

Elephant Management.

A collection of unusual topics.



Elephant Business

Collection 3.

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INDOORS NATURAL SUBSTRATES FOR ELEPHANTS & MEDICAL ISSUES ASSOCIATED WITH HARD SURFACES.

Written October 2006.

It is my hope that the information in this article will make us stop for a minute and consider the captive life of the elephant on their terms. Cement floors that are now commonplace are obsolete and detrimental to elephant health and should be discontinued as the prime inside or outside holding area surfaces. The use of natural substrates will encourage year round natural behaviors; it will improve sleeping, and encourage digging and dusting, elements that are now lacking, especially in zoos with inclement weather.

Having had the privilege to work with elephants for many years and knowing numerous elephant keepers, I present this information from my own experience. Thus, I hope to present an interesting, well-balanced paper on using the elephant's own biology for it's betterment in captivity.

Working with elephants has been an evolutionary process for me. It was made easier over the last fifteen years, on an evolutionary perspective, by the fact that I have not had elephants under my direct control; elephants that I was not directly in charge of elephants myself but I was still maintained by an institution that was locked into a philosophy and old style way of thinking, where elephants were concerned. This position has allowed me to get out of the proverbial historical box when building my futuristic philosophy. It allowed me to think about elephant management in a different way, to use what I see & learn on my travels in many different countries and cultures in its broadest sense and to the betterment of the elephant in our zoos. My ultimate aim is to disseminate and implement these thoughts, especially to the upcoming young people who may be more flexible of thought and are not yet locked into the historical perspective of old techniques and are more open to a totally out of the box perspective, like sand substrates.

The consideration of indoor substrates is only one of many new concepts that I will present in this and future articles that I am writing concerning better elephant management; some of these ideas are now being implemented in several zoos around the world with whom I work. Twenty-four hour feeding strategies, "no more hay on the ground", the use of exhibit furniture that encourages and enables natural body movement like kneeling, stretching and climbing behaviors rarely seen in our zoos unless they are a part a show or demonstration to the public. Important aspects for consideration are improvement and utilization of the indoor elephant space and the size of the space allotted. No more square "convenient" angles in wall design and of course the use of boring concrete everywhere as the prime interactive surface as run its course. The use of natural interactive surfaces, I feel, is the way of the future and what we will be judged against as elephant housing in our zoos comes under criticism. Much larger and more complex outside enclosures with a twenty-four-activity possibility in all weathers & climates is another consideration. We must create places, in our zoo environment, for elephants to get out of eyesight of one another so that they can be alone, much as they would be in the wild when feeding. This will, of course, demand innovative thinking and the use of thought processes that have never been before offered in the design of new elephant facilities.

In essence, a total rethinking of how elephants are being kept in our zoos will need to be launched. The present industry standards do not meet even basic animal needs, we are allowing by the very existence of these standards extremely poor conditions for elephants in our zoos and when new enclosures are being designed, we spend much money on out-of-date captive elephant environments using the same worn-out ideas.

Close friends and acquaintances working in the field of elephant management and people that I have been advising in zoos around the world have encouraged me to write this article concerning the use of indoor natural substrates for elephants. A close friend who is influential in the zoological world, high up in the AZA community suggested that I write about the successes zoos are having with this idea so that the concept would become known and more widely used and accepted.

The comfort of captive elephants has never been a topic that has been comprehensively addressed or fully explored by the elephant care community and by the support or governing organizations the USDA (United States Department of Agriculture), the AZA (American Zoological Association) or the EAZA (European Association of Zoos & Aquarium), in any great depth, in fact their input has been minimal, tending more to avoid the issues rather than address them. The information at workshops schools and at other elephant keeper get-togethers is usually directed towards the *control* of the elephant whether it be Free Contact or Protected. Long discussions on the merits of the handling system in operation and the keepers open defense of system seem to be more important topics of discussion. I believe that there is rarely a consideration to how the elephant is handling its environment and the confinement we provide. The elephant's natural biology is virtually never a reference or benchmark used to guide captive care. The guidelines and standards we write set the bar so low that it has nothing in common with the elephant's long term well-being, comfort and health in our zoos.

Keeping captive elephants on natural substrates cannot be a new idea; after all, elephants spend the whole time in nature on surfaces that they can interact with and manipulate, surfaces that move and yield when touched. Thus, why haven't natural yielding substrates been adopted earlier in the history of exhibiting zoo elephants?

After speaking to many people, the reasons for not considering sand substrates or deep litter on in-door exhibits, as far as I can determine, has been convenience or in a few cases medical, (cleaning concerns and the fear of colic and not being able to disinfect efficiently).

This paper is a discussion into the reasons and feasibility for keeping zoo elephants on natural surfaces, surfaces with which they can interact and with which they can use in their daily lives twenty-four hours a day, even when keepers are not present. The idea of providing natural substrates is not meant to have any sort of scientific basis attached to it because, quite honestly, what I am suggesting is not science, but merely common sense and animal health & comfort.

Some of the common problems that face zoo elephants are associated with and the direct result of being housed on hard unyielding, cold & continuously draughty & damp surfaces. Arthritis, foot abscesses, pressure sores on cheeks and hips, knee calluses that are sensitive to

the touch & swellings at the knee joints etc, are the direct result of kneeling on concrete floors. I have seen large serum-filled swellings on elephant hips, shoulders and heads that are the direct result of exposure to hard surfaces, even to the point where the elephant will only lie down on one side or in a half-right position to rest.

As an elephant grows older it becomes more inflexible in body as well as in mind, not too different from us. Finding a comfortable sleeping position for instance will be a harder task for an older animal when the only surface is a hard flat concrete pad or some other version of hard substance.

Although convenience and sometimes medical are the reasons given, I can say for myself that, if someone had come to me with such an idea during my earlier years in elephant management, I would have laughed at the idea in a similar way as I laughed at not chaining elephants at night. We have done it this way for years so why change it. If I couldn't wash the floor, then I was not doing my job correctly. In many ways this is very much like the stereotypical behavior, one that is not uncommon in the elephants we care for. Today, however, I am convinced that a change in substrates, particularly in cold northern climates or in zoos that uses indoor housing at night as a prime holding area even in warm locations, is one of the key elements of keeping elephant's healthy long term, in a zoo environment.

The turning point in my case to consider the value of natural substrates was the first irreparable foot abscess I had seen and elephants that wouldn't lie down to sleep at night, which in our zoos, are many. I was asked to treat an abscess and then I realized that I could not offer ongoing successful treatment or repair the foot if the elephant was continued to be housed in such sterile unyielding condition. I was witnessing that abscesses were only the symptoms of a problem, not the *actual* problem. The elephant's environment and the elephant's abnormal behavior caused by the environment was the actual problem. I now believe that abscesses are avoidable. It goes without saying that any foot abscess is a problem in itself but if left without treatment or a change in environment is not considered, it will kill an elephant eventually.

Poor facility and exhibit design plus the stressful and biological depletion on the elephant of daily routines all help to develop behavioral problems in captive elephants. Lower stress by lowering the waiting and anticipatory behaviors in your elephants, examine your daily routines, stop the rocking, provide them with surfaces with which they can interact with and use. Finally, enhance their natural biology, encourage natural tendencies feeding and sleeping patterns, create good habits in your elephants; only then can you start to repair the foot abscess and divert psychotic behavior.

Hard surfaces, combined with repetitious rocking and swaying behaviors, as well as anticipatory waiting behaviors are the kiss of death for captive elephants. The elephant does not do well when it is left with "down-time", time just waiting for the next thing to happen. Thus, securing your elephants whether with a gate or chains in a conveniently cleanable stall at night, devoid of any stimulation is the worst kind of downtime; chaining only increases the effects of the confinement.

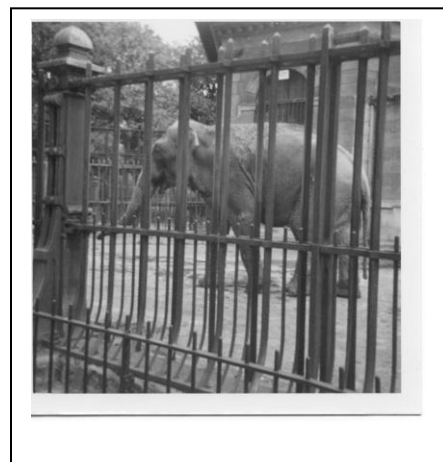
Just so that everyone who reads this article is clear and understands exactly what we are doing and condoning: Elephants spend upwards of sixteen hours out of twenty-four hours on hard,

unyielding, none interactive surfaces and we can now point to this as playing part of their medical and physical deterioration.

As an interim solution now, many institutions install rubber mats and even go to the great expense of laying down poured materials onto the surfaces in elephant night quarters. These interim solutions in zoos are a result of seeing foot problems or other medical issues in their elephants, or hearing from other institutions that have had medical issues in their elephants. Some zoos are pouring rubber pads because they hear it is the right thing to do but don't have any reasonable basis other than someone else did it.

To me personally, rubber flooring in prime housing areas is only an uneducated gesture and recognition that the elephant needs a different surface to stand on, but at the same time there is also a need to hang onto the convenience of cleanable flooring; it has nothing to do with elephant comfort. Rubber flooring does not offer the digging, sleeping position variations, or topography options for older and medically impaired elephants, as a natural surface would do. Some zoos have poured the rubber floors onto slopes with undulating areas in the anticipation of needed topography and lying-down options for the elephants. This idea provides only minimum improvement options at best, and the special needs of each elephant cannot be fully met by installing this idea, particularly if the elephants do not use the slopes you provide. An example of a needy elephants would be a large bull with tusks, and older females with wrist & knee joint issues & pressure sores on head and hips. An elephant's captive environment must represent a haven, a place where each individual with their idiosyncrasies can relax, and a place where their needs are met and not a place in which they merely survive.

Many different floor types have been tried in the past, with minimal to no success & results. Cobble stones were one of the first, asphalt, wooden blocks or wooden pallets, tiling, concrete and rubber are all surfaces that have been used to house elephants at one time or another in the history of zoos. They all have one aspect in common: they are all surfaces that are reasonably convenient to clean and in general terms are cost-effective in upkeep, relatively speaking.



We have moved away from elephant facilities like the one in the photo to the left, with the new architectural statements that are being presented. We are building captive elephant areas that look like the wild but do not act like the wild. Plastic plants, pour-on rock, bird music, concrete floors all create the idea of what an elephant environment should incorporate; but my question is: do our new facilities represent anything better for the elephant? Can the elephant enact natural tendencies or do anything it would normally do as an organism?



Are we building environments for the elephant's or for ourselves?

In contrast, I have been working with five institutions that have installed or are considering installing natural substrates on my recommendation, as an alternative to what is being offered at present in the Zoological World.

Beekse Bergen Safari Park in The Netherlands finished (in 2004) an inside stall for the new African bull Calimerio that arrived from Basel, Switzerland. Calimerio is using the sand area for

sleeping while he defecates on the adjacent hard floor where his daily wash routine is performed. This facility was designed with an in-wall heating system.



Amersfoort Zoo, also in The Netherlands, has also provided a natural substrate in one-half of the bull holding house so that he can lie on contoured flooring, enabling him to make a recess for his tusks and large head. The flooring will also be heat-efficient because of its depth. Concrete floors and pipes have an awful way of holding the cold and as an elephant gets older and less agile, they stop lying down and then prefer to lean against the wall instead.

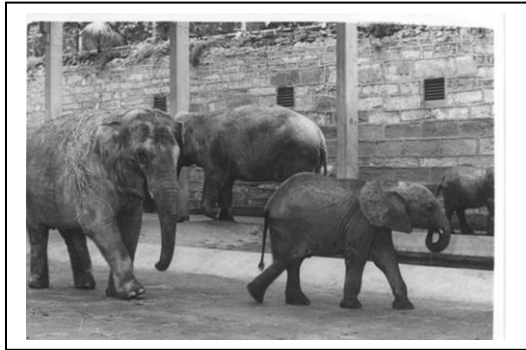
Amersfoort Zoo in The Netherlands co-hosted with Beekse Bergen Safari Park an Elephant Foot Care Workshop in October 2004. A major focus of the workshop was a consideration to natural substrates. The attendees were extremely interested in the amount of effort zoo staff provided their bull Sammy with a new interactive environment every day.



The Dublin Zoo in Ireland, under the direction of their visionary Director Leo Oosterwhegel, is presently considering installing a sand substrate into their new elephant exhibit



design. The Dublin Zoo has embraced the idea for the whole inside area of their new facility for all elephants to be a natural substrate, cows included. One of the most convincing factors was that during the summer months in the outside yard Judy, one of Dublin Zoo's two cows, can lie down to sleep on a very large sand mound that the zoo has provided for just that use. After the new facility has been constructed, Judy will be able to lie down during the winter also in her new improved inside environment.



The Chester Zoo in England is to date remodeling their presently very large elephant house and making it even larger and more elephant friendly. The inside will be divided into two areas; a rubber-covered floor for the daily wash routine and the second, in public view, will be sand. The public will be able to observe elephants during the winter months enacting natural behaviors such as digging holes, throwing dirt and, if they are really lucky, they will see an elephant

making its bed, pushing their massive heads into the soft substrate making inclines and topography to find a comfortable resting position. Now this will be truly massive progress and another good example of progressive husbandry for the zoological community worldwide that Chester will be providing. In the 1960's, Mr. George Saul Mottershead, the founder and Director of the Chester Zoo in England, had the wisdom to try a totally new concept that he called "A Zoo without Bars". He was interested in exhibiting animals in open, free viewing areas, free of bars and free from viewing restrictions with many animals at his zoo. Elephants were one of Motty's, as he was affectionately called favorites, and that led him to the open concept for exhibiting elephants. I also believe that philosophically he never agreed with the fact that chaining the elephants was absolutely necessary. Time has proven him right. This decision, of course, put an additional pressure on his then very hands-on staff. The result was the first of its kind, an inside area that allowed a free run for elephants that put distance between them.



The Roger Williams Park Zoo in Providence, Rhode Island incorporated a sand area for their three African females some time ago. They are now redesigning the elephant house and have decided to enlarge the sand area and encompass more of the facility that is off public view. The reason for the enlargement of the sand area, and a very positive shift in elephant husbandry and I must say, a considerable monetary investment is quite simple: it benefits the elephants. The zoo staff has carefully observed and evaluated the use of the sand by the elephants and weighed it against how elephants were kept in the past at RWPZOO and also, how they are being kept in other zoos.

The photo to the right shows the inside sand area at RWPZOO where an elephant has laid down to rest at night, using the topography of the ground to support tusks, head, neck and legs as they sleep. Most elephants try to attain a foetal position when sleeping; and the slope of the mound helps older elephants to manoeuvre when getting up.



The Animal Kingdom at Disney in Florida as just started to experiment with sand flooring in one of the stalls for their African elephants, the elephant manager who I was together with on a job at another zoo also saw the wisdom in what I was suggesting and implemented it at his facility. Other zoos that are installing sand flooring under my advice are: Copenhagen Zoo, Thoriy Safari Park in France, Alaska Zoo and Heidelberg Zoo. There will be many more. The idea is on the move.

Hagenbeck's Tierpark, Hamburg.

Hagenbeck's Tierpark in Hamburg, Northern Germany has been the inspiration to many zoological scientist, animal professional & enthusiast over their 175-year history. Myself, I took flight professionally because of my 10 years employment at Hagenbeck's. Between the years 1970 & 1981 I worked with the elephant department at Hagenbeck's under the direction of Herr Karl Kock, the then elephant supervisor.



Hagenbeck's, historically speaking, were always known for pushing animal husbandry & care standards to higher levels, and even today they are setting levels for the industry to follow.

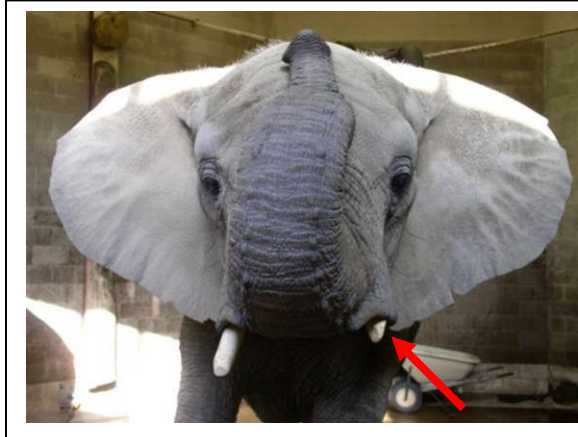
When initially discussing the merits of sand flooring with Hagenbeck's I didn't find it hard to convince them that natural substrates would be a benefit to the elephants. Always on the forefront of elephant husbandry and comfort the Tierpark is redesigning its elephant facility built in 1932 and have, at considerable expense, incorporated a natural substrate in their new, large inside free roaming extension.



Medical issues and ongoing physical problems that are caused & aggravated by the conventional employment of hard, unyielding and non-interactive surfaces.

Medical problems due to living on hard unyielding surfaces, to which elephants have been exposed since being kept in captivity in the west, continues to take

an incredible toll on many zoo elephants. Where possible, elephants enjoy rolling, resting and digging in sand piles twenty four a day, if they are provided. Generally, however, sand piles are provided in zoos on an inconsistent basis and elephants only have access to sand outside but even then many elephant yards are flat and boring with no stimulus value. Sand or natural substrates on indoor areas have not been widely considered at this point. But believe me it's coming.



