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Zoo 2027

And the Monkeys Run the Monkey House!

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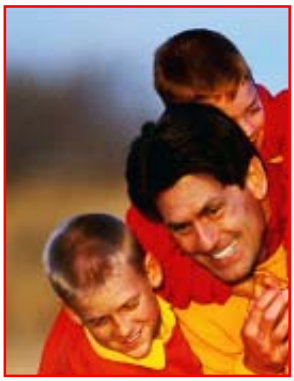
Abstract

Visit the zoo in 2027 and you'll be amazed! Projecting trends of the past twenty years into the future, the author takes you for a visit to a future medium-size Australian zoo. Key features include: a) animals trained to operate life-support systems and communicate with visitors, b) a blend of virtual and real-time experiences, c) decline in exotic species with a focus on native wildlife, regional/global specialization and eco-tourism, d) adaptations to climate change and e) a shift form "conservation" to "remediation," then to "accommodation" and a new sustainable symbiosis with nature.

My Uncle John invited us to Members' Night at the Zoo. He's been a member for 25 years and wants us to see their new Baboon Exhibit which replaced the old Monkey House. My two kids, both teens, aren't too excited about going to the old zoo instead of the mall, but they like Uncle John and agree to humour him with a boys' evening out. None of us has been to the Zoo for quite a few years, but thanks to Uncle John, they're both nature nuts.



On the 'Zoo-Run' bus from the Transit Mall, the kids immediately link their new HM2C hand-held microcomputer 'Handies' to the bus wireless connection and to see what's new at the zoo. The presentation is really geared to a broad audience so we all enjoy getting prepared. These gyro-hybrid buses are popular as they also take prams, wheelchairs and bicycles.

There's old Uncle John waiting impatiently at the entrance. Great zoo enthusiast that he is, he eagerly begins pointing out how things have changed over the years. First there is the new smaller car park shaded by a canopy of solar panels, like large leaves on a grape arbour.[1] This was donated as a demonstration project by the local utility company.

After he swipes his membership card (instantly covering all fees and purchases at the zoo including the VIP Info-Tech Tour pass code) and we step inside, he points out that the large heritage trees, which had been the pride of the park twenty-five years ago, had gradually succumbed to the drought. They have been replaced with native desert species like the mulga, ghost gum, she-oak and a beautiful desert palm grove. This is certainly a big improvement over my last visit when the last of those straggling old trees were looking pretty awful.

As I glance around admiring the new plantings, something seems to be missing – Bird Lake. Uncle John points out that the lake, which had been the centre of the zoo, is another drought victim. The

[1] This was developed for the California Science Center in Los Angeles and approved for funding by the local public utility in 2001. Unfortunately, it was prohibited by the local heritage district.

lake is now an underground reservoir where rain water from the car park and all roof areas is saved. The entry, event plaza and desert gardens where we are standing cover the reservoir. In fact, all new zoo buildings are built under terraced desert gardens.[2] "The new buildings are insulated by the soil and the plants capture $C0^2$, produce oxygen and reduce albedo." Uncle John likes technical talk. The boys miss most of this, but are attracted immediately when he mentions the new musical groups that are scheduled for the plaza in the coming summer evenings.

As we head for the new exhibit Mick asks, "Where are the elephants?"

Graham, the older boy recalls, "Weren't they moved out to the Safari Park? That was a good idea, wasn't it?"

Uncle John responds, "Yes, moving the elephants caused a lot of controversy, but it was best for the animals. Now they have fifty hectares to share with elephants from three other city zoos. The hippos, rhinos and giraffes were also relocated. The elephants are so happy to be in a large herd that they are breeding and producing calves every two years." A small giggle escapes the boys as they picture this.

The zoo is still adapting to the warmer, dryer climate and to severe new restrictions on animal imports and exports. "The new exhibits we'll see tonight, along with the entry, are the first projects designed for these new conditions," Uncle John explains. "The remainder of the zoo is still a work in progress."

"Wow, there it is!"

