April 5, 2015

It is surprising to learn 99% of transocean data and voice traffic is carried in undersea cables. **Scientific American** reports on a visit to a cablesystem's maintainence operation.

Today, 99 percent of our transoceanic data traffic—including phone calls, text and e-mail messages, Web sites, digital images and video, and even some television—travels across the oceans via undersea cables. These cable systems, as opposed to satellites, carry most of the intercontinental Internet traffic. In her new book, The Undersea Network, New York University assistant professor of media, culture and communication Nicole Starosielski tracks submarine systems as they thread together small islands and major urban hubs, conflicts at coastal landing points, and Cold-War–era cable stations.

In this excerpt Starosielski visits the network operations centers where global cable systems are monitored and maintained by a small group of elite engineers.

Entering the network operations center of a globe-spanning undersea cable system, I find what you might expect: a room dominated by computer screens, endless information feeds of network activity, and men carefully monitoring the links that carry Internet traffic in and out of the country. At first glance, it seems to be a place of mere supervision, where the humans sit around and watch machines do the work of international connection, waiting only for a moment of crisis, such as when a local fishing boat drops an anchor on the cable or a tsunami sweeps the system down into a trench.

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The Economist reports on a study that indicates animals may be able to sense impending earthquakes.

SEISMOLOGISTS tend to greet the idea that some animals know when an earthquake is coming with a sizeable degree of scepticism. Though reports of odd animal behaviour before a quake date back at least as far as ancient Greece, the data are all anecdotal. They are also subject to vagaries of the human psyche: “confirmation bias” ensures that strange behaviour not followed by earthquakes gets forgotten, and “flashbulb memory” can, should an earthquake strike, imbue quotidian animal antics with great import after the fact. The US Geological Survey—arguably the world’s authority on earthquakes—undertook studies in the 1970s to find out if animals really did predict them, but came up empty-handed. However, the latest data, just published in Physics and Chemistry of the Earth, are not just anecdotal.

Friedemann Freund of San Jose State University, in California, and his colleagues considered the earthquake of magnitude seven that hit north-eastern Peru in August 2011. They found that, by coincidence, the nearby Yanachaga National Park had in the month running up to the quake been using nine so-called camera traps. These are employed to track the movements of rare or skittish animals, silently snapping pictures (for example, that above, of a paca) when motion sensors are triggered. ...

Remember when Sweet and Low was said to cause cancer. Turns out according to **Futurity**, it may fight cancer.
Labeled as a cancer-causing chemical for decades and declared safe about 15 years ago, saccharin may actually inhibit the growth of cancer cells, according to new research.

The artificial sweetener shows considerable promise for its ability to block an enzyme upregulated in many cancers that helps tumor cells survive and metastasize, researchers say.

After testing its effectiveness on cancer cells, scientists believe saccharin could eventually lead to the development of drugs that treat highly aggressive cancers affecting the breast, liver, prostate, kidney, and pancreas, says Robert McKenna, professor of biochemistry and molecular biology at University of Florida. ...

Smithsonian Magazine reports on the male bonding rituals of elephants. It does not say they sit around and burp.
I spoke with O'Connell about elephant bonding and getting to know the Mushara posse. (The following has been edited for length.)

Why did you choose to focus your new book on male elephants?

Most people don't realize that male elephants are very social animals. Having company is important to them. They form close bonds and have overtly ritual relationships. When a dominant male arrives on the scene, for example, you have the second-, third-, fourth-ranking bulls back up and let him into the best position at the water hole. The younger bulls will stand in line and wait to be able to place their trunks in his mouth. They are waiting with anticipation to be able to do this. In time, all of the bulls will come and greet the dominant male in the same way. It is extremely organized, like lining up to kiss the ring of a pope or a Mafioso don.

The big, older bulls are targets of poaching. People think of lone bulls out there, and they might think, "What is it going to hurt a population if you cull a few of those elephants?" But these old males are similar to matriarchs. They are repositories of knowledge, and they teach the next generation. ...

Bonding is also important if you're thinking of having a stroke. **The Economist** says stroke victims with companions get faster treatment.
... Stroke victims arriving with someone were more than twice as likely to be correctly diagnosed by the triage nurse, and had their CT scans performed earlier. Patients eligible for clot-busting medication also received it much faster if accompanied, although their numbers were too few for the researchers to be sure it was because they had company. The differences were far from trivial. Patients with one companion had CT scans an average of 15 minutes sooner than those unaccompanied. A second companion shaved a further 20 minutes off the wait, although three or more companions did not confer any additional benefit.

