

Bil Anifeiliaid Gwyllt a Sycrasau (Cymru) | Wild Animals and Circuses (Wales) Bill
WA 17

Ymateb gan : Chris Barltrop
Evidence from : Chris Barltrop

'WILD' ANIMALS IN CIRCUSES

1: Introduction

I write as a member since the early 1970s of the Classical circus community, working as a ringmaster and manager in Great Britain and abroad. I am the former Chairman of the group of circus people whose participation in the DEFRA Circus Working Group over a lengthy discussion period contributed to a UK Government Report (*Wild Animals In Circuses, Nov 2007*, commonly referred to as the 'Radford Report').

2: The Radford Report

In contributing to the Radford Report, six specialist Academics reviewed evidence on both sides of the question. Three were nominated by the circus community, and three by organisations opposed to the use of animals in circuses. Despite this antipathy, the Academics' conclusions were unanimous. They include the words:

<<On the basis of the scientific evidence submitted to it, the (Academic) Panel concluded that such an argument (to ban the use of wild animals in circuses) had not been made out.>>

and further note was made by the Chair, a specialist Lawyer, that:

<<...Ministers do not have before them scientific evidence sufficient to demonstrate that travelling circuses are not compatible with meeting the welfare needs of any type of non-domesticated animal presently being used in the United Kingdom. It is further submitted that such a decision must be based on scientific evidence, and other considerations are extraneous, and therefore unlawful in the context of section 12 (of the Animal Welfare Act). Furthermore, in the absence of compelling scientific evidence, any attempt to ban the use of an animal would fall foul of the principle of proportionality.>>

3: Circus care standards and official Regulation

Good circuses welcome constructive criticism. They have responded to advice from the world's leading animal behaviourists and welfarists to ensure the behavioural needs of their animals are met to the same high standards as their physical welfare.

Circuses have themselves been the leaders in proposing and initiating moves to guarantee those high standards to the general public. The UK government's current Licensing system for wild-animal circuses ensued from that proposal. Licences are granted only after DEFRA experts have made thorough and stringent inspections of a circus on tour and when resting. Those multiple inspections include surprise visits, and cover every aspect including records of day-to-day care, nutrition and food stocks,

transportation vehicles, and a huge amount of documentation covering every aspect. This inspection régime costs the tax-payer nothing; it is charged in full to the circuses involved. Inspection records are publicly available, and demonstrate the very high standards of the Licensed circuses in all aspects; no fault has been found by the expert Inspectors during the past several years.

My own personal contact with circus trainers has shown me the affection and rapport which exist between them and their animals. I appreciate that exceptional incidents have come to light, but my experience persuades me that these are indeed exceptional, and that the norm within the circus community is of partnership with the animals rather than domination, and certainly not cruelty. Radford confirmed that animal care in circuses equals that given in zoos and safari parks, and that transportation is not an issue as the animals are so familiar with it as part of their regular routine.

3: Animal Rights material

No doubt you have heard from organisations with a vested interest in condemning circuses. That 'interest' includes both financial and political gain. Their published material is persuasive, hinging on emotive appeal, and is designed to generate outrage towards many whose work and / or lifestyle involves working with animals. As such, its accuracy is highly questionable. Animal rights organisations fund University departments to produce such 'reports'; integrity is sadly lacking.

An eminent American animal behaviourist, Professor Ted Friend (Texas A & M University) wrote to the then UK government Minister Lord 'Jeff' Rooker that, when he and his colleagues were told their lengthy specialist researches on behalf of the US government were extensively quoted in one such document, they were 'flattered'. However, on reading a copy, they were appalled to discover that their work had been (as his letter put it) 'egregiously misrepresented', with oddments cherry-picked to suit an anti-circus argument. More recently (July 2017), Prof Friend submitted a lengthy complaint to the Italian Parliament regarding similar matters. In opening a detailed demolition of such evidence, he condemns the '180-degree spin' of his actual findings in reports from a certain author. That author is Stephen Harris, whose material the Welsh Assembly has relied on in arguing against the inclusion of animals in circuses.