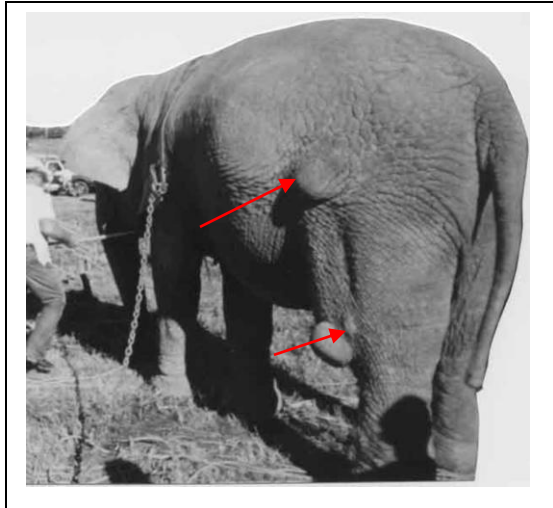
Tusk wear on concrete flooring has been a big problem for elephants in zoos for many years. Some zoos have even resorted to capping or metal banding the tusks so that tusk contact with the concrete is avoided. This has had mixed success. I have always wondered how mature bulls with large tusks can lie down on a flat level surface to sleep, and as also always wondered when exactly does the time comes that they stop lying down; how does that very moment occur when the animal says to itself: *the pain and discomfort of going down and then getting back*

up again is not worth the benefit of being down.

When growing up I always heard that elephants could sleep standing up. That was fascinating to me then like a lot of other elephant mystic. Today I am not so sure how acceptable such a statement has been and what effect it might have had on the health of thousands of zoo and circus elephants that had to sleep standing up because their quarters were inadequate.

Elephants need to rest, they need to take their enormous weight off their large feet, and they cannot do it easily on a flat or hard surface.

Pressure is the worst thing for elephant's feet, particular for older and out-of-condition, overweight and lethargic animals. The lack of muscle tone and abnormal bone development in the legs can only mean that their feet take more abnormal pressure than they would normally take in nature. The skeleton is meant to carry the weight of the body with the help of the muscles but, if the muscles are limp and sagging, then the weight is only going one way - down. Weight distribution in elephants is a 60%-40% split most of the weight being carried over the front feet. If these percentages are disturbed or the elephant is compensating because of a physical



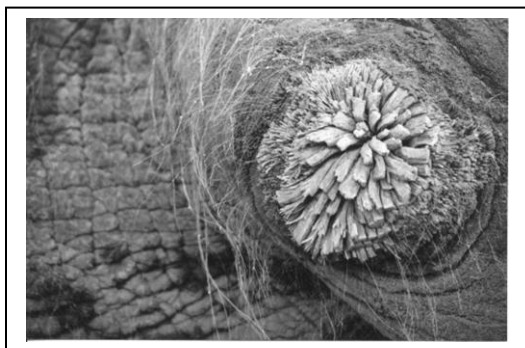
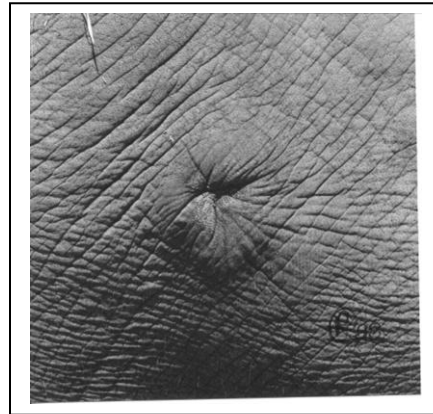
abnormality, the percentages will shift creating damaging pressure where other foot & legs joints start carrying the extra weight.

Pressure sores on the hips and temporal areas, large uncomfortable sinus and sensitive spots on the body from lying on concrete floors are common in our captive elephants.

This old circus elephant has two very large sinus growths and a small bump above the knee on her left side; she had none on the other side. These sinuses are usually filled with a clear serum and, in

my experience, they are benign swellings that cause extreme discomfort to the elephant when touched and will obstruct the elephant from lying on that side, but they have no other medical consequences. If the decision is made to operate, they take a very long time to heal, and this then leaves an uncomfortable scar making lying down even harder. The sinus itself is better left alone in my opinion if no weeping or drainage is present.

The photos below are of hip sinus that was operated upon whilst the animal was under my care; it took five years to heal. The original hole was 6" square and 4" deep on the initial day of surgery and it was extremely difficult to keep clean. Throughout the healing process, lying down on the left side was out of the question for this animal, at least at first but, as the inside face of the sinus hardened and dried, the elephant would lie down on that side also. This particular sinus developed because of an uncomfortable stall arrangement where she could only lie against the wall of the stall in a half upright position, thus stretching and applying, I believe, abnormal pressure on the left hip and thus causing a sinus at the hip joint to occur.



Elbows and the temporal area of the head are two other areas that suffer tremendously from continual contact, either during mandatory wash or performance routines, or at night when the elephant is trying to find a position to rest on the hard surface of its stall.

When an elephant is in the first stages of joint discomfort and it appears difficult for the animal to attain a stretch position during a routine care, one should alter the daily routine until the underlying nature of the problem has been detected and possibly alleviated. All too often I hear that the animal is "playing with you, she knows how to lie down". This, of course, could be the wrong answer. Check her kneepads, front and rear; if they are tender to touch, she



probably has a pressure sore developing under the hard callous surface of the knee. This type of condition needs time to heal, so all lying down routines should be discontinued until the extent of the damage is known. Every consideration should be given to the animal's comfort, thus observation is the key. In the photo above a soft rubber pad was used as an interim solution to soothe a tender knee joint and help the elephant gain confidence in lying down again.

Re-evaluate your routines. The knee joint of an elephant is not meant to be a weight-bearing joint thus the stretch positions where all four knees are on the ground at one time for the elephant to be washed or brushed off is an abnormal position, the half right position is even worst because all of the front body weight is on one knee. Pressure and tissue damage in the knee joints occurs rapidly.



Who has not seen temporal or hip pressure sores on elephants? They are so common in our zoos that, when speaking to young keepers about them, many think it is a normal part of the elephant's physiology, something we should expect with captive elephants. How sad to think that a medical issue caused by inconsistencies in our husbandry practices has reached a level of normalcy. What other inconsistencies and detrimental practices to

our elephants in our husbandry have reach a level of normalcy?

An elephant's foot is not designed for continuous contact with hard surfaces. Their feet need an undulating topography and sideward motion that strengthens tendons and ligaments so that the feet grow strong and straight. They need dry sand, sometimes wet sand through which to run their feet on a twenty-four hour basis. I just recently visited a zoo in the west that had built a brand new elephant complex, the outside yards were so flat it was if someone had purposely use a laser level on them to get them so flat.

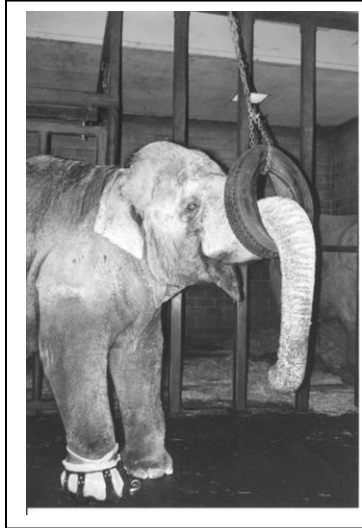
Elephants are not a vehicle or an inanimate object; you cannot just put them away into the garage at night on hold, waiting for the next convenient time to take them out or put them through a control-orientated activity. The elephant has a very distinct and unique biology that needs to be enacted over a twenty-four period. An eight-hour keeper shift means absolutely nothing to an elephant, and the down-time, the sixteen hours standing around waiting for the keepers to return is devastating to an elephant's physical and mental well-being.

Pressure to the feet and tissue damage is relativity quick to start and it advances rapidly if not attended to by experts.

Below are two examples of abscesses in elephants' feet that, I believe, have their root cause in continual pressure, standing in a confined space and on hard surfaces.



The first photo above to the left is an African elephant that was allowed to stand and stereotype in her reasonably large enclosure at a gate for years, plus spending sixteen hours in her stall at night on a concrete floor doing the same thing. Eventually, the rocking motion caused irreparable tissue damage in both of her number two nails on her front feet. The second picture to the right is an extreme case of an abscess in an Asian elephant's left front foot. This animal had abscesses in the other foot also. The environment that this animal lived for years was totally unsuitable for her biology and consequently, she died from medical issues related (I assume) to her foot conditions.



Once an elephant becomes infirm, particularly as far as the feet and joints are concerned, it will decline and deteriorate rapidly. What further impacts the elephant's health and compromises its condition is the fact that it cannot rest adequately. The elephant in this photo in the latter days of its life was provided a tire so that it might at least redistribute some of its body weight in order that its front feet and leg joints could rest. Please remember, the elephant cannot get away from the environment that we have provided for it.

With access to natural substrates, throughout its whole life, the elephant learns that it can manipulate the sand and use it to its advantage. Leg joints and tendons, feet muscles and ligaments become strong and flexible. Anticipatory and repetitive behaviors that encourage stereotypical motion are greatly reduced if feeding strategies and other behavioral furniture that will enact & encourage natural behaviors are installed along with sand flooring. Digging, kneeling and lying down on a regular basis, even at night, twenty-four hours a day, 365 days a year, encourages behaviors in the elephant and instills good habits that the elephant benefits from over the long term of its life in the zoo. Even if a healthy elephant learns that it cannot find a comfortable position in a concrete stall, it will eventually stop lying down because now the elephant knows that it cannot find a comfortable position to rest; it becomes a bodily habit of the elephant and, in essence, the elephant gives up on the process and reverts to the next best possibility, leaning against a wall with its head or sides, causing other problems.

Old style elephant keeping and housing.



Finding elephants in unfriendly, unhealthy, biology-deprogramming environments is not hard, even in our zoos today worldwide. Old elephant facility design, encouraged unnatural physically depleting behaviors. Long hour of waiting at doors, chained in one place and constantly pacing until the keepers arrived was and is the norm. We are not so

far from that photo above in our modern zoos even today. Even though chaining was abolished in many institutions many years ago, the elephant moved its stereotypical habits to another area of the barn just to stand and rock in a corner or at a door or safe area of the barn. Removing the chains was an easy decision for zoo administrators because it is unnatural for the elephant to be restrained for sixteen hours at night. But what else should we see as demeaning to our captive elephants? I still see huge steps that must be taken in order to bring our zoo elephant management to only a basic level of welfare for the elephant.

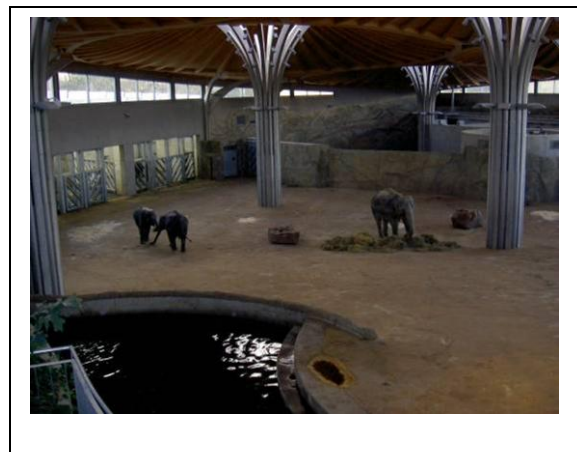
New elephant facilities, with new ideas.



There are, unfortunately, not many zoos at the moment where innovated elephant biological supporting ideas are being implemented. The present elephant facilities are not elephant-friendly by definition, and it is my opinion that the present designs have a tendency of causing many long-term problems for our elephants, physically, mentally and socially.

Old ideas are dusted off and reinstated; somehow it seems to be difficult for the design process to get

out of the historical box in which the zoo community all too often finds itself. Effectively, when a new house is opened to the public for the first time it will be fifty years out of date already on the day it is opened. Elephants are still standing on hard unyielding surfaces for long hours in the winter and they eat hay off the ground and stare at concrete walls for long portions of the day, not very different from the way it was years ago. They are standing around for hours, looking at the walls until the keepers arrive, and they all do what they can, wait & cope that is the norm for many of our zoo elephants.



I have to say at this point and in defense of our zoos knowing the people like I know them that this is in no way a malicious act or done with malicious intent. The issue of change is so large and overwhelming when dealing with captive elephant management that it is not easy to activate a forward motion that will benefit the elephants long-term. I know and work with many people in our zoos worldwide that would change the situation for elephants if it were within their power. And there are some people who I work for that have to date, radically changed the lot for elephants in their zoos, in a positive way.

The Chester Zoo built a revolutionary open-space elephant building in the 1960's for their then two African bulls and one Asian female. This visionary idea never caught on a grand scale because nobody in the elephant community then thought that elephants really needed space, both physical and visual. The zoo community back then, me included, saw them as a beast of

burden whose lack of freedom could be easily justified because thousands in Asia were under the same circumstances.



Another idea that didn't catch on was, in the early 80's I was part of a team of people heading up an idea for an elephant reserve & university concept at the San Diego Wild Animal Park in California. I originated the idea because I was beginning to see tremendously inequity even back then in the way elephants were being kept and in the way people were being trained and finally in the way

we were meeting our mission, a sustainable elephant populations in captivity, so the idea of creating a large open scope place for free roaming elephants where young people could come and learn about elephants and their unique management requirements was an attractive proposition, I thought. The idea was simple, bring all elephants that zoos didn't want or couldn't manage any more and put them in an extremely large facility that could provide the care they need long term, give them hilly space they could roam, areas to climb, feeding stations for motivation & productive movement, animal numbers elephants desperately needs to build relationships and bonds with one another, basically, an environment that would reinstate the elephants natural biology. No elephants were to be brought from the wild as support animals. Each zoo sending an elephant would pay a yearly fee for the up keep of its elephants. The ultimate goal of the concept was to centralize elephant knowledge, bring in considered experts of the time; I still have the list, from all fractions of elephant management from in-situ & ex-situ areas, we would start to set a standard of care for elephants that would generate information that would benefit the elephant. We would have called the centre "The Elephant University & Fan of Conservation". The centre and spawning organizations would have been designed over the next hundred years to create a sustainable population of elephants in the USA & Europe from the then, biologically dysfunctional elephants already in zoos. One not so feasible aspect of the centre would have been the attempt of the reintroduction of elephants into a selected location; managed and funded by our zoos both AZA & EAZA in Asia that would have been our contribution to the future of elephant's worldwide. If we would have implemented the idea in the 80's possibly, our elephant management would have been a huge step ahead right now and we would have had accumulated much more information on the importance of social structures and herd dynamics and not to mention all the criticism that the AZA is under for the inadequate welfare of the elephant. That was over twenty years ago and although we started the process of concept building & facility design the idea fell on deaf ears when we started to talk about money and the people involved didn't have the essence needed to see such a visionary project to fruition.

In conclusion then, for far too many years we have centred on the convenience of elephant keeping by maintaining them like a bus in the depot, when not in use. Cleaning the barn took precedent over many of the important elephants biological needs. Moreover, for reasons of the always-present looming cost of elephant programs, we have never focused on the elephant's basic comfort as an organism, putting our money more often into interpretation & visuals for the public. Elephants are locked up in small stalls for long hours, often at extremely low temperatures not even being able to relieve an itch on their backs on the round metals bars of the stall.

Why don't we let them throw sand over their backs in the early hours of the morning or obtain a trunk-full of food hanging high and barely in reach. Elephants have wonderful natural abilities that we could show to our zoo guests and which create an enriching zoo experience if they are planned correctly.

Use the elephant's biology as your reference when considering their captive care and work from the elephant outward; if there is anything on your elephant program or institutional priority list that has a higher priority than elephant welfare, the elephants are ultimately not the main focus and we as a community will face the continuous and ongoing challenge of how to justify our poor successes at exhibiting elephant's in our zoos.

Acknowledgements:

My sincere appreciation and thanks go to the following people who have influenced, encouraged and helped me with my ideas to introduce innovative husbandry to captive elephants, some have already implemented or are seriously considering the implementation of my ideas at their institutions. My hat is off to you all.

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Dr Stephan Hering-Hagenbeck, Hagenbeck's Tierpark, Hamburg, Germany.

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Mike Hudon.
Doris Sorby.
Alan Roocroft.

PROTECTED CONTACT TRAINING OF ELEPHANTS IN EUROPE.

Written October 2005.

First a Historical Perspective.

During a recent conversation at the third "First European Elephant Management Training School" at Hagenbeck's Tierpark in Hamburg, eminent elephant specialist Prof. Fred Kurt reminded me that a variety of Protected Contact elephant training has been practiced in Southern India for centuries and the style of elephant management we are introducing and suggesting, is not a new consideration. Professor Kurt went into great detail and pointed out how the tribals, the native people from certain areas of India, after catching an elephant would place it into a kraal structure which is specially built for the purpose. Photo above taken at Mudumali Elephant Camp Tamil Nadu State in Southern India.



The principle training philosophy of the structure is, after the captured elephant is placed in the kraal so it can be approached from all sides and over days and weeks it is slowly accustomed to human and in particular, the mahout's presence. One of the main desensitizing methods the tribals use in the calming of the elephant is by putting food items directly into the mouth of the elephant from the attendant's hand; this practice brings the elephant close to the attendants and bolding is established for the next stage of training. While being fed in the mouth another



attendant would rub the elephant with a long stick on all parts of the body, there by desensitizing the animal to the presence and proximity of the attendants and ultimately, human touch. After long hours over many days of touch and desensitizing the attendant would enter the stall with the elephant to clean up and groom the elephant. By entering the stall the attendant would give the elephant a totally different view

and open up the next level of communication that would bring the elephant closer to it's ultimate status as beast of burden.