Dr Ifergane did not record who the companions were, however, or how they were able to reduce delays. He believes that it is probably a combination of focusing the attention of clinical staff on their loved ones, and providing basic care such as helping to move patients into bed. ...

NY Times reports on a Finish study that says old folks gotta exercise and get some vitamin D.

Exercise and vitamin D supplements may help prevent injurious falls in older adults, a randomized trial found.

Finnish researchers recruited 409 women ages 70 to 80 who were living at home. They randomly assigned them to one of four groups: a placebo without exercise, daily vitamin D supplements without exercise, placebo with exercise, and vitamin D supplements with exercise. The exercises, done regularly over two years, concentrated on balance, weight bearing, strength and agility. The study is online at JAMA Internal Medicine.

Neither vitamin D supplements nor exercise reduced the number of falls. But compared with the placebo without exercise group, those who took vitamin D alone were 16 percent less likely to be injured in a fall; the placebo and exercise group were 54 percent less likely to be injured; and those who exercised and took supplements were 62 percent less likely to be hurt.

The authors suggest that physical conditioning and vitamin D increase bone density, which could help prevent injury.

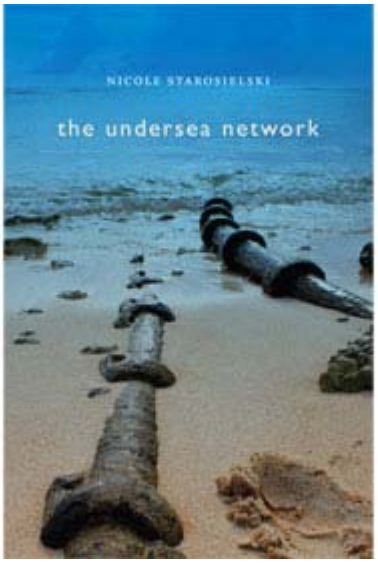
"It's important to develop muscle power, because without muscle power, you can't have good balance," said the lead author, Kirsti Uusi-Rasi, a senior researcher at the UKK Institute for Health Promotion Research. As for vitamin D supplements, she said, "If you have low levels, supplements are important, but if you have sufficient levels, more is not better."

Scientific American

Undersea Cable Network Operates in a State of Alarm

The world's undersea network of transoceanic cables serves as the cardiovascular system for data coursing through the Internet and other communications, but not without a lot of human help

by Nicole Starosielski



Situation Normal: State of Alert New York University assistant professor of media, culture and communication Nicole Starosielski's new book tracks submarine systems as they thread together small islands and major urban hubs, conflicts at coastal landing points, and Cold-War–era cable stations.

Today, 99 percent of our transoceanic data traffic—including phone calls, text and e-mail messages, Web sites, digital images and video, and even some television—travels across the oceans via undersea cables. These cable systems, as opposed to satellites, carry most of the intercontinental Internet traffic. In her new book, *The Undersea Network*, New York University assistant professor of media, culture and communication Nicole Starosielski tracks submarine systems as they thread together small islands and major urban hubs, conflicts at coastal landing points, and Cold-War–era cable stations.

In this excerpt Starosielski visits the network operations centers where global cable systems are monitored and maintained by a small group of elite engineers.

Gateway: From Cable Colony to Network Operations Center
Entering the network operations center of a globe-spanning undersea cable system, I find what you might expect: a room dominated by computer screens, endless information feeds of network activity, and men carefully monitoring the links that carry Internet traffic in and out of the country. At first glance, it seems to be a place of mere supervision, where the humans sit around and watch machines do the work of international connection, waiting only for a moment of crisis, such as when a local fishing boat drops an anchor on the cable or a tsunami sweeps the system down into a trench.

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It would perhaps be more precise to say that cables are always in a state of “alarm.” An “alarm,” in network-speak, is anything from an indication that the cable has been severed to a reminder about a needed computer update. Undersea systems are not so different from our personal computers. They need regular updates and upgrades. They are susceptible to bugs and environmental fluctuations. Sometimes things just don’t work as planned. The men in a network operations center work daily to resolve a continually updated batch of alarms, which at this particular location number around 120–150 per week. The vast majority of these are only warning alarms, which notify them of some approaching threshold, a problem with a backup system, or a source of potential interference. Even if our signals continue to pass through cable systems without delay, the undersea network never quite functions perfectly on its own, that is, without alarm and without human assistance.