A copy of Prof Friend's full Complaint to the Italian Parliament is attached to this email.

While I praise all those who work for the cause of animal welfare, I am suspicious of individuals and organisations who refuse to acknowledge welfare improvements in favour of an 'animal rights' agenda. The philosophy of animal rights is diametrically opposed to that of animal welfare. It seeks to end all contact between humans and animals. I do not believe measures towards such an agenda would be of ultimate benefit to either human beings or to the natural world of which we are all part. A brief glance at the same websites which condemn circuses confirms that farming, horse-racing, and even pet ownership are also targetted in a philosophy which, if encouraged, would radically affect many aspects of social and economic life, both personally and nationally.

4: Circuses as an example of human-animal cooperation; and EU support

No circus animals have been taken from the wild for generations; circuses are not a threat to wild populations of any species. Circuses show how humans and animals can

work together in cooperative partnership; they may even help highlight the plight of their poacher-threatened cousins. The circus people live for their animals, and the traditional circus with animals is acknowledged to be an important aspect of our culture. The European Parliament voted strongly in favour of animal circuses as an important cultural phenomenon:

“Whereas it would be desirable for it to be recognized that the classical circus, including the presentation of animals, forms part of European culture ”
(European Parliament Resolution, 13 October 2005)

5: What’s ‘wild’?

The question also arises of how one defines a ‘wild’ animal. In the Report of her extensive study of the condition of circus animals (published as ‘Animals in Circuses and Zoos – Chiron’s World?’ⁱ), research carried out on behalf of the RSPCA, Dr Marthe Kiley-Worthington is clear that one must look at the conditions of life of each individual animal rather than at its ancestry. To argue the unsuitability of a captive environment on the grounds of the species held there is false when one assesses the argument from the point of the animal rather than that of humans who are frequently anthropomorphic or politically-motivated in their views.

It is particularly anomalous that species such as camels and reindeer, which have been selectively bred over centuries for domestic use and which are classified throughout the world as ‘domesticated’ should be considered in the UK as ‘wild’ on the grounds that they are ‘not native species’. In circuses, such species are kept and cared for in exact parallel to equines. They are perfectly suitable for and comfortable in circus care.

6: A plea for choice

I hope that, rather than condemning circuses in the face of the body of positive evidence provided by open-minded and truthful research, you will choose measures which protect both the circus, as a vigorous and cherished aspect of all our cultural heritage, and its animal performers. I believe it would be unethical, perhaps even discriminatory, to ignore that evidence and thus to remove the public’s right to choose.

Thank you for your consideration of these points. I shall be happy to provide further comment, documentation, etc., if requested.

ⁱ http://www.the-shg.org/Kiley_Worthington/

Copy of Prof Friend’s full Complaint to the Italian Parliament:

Dear Legislators and Veterinarians,

I was contacted by several veterinarians and scientists based in Italy who are very concerned about Italy banning animals in circuses. The ban is controversial because the overwhelming misinformation espoused by activist groups and individuals has led to an incorrect interpretation of the scientific literature on the welfare of animals in circuses.

The Italian veterinarians told me that the decision to ban animals in circuses is based on documentation presented by **LAV (League Anti-Vivisection)** whose present position (FVE, FNOVI, EUROGROUP4ANIMALS) and is drawn from Stephen Harris' selective interpretation of my studies and the biased accounts of other activists. The following three articles are often referred to as the "Harris Reports."

A review of the welfare of wild animals in circuses – Stephen Harris, Graziella Iossa, & Carl D. Soulsbury - 2006, unpublished, RSPCA.

Are wild animals suited to a travelling circus life?"- G.Iossa, C.D. Soulsbury and S. Harris (2009) Animal Welfare. 18:129-140.

The welfare of wild animals in traveling circuses – J. Dorning, S. Harris and H. Pickett (2016), unpublished thesis.