Protected Contact training was initially developed in 1987 at the San Diego Wild Animal Park, although a productive form of remote handling without the use of targets was practiced at the Zurich Zoo, Switzerland in the early 80's. Maxi's the resident bull at Zoo Zurich arrived from a circus in the UK. On his arrival Rudi Tanner the head keeper would ask Maxi to perform his old circus tricks in the outside enclosure while Rudi stood on the other side of the moat. This, I imagine, was transferred inside where, I was told by the keepers, Maxi is maneuvered into positions so care could be administered by the use of a water hose which was aimed at a body part combined with voice commands and keeper body positioning. Foot ports/holes were installed into the existing facility so the staff was able to access Maxi's feet for washing and pedicures. The situation in Zurich Zoo was then the first of its kind in a zoo where they had successfully captured the elephants previously trained behaviors and refined the process to create a husbandry process. Of coarse there have been many situations where elephant and human in zoo have together developed a process that turned into a routine but revolved only on the elephant coming in or going out and not on medical or husbandry access. The type of Protected Contact training my business introduces into institutions uses body positioning, timing, touch, food rewards and positive reinforcement as its foundation. There are no consequence bases free contact commands or loud voices used to control the behavior. No hitting or intimidation of the elephant. "Protected Contact" will not render the elephant a beasts of burden, but it will give some elephants now in captivity, that are too difficult and dangerous to handle, in the historical way, that have generally been forgotten or ignored by the mainstream trainers, a new lease on life.



Introduction.

One of the reasons for writing this article was - I sat at an open elephant EEP meeting during the Bath EAZA conference in England 2005 and I was shocked to discover how little was known by the conference attendees and by the EEP chair people about the successes of Protected Contact training of elephants in Europe.

Having not written anything about what is happening with PC training in Europe I guess I am as much to blame as anyone else for the lack of understanding in the general zoo community about the benefits of this type of husbandry training.

As most people who know me know I assist zoos in both free and protected systems of elephant management around the world and I see many progressive institutions operating in both systems that have animal welfare as their highest priority. So the following is a not so brief introduction to PC training of elephants in Europe. Moreover, it is also a short interesting insight into some of the zoos and the people that are currently performing successful PC training with their elephants.

Protected Contact was primarily discussed and designed to offer a higher standard of care to the two very large hands-off bulls, Chico the African and Ranchipur the Asian elephant housed at the San Diego Wild Animal Park in California, USA, in the mid-eighties.

Protected Contact is not to be confused with hands-off or remote handling of elephants.

Protected Contact management with elephants, if correctly introduced, allows much more of a hands-on relationship, maybe not in the traditional sense, but like I said earlier the elephants that I generally work around are either extremely large male elephants with no training but with lots of attitude or old cows that have been left without care for many years and or elephants that have been exposed to extremely harsh treatment and have no more respect or trust for people. In some cases some of the elephants have even kill their keepers. Not the cream of the crop by any stretch of the imagination. But never the less, still animals that need attention and care. Protected Contact training has allowed staff all over the world to get closer to their elephants in a positive way, even with elephants that were extremely difficult to handle and were a danger to staff.

Elephant keeping in zoos has been a dangerous undertaking. The lack of experienced staff, the lack of staff in general, keepers working alone under normal daily circumstances, dangerous or aggressive animals all add up to an unsafe environment for the zoo elephant keeper.

The decision by zoos to transfer an elephant program from keepers going into the compound "Free Contact" to not going in "Protected Contact" was not a difficult decision for them.

Unfortunately, some zoos had had a keeper fatality and were immediately prompted to transfer to PC because of safety reasons. Over the last 15 years when the PC ball, so to speak, got rolling some zoos made their decision based only on what they had heard from other zoos concerning the merits of PC, and wanting to eliminate the possibilities of accidents in their zoo they transfer from what ever they were doing with the elephant at the time, to their form of PC, their translation of how it should be implemented.

PC programs that I have introduced into European Zoos follow a very definite process and introduction. The whole introduction process takes at the very least 13 days to install followed by tri-yearly evaluation for further program and process introduction. Initially a three-day facility and staff evaluation gets the process started. The design of the PC wall has specific size criteria and other recommendations for the facility remodeling will be suggested during this period. After the wall has been installed the training can start. Carefully following, a 10-day training period will bring the process to a point where the elephants and staff have a very good combine idea of the training philosophy and the strength of targeting training. After the ten-day period has finished the elephants and staff can move as one and at the very best during the first ten-day period elephant will offer its feet for washing and inspections and follow the head target at any location along the wall. This in many cases is a major step for some of the aggressive and previously dysfunctional elephants I encounter.

There are no benefits to the method of withholding food as a training tool with elephants as is done during the initial training of whales and dolphins. Some zoos in the USA, are suggesting that this method will work with elephants I can only imagine it will frustrate the elephant, confuses them in some cases, it will I'm sure, increases social confrontational and fighting within the group and ultimately create instabilities and individual phobias that will be un-repairable.

One over whelming fact for me throughout the process of PC introduction in all of the zoos I have initiated the system is the success of all the programs and the very rapid growth potential of the zoo staff involved. Some of the people I work with have no previous elephant experience. I have made many friends in the zoos where I work and I have developed a great admiration for their efforts and determination bringing a better life to their charges, amongst them many dysfunctional animals.

The following is a list is of some of those European Zoos and their staff that I have been associated with over the years.

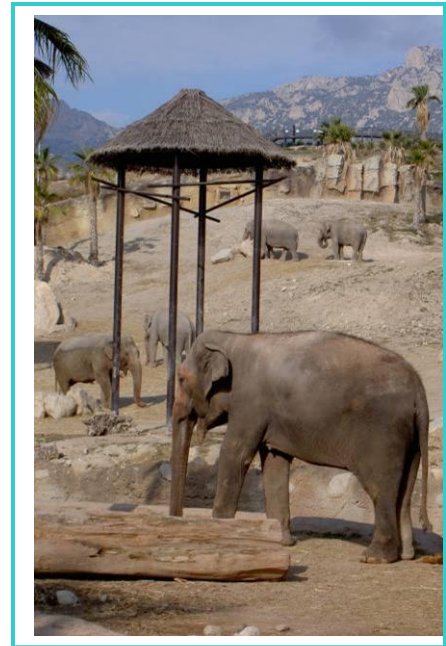
Terra Natura Adventure Park, Benidorm, Spain.



Terra Natura Adventure Park near Benidorm in Spain are in the process of creating a home for upwards of eleven maybe more elephants some of which were in less than desirable places before arriving in Benidorm. Some of the elephants that TN took were extremely aggressive and neglected in their previous situations and desperately in need of husbandry care and some T.L.C. Foot care in particular was a high priority and the staff very soon after the initial training was implementing a high standard of pedicures. Free Contact was not an option with most of the elephants that TN acquired so we set about implementing a comprehensive



Protected Contact training system for all the elephants. Because of the nature of the animals TN brought in to their facility great precautions were taken and an acute awareness to safety was adopted from the on set of the program.



Red lines around the stall areas were an indication to staff and visitors alike that there was a



danger zone or, as we like to call it, an awareness zone when working with the elephant, when all your attention should be on the elephant. Any training discussions should be undertaken behind the redlines in the safe zone. Keeper training was a high priority when venturing into this project; only one of the staff had had previous training at the Madrid Zoo where we had introduced a

Protected Contact training program with the elephants a year or so before. Because of the interest and close involvement of the upper management at the park (Director of the Zoo, Dr Manual Lopez and Director of Conversation Danni Sanchez), it didn't take long to establish a group of dedicated persons with an interest in elephant management. Foot care, as mentioned earlier, was a high priority from the very start because of the condition of some of the elephants on arrival. The staff at TN is always eager to learn new foot care and training techniques and exhibited sponge like qualities when it came to new information. I would say to any one with an interest in elephants Terra Natura Adventura Zoo is a great

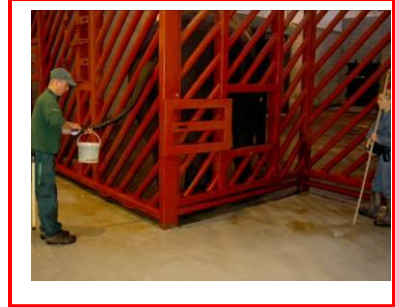


place to visit and to learn. Since this article was written a new lead keeper is now running the elephant program.

Chester Zoo, England.



Chester Zoo in England was the first institutions in Europe to build a complete specially design safety wall so they could perform PC training on a routine basis on their breeding bull Chang. The training of Chang, then Chester's very large breeding bull was also used as a PC training workshop and a number of select zoos were invited to watch the weeklong



training. Basel Zoo, Madrid Zoo, Amserfoort Zoo and Emmen Zoo were offered the chance to observe Chang as he was taught the initial basic behaviors. Chang turn out to be an excellent candidate for PC training. His initial response was one of disbelieve, and his body posture was saying, "Why is this insignificant person standing right in front of me"?

The elephant team at Chester Zoo has developed professional with an extremely high proficiency both in the area of elephant husbandry but also in the delicate area of team building and interpersonal communication. Team communication and information dissemination is a must with any group of people, none the least, when working around dangerous animals. The elephant program at Chester has the ability to cope with all elephants of many dispositions and



is divided into two parts. One group of tractable animals is in Free Contact and the other group is handled in Protected Contact. The behavioral profile of each elephant is carefully evaluated on a regular basis and the animals behavioral classification is determined. All mature bulls, for instance, are handled in PC because of their potential aggressive outbursts and unpredictable nature.

Young males are switched to PC handling before any aggressive characteristics mature. The females also, are divided into two behavioral classifications that can be shifted into PC if the need should arise. This gives the program an extremely flexible ability to receive all animals with breeding potential, animals that have different behavioral profiles.



As the elephant program at Chester matures, which for any institution, is an ongoing process, comprehensive husbandry access to all elephants becomes the top priority along with safety and communication. Mick Jones, elephant manager and second in charge senior keeper Alan Littlehales, are the point people for the elephant program guided and supported by Mark Pilgrim, Chief Curator and Mike Jordan, Mammal Curator. Together, along with a very motivated keeper staff, they are responsible for the direction of elephant management at Chester Zoo. The zoo is currently in the midst of constructing a new elephant facility twice the size of the original house that in itself was one of the largest elephant buildings in the Europe.



This will give them the ability to receive more viable females and add to their already excellent success with Asian elephants breeding. Visitors are able to learn about the different types of handling systems available to the elephants at Chester Zoo. Well-designed interpretive graphs explain how and why the keepers must interact with the elephants and if they are lucky can at certain times encounter the staff performing their daily routines.

Selwo Safari Park, Malaga Spain.

Selwo Safari Park near Estepona on the Costa del Sol in Spain has been a success story of dedicated staff with no experience of elephant training and turning what they learnt into an extremely positive situation for elephants at the park. Selwo is a part of Parques Reunidos a



company that owns and operates many Zoological Parks, Marine Life Parks and Dolphinarium in Spain. Madrid Zoo is also a part of the same company with the same curatorial staff managing the animal collections. The Selwo Park is blessed with a number of animal sensitive personal that was very helpful when we started training with the elephants. The Vet, Sergio the animal manager Leandro and elephant manager Miguel were the point people and the staff responsible for the success they have had at the park. Not long after I started the training with the

staff and elephants Selwo received a bull elephant from Lisbon Zoo with him was a young female that had previously given birth at Lisbon. My initial thoughts were that a bull should not



be brought to Selwo because the staff had no experience with elephants and bulls are the top end of the challenge scale. Miguel with his quite confident approach took it all in his stride and after watching me with the





initial training with Gana the bull, was able to do what I did and then took it to his own training heights and by the time I came back for my next visit he was taking blood from Gana and it appeared that he and Gana understood each other to the point that he was introducing and overseeing training with other staff with him also. Gana has shown increased breeding interest in Sammy the young female that came with him from Lisbon, so baby elephants are very much on the horizon for the Selwo staff. This

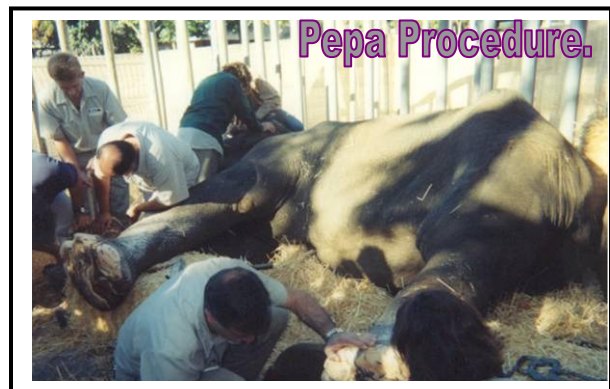
will of course offer new challenges for the elephant team, challenges that they are very much ready and willing to accept.

The future of staff and elephant care looks very good at Selwo Safari Park. The Costa del Sol is a great place to visit which many of you, I'm sure, are a where. Drop in and say Hi to the team at Selwo, call ahead they are great hosts and are really open with their experiences and knowledge.



Madrid Zoo, Spain.

Cova Talavera was the mammal curator for Madrid Zoo, Selwo Safari Park and other animal associated parks when I was first asked to start PC training. Two circumstances that changed the course of the elephant program at the Madrid Zoo were the very near lose of Pepa an Asian female elephant that needed urgent foot care. Pepa was immobilized, all four feet were trimmed, but like many of these old elephants that are immobilized was unable to get up because of the lack of muscle condition, we helped to her feet with machinery that was on hand for that very reason. Immobilizations are risky for elephants and any procedure



that can be done while the elephant is standing is money in the bank. The

Madrid Zoo didn't want to take that risk again so PC training was introduced to the team. The other reason that convinced Cova that PC training was an important step to take at her zoo was, she was invited to attend the Chester Zoo PC workshop where she observed the Chang training being impressed with the results we had in an extremely short period of time, she asked if I could start at Madrid Zoo. Mario the head of the Madrid team is an extremely experienced animal person with a need to do things, no matter what they are, correctly. Mario is also a quick learner, like Miguel in Selwo, he was quickly interested in footwork, trimming tool maintenance and of course the power of PC training. One elephant in particular that did benefit from the introduction of PC husbandry training was Tima. Tima was an ex-circus elephant that had a reputation for aggression in both the circus she originated and the zoo she spent her last years. As with most of the aggressive elephants I have personally known and who had turned aggressive, Tima was extremely intelligent. In the circus she was trained to perform all the tricks of the show and probably after years of performing she had just had enough of the entertaining and traveling and finally rebelled.



Visitor experience and interpretation like in all zoos is important at Madrid. Signs explaining why and what the keepers were doing when they were working with the elephants at the PC wall was as much an important part of the process as the training itself.

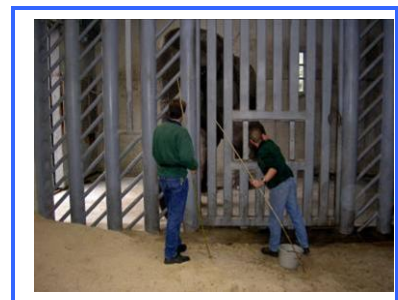
On busy days when I was there I would stand at the fence overlooking the training wall area and listen to the people's comments, if I could understand them of course, my Spanish is not perfect. The children in particular would give away the most clues, "what are they doing". A shrug of the shoulders was the response

the children got till the signs were installed. After they read the signs the parents had a whole lot more to tell their off spring and I'm sure learnt a whole lot more themselves.

Beekse Bergen Safari Park. The Netherlands.



Beekse Bergen Safari Park originally had five adult untrained African female elephants when I was asked to implement a training program at the park.





Training towards husbandry needs.

The stretch position allows back inspection. Training this position without the use of traditional tools like ropes or some force of some kind has always been thought to be impossible. The elephant team at Beekse Bergen Safari Park thought the process through, what does an elephant have to do to attain the position of the stretch. With patience, persistence and kindness the team were able to coax the elephants into a stretch position. An elephant that has had no past traditional training, meaning it has not been trained to offer a certain behavior or position with the use of only a voice command or the placement on the elephant hook on a part of its body and is behind at protective fence, will be a lot harder to teach to stretch, well that's what we thought. In such a situation is where the strength of the target and target recognition is very important. The elephants were taught to recognize and react to the target on any part of their bodies moving to it with whatever convenient part of the body was nearest. So, if the belly was the nearest part of the body the elephant would lower its belly to touch the target. To get the elephant to go all the way down the team used their problem solving reasoning. A hole was dug along the fence where the elephant was practicing the behavior, photo 1. The elephant was asked to walk into the hole then touch the target with its belly. Coincidentally it would also touch the side of the hole as it went into the stretch position and very soon it would be resting its weight on the side of the hole in a down position. This behavior would then be taken to another part of the sand yard and the elephant was asked to perform the same behavior, photo 2. After weeks of repetition the elephant would be ready for the morning routine in the house, photo 3.



Daily routines are well established in the Beekse Bergen barn. All feet are washed and inspected on a regular basis. Foot care, of course, is important and well implemented by the park staff. An elephant restraint chute ERC, was installed a number of years ago with the anticipation of possible adverse medical access, for example, rectal administration of antibiotic's or rectal ultrasound when and if an elephant was to become

pregnant. Blood draws, like in many elephant breeding situations, is a crucial behavior to desensitize.



A blood sample can tell you if the elephant is pregnant after breeding and it can tell you close to the day when the baby elephant will be born.

All the cows allow blood draws and the behavior with dry runs is routinely practiced.