System errors can be produced by even the smallest events. The stations where undersea links terminate house immense cooling systems, and with all of the air conditioners blowing dust around, regular cleaning is required. Yet even when companies employ specialized cleaning crews, there is often an increased number of alarms during the process. By contrast, during Christmas the number drops dramatically. An operations manager explains what might seem obvious: “when you haven’t got people touching stuff it tends not to break.” The inside of his station testifies to the danger of human hands. The primary fibers running in from the sea are

labeled with bright tape reading “Danger Optical Fiber,” to warn anyone who enters the station not to touch them. During Super Bowl weekend, another company planned not to have any activity in their station at all, just to ensure that nothing went wrong. The circulation of human bodies, necessary for network operation, inevitably bump, jostle, and set equipment into an alarm state.

Alarms can also be generated by the machines themselves. Although network equipment is supposed to be identical and thus predictable, in reality each device displays remarkably individual behavior and can produce errors without anyone even coming into contact with it. One manager gripes to me that their station just hadn’t gotten the right piece of transmission equipment, and once it had started to have bugs, it required repeated maintenance for most of its life—a kind of problem child. Another cable engineer explains that each machine has been manufactured using different batches of raw materials and assembled at different times. Two circuit packs might be technically identical but might function differently over the course of their lifetime, in part because different computers contain materially different components. The glass or the solder wire may have been of a different quality or come from a different origin. This can result in “batch faults” which occur in a series of equipment manufactured at the same time. The engineer uses an analogy to explain the process: “It’s a bit like making a fruit cake. I can make a fruit cake on Monday and I can make one on Wednesday, but they can be different even if I followed the same recipe. In the one on Monday I might have used 198 grams of sugar and the one on Wednesday I might have had 205 grams of sugar. Very, very minor differences could have an unknown impact sometime in the future.”

The men at this network operations center are tasked with reading the incessant feed of alarms, determining what needs to be fixed, and conducting the necessary maintenance, all without a drop in signal transmission. One technician lets me follow him to a cable station on a routine follow-up to a warning alarm. He explains that there is not a one-to-one correspondence between each alarm and an actual problem with the system. Rather, an alarm is a symptom that something is wrong—an indication of a failed connection. It could be compared to a fever or a rash on the human body: a manifestation of a problem, but not an indication of cause. A full cable break might generate many alarms. In turn, multiple problems might contribute to a single alarm.

As a result, there is a significant amount of human interpretation required to deduce the origin of a problem from an array of alarms. Cable engineers might be thought of as the doctors of the global cable network. Pointing to one rack, which has a light on, this technician says, “See… that machine is in a state of alarm.” He plugs in his computer to figure out what is wrong, but it remains unclear. He then turns to a rack from which several cords extend, plugging into another machine. He looks at the loose cords. “I think that this one here,” he says, picking up a cord, “is supposed to be in here”—he points to a jack— “but I’m not sure.” He’s not ready to risk it. This alarm is only for a backup machine, so it can wait. We leave the station, still not quite sure what the cause is, and head back to the network operations center to consult with the other technicians.

While in some ways the computers that support global networks are not so different from our personal laptops, the stakes are dramatically higher for this kind of maintenance work. The technicians aim to make every backup system, and backup-for-the-backup system, run perfectly. Much of the equipment is designed to function for 25 years, the expected life of an undersea cable, including the repeaters that sit on the bottom of the seafloor. These are some of the most durable computers out there. And yet some parts will develop bugs, and others won’t. Technicians keep detailed records on individual pieces of equipment so they know what each part’s history is. Tracking “what each one’s been through” is critical to maintaining a

reliable network.

Even the smallest discordances in the network need to be addressed. One cable worker describes a problem he had with a piece of equipment that was displaying an alarm state when he looked at it in the landing station, but the alarm was not detected back at the network operations center. As a result, he could not determine where the bug was: in the piece of equipment or in the computers at the center. Even though it was at great cost, the engineer decided to send the equipment out to have its code rewritten, just in case. Even though the alarms are constant, because of this thorough labor, actual failures are few and far between.

Operating undersea networks requires this kind of careful interpretive work and a detailed knowledge of the history of cable equipment, skills that cannot be outsourced to computers. Although we might think of digital networks as purely technical, engineers and technicians are the human components in a system carrying 99 percent of transoceanic Internet traffic. If these workers were to disappear, the system would ultimately collapse. We owe the smooth operation of global communications in part to their ability to act quickly and minimize disruptions.