All of these reports are quite similar and cite my studies multiple times. The lack of objectivity and the biased presentation of the research on animals in circuses in the so-called "Harris Reports" is unfortunate because activist groups are promoting the Harris Reports as the definitive study on the topic. Even more concerning is that many veterinary groups are adopting the Reports without knowing of their blatant inaccuracies. I am concerned that very few people have actually read my scientific publications and discovered that Harris's spin is 180 degrees from what we found.

Please let me start off with a short introduction of myself, and then I will discuss just a few of the more egregious items in the Harris Reports. If you would like a more in-depth analysis of the report, please let me know.

I am a Registered Professional Animal Scientist and a **Diplomate of the American College of Applied Behavior Sciences**. The Diplomate certification is the highest certification possible in the Applied Behavior Sciences. I have been conducting behavior and stress-related research on a wide range of species of animals for over 30 years. I was a Professor and Texas Agrilife Research Faculty Fellow with Texas A&M University's Department of Animal Science for 38 years, where I was their head scientist working in the field of Animal Welfare. I retired two years ago after a successful career as an animal advocate by conducting objective research and applying basic logic to assist legislators and other policy makers in making wise decisions.

In 1986 the Animal Protection Institute (based in Sacramento, California, and now called Born Free USA) named me their Humanitarian of the Year because my research documented welfare problems with raising milk-fed veal calves in narrow crates. The U.S. veal industry recently announced they were phasing out the narrow crates. API also recognized some other research I conducted that was key in their getting a federal injunction against a USDA program that required hot-iron branding of dairy cows on the jaw. We clearly showed that freeze branding was a viable and less painful alternative. On the other hand, my research on circus animals was involved when in 2014, API/Born Free was one of several activist groups that were forced to pay the Ringling Brothers Circus \$15.75 million. A U.S. Federal Judge found their lawsuit over the care of the circus elephants to be 'frivolous,' 'vexatious,' and 'groundless and unreasonable from its inception.' Infact, the judgement states that the activist groups' main witness "Mr. Rider was

repeatedly impeached, and indeed was “pulverized” on cross-examination.” “The Court finds that Mr. Rider is essentially a paid witness...” (Case 1:03-cv-02006-EGS Document 559 Filed 12/30/09 Page 19 of 57)

In 2001, the **United States Department of Agriculture’s Animal and Plant Health Inspection Service Animal Care Program** (USDA APHIS Animal Care, the program of USDA that performs animal welfare inspections on research laboratories, zoos and circuses) funded me to conduct a series of studies looking into the welfare of elephants and big cats traveling with circuses. My studies on elephants and tigers resulted in **eleven articles published in scientific and trade publications**, a list of which is attached. I purchased a travel trailer for the project, and up to ten graduate and undergraduate students and I travelled with eight circuses over the next six years, from California to New York, as time permitted. Our trailer was usually parked directly in front of the elephants or tigers to facilitate data collection, and we could see every aspect of their animal care.

I have continued to be active in exotic animal issues and am presently a member of the Scientific Advisory Committee for **American Humane’s Humane Conservation Program**, which conducts audits of the welfare of animals in zoos, aquaria, and other conservation facilities.

My studies have been cited numerous times by both pro- and anti-circus factions. For example, the anti-circus **Animal Defenders International** issued a report in 2006 entitled: “Animals in Traveling Circuses: The Science of Suffering.” ADI cited my studies at least six times, which is about six times more than they cited anyone else’s. Clearly ADI considered me to be one of the top experts on circus animals, although most of their references to my lab’s work were egregious misrepresentations. All of that report, and their use of my studies and the literature was similarly exceedingly biased.

