IndiaWilds Newsletter

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Tiger Census: Past & Present :

Is there a design behind this good news?

The MoEF has announced a massive 30% increase in tiger population in India. This kind of increase has never been seen since the estimation of India's tiger population started several decades ago. Initially, the estimation of tiger numbers in India was based on numbers thrown around by a few experts over cocktails. Those numbers of 100,000 and 40,000 have stayed with us ever since. It would be pertinent to mention that when a number is quoted again and again, it gains sanctity and is believed to be true.

E.P. Gee a celebrated naturalist and wildlife photographer had said that there were some 40,000 tigers at the beginning of the 1900s and 4000 in 1964. Shri Kailash Sankhala writes in his book "Tiger! The story of the Indian Tiger" that when he questioned E. P. Gee about his estimates of tiger population in India, E. P. Gee replied: "Some estimate is better than non, and it should hold good until it is improved."

Prater had compiled a list of 540 tigers shot in 1938 (BNHS). In 1967 Sankhala has written based on perusal of hunting records "1730 permits were issued in the year and only 159 tigers were shot throughout the country, a "success" of only about 10% compared with almost 100% in the nineteenth century." Sankhala estimated 2500 tigers in India in 1969 and within six months the Government moved in to ban tiger hunting. Sankhala admits that that though his estimates were based on second hand information, it was from his forest department colleagues so had bit of sanctity.

After thee initial estimations by experts were done, a little bit more care was taken to estimate the tiger numbers. In 1972, a tiger estimation operation termed as "tiger census" based on pugmarks was conducted in April and May

and the estimated number was 1863.

Later on these estimations based on pugmark method was further refined to include simultaneous estimations in various protected areas. With the inability of people to differentiate the pugmarks of individual tigers, the estimations were off the mark. Several enterprising protected area managers started using this loophole and inflated the tiger numbers in their areas as tiger being the apex predator, its population in a particular area reflected the well being of the forest. So many Field directors/DFO's and other officials used these numbers to claim their efficiency and in some cases were even rewarded with career advancements.

Various facilities as well as fund allocation were also demanded to protect these tigers. Several National Parks like Sariska and Panna saw decimation of all their tigers, but the tiger reserve authorities were in denial mode. There were also disappearance of tigers in other well known places like Ranthambhore.

The camera trap method disrupted this misrepresentation of tiger numbers and brought some sanctity to the tiger number claims.

Scientifically, despite the increased usage of camera traps, the term tiger census continues to remain a misnomer at best as this exercise is an estimation and not counting of individual tigers. One can argue for increased usage of camera traps in all the tiger reserves and wilderness areas to document all the tigers. However, limitations of resources like remote cameras, trained manpower, funds remains a bottleneck. Remote cameras have also malfunctioned and some have been stolen by poachers to obliterate their record of crime.

The camera traps are placed based on a sampling plan and the extrapolation of these results can give us a better estimation of tiger numbers. The capture and recapture technique by camera traps have helped in establishing fool proof record of individual tigers in places. Since tigers move from one area to another, matching their stripes helps in eliminating an individual tiger to be counted several times.

Stripes can be used to differentiate tigers

Unfortunately, the technique of estimating tiger numbers need to be scientifically robust and more importantly consistent over a period of time to be of any use for conservation.

In the latest tiger census, the double sampling method which uses data acquired from ground based surveys as well as camera traps is utilised and is described as weak and inadequate by Dr Ullas Karanth.

"The double sampling method is not the best currently available methodology for this task. We do not believe this method can yield sufficiently refined results to accurately measure changes in tiger numbers at landscape or country-wide scales as is being attempted."

When there is no consistency in the approach to estimate tiger numbers, the results stare at us as if it is in vacuum as we cannot attribute any meaning to those numbers. In the latest tiger census, there were 1540 unique tiger captures based on camera traps. However, we don't know if the number of camera traps were more this time and if the increase is because of the increase in coverage of areas by camera traps and physical counting. We also don't know the impact of change in census techniques on the tiger numbers this year.

This is akin to a teacher changing the methodology in a particular year to grant pass marks to one batch of students where his son is studying. This may suit the present Government, which would be happy if the tiger numbers are high, as the "30% increase" would come in handy as a good excuse to open up large tracts of forests for exploitation by industries.

Sometime back the NTCA (National Tiger Conservation Authority) had even talked about creating individual tiger id cards. The id card conveyed a ludicrous vision of something hanging from the neck of the tiger and was thoroughly ridiculed. However, tiger scats, hair etc can be collected to create database of tigers in each forest. This will also help match with the confiscated tiger parts and establish the tiger part to a particular individual tiger. This will also help in prosecution of poachers. The labs can be opened up in various regions for faster analysis and the results can be compiled into a master database and made available for independent analysis.