The level of secrecy of this job, the specialized nature of cabling, and the small number of systems, however, have kept this a fairly insular group of men. Many have been in the cable industry for decades. Even with all of this experience, though, no single person has an understanding of the entire network. In the station that I visited, new servers and stacks have been added, and the technician I interviewed was not familiar with the history of every single one. As a result, engineers depend heavily on each other to solve problems: they must know who to call for what information and how to coordinate system fixes across platforms. The insularity of the cable community supports this interpretive work.

When I ask operators about the vulnerabilities of today’s undersea network, many express concerns about downsizing and retirements. They fear that carefully sustained industry knowledge will be lost and that there will be nobody to take their place that will adhere to the same standards of reliability. Recruiting the next generation of workers is difficult. There is no direct path to the industry and it remains largely invisible to the public. One engineer describes the situation, “Nobody goes to school and says I want to be in the undersea cable business.” In many ways, the operation of the undersea cable system is in opposition to the everyday tech culture: it is built on an ethos of durability, rather than disposability. Many ask who will ensure the continuity of the cable networks, if their industry starts to take a path toward quicker turnover, devalued labor, or planned obsolescence? Who will ensure that the bodies maintaining our undersea networks are as reliable as the cable technology?

The Economist

The chickens are restless

Animals really may be able to sense when a tremor is about to happen

I think he's trying to tell us something

SEISMOLOGISTS tend to greet the idea that some animals know when an earthquake is coming with a sizeable degree of scepticism. Though reports of odd animal behaviour before a quake date back at least as far as ancient Greece, the data are all anecdotal. They are also subject to vagaries of the human psyche: "confirmation bias" ensures that strange behaviour not followed by earthquakes gets forgotten, and "flashbulb memory" can, should an earthquake strike, imbue quotidian animal antics with great import after the fact. The US Geological Survey—arguably the world's authority on earthquakes—undertook studies in the 1970s to find out if animals really did predict them, but came up empty-handed. However, the latest data, just published in *Physics and Chemistry of the Earth*, are not just anecdotal.

Friedemann Freund of San Jose State University, in California, and his colleagues considered the earthquake of magnitude seven that hit north-eastern Peru in August 2011. They found that, by coincidence, the nearby Yanachaga National Park had in the month running up to the quake been using nine so-called camera traps. These are employed to track the movements of rare or skittish animals, silently snapping pictures (for example, that above, of a paca) when motion sensors are triggered.

Well ahead of the tremor, the traps recorded up to 18 animals a day, but that number began to drop off steeply as the earthquake approached. In the five days immediately before it, the traps snapped just three animals. The park's fauna, it seems, had stopped moving around.

Dr Freund believes that what animals sense before earthquakes is airborne electric charge. The idea is that the subterranean grinding of stressed rock which precedes a quake stores charge (not unlike that built up by scuffing shoes across a carpet), some of which then flows to the surface, where it ionises molecules in the air. The varying electric field involved in this phenomenon should be detectable from afar.

The team therefore studied data from two very-low-frequency (VLF) receiving stations in Peru, looking for perturbations of the signals. Sure enough, large disturbances occurred in the two weeks prior to the quake.

The correlation of these several facts is, of course, no guarantee of causation. Dr Freund will have his work cut out to persuade the wider world that what the VLF receiver detects is what animals are sensing, and that it is indicative of an impending quake. But he now has something concrete to work with. It may yet turn out that for millennia, furry and feathery forecasters really were trying to tell human beings something.

Futurity

Can Sweet 'N Low stunt cancer's growth?

by Doug Bennett

Labeled as a cancer-causing chemical for decades and declared safe about 15 years ago, saccharin may actually inhibit the growth of cancer cells, according to new research.

The artificial sweetener shows considerable promise for its ability to block an enzyme upregulated in many cancers that helps tumor cells survive and metastasize, researchers say.

After testing its effectiveness on cancer cells, scientists believe saccharin could eventually lead to the development of drugs that treat highly aggressive cancers affecting the breast, liver, prostate, kidney, and pancreas, says Robert McKenna, professor of biochemistry and molecular biology at University of Florida.

Surprise discovery

The discovery might never have happened if not for Brian Mahon, a curious graduate research assistant who wanted to know how saccharin might affect the enzyme, carbonic anhydrase IX, which is found in aggressive cancers.