Because the “Harris Reports” are very similar to each other, I will focus on the most recent iteration, the 2016 *The welfare of wild animals in traveling circuses*. As soon as I started reading the first page of their report’s, “Background,” alarms started going off. The first and most extensive study on circus animal welfare was commissioned by the Royal Society for the Prevention of Cruelty to Animals in 1990 and it is not even discussed. Why would someone in the EU leave out Dr. Marthe Kiley-Worthington’s ***Animals in Circuses and Zoos*** (Little Eco-Farms Publishing, distributed by Aardvark Publishing, Essex, England) that was conducted in the EU? The RSPCA funded Kiley-Worthington for the 2-year study because she had a pro-animal track record. But, the RSPCA then viciously turned on Kiley-Worthington because of what she concluded, which I quote below (page 220 of her conclusions; a copy of the cover of her book is attached).

“This study shows that the welfare of the animals in British circuses, as judged by physical and psychological criteria, is not as a rule inferior to that of other animal husbandry systems such as in zoos, private stables and kennels.... It is therefore irrational to take a stand against circuses on the grounds that the animals in circuses necessarily suffer, unless they are to take the same stand against zoos, stables, race horses, kennels, pets, and all other animal-keeping systems.”

There is no doubt that the RSPCA and other groups have learned to be much more selective when finding people to write their reports. If a scientist does not agree with another researcher’s conclusions, that is fine as long as they provide their justification for disagreeing. Ignoring such a seminal work as Kiley-Worthington’s because it does not support one’s opinion, however, is not science.

Another seminal report that received just a glance was the **Radford Report**. In my opinion the Radford Report should have been discussed at length in the Harris Reports. When the UK’s **Department of Environment Food and Rural Affairs (Defra)** set up the committee of experts for the Radford Report by forming a balanced expert panel of six academics. The charge was to “provide and consider evidence relating to the transportation and housing needs of non-

domesticated species.” I was a member of that expert panel which met during 2007. This was just a year after the Harris review of 2006 that initiated the formation of the expert panel to determine if animals should be banned from circuses or not in UK. The Radford Report was an intensive examination of the welfare of circus animals by representatives of both sides of the issue, whereas the Harris Reports are cleverly written only by authors who are committed to the anti-circus agenda. H. Pickett, one of the authors of the Harris Reports, said in her LinkedIn Profile that her main clients are animalist groups and her work is “pulling together the key scientific evidence to build a persuasive case for effective campaigning, fundraising and advocacy work. My work has been instrumental in achieving policy change at UK and European Union level and at major companies.”

The Radford Report concluded that there was no scientific evidence to justify a ban on welfare grounds. Again, if Dorning, Harris and Pickett (2016) do not want to accept these findings, I believe they are ethically bound to discuss why they should not be accepted. Sweeping the Radford Report aside and concluding “The available scientific evidence support a ban...” is bad science.

I also have questions about the validity of the **survey** Dorning, Harris and Pickett (2016) sent out that was a major component of that Report. I received several calls from people managing elephants that received the survey and I had the opportunity to talk with several zoo professionals and circus trainers shortly after they also received the survey. They were all concerned about the objectiveness of the Harris group and told me they were not going to complete the survey. I told them I was worried as well, but I did complete the survey. I am concerned that because of the low response rate by professionals who knew the bias of the Harris group, their survey is heavily biased toward the activist agenda. Furthermore the questions of the survey were formulated so that the answers were guided and there was no way respondents could challenge how their responses were interpreted.

The “**key welfare points**” in the Report, **starting on page 33**, are highly biased in my opinion, and just repeat the activist dogma. The authors ignore the simple fact that most circus animals are well acclimated to the circus lifestyle and transportation, just like well-trained dogs or show horses. The Report’s section on **Mortality and Morbidity** gives a litany of rare problems that can also occur with the family dog or pet horses. They overlook the simple fact that the oldest elephants in North America for decades have been circus elephants (just check the stud books). Frequently moving to new locations fits the nomadic lifestyle of elephants, provides much more stimulation than most zoo environments, and being well-trained makes exercise sessions and veterinary procedures much easier and safer.