Mere counting doesn't result in increase in numbers. Else, people would have just sat at home counting their money every day. With the euphoria generated by the news of staggering increase in tiger numbers as a result of this double sampling methodology, the ills afflicting our wilderness areas are forgotten.

According to WPSI (Wildlife Protection Society of India) database, in 2014, 81 tigers had died out of which poaching and seizures contributed to 23 of those ie. about 28%. In 2015 even before we complete the first month of the year, there have been 11 tiger deaths out of which 4 are due to poaching and seizures ie about 36%. Clearly it is some food for thought for the Government celebrating the tiger numbers.

The tiger numbers in places like Odisha have come down drastically. Despite denials poaching of prey continues. There was a time when large herds of herbivores were common in the forests of Odisha. Today, in places like Satkosia Tiger Reserve and Similipal, mere sighting of a spotted deer or sambar is a big thing. There are reports from villages in and around Satkosia about sale of Sambar and cheetal meat. This situation is true in many of our tiger reserves. In such a situation, how can you expect to sight large number of tigers?

The field staff whom I had interviewed in Similipal Tiger Reserve had told me that poaching is rampant. They are demoralized because the poachers get bail soon. With only a stick the field staff cannot catch the poachers who have guns and knives and dogs apart from superiority in numbers. Unless our frontline staff are young, motivated, adequately armed and empowered, we can't win the battle to save our wildlife from poachers and trees from woodcutters.

India's forests are increasingly being opened up for exploitation by mine owners and industries. The Government has

brought in an ex-cabinet secretary TSR Subramanian to create a report to modify wildlife laws to allow unhindered decimation of India's wilderness areas for industries. This "30% increase" in tiger numbers can only be welcomed by industrial lobby and their cohorts who will use this as an alibi for "sacrificing" our forests for "development".

Certainly all's not well in Tiger land.

Interview of Prof. Ratan Lal Brahmachary - by Shubhobroto Ghosh

Professor Ratan Lal Brahmachary, former researcher, Indian Statistical Institute (Calcutta), worked mostly on biochemical embryology of molluscs and chemical communication in big cats, the latter for 50 years now. An ardent wildlife and nature enthusiast, he has visited Africa fourteen times and also gained experience in the Amazon area, Borneo, Andaman and in marine laboratories in Italy and France. His tiger research was initiated in 1964 when he was with the famous pioneer George Schaller in Kanha. He conducted research at George Adamson's lion camp at Kora, Kenya, helped also by conservationists like Tony Fitzjohn and Gareth Patterson. Professor Brahmachary has written numerous scientific papers and also a few popular books (in Bengali) outlining his travails through the wondrous world of animals. Together with his student and colleague, Dr Mousumi Poddar Sarkar, he has contributed a chapter to the just published 'Neurobiology of Chemical Communication' brought out by Taylor and Francis and edited by Carla Mucignat Caretta, a compendium of research work carried out in this field.

Prof. Ratan Lal Brahmachary

Q: SG : **What is the significance of the newly published book, 'The Neurobiology of Chemical Communication' (Editor Carla Mucignat Caretta, Taylor and Francis, 2014) and your contribution to it?**

A: RLB: This book is a compendium of research done all over the world on pheromones and chemical communication. Specialists have contributed different chapters on pheromones and chemical communication in insects and vertebrates.

My contribution is a summary of fifty years of research together with various colleagues on pheromones on tigers and other big cats initiated in 1964 when George Schaller and I were watching a herd of Axis Deer in Kanha National Park.

Q: SG : **What are the modern trends in pheromone research in India?**

A: RLB: Archunan of Bharathidasan University has done good work on cattle pheromones as described by him in the 2014 book of Taylor and Francis on neurobiology of chemical communication. Dominic in Benaras Hindu University and Alexander in Chennai did some good work on pheromones in rodents, some years ago.

I do not know about research that has taken place in the insect world regarding pheromones in India. Although India is rich in biodiversity and offers a vast scope of research, this branch of science is also becoming highly sophisticated requiring very expensive modern apparatus. This puts us at a disadvantage.

Q: SG : **Could you please elaborate on the history and background of pheromone research?**

A: RLB: In late 19th century, the celebrated French naturalist Jean Henri Fabre initiated it in Moths. He rightly conceived that certain smell molecules from the female moth attract the males. Unfortunately, he further speculated on unknown radiations from the female and thus lost the right trail. In the mammalian world, in 1964, Schaller was toying with the idea of tigers leaving some messages in their scent marking, this science was then in its infancy. Only two mammalian pheromones (of Musk Deer and Civet) were known. By about 1976, the study of mammalian pheromones came of age.