But Mahon didn't want to wait a week for an order of pure saccharin to arrive at the lab. "So we just went to a coffee shop and got some Sweet 'N Low. I said, 'Let's just try it' and we did and collected some data," he says.

After doing some initial experimenting, the researchers are collaborating with Susan Frost, professor of biochemistry and molecular biology, to look at saccharin's effect on breast cancer cells.

The researchers "literally took Sweet 'N Low and saccharin and showed that the rate of growth of the cancer cell slows down when you added it," says McKenna, lead author of the new paper that is published in the the journal *Bioorganic & Medicinal Chemistry*.

"The public only remembers the negative attention," says Robert McKenna. "Saccharin was seen as the bad guy and it's definitely not the bad guy. It may actually be a good guy."

How it works

The researchers discovered that saccharin disrupts carbonic anhydrase IX's ability to regulate the cancer cell's pH level—its hydrogen ion concentration. That ultimately makes it harder for the cancer cell to grow and metastasize.

Targeting carbonic anhydrase IX is also an attractive option because it's not expressed in most other cells throughout the body, meaning that healthy tissue should remain unaffected even as cancer cells are weakened, McKenna says.

Any saccharin-based drugs would probably be used in conjunction with traditional cancer treatments such as chemotherapy and radiation. A saccharin drug would slow the cancer's growth, providing the opportunity for radiation or chemotherapy to be more effective at killing off the cancer cell.

"It could help make conventional chemotherapy more effective," McKenna says.

'Bad guy' turned 'good guy'

The irony of a chemical that was once labeled a potential carcinogen now having potential as an anti-cancer agent wasn't lost on the research team. Studies in the 1970s linked saccharin to bladder cancer in laboratory rats, according to the National Cancer Institute.

Congress ordered further study and passed a law in 1977 that mandated a warning label. Later studies found that the cancer incidence in rats was irrelevant to humans, leading to a repeal of the labeling requirement in late 2000. The US Food and Drug Administration declared saccharin safe for consumption the following year.

“The public only remembers the negative attention. Saccharin was seen as the bad guy and it’s definitely not the bad guy. It may actually be a good guy,” McKenna says.

The researchers want to further test saccharin’s effectiveness in cancer cells and eventually move to mouse models. This summer, they plan to submit grant requests that will allow additional study and build on the data that have been acquired.

Smithsonian

Elephants Have Male Bonding Rituals, Too

In her new book, Caitlin O'Connell shows how the interactions of tight-knit bulls can be surprisingly similar to human relationships

by Elizabeth Quill

Ecologist Caitlin O’Connell has spent more than two decades observing elephants on the sandy plains of Etosha National Park, in northern Namibia. She arrives sometime in June each season, sets up camp and settles into her data collection, recording the elephants’ comings and goings, as well as their interactions, from a tower north of Mushara water hole. “The pattern of animal movements demarks the passage of time almost as reliably as the cycles of the sun and moon,” she writes in her new book, *Elephant Don: The Politics of a Pachyderm Posse*, out in April from University of Chicago Press.

African elephants are known for their matriarchal societies, with a dominant female leading a clan that includes her young and their offspring. Males are born into these families, and sisters, mothers and aunts care for the young elephants. As they mature into bulls, the males are kicked out of the group and sent off to fend for themselves. But they don’t become lone wanderers detached from any community, as O’Connell’s recent research at Mushara highlights. They travel together, drink together, urge one another into action and form friendships that, like human relationships, might change with the seasons or last a lifetime.

I spoke with O'Connell about elephant bonding and getting to know the Mushara posse. (*The following has been edited for length.*)

Why did you choose to focus your new book on male elephants?