The claim on page 42 that “Any potential contribution by traveling circuses and mobile zoos to education and conservation activities is a best likely to be marginal” is absurd. Millions of people have been inspired by being able to come into very close contact with tigers, elephants and other animals at circuses. Not everyone is within close proximity to a good quality zoo. All of the circuses with which my students and I travelled looked forward to their customers visiting with their animals before and after performances. Yes, you could get an elephant or camel ride, but children and adults could also get to touch those animals and feel the magic. It is hard to get really excited about conserving an animal that you have only seen on television. These authors did briefly mention the success that Ringling Brothers Circus (Feld Entertainment) has had with their breeding program. Actually, that program had many more baby elephants than any zoo because the Ringling circuses generated enough profits to employ the best people and support cutting-edge research. I have asked the Ringling researchers, vets and trainers if they have ever been restrained due to funding, and everyone has said never. Outside zoos, circuses and private exhibitors of elephants consulted with the Ringling Veterinarians, who (to my knowledge) have always helped them out at no charge. Just Google the name Dennis Schmitt, DVM PhD and look at what he has done for the International Elephant Foundation. I also know that Ringling (Feld Entertainment) had an extensive program training elephant professionals in Sri Lanka (and probably other parts of the world). They trained mahouts all over the world on modern techniques that replaced the traditional brutal system. There is no question that circuses have done more for

conservation of threatened animal species than Harris's group. But unfortunately, the activist agenda was accepted without question by most of the American public, so the Ringling Brothers Circuses are no more.

The following are some specific examples of the clever use of citations that Dorning, Harris and Pickett (2016) used to build their case:

P 79. Bottom left column. The authors do acknowledge that captive animals show anticipatory behavior prior to feeding, training or gaining access to outdoor space "because these are rare positive events", and they even cite a few of my articles to show support for that claim. But these positive events are certainly not "rare" (their term) for circus animals. Circus animals are fed several times a day (big cats once a day), watered several times a day, daily training sessions are common, and they have daily access to outside space^{1,2,3,4,9,10,11}. But these authors also left off the additional stimuli that come from performances, photo shoots, and meeting and greeting people. In their attempt to negate the positive, they then used a published "note" on foxes that have learned to anticipate an adverse event.

P 80. Middle left column. The authors cite some of my studies on stereotypic behavior in tigers, and then a reference an opinion on farm animals to support their unfounded claim that anything that performs stereotypic behavior more than 10% of its time has "unacceptably compromised" welfare (Broom, D.M. (1983) Stereotypies as animal welfare indicators. In: Smidt, D. (ed.) Indicators relevant to farm animal welfare. The Netherlands: Springer.) . This is absurd because most of the stereotypic behaviour in circus animals is caused by anticipation of food¹, water¹, performing^{1,9,10} and transport^{6,7}..

P 85. Bottom right. The authors grudgingly admit that the frequent changes in location of circus animals may have an enriching effect for some species, which is of course true. But they counter any possible benefit by citing studies where regular cage cleaning of rats has "been associated with increased cannibalism and reduced handleability". (Burn, C.C. & Mason, G.J. (2008) Effect of cage cleaning frequency on laboratory rat reproduction, cannibalism, and welfare. Applied Animal Behaviour Sci., 114:235). That could be true for laboratory rats where scent trails are extremely important, but circus animals? If handleability decreased every time a circus moved, what would happen to their performances? Do circuses have a problem with cannibalism in their elephants, horses, dogs, cats?

P 123. Middle right. Here the authors mention a trial I once conducted when a herd of elephants were deliberately left out of a performance. I also showed video of this at an International Society for Applied Ethology meeting. In all talks and written accounts, I clearly state that these elephants were kept in their individual "matriarchal" herds, consisting of an older female and two to four younger females. The keepers knew that mixing these herds could result in a major disruption, as happens in the wild, so these elephants went for walks, went to water and were transported as a herd. The elephant herds also performed in their own ring. This circus had a tent with five rings, hence there were five matriarchal groups. The authors claim that when these elephants performed elements of their acts when left out of a performance "could be anxiety due to social separation" is illogical. Also, if it was "anxiety due to social separation", why were these elephants performing elements of their act in time with the music with no trainers present?²

P 124. The section entitled Reproduction. This section deals mostly with elephants, which is reasonable, as circus tigers and other species breed very readily and there is an overabundance of these animals. If the Harris Reports were impartial, it begs the question of why tigers and other species are not covered?