With the arrival of Calimerio, (the yellow arrow), over Basel Zoo, Switzerland but originally from the



Rome Zoo the breeding program really kicked off. Calimerio took no time at all to establish himself with the females, falling for the two smallest females, Carla and Sheba, he quickly impregnated Carla and they're first baby is due in May 2006. The Beekse Bergen Safari Park elephant program is a real success story and after being around and talking to the staff it is quite easy to recognize why. Christian, Yvonne, Rolf, Misah, Maurice, and Eggbert are six of the most motivated people with elephants I have known; their success is quite simple. Just do it!! Beekse Bergen Safari Park should also be congratulated for their efforts in establishing the first natural in door substrates for elephants in Europe.

Amersfoort Zoo, in The Netherlands.

The Netherlands for me stands alone as a country where innovative ideas are hatched or can be incubated. It almost seems like the people are not afraid to take a risk or would willing to challenges the historical way of doing things so long as the suggestions make sense. This has some of the zoological traditionalist, particular in the elephant arena, awkwardly scrambling to defend the old theories about handling elephants.



The elephant team is lead by an old friend of mine, Marjo Hoedemaker, and elephant manager Bas



along with elephant keepers Maartje and Rene implement the program. They have all made it very easy to introduce new ideas into their program like bull management and housing and other

innovative training techniques that proved valuable when the program changed from Free Contact to Protected Contact.



Boras Zoo, Sweden.

Boras Zoo in Sweden has a long line of successes with their elephants. Their breeding program has produced three or four babies to date. The breeding bull Kibo was born at another zoo with many breeding successes, Hanover in Germany. Kibo's father was the famous bull Tembo who lived at the Hanover Zoo for many years fathering a number of young African elephant babies.



Kibo was very aggressive at the start so many precautions were taken when accessing him during husbandry training. During initial routine training the washing of his feet was achieved with a long handled brush so we could stay at a distance and not encourage him to attack either the brush or the keeper. The long handled brush was also the first human contact he would have and slowly we could demonstrate to him that his cooperation would be paid with food rewards. Adult bull elephants are a remarkable animal to have the opportunity to be around and their size, intelligence and some times aggression offers a unique challenge when

training. Boras Zoo also has a very elephant friendly free contact program. They have also recently built a new PC training wall for Kibo that has many new progressive husbandry access additions plus, a new sand sleeping area for the very large male.

Blair Drummond Safari Park, Scotland.

The Safari Park at Blair Drummond, Scotland out of all the collections I have been associated with illustrates so clearly the power of Protected Contact training and also the dedication of a team of people.

The three elephants that Blair Drummond started with were a group of animals that no one wanted.



Toto arrived at Basel Zoo in Switzerland from Muenster Zoo in Germany as a problem child. Under a Free Contact handling systems the whole of her life it became apparent at some point that she was not suited to direct contact with people and so she was moved to Blair Drummond. Mondula, another product of a Free Contact system arrive at Blair Drummond from Erfurt Zoo in what was then East Germany. Her history was one of long walks on Erfurt city roads and public demonstrations in the zoo with her stall mates. It also

became apparent that she had issues in Free Contact and was moved to Blair Drummond where she could be handled remotely. Estrella, has a very similar history to the other two animals but with one twist, she was removed from Cabarceno in Northern Spain where she was allowed free range in a very large area unfortunately her extra strong character didn't suit that situation there either, becoming aggressive with other animals she too was moved the Blair Drummond. The Blair Drummond



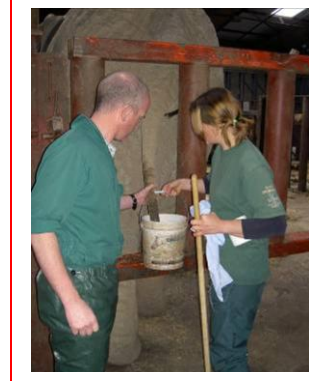
situation presents many challenges because a park that is only open for half of the year wouldn't have much money to offer the training of elephants. Mr. Jamie Murr the owner of the park is an extremely passionate person and an animal welfare advocate, so convincing him and his animal care staff that this would be better for his elephants was a quick sell.

Using the husbandry and training criteria I have listed below we set forth a plan of action. First a PC wall was built and then elephant training could start.



As each of the elephants had been previously trained front leg presentations were not hard to condition. Estrella who had, we thought, the least amount of training could be a different issue. The design of the wall is a crucial piece of information when training elephants and staff into a safe system of Protected Contact. Initially an aggressive elephant will try to hit at you, from the elephants point of view, all of a sudden you are standing there with a bags of fruit and good

intentions but some elephants don't understand that and will try to attack you. The wall is built with horizontal cross bars carefully placed so if the elephant does swing its trunk at you the bars afford protection. After a certain length of training and accustom time all of the elephants start to trust you, that as been my experience using the methods I have adopted. Most of the elephants I have been asked to trained in PC have lost their trust for humans and have been very aggressive towards their keepers and basically the only thing you can do with them at that point is throw the hay over the fence, let them in and out and stay out of their way. To see the relationships that can develop between an animal that some weeks back, wanted to kill you, to an animal that is enjoying the routine the keepers are offering, is amazing at the very least. Keepers that had no previous elephant keeping knowledge can now inspect, wash, and trim the feet of their elephants. Vet visits are regular at the Blair Drummond barn and Dr Colin likes to be involved with the husbandry, here he helps with tail soakings.



Then some months on they are training and desensitizing the elephants for blood draws and in the case of Blair Drummond tail baths and soaks were trained, mouth inspections and remarkably the stretch position with Mondula and Toto was re-captured. The elephant team consists of three main people, Andy Mackenzie, Alison Bickett,



and Chris who also has much interest in Giraffe and Rhino husbandry training. In the front office Animal Management Supervisor, Gary Gilmour keeps the program direction and motivation going and is in charge of the budget and purse strings. If you happen to be driving up to Scotland, Blair Drummond Safari Park is well worth a visit. The elephant team is an enthusiastically addictive group of people and is always trying very hard to push the boundaries and successes of animal management, not only with elephants.



“Artis” Amsterdam Zoo, Holland.

Amsterdam is an amazing city to visit and the zoo Artis has been in existence for many years and they have kept elephants for years also.

One elephant in particular I remember very well, one that left a lasting impression on me was Murugan a very large Asian male elephant that lived at Artis for nearly fifty years. His nature, and how I and many other people will

remember him, was one of a gentleman. Very rarely aggressive, at least when I knew him, he was the perfect candidate for PC because his compliance and cooperation were always high and

he seemed to enjoy the interaction with the keepers. Later in his life Murugan developed abscesses in his front feet so access to him became critical. The then head elephant keeper Cor Bemmelman who I grew to respect a lot over the years, he is now retired, had been caring for Murugan for most of his career at the zoo. Cor and his team of keepers Hein and Natalie were able to offer Murugan a high degree of foot care till he finally died at the age of fifty from, I believe, old age.



Nat performing husbandry.

After Cor retired new animals were acquired



Hein positioning Nicol.

and the elephant team started the re-building process. Hein and Natalie are leading the re-building process with Peter, Jord, and Remco as the new trainees in the house.

Their focus is very much elephant husbandry and access training; so all the training they are implementing supports elephant health.

Nat and Remco inspecting Wintidas foot.



Hein trimming a foot.

Artis recently had their first baby elephant born at the zoo, an event that catapulted the elephant team into a completely new era, challenging their knowledge and professionalism. I see changes every time I visit the elephant house at Artis and I see the enthusiasm of the team growing in leaps and bounds.



Peter brushing off Nicol.

Copenhagen Zoo, Denmark.

This next story is about the zoo in Copenhagen and the team of keeper's, behaviorists and managers at the zoo that are responsible for the elephants.

The elephant house was built in 1914 and was at that time and for years afterwards a state of the art facility for elephants. Like many elephant buildings in those days it combined a number of other thick-skinned animals, "The Pachyderms". Over the long years since being built the house had many different animals but eventually elephants became the prime species.

Although, even today Babirusa a pig species still occupies one of the smaller stalls that were probably originally built for Hippo.

Copenhagen Zoo has bred many young elephants that have become key members in other collections. Chang the breeding bull at Chester Zoo, for instance, was born at Copenhagen and went on to father many young himself that in turn populated other collection.

I have personally known the elephant keeper staff at Copenhagen for over 30 years. Living so close when I work for Hagenbeck's Tierpark in Hamburg Germany it was easy to take the train to Copenhagen for a weekend visit.

The house design lent itself very well to Protected Contact training so initiating the training was simple enough and the zoo managers had a deep desire to do it right and establish a progressive program.



The zoo has two bull elephants a younger animal Tonsak who in November 2001 came from Thailand



with two females as a gift for the Danish Royal Family. The older bull Plaisak or Cheing-Mai his official name, born 1958, was also a gift for the Royal Family in 1962 and is now forty-eight years old. Tonsak and his younger companions were brought in to be the future of elephant reproduction once Plaisak stops reproducing, although that doesn't look like any time soon because Plaisak is still going strong producing babies. During the initial site visit I made a number of suggestion on how to convert the old stalls into PC compatible training walls. Obviously both stalls were built for maximum safe access to the animals in mind but not for the closeness I would be suggesting. Tonsak stall, photo above, was wide open so we had to close areas that would allow us to stand in close, safe proximity to Tonsak for the training. Plaisak stalls had both open and closed spaces we needed to address so he had visual access to us and we had safe access to him with a target. Both stalls were rebuilt, installing ear ports and foot ports so husbandry access was possible safe and efficient.

Initial training visit.



The initial training visit went very well, both animals were perfect gentlemen and by the time I left after 10 days the keepers had taken over the training and were on their way to instituting the comprehensive program they have all work very hard to establish.



The original team of keepers was John, Peter, Claus, Nikolaj, Allan O and Allan S but as most teams do, members have been changed and some the original team went on to other jobs in the zoo.

One of the aims of this part of the article is to show how a team can develop in experience, knowledge and enthusiasm. The initial visit as I explained earlier was a 10-day visit to establish the PC training understanding with the two bull elephants, Plaisak and Tonsak. How a team develops in Protected Contact, what information they retain is my responsibility also, as the consultant. The training methods I try to demonstrate must be easy to decipher and mimic because during the last two or three days of my initial training visit the team must take over the training, till my next visit, some times three months later. After the initial target recognition has been established and the elephant is putting its front feet into the foot port further progress, so to say, becomes a lot easier for the elephant team. The elephant also understands the training principles and is volunteering many of the behaviors it is being asked particularly if it has had prior training, as most of the Asian seem to have.

Second training visit.

The second training visit for me is always the crucial visit. I am going to see if the team is using the information I departed on the first visit. The Copenhagen Zoo elephant team on the second visit had taken the information and ran with it. Both animals were, it seemed, enjoying the interaction and performing behaviors they had not done, in some cases for many years.



Plaisak was presenting his ears so blood could eventually be taken and young Tonsak was stretching down as he had done for his mahouts on arrival from Thailand.

I think the most amazing progress for me was with Tonsak. It has been my experience that most young elephant arrivals from Asia are shy about having their feet touched, a product, I can only think, from the training in the chute/kraal back in the camps as part of their basis training. Gently washing and scrubbing their front feet after they have presented them during the initial training increases their confidence and allows for further advancements. The back feet and tails are sometimes particularly difficult but with the understanding and confidence the elephant had gained with the front feet they generally like the process. The tail may take a little longer to desensitize.

Third training visit.

Plaisak the older bull spends much of each year in musth so training is out of the question, so much more time could be donated to Tonsak and it seemed that he really did expand his behavioral vocabulary with each visit, extremely fast.



On the third training visit footwork could be performed, tail desensitizing and washing was now a part of the daily routine and he even laid down for back inspections. The one facility improvement that was discussed during the second visit was a foot stirrup. Generally when only resting on the bar of the facility wall the foot does not come out so a proper wash or foot trim can be conducted. A stirrup like the one in the photo above, “green arrow” allows for better access to the foot by presenting it further out of the facility.

Forth visit.

The forth visit was very much the same as the third only with further advancements to Tonsak’s repertoire, access to his ears was also further along.



The keepers were also finding out what the boundaries of this type of training were. In an effort to create more interest for Tonsak games were established where had to think. Object retrieval and multi-tasking, carrying logs from one end of the stall to the other or putting a ball in a bucket and bringing the bucket back to the keepers were a couple of the games the staff employed with him. Retrieval exercises with elephants can be used to supplement already existing behavioral enhancement programs.

Fifth visit and “The First Nordic Elephant Workshop”.

Achievements were many at Copenhagen the staff like many other zoos, of course, experimented and excelled with their newfound training and elephant access techniques. The behavioral department at Copenhagen Zoo, headed by Camilla Norgaard, has a very active and important role with the development of the elephant program and all things related to elephant activity and behavioral stimulation. To show case the achievements of the elephant department PC program and to also introduce the zoos intent with elephant management in the future it was decided to hold a Protected Contact and Zoo wide Enrichment Workshop. All zoos holding elephants in Scandinavia and Baltic State were contacted and zoos from Riga, Boras, Kolmarden, Givskud, Aalborg sent staff, along with a number of vets and persons from local colleges and animal training schools.



Participants saw the training with Tonsak but unfortunately Plaisak was in musth at the time. Footwork was a topic that was well received and the behavioral staff compiled a comprehensive program of behavioral enrichment where the attendees could enrich an elephant area receive critic from the BE staff and then see how their ideas would be received by the elephants when the animals were let back inside. Copenhagen Zoo also operates a successful free contact program along side the PC.

Hagenbeck's Tierpark, Hamburg.

Hagenbeck's Tierpark in Hamburg, Germany has had a long history of working in direct contact with their breeding bull Hussein. When Hussein was reaching his 28-year of age the park management and keeper staff felt it wise and proactive to consider placing him into Protected Contact. Never before considered, Protected Contact training would offer a new challenge for the institution renowned for their hands-on and positive approach to elephant management. But

it was that very hands-on staff experience and their knowledge of animal behavior that made it possible. First facility modifications were needed to Hussein's housing arrangements. A PC wall was built adjacent to the bull's night house with a keeper access area that allowed a safe





approach to Hussein. Then with a combination of positive reinforcement, target recognition and old commands, that Hussein brought with him from India where he was a working elephant, the keepers were able to capture the bull's previous behaviors. The results are quite amazing, Hussein offers all of his feet through the foot port so foot inspections, washing and pedicures can be performed and the keepers are now working on blood draws so his health can be monitored. Hussein is now in his 33-year of life and an extremely calm and kind elephant.

Zoo d' Amneville, France.



David training front foot access.

Shorti is an extremely large African bull elephant who is, I believe, only 22 years of age. We started the process at Zoo d' Amneville by modifying the original facility so we could have safe access to Shorti and so he could see every move we made while applying our PC training techniques.

I think Shorti surprised everyone who knew him at the zoo, thinking initially he would be highly aggressive, he proved to be extremely gentle and accommodating. Watching me closely at first, he very quickly got into a routine of enjoying our training periods and the

attention. Being very large he posed some unique problems when training. His head towered

above me so targeting him had to be precise. I am always amazed again and again how accommodating the males are during the training. Shorti had never had his feet touched before but would watch intently as his feet were scrubbed with water and a long handled brush. It is almost as if they have been waiting for something to happen, something he could be involved in and cooperate. Shorti in his former life was the bell ringing elephant from the Lisbon Zoo. After receiving money from the public he would ring a bell on the side of the house that brought the keepers over. The keepers got the

money and Shorti got a reward for his trouble. J.P and David are the main elephant keepers at Amneville. J.P that is an abbreviation for John Pierre is the head elephant keeper. His elephants



JP washing Shorti's front feet.

he told me are his life. I was touched by the detail of care he offered his charges. David a young man with an excellent ear for English made my job very easy providing English to French translations when needed, comes from a family who had worked with elephants in different countries, over the last twenty years.

Sofia Zoo Bulgaria.

The Sofia Zoo has at the moment only one elephant but would like to obtain more elephants in the future. The zoo has launched a program that will bring them, where elephants are concerned, equal to and above standard of other zoos in



Europe. The zoo was searching for advise on how they should progress and asked me to help them introduce safe and productive husbandry routines. I found the people at the zoo to be most helpful and willing to provide their elephant with the highest quality of care.



Barcelona Zoo, Spain.

The Barcelona Zoo has two African elephant females Suzie and Alice. Both are over twenty years old and were un-train and both were thought to very aggressive. Suzie actually turned out to be a very intelligent and learning capable elephant. She was the first to understand the terms of the PC training we were introducing and the first to offer her feet into the specially designed foot ports. Alice on the other hand was all business and very aggressive. The elephant team consisted of two young men with no elephant experience but plenty of enthusiasm, Oscar and Orile are now elephant trainers, well at least elephant trainers in the sense that they can hold training sessions



Orile, Conrad (Mammal Curator) Alan, Oscar and Alice.



and obtain access to animals that even the most experienced elephant trainers would choose not to approach. The management of the zoo choose this path of elephant management because they felt they had weak animal

welfare practices in the area of elephant care and husbandry because all they could do was let them out and let back in again at the end of the day. That has all changed now and even the other keepers from around the zoo after seeing the quick positive results we were getting with the renegade Alice were quick to acknowledge that we had entered into a new era with elephants at the Barcelona Zoo.

Dublin Zoo, Ireland.

The Dublin Zoo received three elephants from Rotterdam Zoo in Holland, three elephants that are to be the foundation for the first breeding group of elephants in Ireland. In preparation for the arrival of the three elephants Dublin Zoo designed and are still building (*December 2006*) a state of the art elephant facility with all the ingredients to offer a family group of Asian elephants a healthy active lifestyle inside and outside. Along with the normal good practices for the comfort of a captive elephant we have included hanging feeders, sand piles for sleeping and throwing a two meter deep sand floor and bright areas with an excellent air quality.



