

Focal Point

The Newsletter from Southwest Precision Instruments
132 North Elster Drive • Tucson, AZ • Tel./Fax 520.546.4986 • swpinet.com

March, 2010

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Figure 1. Sunrise on the Congo River, Democratic Republic of Congo.

The Physician and the Microscope: Making A Difference and Saving Lives

Every so often, if you're lucky, you encounter a person or a situation that brings into focus the fragility of life and the absolute necessity of helping others. This is one of those stories.

It started with a call from Lee Jeffrey in Colorado. Lee was looking for a used microscope for work in a remote location. He needed a mirror for illumination rather than a bulb.

Electricity was intermittent and couldn't be counted on, and batteries would be nonexistent or in short supply. Lee needed the

most basic form of illumination: The sun.

But those few details don't do justice to this story. Lee Jeffrey is Dr. Ransy Lee Jeffrey. He's an OB-GYN (obstetrician-gynecologist) in Fort Collins, Colorado. That's his "Clark Kent" persona.

Lee's "Superman" persona is a medical missionary. He's involved with the United Methodist Committee on Relief (UMCOR). Lee's team is dedicated to revitalizing and refurbishing a remote hospital in Africa.

They have their work cut out for them.



Figure 2. A typical hospital lab in Democratic Republic of Congo.

Samuteb Hospital is in Katanga Province of The Democratic Republic of Congo, or DRC, formerly called Zaire.

Located about 30 miles from the Angola border, the hospital

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has been occupied and devastated by several armies during the Second Congo War, also called “Africa’s World War” and “The Great War of Africa.” It is the deadliest conflict worldwide since World War II.

It’s almost impossible to grasp the gravity of the situation and the immensity of the problems. The numbers are too large to make sense to most of us. Consider the following:

- The DRC is a country of vast natural resources, but it has been devastated by war with unwelcome participation from at least seven other African nations, as well as numerous armed groups.

- **5.4 Million people** were dead by the end of 2008, mostly from disease and starvation.

- **Millions** have been displaced from their homes and are seeking asylum.

- **45,000 people die monthly** from preventable causes.

- **Almost half of the dead are children under the age of 5.**

- There are **more than 6,000 reported cases of rape per year.**

- **Ten percent of newborns and 4 percent of mothers die** at Samuteb Hospital during or shortly after childbirth.

- Common causes of childhood death include **pneumonia, diarrheal diseases, malaria, measles, AIDS and malnutrition.**

- Supplies to Samuteb Hospital come from Lubumbashi, **500 miles away.** A supply trip to

Samuteb takes **12 days** in the dry season and **20 days** in the wet season.

- Water for the hospital comes from **12 miles away**, but a deteriorated supply system provides only small, sporadic flows.

And in the middle of this war and devastation Dr. Jeffrey and his wife, Carla, will be on a 10-member medical team. They will be working to renovate and revitalize Samuteb Hospital, to educate the staff and to treat the ill, and to make a difference in this world.

The team members will be addressing the infrastructure and the problems of power and water, as well as training the hospital staff as they see patients.

A major problem in female patients is vaginal fistulae, resulting from obstructed labors and traumatic rapes. These problems stem from pregnancy in the early teens before the pelvis is fully developed.

HIV/AIDS, the causes of sexual violence, the acute and long-term care for the survivors of rape, and malnutrition will also be subjects of the team’s efforts.

As one of the tools for the hospital’s laboratory, Dr. Jeffrey will be bringing the latest in microscope technology with him. Rather than a used microscope with a mirror, we supplied the group with a new [Micros MC50 microscope](#) with a solar cell recharging system.



Figure 3. The solution: A Micros microscope from Austria with a solar cell array to recharge its built-in batteries.

With modern technology the sun can be harnessed in more than one way for illumination. A solar cell array can be used to generate an electrical current that recharges built-in batteries in the microscope. This is the technology that is used in the Micros microscope.

Soon doctors and technicians will be reading slides at Samuteb Hospital, making diagnoses and saving lives. And they’ll be using their microscope after the sun goes down.

Further Reading

To learn more about Samuteb Hospital, [click here.](#)

For more information about The Democratic Republic of Congo, [click here.](#)

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To read about Africa's children at war, [click here](#).