Q: SG : **Could you please give an outline of the research done on pheromones in tigers and other big cats?**

A: RLB: Background work with tigers : In 150 years of blood sport literature, the phenomenon of what now goes by the name of scent marking was conspicuous by its absence. Surprisingly stalwarts like James Inglis, Dunbar Brander and Jim Corbett seemed to have been absolutely oblivious of this important behavior pattern, which is now known to so many casual observers and tourists who have succeeded in photographing or filming this phenomenon. Valmik Thapar says that he noticed it only after 1980.

In 1954, Colonel Locke in Malaya, in his famous book, 'Tigers of Trengannu' tersely but clearly described the fact and surmised what we know today to be correct. It was Schaller who first brought this to the notice of the scientists through his book, 'The Deer And The Tiger'(1967). Albone in Great Britain was the first person apparently who tried to chemically analyse this material from tigers and lions, but he had no opportunity of observing these big cats in the wild. The first comprehensive approach was by myself and my colleague, the late Professor Jyotirmoy Dutta of Bose Institute followed by our student and colleague, Dr Mousumi Poddar Sarkar. The molecule 2 acetyl-1-pyrroline(2AP) is present in tiger urine (marking fluid) and is the very same molecule that imparts the beautiful aroma to fragrant varieties of rice like basmati.
I can split the pointers of this research into seven parts:

1) Coding and decoding the message left by the tiger based on Shannon's information theory(1949) which was applied by John Burdon Sanderson Haldane in 1954 in the biological field, namely, the information coded in the dance language of bees discovered by Karl Ritter von Frisch.
2) The problem of olfactory sense in the tiger considered to be very poor or nil by Jim Corbett contradicts the concept of phenomenal message in tigers
3) The unclear concept of the source of tiger pheromone in 1967
4) Nature of the putative pheromones in the chemical molecules
5) How can the osmic (phenomenal) messages last long, ie., what is the mechanism of fixing. This is comparable to indelible ink which one has to write a letter with: if this letter is pinned to a tree subject to rain, dewfall and weathering effects.
6) Uncertainty of the concept of territory and home range in the tiger
7) How can the individuality of signatures be stamped in the phenomenal messages

We have addressed the same questions with lions, cheetahs and leopards but these have been treated in less detail.

Q: SG : **What can you tell us about human pheromones?**
A: RLB: Human pheromones constitute a terribly controversial subject. Wyatt of Oxford has discussed this subject in detail in his introduction to the newly published book, 'The Neurobiology of Chemical Communication.' I myself feel that in the distant ancestry of the human species, pheromones played a role but by now only a vestige remains.

Q: SG : **How does research in biology compare to that of physical sciences that you have also conducted in the early phase of your life?**
A: RLB: Biology is as fascinating as probing the mysteries of the physical universe. The "inner universe" of an organism or of an ecosystem is as challenging as the "outer universe" of the expanding cosmos.

Q: SG : **Do you think the contributions of stalwarts in biological sciences like Jagadish Chandra Bose and Gopal Chandra Bhattacharya have been properly acknowledged in India?**
A: RLB: Perhaps they are not so clearly acknowledged although the present generation of scientists are following the same line through their studies and research. I would mention particularly workers in the Indian Institute of Science in Bangalore, like Raghavendra Gadagkar conducting research on wasps, the late Chandrasekharan's research on biological

clocks in animals and plants, Raman Sukumar with elephants and Rene Borges work on fig trees and insects. They are following the path laid out by Gopal Chandra Bhattacharya and Jagadish Chandra Bose.

Q: SG : **What can you tell us about science and conservation given that you have had a role in both and also considering that you are a founder member of Born Free Foundation?**

A: RLB: I have an involvement in both. I am primarily a researcher, secondarily or tertiarily a conservation activist. The two are inseparably interrelated. How can I study tigers if the tiger becomes extinct before completing my studies? How can the conservationists take proper steps to conserve the tiger unless we find out some principles and data through research? All said and done, the appeal for conservation nonetheless is wider because even non scientists love the world of animals and plants. Many people do not want to kill animals or cut down trees on religious grounds. Others are learning the basic principles of ecology and doing the same.

Prof. Ratan Lal Brahmachary is seated in the front along with founders of Born Free Foundation Virginia McKenna and Will Travers

Q: SG : **How can the media help in popularizing modern day research in conservation and biodiversity? Have you written any popular books and articles on these subjects? What publications do you have for students of biology?**

A: RLB: Media, especially television can play a major role in raising awareness on the wonders of nature and the value of doing scientific research on biodiversity and conservation. The BBC David Attenborough series, among many others, amply prove it.