The elephant team were selected from the ranks of the general zoo keepers and had had some experience with Protected Contact training with the two animals that were previously housed at Dublin. All three elephants had also had previous training at Rotterdam Zoo so the introduction of the training went relatively quick. Within a few weeks access to the feet was established and foot care could be offered. The challenge for the myself and the team is going to be elephant birthing. Two of the elephants

arrived pregnant and one is due in March 2007 so all our training focus is now on elephant birth operations. The elephant team are a good hearted, quick witted group of young people, quick learners they have already establish a very high degree of compliant with all of the elephants.

Calgary Zoo, Canada.

Calgary Zoo in Canada is not in Europe, but under the heading of Protected Contact certainly had the most convincing success of any zoo that uses a remote handling of their elephants. Spike, the resident Asian breeding bull developed an abscess in nail four in his front left foot. The abscess, over what seemed to be a short period of time became chronic with what appeared to be a case of osteomyelitis in the bone so it was decided to on the foot



to remove the infected bone fragments. The surgery, of course, was performed while Spike was under full narcosis. The wound was bandaged and rapped with duck-tape because of tapes strength and durability and a fabric boot was designed and placed on the foot after the procedure to protect the area. Spike had been trained before the procedure in PC training techniques so he was familiar with the behaviors that would be asked of him during the post-surgical treatment.



Post care and treatment was determined and a procedural regime was established. The boot had to be removed every day; the bandage was also removed, then the wound had to be inspected, necrotic tissue removed, flushed, cleaned and sterilized and this after a very deep and adverse surgery. My guess going into this would have been a hands-down, no-way will he cooperate.

Should the “Ankus” or elephant hook be used in PC?



The one elephant that comes to mind and answers this question so clearly is an elephant in a zoo in the USA. The elephant in question developed chronic abscesses in both front feet, which were being handled in PC in the zoos elephant restraint chute “ERC”. At the time of my arrival she had been in the chute for many months and the abscesses were possibly pre-surgical on my arrival. The system they had adopted and the consultants they were using did not condone the use of the elephant

ankus under their Protected Contact definition, under any circumstances. The elephant had stop offering its foot so access to the abscesses had stop when I arrived. Both of her front legs were swollen up to her armpits and she was shifting her weight back onto her back legs to compensate for the pain in front feet and legs. Clearly her condition was serious and she needed treatment right away but she had stopped offering her feet to a target. My first question to the staff was, where are your elephant hooks? They explained their previous consultants philosophical recommendations for not using a hook in PC, which under many normal training circumstances I would agree with, but under these circumstances to safely and humanely get access to her feet we could only achieve our goals by using an elephant hook. We finally received a hook from the zoo office and treatment could be



offered.

So can an elephant hook be used in PC elephant training? The answer to this question is, yes, but only under carefully selected circumstances and criteria. The number one question to ask is, is the elephant accustomed to an elephant hook? If not, then the elephant will not understand the consequences of the hook and it could make matters worst.

Other Zoos in Europe Already Implementing or Considering Implementing Protected Contact.

- Berlin Zoo with their Bull.
- Zoo Le Fleche in France.
- Rotterdam Zoo with their Bull.
- Lisbon Zoo in Portugal. In 2007.
- Peaugres Safari Park in France.
- La Pal Zoo in France.
- Bellewearde Park in Belgium.
- Thoiry Safari Park in France.
- Burgers' Zoo in The Netherlands.

Medical and Husbandry Access in Protected Contact.

Below are listed husbandry access behaviors that are required in a fully operational protected contact training program and might be recognized by the BIAZA, EAZA and AZA as the foundation of elephant welfare at a zoo.

1. Blood draws, blood assays, health & viability testing.
2. Tail access, removal of in-growing hairs tail soaks removal of dead skin and immediate treatment if bitten.
3. Foot access, for foot trims, inspections and washes.
4. Mouth inspections, teeth transition and oral health. Note: It is not recommended for staff to reach through the bars into an elephant's mouth in P C. In F C it is also not recommended unless the staff and elephant are highly trained and accustomed with one another.
5. Eye inspections, ability to recognize & treat eye ailments.
6. Full body washes, skin care and removal of dead skin.
7. Trunk washes, TB testing.
8. *Rectal access. The ability to deliver large doses of antibiotics and other medications.
9. Stretch position & lie-down, back inspections and dead skin removal.
10. Injection training.

11. Foot and lower leg joint radiograph training, foot structure knowledge.
12. Urine collection training.
13. *Vulva & penis inspections & access.
14. Tusk washing in male elephants and tusk socket washing in females they have broken there tush.
15. *Tusk trimming.
16. Weighing of the elephant so pregnancies can be followed and so illness and weight loss can be detected.
17. Movement and exercise intervention. A to B's and the keeping of a daily exercise log.
18. Restraining behavior, in case restricted movement is necessary.
19. *Skin biopsies.
20. Foot baths.

*Rectal, vulva and penis access will only be possible for PC handled elephants when there is an ERC (Elephant Restraint Chute) available. Skin biopsies are also possible in a chute.

Conclusion.

Many elephants and zoos have benefited from the introduction of Protected Contact in Europe. The success would not, however, have been possible if not for the interest of the zoo management and elephant staff in the zoos involved. Working in both systems as I do, and seeing the benefit in both approaches, I offer the above as an overview to the status of Protected Contact training of elephants in Europe today.

This article is dedicated to all the fine people and zoos that are making a difference for elephants in Europe. I apologize to those people or zoos that were not mentioned. Thank You. Keep up the good work, you are making a difference.

Photo Credits.

Pages 21 & 22. Hagenbeck's Tierpark Hamburg, Germany. Training of male elephant Hussein. Dr Stephan Hering-Hagenbeck of Hagenbeck's Tierpark Hamburg, Germany.

Page 23. Elephant foot treatment, the Calgary Zoo staff.

All other photos are from the collection and archives of Alan Roocroft.

Hanging Hay Net Feeders

and other things.

Written June 2012.

Are they beneficial and do they really work?

In the days when overnight tethering was the norm there was never a down side in my mind to feeding the elephants under my care on the ground, firstly everyone in the business was keeping elephants that way and it appeared to have no detrimental effects on the elephants, it was the way we had fed elephants for millennium. The elephants could lay down to rest and they were being fed equal portions and under ideal circumstances were stood next to a compatible partner or with enough room on either side that they could eat comfortably. In Germany where I worked for a while and in some of the older establishments we laid down a straw bed the full length of the barn for the elephants to sleep on and in a long barn with many elephants the elephant on the ends of the row, in the corners, would get an extra pile because they could only pull from their neighbor on one side if a wall was on the other, in fact we would fluff up the hay to get out all the lumps and odd things we occasionally find in hay bales and make a straight line so it appeared organized. The elephants would clean up their hay over night and be stood there gently swaying ready the next morning with a pile of poop behind them.



Some years ago, not so long back, someone on the east coast in a zoo decided to try not chaining the elephants at night. So started a new era, a time where everything we were doing, literally for centuries, was stood on its head. Elephants were free at night to wander around their stalls. Hierarchies shifted because dominant animals that were kept apart at night by chaining now had access to everyone in the barn it took a while for the zoos to reconsider their position on the new way of keeping elephants. Bars, walls and barriers were then installed over the next years to stop elephants pushing, fighting and generally reorganizing themselves, some elephants were even separated from one another probably because they would have killed



each other if left together. But the change heralded in the new era and we slowly started to look at elephants differently on many fronts. We couldn't just throw the food on the ground anymore because the elephants would foul the majority before it had been eaten by walking on it, urinating on and of course defecating on the hay, so feeding off the ground was entertained. One of the first zoos to my recollection to install hanging hay net feeder was the Toledo Zoo in the late 90's.

The acceptance of this method was initially controlled by the elephant keeping staff in many zoos, history was hard to over look and it would take a push from zoo manager's to have it brought into the main stream of elephant husbandry.

1. Why would elephants benefit from feeding off the ground?
2. Do hay-net feeders really work and if so is the cost of installation worth the physical and mental benefits?
3. Have we explored all avenues of possibilities for unique feeders.

The answer to the first question why would elephants benefit from feeding off the ground? This question is quite easy to answer. Food off the ground would be out of the dirt and it would stay fresh longer, also there could be a certain amount of search and surprise if the elephants did not have access to all of the food right away, plus the imagination of our keeping staff today, novel and interesting ways of delivering food could be developed.

Question # 2, do they really work is a big YES, absolutely.

The answer to question # 3 is a big No, we have not explored all the possibilities of hay net feeders or feeding strategies in general we are at the tip of the iceberg and in my opinion we are just starting to understand what the possibilities really are of where this addition to our management approach will lead us.

Optimistic as I am, I see elephant facilities in ten to fifteen years from now being equip with all necessary topography, space, natural light, humidity, drenching systems, feeding and hygiene supporting apparatus, along with sand and natural substrates so it would be common practice for new elephant facilities to be designed and built according to elephant biology, "we are not there yet folks", not enough cross referencing and conferring is going on, the wheel is always being redesigned, designers and architects will need some help to reach a point where they have an appreciation and sufficient understanding of the needs of zoo elephants and use the elephants biology as their reference so they in turn can push for change when they are faced with directors and zoo managers who want out date ideas implemented with little vision to the future. Facilities of the future will provide educational possibilities for young elephants, there will be furniture, landscape and environments that will provide a repertoire of possibilities for a young elephant to entertain and educate itself within a planned area, there will be corners to hide behind and hills to climb, no more square building at least from the elephant perspective. Most of all there will be feeding and movement strategies that copy and enhance the elephant natural biology. I see facilities being built with many of the feeding apparatus already fitted, a norm of design as one would install a door or a wall one would include the elephant's biology into the design process.



In the old days we said that to build a new elephants house, the people in charge would go the last house built and add a meter to the dimensions that in some ways is still where we are at. There has recently been a push to build larger elephant building in the industry, largely generated by outside criticism of our care and maintenance of zoo elephants. Only a small number were designed and built with sufficient elephant consideration and basically represent a larger version of an old model.

In the zoos that have installed hanging feeders and that have followed and documented the benefits we are seeing a positive impact on the elephants world-wide, both mentality and physically. It has a positive effect on social structures and herd bonding, longer feeding times means that elephants with lots of time on their trunks don't get into other artificially hang-ups and created normal circumstances like fighting and displacement. Elephants with a purpose generally don't get into trouble. Strategically placed feeding stations and feeding opportunities can be used to enhance motivation and movement reducing stereotypical and anticipatory behaviors. Link that with a surveillance apparatus, like triangulation or GPS we can plot the amount of movement and computerize herd dynamics. Example to the right is from the Dallas Zoo.



There are many more zoo that I interface within a year and many more that have included this concept into their daily routines, but here are a few zoos that have invested into the hanging feeder net vision?

Copenhagen Zoo Denmark.



With the introduction of the new elephant facility at Copenhagen 2008 new occupational feeding apparatus were possible. The open scape design of the elephant building allowed for the introduction of hanging feeders, these items were not an original concept of the architects or animal managers of the zoo but soon after there installation they were seeing elephant behavior never before seen which become an intrical part of elephant



husbandry at the zoo. Animals were seen exhibiting movements and position that you would never see with conventional zoo elephant management. Even elephants using tools to obtain food was observed, Tonsak the younger male would push a log under the hay net so he could get his nightly rations.

Dublin Zoo, Ireland.

Always on the cutting edge the Dublin Zoo was one of the first to invest into hanging hay net feeders. Dublin has firmly committed to the breeding elephants so feeding and occupational strategies are on the fore front of their philosophy where elephants are concerned and form a focal point to the education what the young animals. Young elephants learn from the herd, they follow and mimic the adults, so feeding areas will be a congregational point for them to socialize, feed and obtain information about herd life. Our zoo guest also benefit from our inventions and imagination.



Phoenix Zoo Arizona.

Housing none viable female elephants is a challenge and bring social challenges so variety in habitat is crucial. Phoenix Zoo installed four feeding areas that included shade, misters and fans to keep the ambient temperature as low as 10% below the daily high. This gave us many advantages and high welfare expectations.



Toledo Zoo, Ohio.



Toledo Zoo has incorporated multiple feeders in each of their new facility stalls, with great effect. Renee, to the left, uses a ball to stand on to reach the feeders that the staff elevate for her. One other interesting side note which could be incorporated into a feeding strategy is the introduction of sound to the equation. For instance we have found at Toledo that whenever Renee hears the sound of the winch motors indicating either a feeder is about to descend, or

that the keepers are manipulating the feeders she will her ball over the nearest feeder in anticipation.

Boras Zoo Sweden.



This Swedish Zoo has been using multiple hanging feeders for a number of years and was the first to use timers on the nets. The timers gave the ability to lengthen feed times over a twenty four hour period and create a random status to the process. Boras also introduce wall delivery feeders where on a timer carrots or any other food item would fall out of a hole in the wall per gravity at random times.

Knowsley Safari Park England.



One of the most recent animal collections to date to incorporate hanging feeders and by far the park using the largest nets. The nets when laid out on the floor will hold probably six larger bales of hay. This has been a great improvement to their feeding regime as they would have to put food on the ground which in turn with so many elephants became trampled and fouled.

Knoxville Zoo, Tennessee.



Similar to the Phoenix Zoo structures the people at Knoxville became one of the fore-runners at documenting the physical benefits hanging feeders had on their elephants. Neck girths were measured and a distinct improvement to their anatomy was easy to see. There were also obvious social improvements with elephants having to reach to the hard to obtain hay took their minds away from displacement and other anti-social activities.



Chester Zoo, England.



Chester Zoo has had a long history with elephants and has developed a very strong breeding program. Chester is a zoo with the closest herd dynamics to those in the wild, as babies are born into the group the monitoring and development of natural behavior has become an interesting project. Hay-nets have been a part of the zoo's elephant feeding and movement strategies for a number of years and are constantly being reviewed.

Rio Safari Park Alicanti, Spain.



I hold Rio Safari Park in high esteem because they were the fastest zoo that I have had the pleasure of working with to introduce the idea of hanging hay net feeders. They were especially attached to Bataty their female Asian elephant she was almost like a child to the family that owned her, so the mere mention of something that would benefit her health and mental wellbeing was immediately incorporated.

Circus Krone, Germany.



Circus Krone in Germany is the only circus that I know to have installed hanging feeders for their African elephants. The traveling nature of their routines makes it quite hard to erect and dismantle these structures after every performance date. But I have to say it made it quite interesting for the circus visitor also to see the elephants reaching for the hay.

Dallas Zoo.



Dallas Zoo opened their elephant habitat last in April and are introducing many new items to the elephant program, hay nets are just one of the stimulating ideas. The program expects to be fully operational with elephant searching, digging, reaching opportunities throughout the facility. They have to date seven hanging feeders and some other variation of the same theme. They have also seen some advantages to the hanging feeders, positive compatibility and time spent together has been affected.

Lisbon Zoo.



Lisbon Zoo just recently installed hanging net feeders for their bull and were positive in saying his aggression was reduced after he spends much of his feeding by reaching and searching.

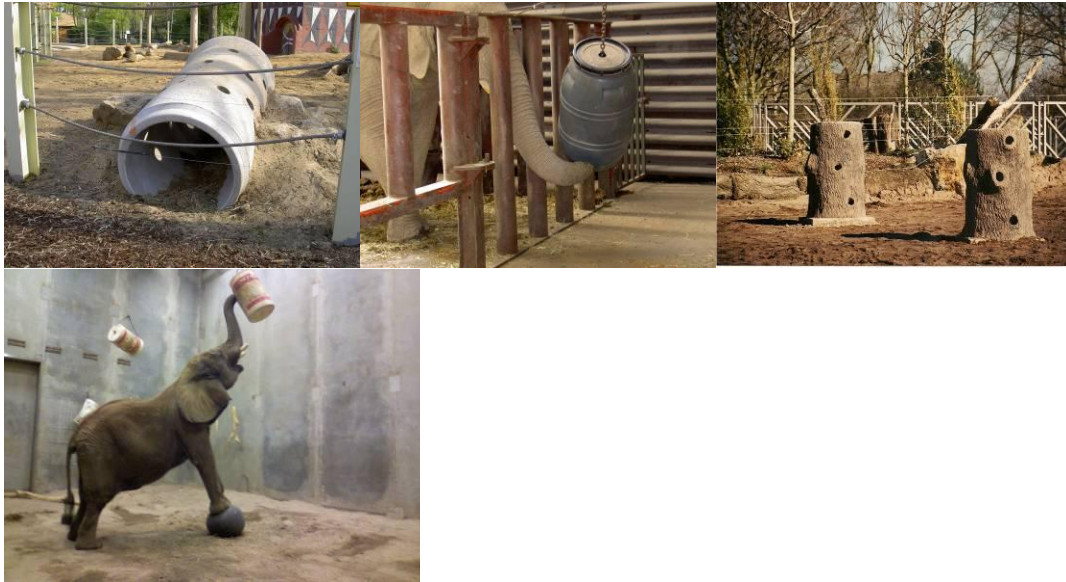
Interesting notes and observations.