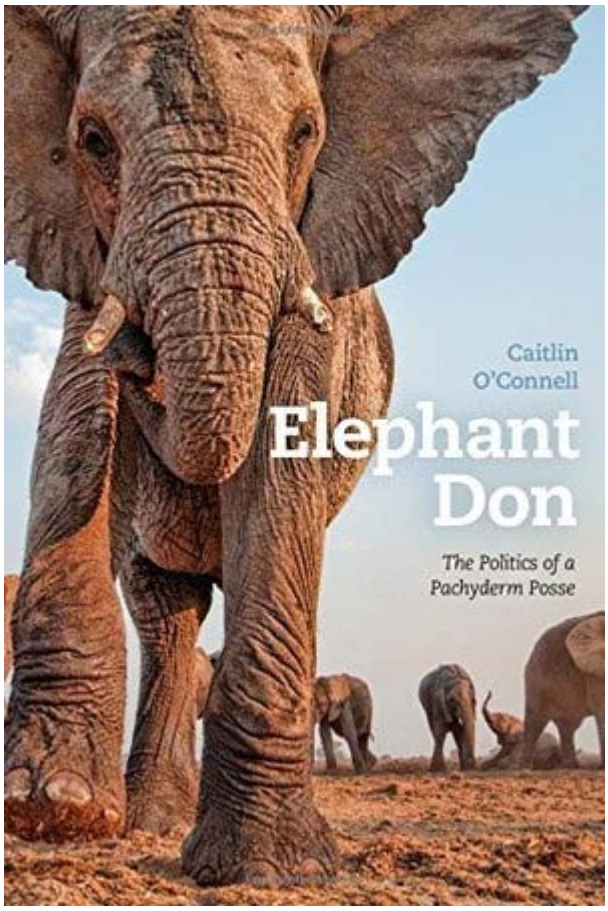
Most people don’t realize that male elephants are very social animals. Having company is important to them. They form close bonds and have overtly ritual relationships. When a dominant male arrives on the scene, for example, you have the second-, third-, fourth-ranking bulls back up and let him into the best position at the water hole. The younger bulls will stand in line and wait to be able to place their trunks in his mouth. They are waiting with anticipation to be able to do this. In time, all of the bulls will come and greet the dominant male in the same way. It is extremely organized, like lining up to kiss the ring of a pope or a Mafioso don.

The big, older bulls are targets of poaching. People think of lone bulls out there, and they might think, “What is it going to hurt a population if you cull a few of those elephants?” But these old males are similar to matriarchs. They are repositories of knowledge, and they teach the next generation.

Are there other rituals the males follow?

You'd think that a male might show up at a water hole, and he might interact with the others and then leave. Why would he want those younger bulls to follow him to another water hole? But the dominant male will actually corral up his constituents. Even if they aren't ready to leave, he will force the younger ones by pushing on their behinds.

And there's a second ritual, a vocal ritual between bonded individuals. The dominant male will make the call to leave, what we call a "Let's go" rumble, similar to what a matriarch would emit. Another male elephant, right as the first finishes, will also rumble, and then a third might rumble. And all the elephants will follow the dominant male out.



[Elephant Don: The Politics of a Pachyderm Posse]

Elephant Don: The Politics of a Pachyderm Posse [Caitlin O'Connell] on Amazon.com. *FREE* shipping on qualifying offers. Meet Greg. He's a stocky guy with an outsized swagger. He's been the intimidating yet sociable don of his posse of friends-including Abe

Introduce us to Greg, the dominant male at the center of your story. Why is he the one in charge?

Greg is not the biggest bull, not the oldest, and he doesn't have the biggest tusks. He *is* very strong-willed and he is a great politician. He is the most felicitous and gentle dominant bull that I've witnessed. He actively solicits the young bulls and gets them into the fold and welcomes them. He's also very quick to discipline someone who gets out of line in the higher ranks. It's like he knows how to manage the carrot and the stick.

I've seen other bulls try to become more dominant and raise their rank, but they are so overly aggressive that other bulls don't want them around. There's an elephant Beckham, and he is clearly trying to become friends with a bonded pair, Keith and Willie, but he becomes so aggressive that they don't want him to follow them.

You've mentioned a few other elephants now. Willie, which is short for Willie Nelson, right? And there's a Prince Charles, a Luke Skywalker. How do you decide on the names?

We try to match the name to at least one physical feature. Willie Nelson is very raggedy. Every elephant has a catalog number, but these names help us in our practical dealings with everyday identification. There are several rock stars in the mix, because of these really long, black, scraggly tails that the elephants have. Ozzy Osbourne is another one.

And do these elephants also have different personalities?

As it turns out, Willie Nelson is a very mild, gentle fellow. All the females seem attracted to him. Another interesting character is Prince Charles, who was a very aggressive, lower-ranking bull until, at one point, Greg went missing. Before Greg went missing, younger bulls would admire Prince Charles and want to follow him and he would never let them. He would look over his shoulder, stop, turn around and give them a big head shake, like "You are not following me." After Greg went missing, though, Prince Charles completely changed his behavior. He became much more diplomatic and much more interested in trying to get a posse of his own.

What other kinds of circumstances might shake up the hierarchy?