I have written quite a few of books and articles in Bengali on wildlife science and conservation. In English, I have written 'My Tryst With Big Cats' that has been published in 2013. (Naturism Publishers). It is a book that has been narrated as a popular style story summarizing the past fifty years of my research and studies on big cats.

I also wrote the book, 'Animal Behaviour', for students of biology, a chapter of which considers pheromones and others are on various aspects of ethology(Naturism, 2011).

What are the pointers for future research on pheromones in animals ?

A: RLB: The work I have described being done at the Indian Institute of Science in Bangalore represents the pointers for future research in this area. A lot of work can be done on pheromones and many ethological aspects of animals in India, Africa and Latin America, because biodiversity is very high in these areas. Almost every plant and animal offers some challenging problem or other and a lot of amazing facts await discovery.

Shubhobroto Ghosh is a former journalist for the Telegraph and has works published in The New York Times and in other newspaper in India and abroad. An ardent supporter of animal issues and organizations like Born Free Foundation, Durrell Wildlife Conservation Trust, People for Animals among others, Ghosh currently works as Senior Programme Officer at TRAFFIC India at the WWF India Headquarters in New Delhi.

IndiaWilds App for Android Mobile

In India most of the internet penetration is happening through mobile phones. And the existing users who have access to desktops and laptops are becoming much more mobile then they used to be a few years ago. So to raise awareness and reach out to more people we need to adapt ourselves and make IndiaWilds easily accessed through a mobile phone using android OS.

Today, I am pleased to announce that we have created a mobile phone app so that people can access IndiaWilds anytime, anywhere without being tied to a computer. No need to type. One can access at the click of a button.

We have developed this app through Business Compass LLC a company based in Randolph, New Jersey, United States so that we create a good app.

Awareness is the first step before a person can become a champion of wildlife. I hope this will help us in reaching out to more people to raise awareness and make a real impact on the conservation landscape. If you have an android device then please download the app from this link:

https://play.google.com/store/apps/details?id=com.businesscompassllc.indiawilds

Conservation News

Dedicated Freight Corridor dissects Balaram Sanctuary

The NBWL (National Board for Wildlife) has cleared a proposal to dissect the Balaram Sanctuary by laying double railway tracks for the Dedicated Freight Corridor (DFC). The Balaram Sanctuary has sloth bear and leopard populations and their habitat will be fragmented and many of them are likely to be killed when this Dedicated Freight corridor connecting Delhi to Mumbai becomes operational.

The NBWL has said that the state forest department should ensure that there are underpasses for the movement of wild-life. Easier said than done, the underpasses unless designed scientifically, will not be used by the wildlife. Gujarat has only 293 sloth bears and a majority of those are concentrated in Balaram and Jessore sanctuaries.

The dedicated freight corridor is a lot different from the regular single tracks and will have a heavy freight traffic. This will result in permanently fragmenting the habitat and any wildlife trying to cross it would be at a risk of being killed.

Indo- German Working Groups on Water Management & Circular Economy to be set up

The Minister for Environment, Forests and Climate Change, Shri Prakash Javadekar has said that Government's initiatives to tap cleaner sources of energy reflected India's commitment to pursue and practice clean and sustainable development. As a fast developing economy, climate adaptation measures along with mitigation formed the defining factor in India's approach towards development. He also emphasized the need to alter the energy mix in favour of renewable energy sources so that a balanced approach towards development and environment conservation could be evolved. Shri Javadekar stated this while giving a joint statement with Dr. Barbara Hendricks, Minister for Environment, Nature Conservation, Building and Nuclear Safety, of Germany here today.

Also speaking on the occasion, Dr. Barbara Hendricks has said that Indian and German governments held similar positions for the Post-2015 agenda on Climate Change. Both Countries needed sustainable development goals that address all three dimensions of sustainability – economic, ecological and social aspects – equally. Germany was ready to share with India its experience in adapting to sustainable development models, the German Minister said.

In a Bilateral Meeting held here, both the countries have decided to set up two Working Groups - One on Circular Economy and the other on Water Management. The Ministers stated that the focus of the working group would be restoration of water bodies, waste management, and more efficient use of water resources.