- Can Asian elephants chew while reaching into the hay nets? Twiggy a female African elephant at the Toledo Zoo can. I observed her packing the food into her mouth, chewing the food in her mouth while still reaching for more hay out of the net.
- Some nets need to be adjusted or extra holes cut in the bottom so the elephant can reach through the net into the center of the hay, be sure that the net will allow cutting without the possibility of unraveling happening.
- Tool use in elephants. We have all seen elephants scratching themselves with sticks on the belly or on their backs, we have witnessed elephants carrying pet rocks and resting logs under chins in what appears to be a comforting manner,



but how many have seen elephants using logs, boomer balls or tires to reach the hay nets? It starts with a mistake, the keepers put the hay net too high so the elephant couldn't reach the food, the power of reasoning kicked in. The first time I saw this was at the Phoenix Zoo in the early 2000's. An elephant would push the boomer ball over to the obviously too high hanging net. The mind boggles to think about the implications that the reasoning power an elephant must have under the hood, waiting to be used.

Other feeder ideas are many of course, below are some that have been used and are providing positive occupational for zoo elephants.



Floppy Ear in African Elephants.

"Some not so scientific observations".

Written December, 2010.

I am sure many of you have seen a case of floppy ear in African Elephants. The condition is where a portion of the ear flops over, sometimes it will right itself but in many cases it remains bent over with no apparent discomfort to the elephant.

I don't remember when I saw my first case of floppy ear but the more I travelled the more I saw pretty much in every country I visited, although percentage wise I don't remember seeing too many in Africa, in the bigger herds.

So how does this condition happen, does it happen quickly, does it happen because of dietary issues, does it happen because of a medical reasons, does it happen when the elephant loses condition, so what happens? These are all questions that I have been asking but no one seems to know.

As far as I can tell it is a gradual process but not extremely slow. It starts with probably a lack of condition or a sickness sometimes, something the keepers or trainers do not pick up, but nevertheless the ear is flopped over in the morning.

I believe it could be like trunk paralysis in Asian elephants, it might be a hereditary condition, that some get and others don't. Now these are all observations not substantiated facts.

An African elephant ear can weigh as much as 100 lbs on a very large bull. This weight of the ear always swinging forward regulating temperature and warding away insects is a lot of weight to control for the elephant just by muscle power, so the ear comes when you look at the structure of the ear, with a stabilizing fold, a counter balance, if you will, red arrow. This stabilizing fold helps keep the ear against the head and keeps the ear from flopping forward all the time.



See photo. I guess the argument could also be made that the folds are extra surface area helping with the reduction in body temperature, but with this enormous weight these ears do need help and this fold does help.

For those of you who have not touched an African elephant ear, the best way to explain it would be, if you were to take a thick piece of leather, let's say about 1/2" thick at the base of the ear but then gradually getting thinner as it reaches the fringes of the ear, cover this with a thin skin on both sides. Now, between the skin and the cartilage (the thick leather piece) there are veins and arteries on the inside of the ear. In very hot climates the elephant can pass a flow of blood through these veins which will, they say, reduce its body temperature by 10%.

The structure of the ear leaves a lot of question in my mind to be asked because ears vary so much from animal to animal and I would be thinking from region to region, but they are not so much different that we have different problems.



All of the ear-fold issues I have seen were very much the same in character it was also apparent that they folded down the same area of the ear, but I guess this is not that surprising because the physics of the ear, weight wise, would pull most of the weight forward once the problem was in full swing. I was also under the opinion that this doesn't occur in the wild, well I was way off and had not seen that many elephants to make that statement, friends of the zoo I am working for at the moment sent me a photo of a bull in Africa with both ears folded over.

But what could make the ears fold over and in some cases stay flopped over, is it a symptom of ill health, a lack of condition that an animal is going through where blood flow to the ear becomes weak, does blood have anything to do with?

I have followed an elephant through a period where one ear would fold slightly hang for a day then flip back over. The elephant didn't appear unhealthy, quite normal actually, so could it be a vitamin or mineral deficiency, but this is hard to determine



The sequence of photos above show a seemingly normal elephant ear but some moments later the ear drooped over, it appeared to have happened when the elephant was scratching the back of the ear and was pulling her ear over with the movement of her trunk. The ear could be push back over with a broom handle. It happened a couple of times at no apparent time and with the elephant appearing to be healthy.



The three elephants above are from three different European countries and not related. The issues has been wide spread and probably been with us since African elephants were brought to our zoos and circuses. Here are few other examples.



Basel 1970's.



Beekes Bergen Safari 2000's.



Washington Zoo, USA. 1994.



Knowsley Safari Park, 2010.



Berlin Zoo, 1970's.



Duisburg Zoo, 1970's.

So folks, here is the question, what's happening with African elephants ears?

Elephant Introductions. *A general overview & history.*

Written February 2011.

Short Introduction.

The issue of elephant introduction have always been a problem for zoos, this article, however, is not going to be a problem solver more I hope, a discussion of some of the things that I have come across in my career that have worked and not worked in the hopes it will help you make plans, problem solving and at the same time make critical decisions when it comes to elephant introductions.

There are many reasons, I feel, why introductions are problematic but let's take a good look at the details and examine why some elephants just don't get along with each other in our zoos.

There are many different types and combinations of elephant introduction and each combination has its moments, its special challenges and its idiosyncrasies.

The number of elephants being introduced can impact the outcome, this is relevant because in my experience although you have a lot of animals together it could simply be the more the merrier, with animals mingling and moving ultimately diluting the moment down into there's a lot going on so no one thing at that time is overly important. Now this does not always work and is probably more suited in a FC system than a PC handling regime, where you enter the yard and can run interference and orchestrate the hierarchy for the sub-dominate animals. This could work with the right animal combination in PC.

The different combinations however, could be unrelated adult female to adult female, male to female, for breeding, baby elephant being introduced back to its mother and possibly a baby elephant to male elephant. Many of these introductory combinations will have challenges dependent on the personality of the elephants involved, the elephant's history at the zoo and its age, also the option and experience of the zoo management, experience of your elephant staff, weather conditions and so on. There are some elephants where you can just open the door and let it happen and there are others where you would have wished you had had a plan when it all goes south. There are elephants that keepers have known for many years, believing they know the elephants intimate behavioral details and can forecast the outcome of the introduction, only to see an animal total change in character as the introduction confrontation progresses and the till then hidden lack of specie specific behaviors emerge. This article is not meant as a how to, more a sharing of experiences. But believe me a whole lot of things can go wrong if the right decision are not employed and a seemingly confident elephant can be left unsure nervous and lacking the confidence it once had.

Aggressive tendencies.



So, why are they sometimes aggressive and why is a normally sociable animal prone to aggressive and sometimes ravenous, almost savage behavior where they will intentionally hurt each other?

I won't go into the natural herd hierarchy the nurturing herd structure details, these things you can

better see and understand from "Animal Planet". Although reflecting back on to wild behavior one thing that is not generally addressed on "Animal Planet" is the importance of role playing in young elephants. Role playing in young elephants is crucial to their future characters traits, recognizing their differences as individuals becomes a blue print for adult life, because like us an elephant will also find it has strengths and weaknesses, likes and dislikes and this is all learned behavior rather like a school yard where young kids are pushing each other and finding out their personal tolerances.



I don't know if any of you remember your first confrontation as a kid at school. Some of you boys might remember getting into a fight or a pushing contest in the school yard, well you very soon at an early age find out how strong you are physiologically and physically and whether you can handle confrontation, these are the same things elephants go through obviously to a lesser extent and with far less active thought processes, I would believe, but never a less they find out who they are what level of stress they can take, even young females get pushed and bumped around creating a picture with every encounter of who they are individually. Funny thing though, I can never find a reference in the literature that recognizes the importance of social confrontations to the females of the herd, quite the contrary, one book even states that females do not fight within a group and harmony seems to be embraced.

So where does the fighting come from? I know they are animals and it's not healthy to read too much sentiment into their behavior, but elephants like many other intelligent animals, for example, none human Primates, Whales have a capacity for caring for each other well above most other animals, some even say they have the power of reasoning. Of course if you watch the nightly news on a regular basis and see how people treat each other it would be easy to determine elephants are way above us also, on the social and caring scale.

Elephants live into their sixties even seventies, have a 22 month gestation periods, outlive their young baring years, wean their young at four or five years of age and why do female elephants hang out every second of their lives together from birth? Males of course, seek or are forced into their solitary life styles after 10 yrs or so but leave the herd with a whole lot of individual specific information before they try to make it in the world.

The bachelor group's phenomenon is worth a mention and is a great example of nature filling a niche. Young male elephants have a potential of causing havoc within the herd at a certain age and even breeding back into their family. After being asked to leave they are on their own but will if permitted find a larger male to follow and travel with. A mixture of safety, companionship and I guess survival brings the groups together the very males not really caring one way or another who is around them and as they grow older there just there, now during breeding encounters the bachelor pack splits with the more mature animals witching to a different gear with a focus on the female in heat and the younger ones making themselves scares.

Elephants it seems have evolved to program and store information, information crucial to their very survival; the storage capacity has evolved to be quite a complex mechanism. Now take that possibility for learning away, what do you have? You probably have dysfunction in most elephants, not all elephants though, because there are elephants that can coop and amongst other things take to other elephants without a hitch.

Why? I'd love to know, why do some elephants just get on with it and make friends, now there are some that make friends to the point of dysfunction where you couldn't pass a piece of paper between them so separating them any time becomes an issue.

Easier to control in FC. Having worked in both systems during elephant's introductions I found it easier to control the situation in Free Contact, the reason being of course is I could regulate the outcome by intervening. In PC you don't have that possibility. But as we all know intervening with elephants that have a problem with each other demands a certain skills, plus a strong

philosophical buy-in from the institution where you are employed. Lots can go wrong when you are inside an enclosure with elephants and as PC becomes the system of choice for AZA, EAZA & BIAZA training people to be in with elephants is becoming less important.

Nita and Omar in FC. Introducing young elephants to older elephants can be tense; particularly none related animals and particularly females that have not seen a youngster before. A behavior profile of the elephant you want to introduce the youngster to would the first thing one would perform is she reliable or not. Then you should discuss and set up the introduce process plan, how, where which keepers should be there extra. I have done both FC & PC young elephant introductions and both processes have their specific details.



Omar was born at the SDWAP San Diego Wild Animal Park in 1993; his mother Connie came to San Diego as a donation from the USS Constellation to the SDZOO hence the name Connie. Connie was approximately a year old when she arrived, her natural elephant education was cut short the moment she was separated from her mother. Elephants arrived in Europe or the US a number of different ways they could have been orphaned or a man assisted separations, either way they were generally void of the basic elephant behavior the basic training and acclimation of young elephants is generally done at the zoo that they arrive at or in her case in the work camps before she arrived.

Connie was very aggressive towards Omar at birth so it was decided to hand rise him till he gained sufficient size and had formed bonds with some of the more dominant animals in the group first one was Nita in the photo to the right. This process was to give him more of an edge socially when he was introduced back to his mother. If he was friends or was being mothered by a more dominant animal in the group his mother or any other elephant in the group, for that matter, would be less likely to do him harm. A time frame for this process is not easy to determine as I said in FC you can run interference and stop most possible incidents. In PC the introduction process is much harder and more time and the use of specially built barriers might be needed.

The education an elephant receives at a zoo is not based on its biological needs or its long term philosophical welfare of an elephant because if the philosophy being employed is for the elephant as a beast of burden most natural considerations do not apply and it becomes more about manners and demeanor and how it should act around humans. So if an elephant grows up under these circumstances, without the years of mother's milk or even maternal nurturing to support the elephants physical constitution, a huge vacuum is created, basically without us knowing because that's what we have done for 1000's of years. Unfortunately Omar died within his first year, the injuries he sustained when his mother attacked him were too much, and gradually he weakened and passed away after considerable effort from the SDWAP elephant & hospital teams.

Baby elephants to males. Baby introductions to males are generally easy, that's not to say all males are easy but they have less interest in babies than in larger females or other males. Unless of course the bull has physiological problems or heavy stereotypical issues that have altered his perspective, but you hopefully have done your research and observations, beforehand. Some males if scared, nervous or just stressed might injury a baby but this can be generally diluted by correct introduction practices and time. They have less biological ties to the young, so aggression is reduced, but don't hang your hat on that statement, do your home work, it might be safer for all concerned to leave them apart. We used a flexible yard separation technique in Spain that allowed us to move an electric fence quite easily to create or reduce space, as needed. The was designed to guide the bull back but at the same time it went over the back of the baby so could allow him to just get on with life quite un a where he was in the middle an introduction procedure.



Tina and Yhettoo at Belfast Zoo. As we said earlier, elephants are information orientated animals, they need information and will absorb a lot of surrounding information if it's made available to them. Coming up with new successful ideas firstly can be challenging, but also ideas that help the elephant with its new surroundings during introductions. That's what we did at the Belfast Zoo, Northern Ireland, January 2009, with the new arrivals to accompany their resident elephant Tina. Elephants need information to better understand their environment, just like we do, new sounds, smells, people, proximity of other elephants all create expectations for a new arrival and for a resident animal. Elephants will not automatically know each other they need time to readjust, firstly to their new surroundings even without other elephants to deal with. Elephant facilities historically, have been built for strength and convenience and for the most part for Free Contact handling, where the keeper can intervene and be the organizer of all goings on in the house and the elephant group.



To date there as only been a small number of elephant facilities built with a complete Protected Contact handling system in mind, where the personal relationship has been remove form the handling criteria. Also to explain short comings in design or to have a flexable philosohpy, or to apise the head person many institutions call their system by different names, modified PC, a type of pe-abo system where keepers are in with the elephants but its still called PC.

Back to Belfast. We choose a method of introduction that had never been done before and we planned our approach every step of the way. Belfast had one elephant and was interested in obtaining other elephants to accompany their one lone elephant. They had had also a change in philosophy concerning their contribution to captive elephant conservation. Previously they thought that breeding elephants would be the way to go and had actually had success with breeding the elephants they had. Breeding elephants has Belfast Zoo found out was not an easy direction to take. Re-thinking their strategy they choose to open up their facility to older non-viable female elephants, animals that were not considered apart of the breeding future of the European population. Older elephants bring to the table all kinds of issues mostly psychological because of the lack of socializing when they were young. The absence of a herd education does not sit well with elephants, no different, I guess as with non-human primates and I suppose dolphins and whales would turn out if not kept in physiologically supporting surroundings. The play ground atmosphere that is created when young animals live and play together cannot be substituted, it's absence leaves voids of information that sometimes rises to the top when strange elephants meet and don't know how to act. A lack of fundamental information leaves this herd animal for the most part dysfunctional. The approach we took in Ireland was simple. The inside area where the elephants would first see each other had an electric curtain attached from the back wall and fastened at the front so it could be easily detached when needed. The wire wall would allow the elephants to see each other completely, no partial viewing of each other, no slapping at each other through a gate or fence and no potential escalated aggression as they pull on each other, baiting and irritating so much that when you open the gate and let them together, it's a battle. Using the electric fence system the elephants spend time along side each other feeding and offering gestures, it is also a period of time that the staff can be observing and evaluating the process.

Using target training and rewards the elephants can be brought together at the fence moving towards each other and then moving away so each elephant can see the other in different positions and places in the stall. This information will then be digested and programmed subconsciously, body language as well as the auditory sounds they make are very important to the elephant and are well underestimated in zoos.

Baby elephant back to an aggressive mother, directly after birth. The old school process of taking the baby away from the mother at birth in order to check the baby's vital signs and to let the mother calm down is slowly being replaced with a group/herd birth consideration. As more and more facilities are moving towards a herd-nucleus sensitive management or a progressive PC style of handling the outcome of births is not so certain any more. "We can be more certain that the baby will survive if we take it away then slowly give it back when it is stronger was always the thought". Some PC programs will even chain the mother to hedge their bets of a live baby at the time of birth. Even if the mother is restrained there is still a chance of aggression to the baby. Do we make the whole process worst in our efforts to have a safe birth? Should we in the future allow fate to take its course?

Some thought these days is going into the imprinting possibilities a mother should have to bond with her baby directly at birth and what this means to the future of the baby and their long

term relationship, not to mention the long term education of our elephant population in our zoos. A group birth, where ever possible, will ultimately polarize the elephants in your group into a self-sustaining unit or nucleus It is hard to see a mother hurt or even kill a baby during or right after birth and on the selfish side after waiting 22 months for the baby to arrive only to see her hurt the baby is devastating to an elephant team.

There are a number of well-known zoos in Europe that now allow group/herd births even after a long history of FC, this decision wasn't made easily and has been made because they wanted to see the future of elephant management in many areas be more about the biology of the animal and be less drive by the beast of burden aspect of elephants in zoos.

Chain or not to chain is more keeper personality/experience dependent and will be an ongoing scenario and debate in the industry and as those personalities retire from our game, I feel, it will draw closer to a more herd importance and will have a greater directional impact in many aspects of elephant management in our zoos, not only birth.

Back to re-introducing the baby back to the mother after she has rejected it, either in FC or PC. Introducing a baby back to its mother directly after birth can be tricky and in PC it is even more of a challenge.

In FC it's all about the relationship and the control you have over the elephant, but even here we must be very careful because a normally tranquil animal in FC, which is not pregnant, can become an uncertain-unknown quality when giving birth. The FC breeding institutions where numerous babies are born generally have a protocol for birthing and a routine which is followed with every birth. The pasted history of the process will be your blue print and it becomes an institutional choice a personal preference which direction the birth process will take guided mostly by pass experience and success. Taking animals off restraints in FC that were normally tethered is not recommended without a serious game plan and consultation with people that might know or have been down that road.