Social animals are thought to form dominance hierarchies to minimize conflict over access to resources, in this case, especially, water. If you don't have limited resources, you don't need to have such a strict linear hierarchy. In the drier years, the elephants form these big, tight-knit groups. But in the wetter years, when there are more resources, more places to drink, that hierarchy breaks down. In the wetter years, the youngsters will get a little more aggressive. They aren't as reverent.

During these wet years, you could see times when Greg was struggling to hold his power. He would initiative a "Let's go" rumble, and then look back and nobody has moved. This is really embarrassing. They are ignoring him. When he comes back, he has to physically coerce by shoving, by rubbing up against close associates that are lower in rank.

Do we know how long Greg's dominance will last?

When I first started keeping track of dominance between males, Greg was clearly the dominant bull. I started asking colleagues who study other long-lived social animals, "What's the life expectancy of the dominant individual?" It is very stressful to be up there, fighting off the others constantly and having to keep your rank. I was surprised how little information there was out there.

There is a window in which Greg is wounded, and we have never learned for sure exactly what happened. There was a slice off the side of his trunk. It was very raw. He'd have to spend double the time drinking because half of the water would fall out; there'd be this spilling noise. And, after drinking, he would soak it in the water for an hour. Nobody wanted to wait around with him. And he did not want to be with associates his age or older. If anyone approached, he would be aggressive.

But then the following year, he came back fully fit again. He wasn't skinny. His ribs weren't showing. He looked healthy again, and his trunk wound was not as raw. He didn't have to soak it. He was back at the height; it was the most amazing thing. He had his posse, and all of those just underneath him in rank fell back in line. The durability of his position at the top, even with fluctuations in wet years, made me think, well, as long as he is fit, he is going to stay on top.

You have another book coming out, a novel about illegal ivory poaching. Why write fiction?

The novel [*Ivory Ghosts*] has been a 20-year labor of love, but it's for a different purpose—to get people to understand what it is like for people to live with elephants on the ground, the very subtle politics of how to conserve elephants, and what's the right way, and how do deal with the craziness of Africa. It's about corruption and trust and how to build solidarity for the elephant.

What inspired the story was working for the Namibian government in the Caprivi region. My husband and I were scientists contracted to the Ministry of Environment and Tourism. I was so inspired by our boss and the rangers that he managed, their dedication to elephants and protecting them against poachers and putting their lives on the line at every moment that they were out on patrol. They were such colorful, dedicated characters. The book is based on a lot of experiences we had. I specifically wanted to write it as fiction to get past the idea of preaching to the choir. I wanted to be able to spread the word.

The Economist

Someone to hold your hand

Having a companion can get a stroke victim faster treatment

EVERYONE arriving at a hospital's emergency room (ER) wishes to be seen quickly, but for stroke patients it can be a matter of life or death. The most common stroke involves a blood clot blocking vessels in the brain, killing brain cells nearby almost immediately. Luckily, an effective treatment exists. Thrombolytic therapy uses drugs to dissolve the clot and restore the flow of blood. If started within a couple of hours of a stroke occurring, it can limit brain damage and reduce long-term disability. Neurologists even have a catchphrase for this: "time is brain".

Understandably, hospitals strive to identify stroke cases and administer such medication without delay. A key step is using a computed tomography (CT) scanner to ensure that there has been no bleeding in the brain, in which case thrombolytic drugs would make things worse. The last couple of decades have seen many innovations in reducing this "time to CT". Paramedics have been trained to recognise strokes and warn hospitals in advance, CT machines moved into emergency departments, and drugs pre-mixed to inject directly following a successful scan.

But in shaving seconds from medical procedures, researchers may have neglected something more important: the human element. Gal Ifergane, a neurologist at Soroka University Medical Centre in southern Israel, noticed that stroke patients who were accompanied to the ER by friends or family seemed to fare better than those who arrived alone. So for 15 months, ER staff at Soroka recorded the number of companions escorting each stroke sufferer, over 700 in all, and tracked their progress.

The results, recently published in *Medicine*, tell a striking story. Stroke victims arriving with someone were more than twice as likely to be correctly diagnosed by the triage nurse, and had

their CT scans performed earlier. Patients eligible for clot-busting medication also received it much faster if accompanied, although their numbers were too few for the researchers to be sure it was because they had company. The differences were far from trivial. Patients with one companion had CT scans an average of 15 minutes sooner than those unaccompanied. A second companion shaved a further 20 minutes off the wait, although three or more companions did not confer any additional benefit.