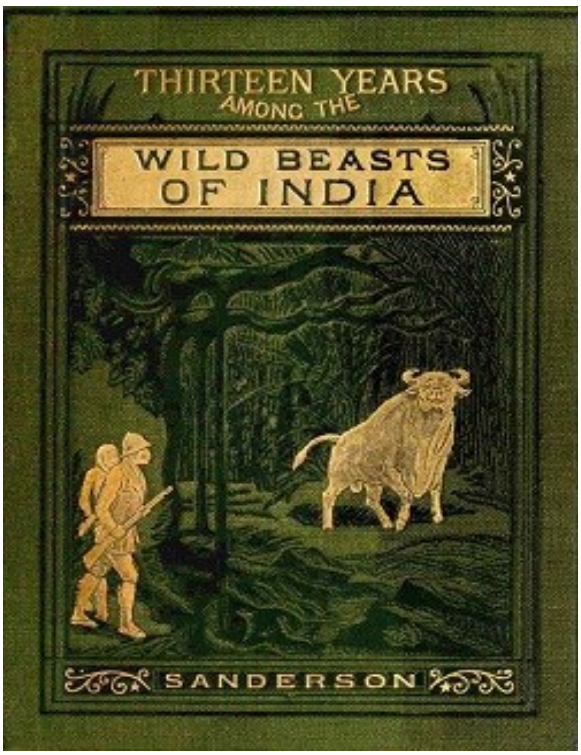
Both the Ministers emphasized that the UN Climate Summit in Lima had laid the foundations for negotiations on a new global climate agreement which would be adopted in the Climate Change Conference to be held in Paris later this year.

Book Review

THIRTEEN YEARS AMONG THE WILD BEASTS OF INDIA: By George P. Sanderson

THEIR HAUNTS AND HABITS FROM PERSONAL OBSERVATION; WITH AN ACCOUNT OF THE MODES OF CAPTURING AND TAMING ELEPHANTS

In our effort to bring to light books on natural history to the new generation of readers, I have gone back in time by more than a hundred years to the late 1800's when George P. Sanderson had written the "Thirteen Years Among the Wild Beast of India".



It was the original idea of Sanderson to try and capture a herd of elephants and he was granted permission after 8 months. Before this attempt, Hyder Ali had made a failed attempt at catching a herd of elephants and had even given a curse that anyone attempting such a misadventure is bound to fail. At that time no one had believed that one could capture a herd of elephants. He details his approach, his first failure and the amount of planning and drills that he had done with his men for the second attempt which became a success. Sanderson later oversaw the kheddah operations in Bengal in the Chittagong district.

Sanderson's book "Thirteen Years Among the Wild Beasts of India "is an interesting read not only to learn about the elephant catching operations that he undertook, but also because it gives us a third party view of the country, the prevalent society, social mores, religion, apart from the state of wilderness and wildlife a hundred and thirty five years ago.

Society:

Sanderson's observations about the various social strata is keen and some of which is even relevant today. Sanderson writes

"*The Hindoo people of Mysore are peaceful, orderly, and good-natured, but lacking in enterprise. The Brahmins are intelligent and ambitious ; they have always filled most of the posts in Government offices. The Mussulmans have sunk into deep poverty, chiefly through their own laziness, since the overthrow of the Mussulman power in 1799. A few engage in mercantile and agricultural pursuits ; many are enlisted in the Mysore Horse and the Sepoy corps ; they also find employment as elephant and camel attendants, and horse-keepers. The domestic servants of Europeans in Mysore are all Madrassees, as the Canarese people have never taken to indoor service.*"

Irrigation System:

In India today, when major parts of the country is facing drought and the so called experts are giving grandiose suggestions of constructing mega dams and river linking, Sanderson is also all praise for the irrigation system.

"*The country is well cultivated in many parts, the wisdom of former rulers having provided it with irrigation, both by channels drawn from the rivers passing through it, and from tanks or lakes formed by embankments thrown across the valleys. These ancient works are constructed upon such scientific principles that little can be done by European engineers to improve them. The lakes store the surplus rain-water for the use of the land further down the valley, and the*

cultivation thus artificially watered is called "wet" in India, in contradistinction to "dry," or that dependent on rainfall alone." Wish we could revive our long-lost traditional water harvesting and management systems.

Wilderness:

His writings gives us a sneak peak of the wilderness. While describing jungle fires, he writes that there have been trees so enormous that the fire was smouldering in the tree for a long time. "*Long after the main conflagration has passed, isolated bamboo-clumps and dried trees are seen burning fiercely like pillars of flame, till they fall over with a sullen crash, and are quenched. Many trees smoulder for months. I knew one of enormous size, the roots of which, some of the girth of a bullock, or greater, burnt for three and a half years, the fire smouldering slowly underground in the roots long after the parent stem had fallen.*"

After the introduction of wood-cutting as a major revenue of the forest department, some of the pristine forests had been felled. With the demand of wood soaring up due to increased demands from railways and other enterprises as well as from individuals, our forests are no longer the same. So his observation of trees with massive roots may appear as gran-ma's tales to some people.