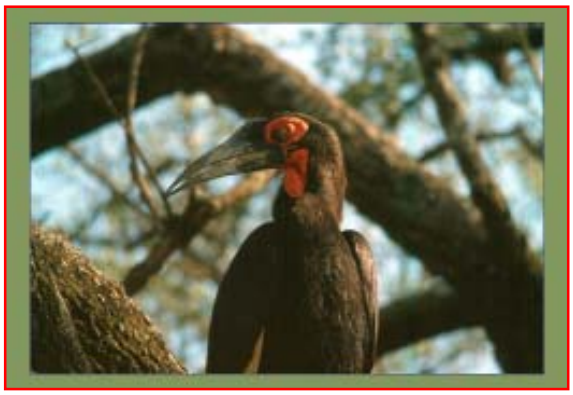
And indeed the towering rock formation rising from the desert acacia is clearly from Africa. My younger son Mick's forgotten he didn't want to come and excitedly points out baboons and wild goats resting in the shade of some over-hanging rocks. A pleased Uncle John describes how the artificial rock formation was designed like huge, passive solar furniture[3], collecting warmth in winter and providing shady overlooks for the animals all summer. "What baboons like most," explains Uncle John "is a great view with lots of other baboons around. They feel safe and connected."

"Yeah, like being at the mall!" exclaims Mick.

Graham asks, "Is this what Africa is like...with thick, thorny scrub bush?"

"Oh yes," responds Uncle John. "You're right. They've also had drought there because of global warming.

The areas approaching the Safari Lodge and around the baboon exhibit were designed in the fifty year old 'immersion mode,'[4] like going on a safari in Africa, but with lots of software upgrades." A red-billed hornbill flies passed. "He's learned to make a



circuit of feeding stations. Simple A to B training," he cryptically adds and, seeing no one is listening, leaves it at that.

"Will the Handies work here," Mick asks.

"Give them a try," I suggest.

"Wow, look at this!" Graham's Handie shows our location on a zoo map, path options to the various exhibits in this area and to other zoo attractions. "We can learn about hornbills, kopje rocks, local tribes, rock art, even pre-humans" he reports. "Good wireless tech."[5]

We approach an overlook and Graham describes

[2] The National Zoological Park in Washington, DC, built their administration and education buildings an a big cat exhibit underground in the late 1970s. Buildings covered with "living walls" and roofs were built at Woodland park Zoo in Seattle and Brookfield Zoo in Chicago.

[3] For an example of artificial rock formation solar furniture see the description from Zoo Atlanta in *"Naturalistic Behavioural Enrichment"*, PDF is available at www.joncoedesign.com.

[4] For more on 'immersion design' see Coe, Jon C. 1985. "Design and Perception: Making the Zoo Experience Real" in *Zoo Biology*, Vol. 4, No. 2, pp 197-208.

[5] Magian Design Studio, www.magiandesignstudio.com, was the source of information on future wireless and hand-held microcomputer technology.

more information options available through his Handie, "We can find the alpha baboon, check out what he's done through the day, locate all the troop

members or read up on their individual histories." As we near the fan-cooled shady hut at the overlook he goes on, "We can also run remote cameras....Hey, check this out!" The HD monitor comes to life as we enter with the same images

Graham calls for from his Handie by controlling remote, telephoto cameras. Suddenly the alpha male is life-size, every hair on his magnificent brow clearly visible, as is the glint in his deep-set eyes. Graham pans the camera and there below are four small human figures. This is how the baboon sees us! He is king of his mountain.

We amble on with the excited boys trying out some baboon moves. The shade of the baobab trees and date palms looks truly inviting in the lingering afternoon heat as we approach the Safari Lodge. Under the big round thatch veranda and inside the building itself, there are colonial-era ceiling fans to keep the air moving. Around one side are windows into the baboon's world. Behind the bar, in a deeply shaded grotto a leopard plays with her cubs. Over the bar, like a sports bar, are HD flat screen videos of the leopard in action. Marvellous!