Dr Ifergane did not record who the companions were, however, or how they were able to reduce delays. He believes that it is probably a combination of focusing the attention of clinical staff on their loved ones, and providing basic care such as helping to move patients into bed.

Little research has been carried out into the impact of companions during medical treatment. Many hospitals currently have a policy of admitting only one family member to the emergency room, and some discourage visitors altogether, to avoid them getting in the way of busy doctors. An experiment in Michigan in 2009 found that the presence of a distraught family witness (actually an actor) during a simulated cardiac arrest delayed physicians delivering vital defibrillation shocks. Other studies, however, have not found the quality of care in cardiopulmonary resuscitation, paediatric trauma and other procedures to be affected by family members.

Dr Ifergane admits that his study has limitations. The sample size was rather small and his findings may reflect cultural norms in Israel that do not apply elsewhere. But he has already tried to make changes in the way the Soroka University Medical Centre operates. “We asked our security team to allow two people to come in with stroke patients rather than just one,” he says. “And we now consider stroke patients who are coming alone as a group at risk.”

Dr Ifergane also recommends that ERs provide a friendly “stroke liaison” to accompany lone patients during the diagnostic and treatment processes. Something other hospitals might think about, too.

NY Times

Exercise Beats Vitamin D for Injury Prevention

by Nicholas Bakalar

Exercise and vitamin D supplements may help prevent injurious falls in older adults, a randomized trial found.

Finnish researchers recruited 409 women ages 70 to 80 who were living at home. They randomly assigned them to one of four groups: a placebo without exercise, daily vitamin D supplements without exercise, placebo with exercise, and vitamin D supplements with exercise. The exercises, done regularly over two years, concentrated on balance, weight bearing, strength and agility. The study is online at JAMA Internal Medicine.

Neither vitamin D supplements nor exercise reduced the number of falls. But compared with the placebo without exercise group, those who took vitamin D alone were 16 percent less likely to be injured in a fall; the placebo and exercise group were 54 percent less likely to be injured; and those who exercised and took supplements were 62 percent less likely to be hurt.

The authors suggest that physical conditioning and vitamin D increase bone density, which could help prevent injury.

“It’s important to develop muscle power, because without muscle power, you can’t have good balance,” said the lead author, Kirsti Uusi-Rasi, a senior researcher at the UKK Institute for Health Promotion Research. As for vitamin D supplements, she said, “If you have low levels, supplements are important, but if you have sufficient levels, more is not better.”

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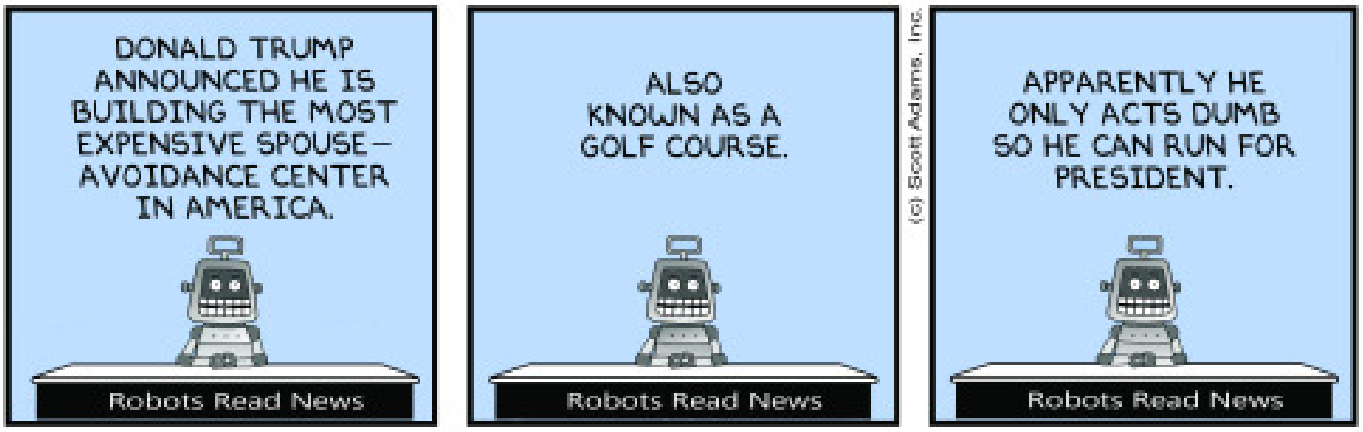

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