On Cruelty:

Like many of the British in India in those days, Sanderson had participated in cruel bloodthirsty pursuits of hunting wild animals with dogs. In the chapter Bear Hunt, he has written about unleashing a pack of dogs on sloth bears and proudly mentions that he had only to use a knife to put an end to the bear. He also mentions releasing a panther from cage and unleashing the blood hounds to restrain and kill it. Calling it a sport, he has given detailed descriptions of the dogs and his methods.

Bear hunting with Dogs

His take on cruelty of Indians in his era:

"*Natives' ideas of cruelty are peculiar. They differ widely from ours. They think nothing of letting a domestic animal, with broken limbs or sores swarming with maggots, linger to death rather than raise a finger to put it out of its misery. They would consider taking its life under any circumstances cruel. Humanity as understood by us is a feeling of which they have no conception. When orders are issued at certain seasons by Government for the destruction of starving and half-rabid pariah dogs, by which Indian towns are infested—a merciful course to the animals themselves, and one necessary for the protection of the public—even educated Hindoos are seldom wanting to raise an outcry against the step. The same men would pass, without notice or pity, a donkey or cow by the roadside suffering from raw wounds at which crows were pecking (no uncommon sight in India), whilst the maddened animal made vain attempts to defend itself. I have never heard any native when with me shooting suggest such a thing as putting a wounded animal out of its pain. They have frequently said, " Why waste another bullet on it ? it will die." A Sholaga (hill-man) in my employ recently found a bison in an elephant pitfall; he had a gun, but rather than expend a shot on an animal that was useless to him, he left it there to starve to death : it did not die tUl the thirteenth day. When my men caught pea-fowl in snares they would puU out a feather, poke the stem through both eyelids, and fasten up the birds' eyes, to prevent them fluttering and spoiling their plumage, which " master would want." None of my men ever thought of sparing the youngest animal we might find in the jungle. If permitted to do so, they would consign fawn or leveret, whose helplessness might have been expected to excite even their compassion, to the game-bag without a regret, except at its size*." (page 24)

On Religion:

While talking about religion Sanderson writes "*Personally I have learned to respect the feelings and earnestness of the simple village communities around me. I can say that there is not a hypocrite in the country-side, nor one who decries the religion of his neighbour—rather a contrast in the latter respect to the jealous wranglers of various denominations who do their own causes injury by their intolerance of each other in the same mission-field*."

Great swimmers:

He writes about the remarkable ability of elephants to swim long hours "A batch of seventy-nine that I despatched from Dacca to Barrackpur, near Calcutta, in November 1875, had the Ganges and several of its large tidal branches to cross. In the longest swim they were six hours without touching the bottom; after a rest on a sand-bank, they completed the swim in three more ; not one was lost. I have heard of more remarkable swims than this."

Gentleness of Elephants:

Sanderson who caught many elephants writes about their gentleness:

"It is exceedingly entertaining to note the gravity of young calves, and the way in which they keep close to their bulky mothers. The extreme gentleness of elephants, the care they take never to push against, or step upon, their attendants, doubtless arises from an instinctive feeling designed for the protection of their young, which a rough, though unintentional, push or blow with the legs of such huge animals would at once kill. Amongst all created creatures the elephant stands unrivalled in gentleness. The most intelligent horse cannot be depended upon not to tread on his master's toes, and if terrified *makes no hesitation in dashing away, even should he upset any one in so doing. But elephants, even huge tuskers whose heads are high in the air, and whose keepers are mere pigmies beside them, are so cautious that accidents very seldom occur through carelessness on their part. In the kheddahs, though elephants are excited by struggling, they never overlook the men on foot engaged in securing the captives ; and though there would seem to be great danger in being amidst the forest of huge legs and bulky bodies of the tame elephants, they evince such wonderful instinct in avoiding injuring the men that I have never seen an accident occur through them."*

Under-fed elephants:

Sanderson's observations about under-fed elephants suffering is still valid today as many elephants in temples and in other private custody immensely suffer due to starvation.

"There is, perhaps, no animal less liable to sickness than the elephant if well fed. This point is of paramount importance, and without it good management in other matters is of no avail. It is common enough to see elephants in poor condition, suffering from nothing but partial starvation, being treated with medicines and nostrums for debility, whilst their appetites are good, and they only require a sufficiency of fodder to effect a cure. It may truly be said that all ailments to which elephants are subject are directly or indirectly caused by insufficient feeding. Under-fed elephants become weak and unable to stand exposure ; they cannot perform their work, and are laid open to attack by even such remote maladies as sunstroke and sore back through poor condition." (page 98)

Apart from that there are many other interesting points in the book.