What about Protected Contact? Well, here the rules change completely you don't have the same influence over the mother, now remember we are talking about elephants that have hurt their babies in the past or for some reason you suspect that she will hurt her baby, or and this is a point of many debates today, it's her first birth and she has never been around a birth before. It will all come down to, are you willing to take a chance with the unknown, many people like better odds than 50/50. With first time mothers the 50/50 chance percentage is the strongest and even with this some zoos will take a chance, some zoos have lost and some have won. One zoo I know was so dedicated to its philosophy of free births it allowed babies to get hurt till the mother eventually raised her baby, foolish some would say, I believe, knowing the players at the zoo in question, it was a huge commitment which paid off and now all the elephants are in with every birth and the keepers would show up if things would go wrong.

The same standard rules apply in PC as they do in FC particularly if you go down the route of restraining the mother, because she be must be trained to tethers also, which would be started many months out so the pregnancy is not affected by stress, and don't forget, all restraints must be attached through the PC wall, not easy task. Safely training the tethering routine is the

first priority, this would be done every day as part of the mothers preparation. Concession would be built in so chains can be taken up or given out so the elephant has a certain amount of freedom while restrained, sounds like a contradiction doesn't it. First indication of the mother after the birth will be your sign to start taking off the chains or not. If she is trying to calmly reach the baby without any indication of aggression an executive decision can be made to get her free from restrains and see what happens, not an easy decision but it will put you at a better place than hand raising or long introductions with the mother on chains. So best case scenario is she is calm and you can release her restrains and let her relate to her calf.

Now, what if she starts trying to kick the baby violently, and she is showing every indication she will hurt the baby if she's released or still on restrains. The baby will be removed to a safe distance checked by the vet, possibly a blood sample taken, help to its feet and the reintroduction process can start. There are other more advanced considerations like serum, IV etc, but the most pressing issue at that point is the reintroduction back to mummy. Making a little harness is important at this point, a tool so you can allow the baby to drift into the mother at one side,



preferably the side where you have short chained the leg exposing the nipple. The harness would be made out of cotton rope and would be 3 meters long tied so there is a loop in the middle for a longer rope to pass through. Passed over the neck of the baby with the loop on top the rope would cross through the front legs of the baby up over the back and tied at the loop. I have demonstrated this in the photo above.

Introducing the baby to the mother is of course the tricky part of the operation. Giving yourself the advantage with little heroic the mothers front leg would be taken up as in the photo so the baby can reach/see the nipple, thread a long rope through the loop on the babies harness and allow the baby to drift in to the mothers side, at this point you are looking at her reaction, is she calm or aggressive.



One could also give the mother a tranquilizer which makes the process calmer but the down side is when she comes to her senses she still might be aggressive. The introduction at this point is a time issue and how long it takes depends on the mental status of the mother, they say once the baby latches on to the nipple it has a calming effect on the mother, not really seen that myself.

Of course, if the mother is accepting the baby and the baby is nursing the long rope can be pulled out of the loop of the harness and the baby will be free to approach the mother. Drawing the final conclusions, she could then be taken off restrains. If all's well with the process you are home free, but these are very broad steps I have explained, so seek further advice if you are uncertain.

Fence and gate aggression. Elephants are all about information, information that allows them to make decisions. I believe zoo elephants can be forced into a position that pressures them into the wrong decision.

Bared gates or adjacent stall introductions offer too little info all at once to where the elephant has to act on info it is receiving





too fast, I believe we should build up a repertoire of behavior and give then elephants a chance to understand their surroundings before the elephants get close to each other. This type of introduction can escalate into aggression if the females choose that path but there are numerous levels of behavioral possibilities when they are just put next to each other in a stall with bars for the first time. If one reviews the situation of first time contact introductions it is easy to see how it can go very wrong if the elephants do not know each

other because lone animal's elephants that have been moved around a lot are usually socially uneducated and under the right scenario they are bomb ready to go off. First time stall intros are not recommended because you don't know what is going to happen, one assumes they will want to touch and investigate each other through the bars and at that point it will either escalate to aggression or not, you have a 50/50 chance of it going south. These are the odds you have when you don't make a plan and you just throw them to deal with something they are not sufficiently educated to understand.

Leaving it too long. One of the biggest problems we can have is leaving two animals too long in a holding pattern before we introduce them. There are many reasons for this, time, facilities, but mostly it's not knowing what to do next. A recommended time frame for intros would be to let the new elephants get to know the people, facility, also becoming comfortable with its surroundings, the noises of the house, then we introduce a daily routine that doesn't involve sight or contact with the other elephants, now this is all very good if you have a plan and a way of letting the elephants get to know one another immediately that doesn't elevate an aggressive scenarios like we addressed in the fence and gate section of this article. Leaving it too long is never an option to me because the moment is lost, the novelty of the surroundings have gone, the comfort level of the new elephant is very high and the confidence that can build is going to be your enemy. Providing you have made a plan and made the facility chances & additions need for a safe introduction it would only take a week or so till both elephants have clear picture of what's happening and you have all the info you need to introduce the elephants. Now this not to say it will be a clear shot done deal, some elephant intros can take a long time till they are completely finished and the elephant are compatible. The chapters of the introduction book are not finish when they are stood together in a yard, if they are just baring each other it can still go off, but chances are if aggressive should spark off it will be much less ravenous than a first time no plan intro, the elephants will have gathered more info about each other and about themselves under these circumstances.

Breeding intros.



What can you do about it, have a plan?? Introducing females to males in breeding situation can be difficult, has the male been with females before, has the female been with males before, is she in estrous, are there moats in the enclosure, have the elephants enough obstacles to move around to re-treat into. The list goes on, but one thing will be generally understood early on in the process, if the female is not right for the male it will be known quite quickly and the safety of the female will be paramount.

Phoenix Zoo Elephant Program.



Bringing new elephants together can be tricky and as I say, you never know when the chapter of the book has been completely written or when aggression will start up again and, or it is only on hold. At Phoenix Zoo the task was simple introduce three elephants that had been with other elephants early on in their careers but now for some reason do not like other elephants.

The Phoenix Zoo had acquired three adult female elephants with a history of aggression, two from the circus and one from another zoo in the US. All three were post reproductive and at a level anti-social towards other elephants. The task was easy but the implementation was going to be hard. There had been attempts with introduction before but with not so pleasant outcome. So now we want to try again under different circumstances and with a different philosophy. One elephant had been the aggressor before so every focus was being given to her at the start. We started by creating the enclosure for them to be introduced with many way for the least aggressive animals to re-treat in safety. Then yard was laid out so there was no direct access to another animal an aggressor would have to follow it query down and it would be easy to see by the observers and intervention could be introduced or not. With one combination of elephants this plan worked very well because as soon as the less threatening animal caught



wind of being hunted it took off quickly leaving the aggressor with an option to follow or not. The chasing in this combination was quickly resolved and the two with the help of cooperative feeders quickly came together to eat. The third elephant in this group was tried with the two other animals but would relentlessly hunt the other two down at any opportunity; needless to say this elephant with the space that the zoo has available can only be kept on its own.

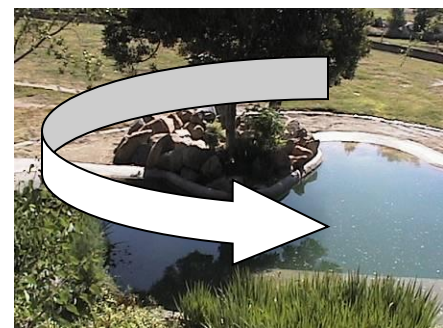
Facility considerations. Considerations when preparing for introductions, pool design and habitat furniture. There has not been, to date, a facility built that would fully accommodate aging female elephant social short-comings, some would say I over emphasize the down sides of the situation, twenty years ago I might say you were right but I now know too much about captive elephant dysfunction to turn my back on it. Elephant facilities, with a few exceptions, are underdeveloped at their conception.

Space requirements for elephants in zoos are always being under estimated or being miss interpreted, the first base value we use is the governing bodies minimum standards generally a collection of measurements that people had in their zoos at the time in their zoos when the standards were first submitted to paper. So the standards were written with minimum in mind laying down an underachiever mentality right from the start, a less is ok outlook. Rather than using the elephant's biology in more certain ways and seeing the value in what was good for the elephant such as space, light, sand as a starting point the team leaving the zoo for their fact finding excursion generally ended up measuring the last place built and adding a meter.

My mentor Karl Kock of the Hagenbeck's Tierpark organization in Hamburg, would I thought at the time, over emphasis the social structure and the compatibility of each elephant, no one else I knew in the world of elephants was talking like that , but now I can see exactly what he had in mind. Forgive my interpretation of what he might have thought completely. "The elephants are in captivity so we must do everything in our capacity to make them comfortable". My own addition of that is "In the times you are operating in, we are in 2010". Then we were in 1970.

Killing stall mates.

This seldom happens, but never the less, it has happened. In a number of ways it has happen, two older females had been together for fifteen to twenty years when the younger one turn on the older one and over a period of a few days knocked her down on numerous occasions to the point where she couldn't/wouldn't get up. Overcrowding and flight distances has been a problem in the past and as stockman-ship is lost in the up and coming zoo keepers and the new generation of animal experts take over basic elephant behavior is being dangerously lost. Old facility design and increased breeding success we always see at first with new compatible imports, we will inevitably see, for a brief time but as the new animals get older and more disorientated to captivity when new elephant groups are brought into our zoos from the wild to replace the old guard of elephant. Pools have been on the focus of social issue, particularly with animals that



are not compatible which was a point when we started just leaving elephants together on the heels of taking them off chains in the early 90's. New found freedoms small enclosures pushed animals together that didn't have the social education and would start the displacement of other animals around them. Trying to get away, elephants would learn to go in the pool to get away from their pursuers because they would not be followed; needless to say standing in water all night even to waist high an animal would lose core temperature and drowned. Pool design can offer an advantage to a less dominant animal.

When designing a pool for free living elephants it is always good to place an island in the middle of the pool so a pursued elephant can get out of the pool before a pursuing animal catches it, of



course the distance is critical in these circumstances. Gone are the days of the squared back one elephant pools.

As I mentioned in the Phoenix Zoo elephant program overview one thing we have found out is that furniture and multiple feeding opportunities carefully placed will defuse aggression in some animals, not all. An elephant pursuing another elephant will lose interest in the pursuit if there are sufficient objects and placed tree stumps, sand mounds that make a direct attack possible. We found that some elephants lose interest in the chase once the exertion of

energy out weights the thrill of the hunt.

Some just get along. Some elephants just don't care but you will not know this till the time of impact. For course you never know that there could be problems if your elephant just walks out of the travel crate gives the other stall mate a big hug and everyone is happy and goes home. But please do not take luck for good management; this doesn't do anyone any good in the long haul. Having a healthy respect for the process and giving people who might have more questions than answers is the direction to follow, always air on the side of caution and have a healthy respect for what our elephant might not know socially.

Their social incompatibilities can just go on hold. This area is weird to say the least, but some elephants that are appearing to get on are just on hold and will come to the boiling point over time. We never know when but their seemingly tolerant demeanor and attention to one another will change and their intention turns aggressive. It be could be that a point of frustration is reach and without the normal elephant hardware in their computer they cannot categories or control their feelings and react in abnormal manner. I don't really have much more to say about this area because there are no visible rhyme or reason for it. Although a more complex environment with daily enhancement schedules will dilute many incompatibles as an elephants dysfunctions are absorbed into other ways of acting, not available during all avenues of the elephant's previous zoo life.

And..... some just don't get along at all, at any time, beware.

This you generally find out the hard way and at some point have to make some decision to either keep the elephants separate for the rest of its life or move the elephant to another facility, problem will be finding that facility, because most places other than a sanctuary with normally very large enclosure could entertain such an animal. There are some cases that will change their outlook when moved to another zoo, particularly if there are a lot of elephants and the dynamics are complicated, it sometimes makes them reconsider their options and quite down.

Final words.

Two components that you need to bring to the table are patience and time. Setting these animals for success is critical to their future at your zoo. I have seen many different ways that elephants have been introduced, through barred gates, over moats, over walls, and just let together 50 percent have worked 50 percent haven't those that haven't are the ones I am interest in examining because I firmly believe with the right approach and time any elephants can be introduced, but start them the wrong way, let them fight at the start and you will be setting the scene for their dysfunctional future at your zoo.

I have seen animals that have been together for year's change partners create bonds with the new elephants and forget their old stall mates. I have seen elephants that were in bad condition physically and mentally for years just slowly pick up after a short time around a new stall mate and noticeable physical changes appear, they have gain weight and they have even started to walk differently and more confidently. Those are the benefits of time & patience.

The Sand Invasion, five years on.

Written August 2011.

"Two parts sand, one part imagination".

Who's been doing it?

Well, since my first article in the American Keeper Forum 2006 the sand flooring idea has really taken off in many directions and in many versions. I feel now zoos and even private elephant holders are considering the use of soft substrates for the elephants to interact with and sleep on.

The original article in 2006 firstly rubbed a lot of people the wrong way and I heard through the grape vine sweeping statements, that elephant management as we know it is going to the dogs and we were putting our industry at risk by suggesting such ideas out of the box ideas. Some notable experts suggest that we should just all stick together, become one, rather than suggesting such things, all statements were quite a shock when you consider we are responsible for the future of a highly endangered species. The lets all stick together suggestion was the funniest to me after being in the business for so long and watching people come and go

some trying to make their empires on the backs of elephants wouldn't you think we would want the best for our elephants.

These were of course ridiculous statements and all efforts and opinions at this point should be considered if we are going to make further inroads and successes with our captive elephant management in our zoos. We should get back in the box in some cases of elephant health and comfort.

There are many zoos that have altered an existing elephant space, that's to say a small stall, one of four and put 6 inches of sand to allow the elephants contact with a soft material at night, this is only an offering a placating of the subject, also very similar to putting down a rubber floor because it is softer on the elephant's feet. This approach is not an actual buy in to an elephant's captive issues and comfort, nor is it a true investment of philosophy that will support the future of captive elephants in our zoos.

Seen by many as too much work, I have heard everything there is to say about the problems of sand topography and flooring. Won't they dig and make holes in it? Yes. Won't they throw it on their backs? Yes. Won't it be harder to clean? Yes. Will it smell of urine? Not necessarily if the area is large enough, but if you try and make a space which is too small and not meant to hold sand, it will become saturated and smell of urine. Will the sand not get wet and hold bacteria? Same answer as above.

The comfort as it pertains to the elephant was never a consideration twenty years ago, a working animal was very rarely offered physical enhancements, betterments to where they could express themselves, be comfortable and satisfied as an organism.

Elephants have always been seen in the west out of convenience or just out of a historical perspective not really sure, as a domestic animal parked at night like a bus, ready to be used the next day at a moment's notice. This, I have to say, was not a calculated "let's be mean to the elephant" as many would have it portrayed, particularly in the fringe welfare groups and animal rights businesses, we the people of long histories became very good at normalizing the abnormalities we created we made an elephant's life comfortable to the point of our knowledge and understanding, our understanding has broadened, it got out of the box many times.

So who to date has provided deep sand or natural interactive flooring for their elephants 365 days 24/7 and what has been the benefits? The four most prominent zoos at the moment that have installed large natural inside surfaces for their elephants in Europe are Chester Zoo in England, Dublin Zoo in Ireland and Copenhagen Zoo in Denmark. Dallas Zoo in the USA also added an inside sand area to their new habitat which opened last year.



Chester Zoo.



Copenhagen Zoo.



Dublin Zoo.



Hagenbeck's Tierpark

Who is thinking about it? The sand idea is catching on around the world in various styles and designs; some zoos are just piling sand up in a corner of an old stall and getting good results and in some cases seeing elephants acting differently. One zoo in France that I worked with for a short period, some years ago, actually put sand down in a very poor inside environment on my advised, an environment that would be mentally draining for any organism even a human, more like a dungeon than a habitat. The elephant that was housed in the room hadn't lay down since he was young but evidently found some satisfaction with the sand, which had been stacked at one side of the square room, because after a couple of weeks of recumbent rest and sleep on the sand he started breeding the cows who he previously had no interest in. A coincidence, maybe.

What have been the benefits? When I was a child my father would take me to the local zoo in Manchester, England, an old zoo called Belle Vue, incidentally the first zoo to install & use electricity, I was told. The elephant house was designed so the elephants stood on a platform on a backward sloping floor with a moat in front for the best possible viewing for the visitors. When I was eight my father who was an amateur naturalist and a fish and reptile enthusiast would divulge information about animals as we walked around the zoo, kind of like my own animal planet, some of the information he would tell me would stick in my mind, for instance, elephants can sleep standing up, that of course is true, but what he didn't tell me, something he could not know was that the elephant deteriorate physically if sleep and positive rest is absence long term. Like us the elephant as to lay flat to truly rest, leg hopping and dosing does not constitute rest. Another thing he told was, elephants need to walk, and this of course is true. The resident elephant trainers at Belle Vue Zoo would take their elephants for long walks around the zoo, only on asphalt, because they didn't have an outside enclosure. Other less appealing items from his commentary would be promptly lost in my young mind. One thing that always intrigued me was the ability of the elephant to sleep standing up. A fact later in the same elephant house and the then employed mahouts would verify, but actually would also not understand. The fact that most zoo elephants stop laying down to rest is they can't anymore, the floors were either too worn & broken up or the elephant would be too old and out of condition to make the effort. It wasn't till later in my life, much later unfortunately, would I understood the consequences the lack of rest or the lack of space would have on the sleeping habits of zoo elephants.