Our dinner booking isn't for forty minutes so we continue exploring. In the centre of the lounge there's a pavilion extending into the baboon area. Here is another side to baboon life...baboons playing computer games with visitors, competing in finger-maze dexterity contests and showing their amazing adaptability. "Having evolved to survive the vicissitudes of desert life, baboons have intelligence and physical skills in abundance to handle simple tasks like human games! The idea," Uncle John goes on, "is to showcase the animal's competence and adaptability not just in the past, but in the future as well.

"Some people objected; this was 'unnatural'," Uncle John explains, "but we thought that was a backward-looking view, and we must focus on the future, when wildlife and people must reach peaceful coexistence or even symbiosis. It is also essential to provide the monkeys with challenges to maintain their mental and physical fitness and to give them choices in what THEY want to do!"

"But what do baboons want to do?" inquires Mick.

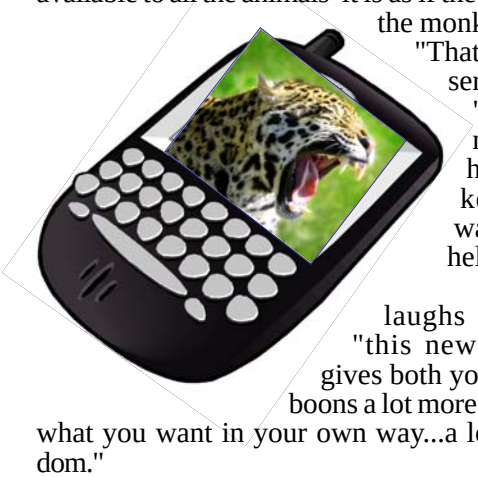
"Youngsters like to play, explore and test their strength and courage. They like to interact with zoo visitors," Uncle John explains. "Older monkeys like to socialize and rest from the heat."

"Baboons like to control their environment not only by moving into the sun or shade, but also by activating fans and heaters. They can turn lights on or off using motion detection hardware. They can stay outside in the more natural areas or come inside to play these games; it's their choice. All

the animals have microchips embedded under their skin to identify them. In the new exhibits a system of reading devices recognizes the presence of each animal and what built-in features it can control.[6] For example, a diabetic baboon gets her medicine in snacks available only to her. Other readers allow free access to holding areas to

[6] Information on new applications of microchips in "automated enrichment systems" is the thesis subject of Ms. Julia Hoy, j.hoy@uq.ed.au.

some animals that may need it. The dominate male has other special options, appropriate to his status and preferences. When you add up all the choices available to all the animals it is as if the monkeys run the monkey house!"[7]



"That means," observes Graham, "the monkey's microchip helps the monkey the same way my Handie helps me."

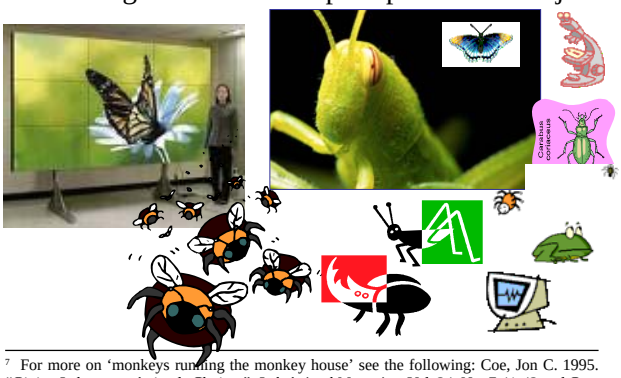
"That right," laughs Uncle John, "this new technology gives both you and the baboons a lot more choices to do what you want in your own way...a lot more freedom."

A nearby graphic explains how the same systems help the Zoo's research program by tracing each animal's movement and activities, even recording things like body temperature and levels of certain hormones. For example, keepers would know if an animal was stressed. Scientists can compare this data with surveillance videos and have a good record of behaviour. This can then be used to evaluate and improve conditions for the animals.

Uncle John explains, "Miniature measuring devices are also being used by volunteers to measure the effects of the new exhibits and animal encounters on their own heart rates and other signs of excitement.[8] This data is really helping us evaluate new exhibits."