This book is rare to find, however it has been digitised and available for non commercial use. It can be downloaded from this link:

https://ia600409.us.archive.org/28/items/thirteenyearsamoosandrich/thirteenyearsamoosandrich.pdf

It is also available in Amazon in Kindle for reading with a Kindle reader or downloading it to your computer by using the Amazon Kindle software. This is the digital copy of the second edition published in 1897 and it costs about 493 rupees ($7.59 usd).

Equipment Discussions -

Rodelink Wireless Filmmaker KIt

Australian microphone maker RODE has announced an interesting wireless system named as RodeLink Wireless Filmmaker Kit.

This wireless microphone system operates in the Series II 2.4 GHz band and can be used worldwide at this frequency. Unlike Sennheiser and the higher end Lectrosonics, which can only operate on different frequencies in different countries thereby limiting their use, the Rode system can be used worldwide. Hence as a filmmaker you can now carry your wireless microphone system abroad for use.
The RodeLink Wireless Filmmaker Kit also uses 128 bit encryption which is sent on two channels simultaneously. It provides 24bit/44.1K signal over 100meters. It is also USB as well as AA battery powered.

Unlike my Sennheiser G3, it has got internal antenna. So another botheration of packing will be over as the antenna of my Sennheiser G3 kit needs more space. The transmitter as well as receiver weigh 190 gms each.

A broadcast quality lavalier microphone is also included in the kit. The price mentioned in 399 usd. It costs considerably less than my Sennheiser G3 kit. It would be available in mid march.

This kit will surely be added to my audio equipment the moment it is available.

Detailed Specifications of the Rodelink Wireless Filmmaker Kit

Transmission type	2.4GHz Fixed Frequency Agile System
System dynamic range	112dB
Range (distance)	100m
Frequency range	35Hz - 22kHz
Maximum output level	1v Rms (2.8v P-p)
Max input signal level	1v Rms (2.8v P-p)
Max latency	4ms

Receiver (RX-CAM)

Power source	2 X AA Battery Or MicroUSB
Antenna	Internal
Output connection	3.5mm TRS Locking Jack Socket
Output impedance	10kΩ
Dimensions	111mm X 65mm X 40mm
Weight	190gm

Transmitter (TX-BELT)

Power source	2 X AA Battery Or MicroUSB
Antenna	Internal
Output connection	3.5mm TRS Locking Jack Socket - Dual Mono
Output impedance	300Ω
Dimensions	111mm X 65mm X 52mm
Weight	190gm

Lavalier

Acoustic Principle	Pressure Gradient
Active Electronics	JFET impedance converter
Capsule	0.10"
Address Type	End
Frequency Range	60Hz - 18kHz
Output Impedance	3000Ω
Maximum SPL	110dB SPL (@ 1kHz, 1% THD into 1KΩ load)
Maximum Output Level	189.0dBu (@ 1kHz, 1% THD into 1KΩ load
Sensitivity	-33.5dB re 1 Volt/Pascal (21.00mV @ 94 dB SPL) +/- 2 dB @ 1kHz
Equivalent Noise Level (A-weighted)	25dB-A
Weight	1.00gm
Dimensions	12.00mmH x 4.50mmW x 4.50mmD
Warranty	10 year warranty

Natural History -

COUNTRY NOTEBOOK: M.Krishnan: 'THE MONGOOSE - COBRA FIGHT'

The Sunday Statesman: 11-January-2015 (shared by Shri. Saktipada Panigrahi)

"SO much has been written already about the mongoose-cobra fight that unless one has something new to say there is no point in saying anything at all. And even if one has something new, it is impossible to say it without covering the old ground.

Clearly one of those situations that Shakespeare summed up admirably add to the embarrasment of grammarians in the famous lines:

If it were done when 'tis done,
then 'twere well
It were done quickly.

Here, then, is the resume of the fight as reported by observers ranging from Jardon and Kipling to Sunday magazine photographers. In the fight, the mongoose rely on sheer agility and not, the legend would have it, on a herb which it knows and whose leaves, well chewed, are a sure remedy for snake-bite. It is also helped by its thick, harsh, pepper-and-salt coat - the bristled hair magnifies the size of the mongoose and causes the cobra to strike 'short', and to some extent the coat prevents the fangs sinking into the flesh, even if the snake does succeed in getting in a bite. Furthermore, mongooses, like hedgehogs and pigs, are less susceptible to snakebite than most mammals. However, it is its superior agility that serves the mongoose best in the encounter. It hurls itself aside when the snake strikes, sometimes turning a somersault in its haste, and when the cobra is somewhat spent by the effort and can no longer raise its head quickly from the ground after striking and missing, the mongoose leaps in and fastens its teeth in its adversary's head. Then it crunches the life out of the snake.