Heidelberg Zoo in Germany has moved to a totally new environment for their elephants. The old Heidelberg Zoo elephant house was built in the 60's and was an example of the old architecture that was deemed acceptable in its day. Even with the small in door exhibit the zoos elephant staff and management had



provided Heidelberg Zoo elephants with a comfortable environment see sand bed to the right and presently have moved over to a larger scale habitat with a large inside sand area, a mixed exhibit element by allowing Axis Deer an Asian species of deer to share the environment with the elephants.

Another well known zoological institution that is considering natural flooring in their elephant habitat is Blair Drummond Safari Park in West Scotland. This institution has made extraordinary progress in living conditions and training with their elephants and are ready to make the next very important step. In 2007 the park made a very strong statement when they designed in house and built a new Rhino habitat, also with natural flooring and outside covered areas for extended periods in the fresh air, a must see if you are holidaying in Scotland. Jamie Muir, Blair Drummonds owner and Director is pushing for the park to be one of the most innovative and progressive zoological organizations in Europe when it comes to Elephants, Rhino and Giraffe. In 2012 Blair Drummond Safari will open a new habitat for elephants at the park which in my opinion will push the bar up even higher with new inclusion, feeding, movement, surveillance equipment and sleeping strategies back up with research and backing from a major University.

Phoenix Zoo in Arizona, USA made many positive changes to their elephant management, one of which was a focus on the inclusion of sand sleeping and resting areas for their elephants. Inside and out they provided opportunities for elephants to interact naturally with the substrate.



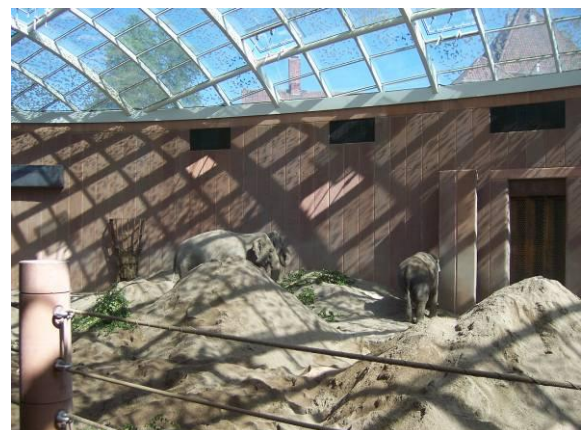
The keepers at Phoenix try very hard and

success in creating areas where elephants can relax and charge their batteries. The inside elephant areas once had hard floors but with careful observation of the elephant behavior the elephant staff put their finding to work.



Facility design, biological awareness.

Watching elephants in these larger sand facilities its easy to see the benefits, but its not only sleeping where the difference is made. After watching elephants that have little understanding of their own natural behaviors move across an inside sand area that has been manicured and



pre-furnished to attract natural elephant behavior is one of the most satisfying accomplishments.

Herd dynamics are being positively affected because the space we are now using and are willing to invest in combined with a sand environments being built where other natural tendencies like climbing, digging, encouraged after the keepers hide turnips, apples and carrots, elephants also like to throw sand and dirt on their backs, but not on our 9 to 5 schedules, they like to move around 24/7 and have space even inside where we historically kept them in small boxes. Light is a key component to happiness and wellbeing in humans. I believe the cabin fever effect also impacts elephants zoos. We already know that long hours of darkness bring down the spirits in northern climate with people actually going crazy from being cooked up for so long under artificial lighting. In Copenhagen for example the new habitat with its huge free spanning glass roof allows natural light in, without restriction. But what does natural light mean to the elephants? It means they can use their habitat from sun up to sun down, even in winter, benefiting from the continuous movement and the ability to exercise their natural attributes like reaching & climbing 365 days a year.

Positive stress in elephants, is there such thing? Are there circumstances that create or can create a positive reaction within the group, I believe there are. For example elephant facilities design with adaptability is the key, flat hard baron areas with little stimulus are rapidly becoming out of favor with our design teams and are very fading into the past. One young elephant in an elephant facility I work got lost in the inside area, because we have the ability now of moving furniture and either flattening or randomly piling sand, depending on the habitat design direction the elephant team has chosen that week. This for me was a huge step forward and seeing that the sand manipulation concept is working well and witnessing it firsthand, I knew that we are still on the right track.

From an elephants perspective.

The elephant habitat at Copenhagen Zoo. (An article the author wrote for an Architectural magazine).

When I was asked to write this article I felt honored because I feel strongly about the attributes and behavioral opportunities this new building offers elephants and because I know it will make a difference in many areas of elephant's welfare in our zoos worldwide. Some people are calling this the best elephant habitat anywhere, on a par with slice bread. I have had a relationship with elephants for over 40 years and I have spent my life pushing ideas that would benefit elephants worldwide. The new Foster elephant habitat in Copenhagen provides the elephant with three main components space, sand & light and of course many more when looks around this excellent building, but I was given the direction of only 1600 words to give my opinion. What difference do these three elements make to an elephants life in a zoo?

Take space for instance, we as humans take it for granted, long walks in the country, a change of atmosphere put things in perspective for us. But what does space mean to the elephant? I believe elephants need to get away also, they need to a walk in different surroundings and need to have time without interference from their co-specifics; the new habitat provides just that and much more.

Inside the new habitat due to the ample space we are able to move enclosure furniture around, like large tree stumps & rocks creating a different environment so the elephants are challenged mentally and physically every day. The climate in Copenhagen has its challenges also; long periods of very cold weather means that at time the elephants cannot go outside but with our ability to create habitat in the space we have provided, the elephants can go about their business as normal, throwing sand, digging, rubbing their skin on the rocks and tree limbs.

Copenhagen Zoo is one of the few zoos around the world breeding elephants. The Asian elephant is an endangered animal so anytime a zoo has a baby it has enormous significance on the world wide population which stands at the moment between 30 & 40,000. The education of these babies is our responsibility and in the space the Copenhagen building offers the young elephants can play and grow safely. The spaces allows for the young elephants to stretch their bonds with their mothers and at the same time grow in confidence as they find themselves further and further away from mum. We are witnessing changes in herd dynamics; elephants usually subordinate or reluctant to push in during feedings are now exhibiting behaviors more indicative of elephants with confidence and an understanding of social skills, we are seeing positive changes in their daily patterns and we believe there is more to come.

Light is a key component to happiness and wellbeing. The cabin fever effect also impacts elephants. We already know that long hours of darkness bring down the spirits in northern climate with people actually going crazy from being cooked up for so long under artificial lighting. The new habitat with its huge free spanning glass roof allows natural light in, without restriction. But what does natural light mean to the elephants? It means they can use their habitat from sun up to sun down, even in winter, benefiting from the continuous movement and the ability to exercise their natural attributes like reaching & climbing 365 days a year.

Sand, now this is a revolutionary inclusion and truly a benefit that is taking zoos in Europe and the world by storm. The story of a sand substrate in the Foster elephant habitat began when I was asked to advise Copenhagen Zoo on their elephant management. I came into the zoo after the plans for the new building had, for the most part, been agreed upon but one aspect was still a concern, the hard floor in such a large space. Introducing Camilla Norgard head of the behavioral science department and who at the time of the habitat design was responsible for elephant behavioral enhancement at its concept in the zoo. Other zoos I worked for had installed sand and natural surfaces inside their elephant building with great success and we thought it would be worth suggesting the idea to the zoos design team and the Foster Group. Camilla and I took a strong stand for sand at design meetings and finally the idea was accepted and became a major focus to the house. But what does sand mean to the elephants? Quite simply put, variety. The sand gives us the ability to create different spaces, mounds, hills, flat areas in different places each week. Historically elephants have been kept on flat floors with little variation, so our new inside sand floor allows us to design topography into the elephant's daily life. The type of topography we create offers the elephants climbing opportunities for building muscles it also promotes problem solving when we bury apples and carrots randomly around the sand area. We have found that the elephants really like this behavioral enhancing procedure, searching for hours after the last apple has been found. For me I think the most important aspect of the sand flooring is the possibilities it allows for elephants to rest & sleep. Elephants in the wild seek soft slopes of sand or deep litter to lie down it supports and forms to the body. The slope is important because of the elephant's large body mass it can get up easier with one swing of the back leg and the soft sand cushions the knees and elbows as it gets to its feet. Elephants like comfort they seek anything that makes life easier and sand flooring as proven time and time again that if the sand is manicured and prepared they will use it in their daily life and hygiene. The sand also holds the humidity which is important to the health of the feet and skin of the elephants, all this in conjunction with the elaborate climate control in the house, we have the ability, at any time, to create a near perfect condition for the elephants to thrive.

Of course the habitat has many other important aspects, complex feeding apparatus so the elephants exercise while feeding, a deep pool filtered where in summer the elephants can bath thrilling the crowds with their driving and snorkeling games.

So in conclusion, are we happy with our new habitat? That would be a big Yes, are our elephants happy that is also yes, they are moving more, spending time exploring every corner of the habitat, and with ability to move it all around on a daily basis, they never know what the day is going to bring.

In closing one element I must mention, the clear visibility and walking space combined with a second to none interactive section it is a great experience for our zoo guests. If you happen to be in Copenhagen come look us up we will be pleased to show you around.

Teaching old elephants new tricks.

Early in 2006 I met a family near Alicante Spain that left an every lasting impression in my mind. Alex Cristiany and his father Michael and mama the mother of the family own an elephant; “Babaty” is her name. Babaty has been with them nearly all her life; she is in her thirties now. I have been around human elephant love most of my life, people who say they have the best interest of elephants at heart, but I have to say love like this I have never felt before. The Cristiany family called me in to look at her feet where abscesses they had been dealing with, had for them, got out of control. We brought the abscesses back to center in relatively quick time.

I wanted to mention this meeting with Alex’s and Michael because their dedication sticks in my heart and has become an inspiration, in a small way and will help me go on to help others with elephant’s. After we had worked on Babaty’s feet and redirected the families’ efforts and treatments with the abscesses we got around to talking about Babaty as an elephant. They had never had such a conversation before and sat and took it all in as I preached to them over many coffees. The upshot of our discussion was an absolute turn around in the way their thought about Babaty. We talked about soft flooring for her comfort, hanging feeders for muscles conditioning and pipe feeders to make her think. She went from family pet to unique organism with independent requirements and physical tendencies in the time it took to drink three coffees, the light going on at the Cristiany residence was far faster than at any zoological institution I interface with. I guess for me the time frames concerned to establish a difference for Babaty was another eye opener, in about the time it took for me to fly home to San Diego I received numerous photos per e- mail; I want to share those photos with you now without explanation, they speak for themselves.



If we are not in the future yet, what does the future have in store? I feel the future holds a number of exciting challenges to the way we will think about elephants in our zoos. First, I believe we will finally and completely start to view elephants in zoos as an organism with unique attributes and interesting social structures and not take are examples from the working animals we see in Asia.

Now, I have to say in support of all the people who are pushing the envelope in areas like reproductive biology and AI, TB, and herpes research these are important aspects, but these

areas of elephant management live under the shadow of herd nucleus and the education of young elephants, longevity and the individual comfort for older animals in our collections.

Although we cannot ignore our history and our long standing relationship with the elephant, I feel at some point we must cut this form of exhibitory loose and start to look at the elephant as a wild animal in zoos if we are to meet our stated conservation goals. Why? Well, it's quite easy, we have generated by our inconsistent handling and care many unstable animal, rejects, animal's without a social educations de-programmed so to speak, elephants not knowing how to react even with their own kind. Do we want the next generation of zoo bred elephants to be void of their own history and how will we keep explaining our short comings when we continue to produce so many bad examples at hand, we can only push the ambassador envelop so far till we ourselves have to look at what it we are saying.

What the working elephant stands for in Asia cannot be repeated by many people in Europe and the USA, there are only a small few people who even come close to having satisfactory experience, personal work ethic standards and management philosophy with elephants to be working with them in a free contact. I know two, how many do you know?

The future for elephants in zoos has to lay in herd management complementing the herd nucleus, kept in sustainable groups free of restrictive routines, wandering under semi-normal conditions in newly design and thought through habitats where animals are approached and accessed at their point in the day, not brought into a building taken out of their daily rhythm. We are nowhere near this at the moment in our zoos, in fact in some cases we are going away from it.

So if sand areas are beneficial, what else should we be thinking about? One thing that is not in focus, in my opinion, is our support of herd nucleus. We have not decided in our zoos whether the elephant is a beast of burden or a wild animal. Till this fact is brought into focus nothing else will fall in behind for our zoo animals and we will continue to be content with fragmented groups and a very low breeding and social competence in our elephants.

New interruptive examples that educate our zoo guests.



Humidity controlled environments.



Sound explanations of the beneficial of sand.

It is a challenge to keep an animal that has evolved in a humid, wet and in some cases elusive environment, like the Asian elephant but with careful planning and designing using the elephants own physiology and natural history as our guide, I feel we can provided these undebatably unique animal a comfortable and sustainable future in our zoos, but it does take vision, imagination and people who are willing to view into the future and to take proactive steps in new direction.

Older elephants benefit the most. *“One small step for elephants”.*

Young elephants, as we all know, bounce around on hard soft flooring, it doesn't matter to them but as the years creep forward the bouncing slows down to that moment in time where they give up and cannot negotiate the hard concrete.

Just recently I received a photo from Copenhagen Zoo in Denmark it was of their 56 year old breeding male Plaisak laying down on his corner sand pile that is provided for him in the new habitat. Plaisak was kept in an older building built in 1914 since his arrival from Thailand many years back. He negotiated his designated area for his whole life till the zoo built a state of the ark new habitat for the breeding group.

Plaisak, I believe had stopped lying down to sleep many years before because of his size his condition and the lack of space but had created his resting habits like many other older animals in our zoos. Plaisak took with him to the new habitat in 2008 these habits which took him many years to hone but which were not his own best interest. After his arrival at the new habitat the staff at the zoo religiously prepared his sand area every day in fact they prepared it for the last three years, believing one day he would lay down to rest. Well, earlier this year Plaisak was caught on the night surveillance cameras lying down. This is a huge achievement where his future health is concerned and it will put more miles on his clock for him to use in his twilight years at the zoo.



Challenges with sand flooring.



I remember the days when we hosed and hosed the inside areas of our elephant houses, and although there are still modern zoos, which to me is mind boggling, installing large barren concrete floors, that offer no interactive value but still need brushing and washing.

I am happy to say that there is a general shift in the zoological world is towards sand, large quantities of sand, but more arm twisting is still needed for the none believers'. This shift in philosophy does not come without a cost, however, a cost in time budgets, purchasing of earth moving equipment and a cost in our overall thinking and historical cleaning tendencies. Making the decision to install sand for any elephant habitat should be evaluated so the outcome is beneficial for the elephants and ultimately the organization is behind the decision. I say this because it is not just a matter of installing the sand and we all go home, a manicured, prepared sand floor should be more interactive for the elephants allowing the elephant to demonstrate many more complex behaviors than they can on a hard unyielding floors you're your sand floor is as flat as a table you are off the mark completely.

When first considering sand areas, one of the first things people ask me is what is the optimal depth of natural flooring. Please refer to the BIAZA elephant guidelines for a more complete understanding of the requirements for sand flooring for elephants, it will give you the size of sand grains to buy, some are better than other and allow water to run through easier than others. To date there have been many tested ideas, depths vary from 20 cm to 2 meters have been tried and even after having long discussion with zoo designers, directors and curators about the merits of sand topography the deeper the sand the better it works when you consider all the possible uses in an elephants life.

For birthing sand has proven revolutionary, gone are the days of restricting the elephant while she give birth, the first imprinting possibilities for the mother and calf are very important to the mental health of the calf. Babies are gaining their footing after 4 minutes without assistance from the keepers. Zoos are seeing faster development in their young elephants, more confidence and it seems a greater capacity to learn. It is early stages yet with a lot more to learn about the benefits of sand in the birthing process, but please do not underestimate its role in this area. It has been suggested in conversations at the Hamburg School among some of the young attendees that one possible reason why the mother goes down with her head to the baby right after the birth is she might be flooding the baby with infra sound, a level of imprinting that slip through our net back when we thought she was going down to kill the baby, the reason why we chained many of our births.



The photo sequence above is from Hagenbeck's Tierpark Hamburg in Germany where they are now entertaining multiple births on sand, and are seeing quick recovery times of the babies, less stress in the mother and other herd members who are present at every birth providing a crucial education of the multi-generational herd.

Searching for Signs.

A new observation technique in the arsenal of the elephant manager 2011 is searching for signs of rest and sleeping over night in the sand piles around the habitat. Providing you have adequate sand, deep enough to manipulate with machinery and form into slopes and attractive sleeping areas, a result will be an impression left in the sand indicating how and where your elephant slept. "So what I hear" well a rested elephant is a productive elephant both during training and possibly when you have a breeding group and tranquility might have a positive impact on the herd nucleus.



Copenhagen zoo to the left has a high maintenance schedule for creating habitat for their elephants and all elephants staff members are focused on this task, the manipulation of sand falls right under food and water in their husbandry routines. One of their main focuses after the elephants have left the space is to look for sleeping patterns in the sand, this combined with a review of the overnight surveillance camera form one hell of a health support program.

Some zoos have, on their/our journey to understand natural flooring and other natural needs for zoo elephants adopted major philosophical changes to the way there are approaching elephant management. The elephant is not a complicated animal by nature we already identify them as super intelligent, I heard a zoo commentary the other week that portrayed them to have the intellect of a five year old person, a fact that might make them so tolerance to our indecisions in human hands. Folks, it can only get better.



What impression will you leave on your elephant management program?????

Photo acknowledgments:

- Copenhagen Zoo elephant team.
- Dr Stephan Hering-Hagenbeck.
- Phoenix Zoo elephant team.
- Dublin Zoo elephant team.