We watch as a keeper trains a new male leopard.[9] Further away, the baboons also watch with interest. Working through protective mesh and using simple tools like a slender rod, a whistle and food treats, she helps the leopard learn how to activate his own environmental and enrichment systems. Judging from the number of other visitors watching this training, it is a popular exhibit in itself. And the leopard's keenness suggests it too is enjoying itself.

The exhibits in the Lodge are amazingly diverse with the next HD plasma screens allowing us to explore down ant tunnels and check out the thermal world of agama lizards and pit vipers. There is just so much to see that we must hustle off to our dinner booking.



We enjoy al fresco barbie on the terrace overlooking the granite kopje. The baboons, in orderly files, move off to their night quarters as the sun sets.

Then, in the last streaks of sunlight a leopard appears. It leaps gracefully from rock-to-rock looking for lingering baboons or mongoose, descends to a rock pool for a drink and then bounds to the cliff top to view the surrounding countryside. The evening comes alive with a new set of animals. An eagle owl glides silently over the terrace and bushbaby and hyrax call in the distance.

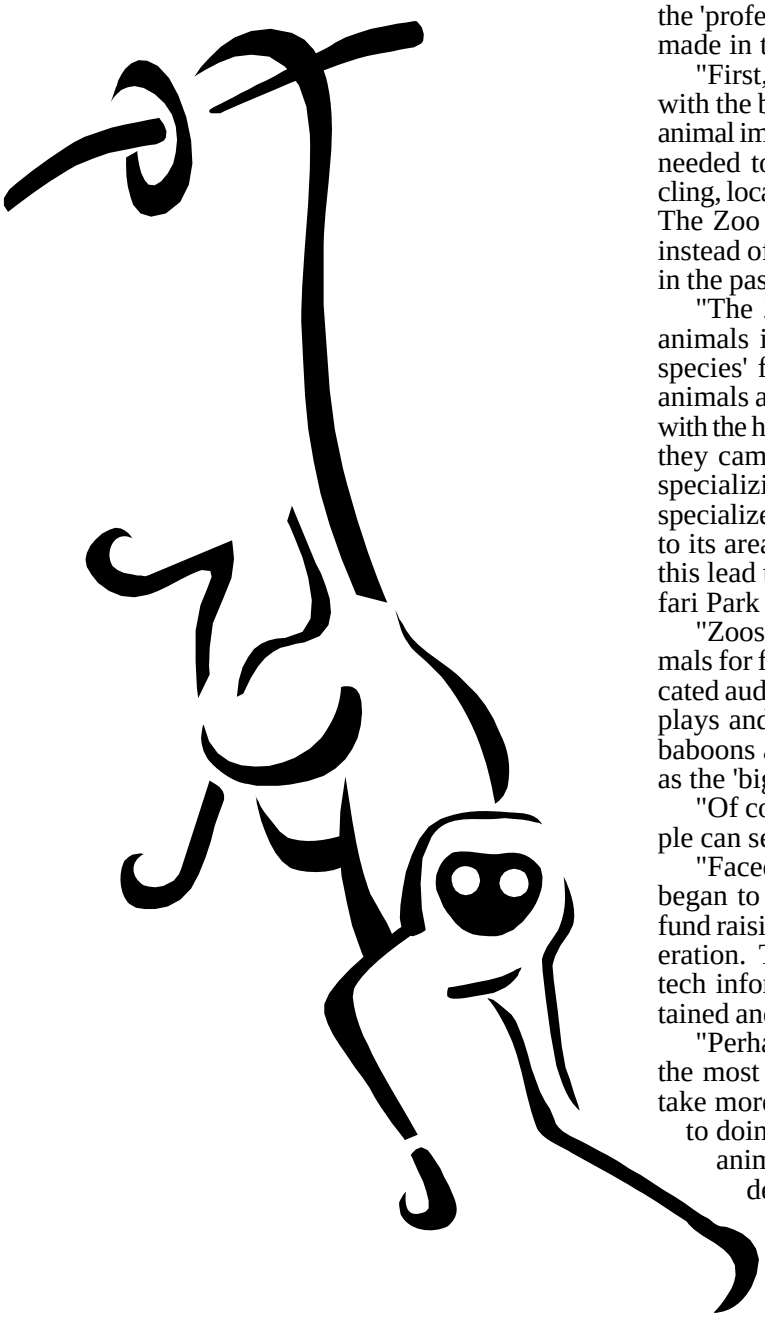
After dinner in the cool of the evening, we walk through the new Australian Bush Trail to take in a campfire story time. Along the trail we hear rustlings and glimpse small marsupials, potoroos and pademelons, feeding all around us. A soft glow of light (invisible to the animals) follows them around. Again the Handies come out as the boys query the Zoo website to identify these quiet night creatures. Solar powered, trailside graphics provide a similar interactive service. Each small animal's microchip communicates to hidden devices to be sure the website information available covers the animals visible at the time. The readers also assure that each creature gets the amount and type of nutrition it needs and no more as it travels throughout the area.