Mongoose **Image courtesy - Mrudul Godbole**

It is a pretty fair and complete summary of what has been written so far, and accurate enough as an observation report till the very end. But the fight never ends as simply as that - the mongoose pouncing in and crunching up the snake's head in

one bite. It leaps in and bites, and if it gets a fair hold, hangs on - if it does not, it releases the hold and leaps aside before the snake can do any harm and then waits for a better opportunity. When it has secured a firm grip on the snake's head, a violent, though frequently brief, struggle follows.

That may seem an academic nicety, whether the mongoose kills in one quick crunch or in a prolonged bite, till I explain my point. The mongoose invariably gets it hold on the snake's head, usually on the SNOUT. Thereafter the snake thrashes about and writhes violently in an attempt to break the enemy's grip. It is then the damage is done. A snake is only as good as its spine - as those who have killed a snake with a stick will know, a blow that breaks the back is far more effective in immobilising the reptile than one that crushes the head. A snake with a crushed head will no doubt die ultimately whereas such injury to the brain will kill a mammal instantly and outright in the lowly snake whose nervous system is less specialised and capitalized, the body continues to move rapidly after the head is dead, since the spinal nerves that control movement still function. "Eha" commenting on its peculiarity in his immutable manner says,
"There is nothing new under the sun - it is only the boasted principle of Self-Government"!

In the struggle that follows the mongoose's abiding bite, the cobra lashes out and coils and uncoils itself so violently that often the mongoose is tumbled right over. Nor is the attacker passive, merely hanging on grimly - it jerks and worries the snake, and I am not at all sure that its tumbles are not voluntary.

Whether this is so or not, the snake gets twisted and often it is on its back for considerable portions of its length - it is then that the mongoose is able to jerk it about, for a snake, whose "legs" are its ribs, has little purchase on the earth when turned over on its back. Within a minute or two the snake's struggle becomes weaker and less effective and controlled - its spine has been injured, or else numbed for movement, in course of its desperate struggles. Thereafter, with its adversary rendered helpless by spinal injury, the mongoose has little trouble in despatching it.

In the course of many years, I have seen only three mongoose-cobra fights, all three staged by snake-charmers for the entertainment of a crowd of spectators - two of those cobras were quite impressive (though, of course, they had been rendered impotent by removal of their poison glands) but none of the mongooses were full-grown. Once I had a good fortune to witness a KITTEN killing a middle-sized wild cobra _ its tactics were similar to those of a mongoose except that it made free use of its forefeet and claws to hold the snake's head down.

I remember the first mongoose-cobra encounter I saw more clearly than I should for purely adventitious reasons. I was school boy then, and the "battle" was staged in the yard of our school. The cobra was small and thin, and the mongoose was almost full-grown. It was all over in a few seconds. The snake's back was actually broken very early so that the bones formed a sharp protruding angle beneath the skin. I remember how, when I pointed this as the main cause of quick killing, my form -master held me up to ridicule, to the loud delight of my fellows, and was most sarcastic over my powers of observations. His view was that the snake was killed by a single bite.

The other two cobras were much larger and heavier and the battle was somewhat protracted. I noticed in these fights (and in the encounter between that kitten and wild cobra, too) a spinal injury (or shock) sustained by the snake in the course of its furious struggles and in in the worrying it was subjected to, preceded its death - the spinal injury (or shock) was apparent in the sudden lack of coordination of the snake's movements even more than in the slackening or their tempo.

One last point. In every instance the mongoose sank its teeth into the snake's upper jaw, getting a hold over the snout and leaving the lower jaw hanging loose. In a snake too, it is the lower jaw that is moved when it bites but the cobra was unable to snap with its loose-hanging lower jaw. I do not know the reason for this.

Of course, it is possible that a full-grown mongoose may deal masterfully with a cobra and kill it in one crunching bite. It is also quite possible that a really large cobra may get the better of a rash mongoose in a fight. The more I see of wild animals, the less certain do I feel of knowledge of animal behaviour gained by the study of captives. However, this uncertainty is most

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acute and valid in the study of intelligence and social behaviour of an animal and perhaps captive creatures love and fight very much as they do when wild."

-M. Krishnan

*This was first published on 24th August 1958 in The Sunday Statesman.

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Regards,
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Publisher's address:

Plot No. 1, Akarpuri Colony,
Near Vaithal Temple, Old Town,
Bhbuaneshwar, 751002
Odisha
Mobile - +919910900446