To learn more about the Second Congo War, [click here](#).

The oldest continuously inhabited settlement in North America is the Hopi Village of Oraibi, Arizona, established in 1100 A.D.

Oraibi is governed by a village chief. It does not have any representatives on the Hopi Tribal Council, it has no village administration, and it rejects all funding from the Tribal government.

Visits by non-Hopi are controlled, and visitors may not take photographs or use video cameras. Entering buildings and disturbing sites in any way are forbidden.

Green Tea May Protect Against Eye Diseases



Figure 4. Green tea for eye health? It looks like there's a link with catechins in green tea.

New research from Hong Kong suggests that green tea may protect against eye diseases such as glaucoma. Researchers found green tea antioxidants called catechins present in various tissue structures in the eyes of laboratory rats after they had ingested green tea.

Catechins belong to the family of antioxidants that includes vitamin C, vitamin E, lutein, and zeaxanthin and is well-known for its disease-fighting properties.

Until this study, however, nobody knew if green tea catechins actually passed from the stomach and gastrointestinal tract into the tissues of the eye.

Dr. Chi Pui Pang, of the Hong Kong Eye Hospital, and colleagues examined the eyes of rats that had been fed green tea extract for varying amounts of time.

When they examined the cornea, lens, retina, choroid-sclera, vitreous humor, and the aqueous humor, they found evidence that these various eye structures had absorbed significant amounts of catechins.

Source: [Medical News Today](#)

"You can live to be a hundred if you give up all the things that make you want to live to be a hundred."

Woody Allen

Prozac and Celexa Have Anti-Inflammatory Effects



Figure 5. Prozac and some of its cousins may have new beneficial effects.

A new study has found that fluoxetine (Prozac®) and citalopram (Celexa®) treatment significantly inhibited disease progression of collagen-induced arthritis (CIA) in mice.

Dr. Sandra Sacre, from the Brighton and Sussex Medical School (BSMS) in the UK, led a team that studied the anti-arthritic potential of these drugs, known as selective serotonin reuptake inhibitors (SSRIs), most commonly used to treat depression.

Both SSRIs exhibited anti-inflammatory effects and may provide drug development opportunities for arthritic conditions such as rheumatoid arthritis (RA).

Source: [Science Daily](#)

Hummingbirds can fly upside-down.

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Cooling Stroke Patients from the Inside Out: Device Placed in Vein Chills the Blood

A tiny device placed inside a central vein can safely refrigerate blood as it flows through stroke patients, lowering their temperature and raising the possibility that they might gain brain protection from hypothermia without having to be packed in ice.

Although the trial didn't find that stroke patients getting their blood cooled fared any better or worse than a comparison group of patients who weren't cooled, the technology proved safe enough to clear the way for testing the device in a much larger group, said Thomas Hemmen, a neurologist at the University of California, San Diego Medical Center who presented the data February 25 at the International Stroke Conference.

The new results also demonstrate that stroke patients can be cooled to 91.4 degrees Fahrenheit safely while they are receiving a powerful clot-busting drug called tPA, the standard treatment given to patients during the first few hours of a clot-induced stroke.

Source: [Science News](#)

"With my sunglasses on, I'm Jack Nicholson. Without them, I'm fat and 50."

Jack Nicholson

Materials Science: Water Practically Flies Off 'Near Perfect' Hydrophobic Surface

Engineering researchers have crafted a flat surface that refuses to get wet. Water droplets skitter across it like ball bearings tossed on ice.

The inspiration? Not wax. Not glass. Not even Teflon.

Instead, University of Florida engineers have achieved what they label in a new paper a "nearly perfect hydrophobic interface" by reproducing, on small bits of flat plastic, the shape and patterns of the minute hairs that grow on the bodies of spiders.

"They have short hairs and longer hairs, and they vary a lot. And that is what we mimic," said Wolfgang Sigmund, a professor of materials science and engineering.

A paper about the surface, which works equally well with hot or cold water, appears in this month's edition of the journal *Langmuir*.

Spiders use their water-repelling hairs to stay dry or avoid drowning, with water spiders capturing air bubbles and toting them underwater to breathe.