We join a circle of visitors in a grove of river red gum and are greeted by the striking figures of an Aboriginal Elder and his dance group. Using traditional dance and singing, augmented with subtle projections on mist curtains, the grove comes alive with adventures and lessons shared by the local Traditional Owners. We begin to experience how land and people blend and are one and inseparable. Bats dart in and out and later owls fly softly among the dancers. Dingos join in the singing. Possums come to watch from the trees with solemn round eyes. After this memorable experience we walk quietly back through the bush, past pademelons and quick bandicoots. The boys are unusually quiet, perhaps more 'in tune' with the bush then they were on the way in.

[7] For more on 'monkeys running the monkey house' see the following: Coe, Jon C. 1995. "Giving Laboratory Animals Choices", *Lab Animal Magazine*, Vol. 24, No. 7:41-42 and Coe, Jon C. 1998. "Chimpanzee Choices", *Chimpanzoo Conference Proceedings*, Jan Goodall Institute, Vol. 1, pp 17-18.

[8] Smith, Liam, 2007, "Can We Design Zoo Experiences that get Hearts Beating?", *2007 Proceedings of the Australasian Regional Association of Zoological parks and Aquaria Conference*, Wellington, New Zealand.

[9] Having special areas for animal training designed into exhibits was first developed, to my knowledge, for Louisville Zoo's Islands exhibit in 1997. This idea was more recently incorporated into the Amur Tiger Exhibit at Bronx Zoo/Wildlife Conservation Park, New York.



As we board the Zoo-Run bus to go back to the ever more crowded suburbs, Uncle John, always the 'professor', summarizes the changes the zoo has made in the last twenty years.

"First," he begins, "the zoo had to come to terms with the big issues of global warming, drought, and animal import restrictions. They had no choice. They needed to be a leader in the fields of water recycling, local power generation and sensible power use. The Zoo has become a good community example instead of the big power and water consumer it was in the past."

"The Zoo had to decide what was best for the animals in their care and what was best for each species' future; that they were responsible for the animals and not vice versa. This wasn't easy. Then with the help of their national organization, ARAZPA, they came up with ways to work with other zoos specializing in other new climate areas so each zoo specialized in animals, native and exotic, best suited to its area and expertise. You can understand how this lead to the elephants moving out to the big Safari Park for example."

"Zoos used to depend upon their big, popular animals for financial survival. Now today's better educated audience is discovering that with exciting displays and marketing, getting close to animals like baboons and pademelons can be just as interesting as the 'big-name' animal attractions of the past."

"Of course, the new electronics help a lot. People can see animals in new exciting ways."

"Faced with multiple major challenges, the zoo began to think more holistically. They integrated fund raising for both construction and long-term operation. This will insure animal enrichment and hi-tech information programs will be properly maintained and upgrade."

"Perhaps the biggest breakthrough, and one of the most challenging, was to allow the animals to take more care of themselves. Keepers were used to doing everything for the animals, whether the animals needed it or not. Now the animals can decide when and what to eat within a dietician's outline; who they want to be with and what they want to do. Hormone studies show that giving choices reduces stress and we believe it helps individual animals develop self-confidence and become more effective and less dependent, thus expressing their true natures while successfully adapting to changing times."

"Yes, it was a good idea to let the monkeys run this new kind of monkey house."