Please let me offer some additional clarification of some of Harris's statements regarding the breeding of elephants.

The 2016 Harris Report faults circuses for collaborating rarely with zoos in their efforts to breed elephants in the recent decades. I had direct experience with the zoo collaboration issue when I got some of our reproductive physiologists involved with Carson & Barnes Circus 20 years ago.

That circus was very proud of their breeding program, which involved their regularly collecting blood samples that they sent to a major zoo (Oregon) in the U.S. as part of a cooperative breeding program. The blood was analysed so they could track estrus cycles, and they were on the forefront of developing artificial insemination using semen sent from that zoo. Their elephants were trained to raise a foot for blood sampling using positive rewards (usually a loaf of bread). Just a year or two later the zoo stopped the program, so I called the zoo director to see what had happened. He explained that animal welfare activists had gotten word about the collaboration and were picketing and deliberately undermining fundraising for the zoo. He was apologetic about stopping the program because the circus had many more elephants than the zoo, but he had no choice.

I have had numerous zoo directors tell me over the years that they prefer circus elephants because they are well adjusted, trained and in better physical shape than zoo elephants. The general consensus was that the training and physical shape of circus elephants increased fecundity, but circuses do not usually travel with intact males for safety reasons, so breeding cows directly with bulls for maximum conception was not possible when on the road.

Most recently, some circuses and independent owners are giving up on breeding elephants because of the pressure brought by activists. It is tragic that circuses and private owners are being criticized for reducing their breeding programs when they are being forced out of business because of pressure created by biased reports like the Harris Reports.

P. 133. Effects of performance. This section goes against common medical knowledge. Certainly circus animals are expected to perform physically challenging movements, but that is good. What physician does not encourage older patients to exercise using the term “use it or lose it”? Isn’t exercising our pet dogs or horses important to their health? Of course elephants might rarely get back and girth lesions when the trainer is negligent and does not catch the problem, but pet horses can get similar minor injuries. The authors are very critical of circus elephants standing on two legs as being unnatural movements. Please see the attached photo of a wild elephant standing on two legs, it is common behavior.

P. 135. Top left. Certainly many zoo elephants are overweight, but zoo managers have no choice. If their elephants are not on the fat side, they get criticized by ignorant activists. Overweight elephants traveling with circuses, however, are rare, just like overweight football (soccer) players or performance horses.

P. 139 Bottom right. This is a gross distortion of one of my studies⁷. We reported our justifications for concluding that the elephants considered their transport containers as “home,” but the quote “since circus animals often spend much of their time in transport containers even when not being transported” that is credited to my paper was fabricated by these authors. Unfortunately, this is just one of many gross misrepresentations of my studies.

P. 140. Transport. The authors did a very skillful job of picking bits from my studies that fit their objectives. We avoided making major claims and limited our discussion to the data. Everything we saw indicated the elephants⁷ and tigers^{6,8} were excited about the transport process and moving to a new location. Harris et al. inserted quotes like “Stereotypic-eliciting situations are likely to be poor for welfare¹²⁷” without explaining that there is an extensive literature that those situations could also be beneficial for welfare.

P 141. Bottom left. I am very disappointed that the authors did not explain that the translocated bull Asian elephant that displayed a 400% increase in stereotypical behavior and had disturbed sleep patterns had been translocated for breeding purposes (Laws, N., Ganswindt, A., Heistermann, M., Harris, M., Harris, S. & Sherwin, C. (2007) A cast study: fecal corticosteroid and behavior as indicators of welfare during relocation of an Asian elephant. *J Appl. Animal Welfare Sci* 10, 349.) The huge increase in stereotypical behavior and the disrupted sleep patterns occurred when “Chang” was first allowed contact with the four cows during the day, but separated from the cows during the night. I just cannot fathom

why the authors attributed the stereotypical behavior and disturbed sleep patterns to having been transported several days earlier, and not to excitement over being introduced to the cows and frustration over being removed from the cows each night.