Potential applications for UF's ultra-water-repellent surfaces are many, Sigmund said. When water scampers off the surface, it picks up and carries dirt with it, in effect making the surface self-cleaning.

As such, it is ideal for some food packaging, or windows, or

solar cells that must stay clean to gather sunlight, he said. Boat designers might coat hulls with it, making boats faster and more efficient.

Source: [Science Daily](#)

Low Levels of Vitamin D Linked to Muscle Fat, Decreased Strength in Young People

A ground-breaking study published in the March 2010 *Journal of Clinical Endocrinology and Metabolism* found an astonishing 59 per cent of study subjects had too little Vitamin D in their blood.

Nearly a quarter of the group had serious deficiencies (less than 20 ng/ml) of this important vitamin.

Since Vitamin D insufficiency is linked to increased body fat, decreased muscle strength and a range of disorders, this is a serious health issue.

"Vitamin D insufficiency is a risk factor for other diseases," explains principal investigator, Dr. Richard Kremer, co-director of the Musculoskeletal Axis in the Research Institute of McGill University Health Centre in Montreal.

"Because it is linked to increased body fat, it may affect many different parts of the body. Abnormal levels of Vitamin D are

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associated with a whole spectrum of diseases, including cancer, osteoporosis and diabetes, as well as cardiovascular and autoimmune disorders."

Source: [Science Daily](#)

UN Warns: HIV/AIDS is Leading Cause of Death in Women

HIV has become the leading cause of death and disease among women of reproductive age worldwide, the UN program on HIV/Aids (UNAids) says.

At the start of a 10-day conference in New York, UNAids launched a five-year action plan addressing the gender issues which put women at risk.

One of the key issues, it says, is that up to 70% of women worldwide have been forced to have unprotected sex.

UNAids says such violence against women must not be tolerated.

"By robbing them of their dignity, we are losing the opportunity to tap half the potential of mankind to achieve the Millennium Development Goals," said Executive Director Michel Sidibe.

"Women and girls are not victims, they are the driving force that brings about social transformation," he said.

Source: [BBC](#)

Funny 404 Error Messages

OK, you're sitting at your computer right now, and you've been staring at the monitor for – how long? Forever?

Let's take a break for a few minutes and explore a corner of the Internet devoted to the dreaded "404 – File Not Found" error message.

Web designers often show a refreshing, and occasionally perverse, sense of humor when they modify that ho-hum 404 message that your browser cranks out when it can't find the page you requested.

If you don't see any funny business below, open your browser and copy and paste the links into your browser's address bar.

Nerdy, but cute:
<http://patterntap.com/404>

An "Oh Crap" kind of a day:
<http://www.itchyrobot.com/404>

It's the same in any language. Things get lost:
<http://www.frettiqgestoord.nl/404.html>

At least the Geek Squad has a sense of humor:
<http://www.geeksquad.com/404.html>

Your page has been consumed by a goat:
<http://www.thenorthface.com/404>

Birds on a wire:
<http://www.fryewiles.com/templates/errors/404.html>

Time to take a break, pal:
<http://www.ziff.net/404/404.htm>

A dinosaur ate my page! Waaaah!
<http://macfarlane.ws/404.htm>

How do you say that in Tagalog?
<http://www.ibiblio.org/usernet-i/groups-html/alt.comp.virus.html>

A presidential 404:
<http://meenainc.com/404.php>

Lost in Space:
<http://www.jmaika.com/erre/404.html>

Quick! Call the travel agent!
<http://www.madeirablog.eu/404>

These error messages, and more, can be found at **The 404 Research Lab:**
<http://www.plinko.net/404/>

"The taxpayers are sending congressmen on expensive trips abroad. It might be worth it except they keep coming back!"

Will Rogers

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Figure 2: Paul Jeffrey, Kairos Photos. Image from "Saving Lives in the Democratic Republic of the Congo." (http://gbgm.umc.org/global_news/full_article.cfm?articleid=5574). Reprinted under license (22 February 2010).

Figure 4: Public domain image by Anna Cervova, Public Domain Pictures.net (<http://www.publicdomainpictures.net/view-image.php?image=831>). (22 February 2010).

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