Slipped during rehearsal, RH hamstring very swollen, very lame.

-Stiff in RH leg, showing discomfort, out of show, transferred to CEC.

-A little weak, put in show.

-Occasional lameness after she is asked to stretch out.

-Reluctant to perform some tricks that require hind limb strength, suspect residual pain.

-Occasional RH lameness, residual pain from previous injury.

-Intermittent lameness problems in right rear leg, assumed to be pulled muscle.

2001-Chronic intermittent lameness right hind, assumed to be arthritis.

-Healing wound on back.

-Colicky.

-Suspect residual pain from previous injury.

-A few bouts of colic lately.

-Not effectively grinding with either of her upper molars.

-Horizontal crack in middle of LF #4 nail, black spot on the sole associated with this nail (likely necrotic epithelial tissue).

-Active NBA LF #4.

2003-Swollen right eye.

-Possible malocclusion of right upper molar.

-LH #2 small vertical crack.

2004-Avulsed a superficial skin flap a the back of her LF; at the heel-pad junction.

2005-Step on a bolt from the stair coming off finale.

-Opacity in left eye. Healing stromal abscess.

2006-LF abscess or seroma or hematoma.

-Appeared sore in her right hip, she appeared to be uncomfortable.

2007-Vertical crack RF/D4, vertical crack LH/D2.