In conclusion, although the Welsh Government funded the 2016 Harris Report, Wales announced in early 2017 that it will not ban animals in circuses. Having been involved in the attempted Welsh ban, I think this was because the Report was so biased. Animal activists have often painted a very distorted picture of many animal issues, often citing other activist propaganda to support their claims, which I have grown to expect. **However, I am gravely disappointed with the the lack of verification of sources and fact checking by professionals who advise governments and policy makers on animal welfare-related issues.** Perhaps those professionals have heard the activists' claims so often that they accept that dogma without question. My many students and I confirmed that Kiley-Worthington's 1990 RSPCA funded study got it right, which I quote. "It is therefore irrational to take a stand against circuses on the grounds that the animals in circuses necessarily suffer, unless they are to take the same stand against zoos, stables, race horses, kennels, pets, and all other animal-keeping systems." I sincerely hope that the Italian people will be more rational and informed in their decision making and will be more able to resist the pressure from misguided animal activists, than what has happened in America.

Sincerely,



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Scientific Publications from Dr. Ted Friend's Program that Relate to Circus Elephants and Tigers (chronological order)

1. Friend, T. H. and Bushong, D. 1996. Abstract. Stereotypic behavior in circus elephants and the effect of "anticipation" of feeding, watering and performing. Proceedings of the 30th International Congress of the International Society for Applied Ethology 14-17 August 1996, Guelph, Ontario, Canada.
2. Friend, T. H. 1999. Behavior of picketed circus elephants. Appl. Anim. Behav. Sci. 62:73-88.

3. Friend, T. H. and M. L. Parker. 1999. The effect of penning versus picketing on stereotypic behavior of circus elephants. *Appl. Anim. Behav. Sci.* 64:213-225.
4. Gruber, T. M., T. H. Friend, J. M. Gardner, J. M. Packard, B. Beaver, and D. Bushong. 2000. Variation in stereotypic behavior related to restraint in circus elephants. *Zoo Biology* 19:209-221.
5. Toscano, M. J., T. H. Friend and C. H. Nevill. 2001 Environmental conditions and body temperature of circus elephants transported during relatively high and low temperature conditions. *J. Elephant Managers Association* 12:115-149.
6. Nevill, C. H. and T. H. Friend. 2003. The behavior of circus tigers during transport. *Appl. Anim. Behav. Sci.* 82:329-337.
7. Williams, J. L. and T. H. Friend. 2003. Behavior of circus elephants during transport. *J. Elephant Managers Association* 14:8-11.
8. Nevill, C. H., T. H. Friend and M. J. Toscano. 2004. Survey of transport environments of circus tiger (*Panthera Tigris*) acts. *J. Zoo and Wildlife Medicine* 35:167-174.
9. Nevill, C. H. and T. H. Friend. 2006. A preliminary study on the effects of limited access to an exercise pen on stereotypic pacing in circus tigers. *Appl. Anim. Behav. Sci.* 101:355-361.
10. Krawczel, P.D., T.H. Friend and A. Windom. 2006. Stereotypic behavior of circus tigers: Effects of performance. *Appl. Anim. Behav. Sci.* 95:189-198.
11. Nevill, C. H., T. H. Friend. & Windom, A.G. (2010) An evaluation of exercise pen use by circus tigers (*Panthera tigris tigris*) *Journal of Applied Animal Welfare Science*, 13, 164-173.

ANIMALS
in CIRCUSES and ZOOS
Chiron's World?

Dr Marthe Kiley-Worthington



**including the independent scientific
report commissioned by the RSPCA on
ANIMALS in CIRCUSES**

It's a Hand! It's a Nose! It's an Elephant's Trunk!

NATURAL HISTORY

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