

A note in the sky

Measuring the ozone hole. A warning about dangerous radiation levels



can help cause skin cancer, injure eyes, harm the immune system of people below and upset the balance of entire eco-systems.

The green laser beam is emitted from a highly sensitive millimeter-spectral radiometer from Japan's Nagoya University which measures ozone profiles and is part of an international effort to understand the phenomena of the ozone layer and its ozone hole.

Under the umbrella of JICA, Japanese experts principally from Nagoya University's solar terrestrial environment laboratory have been working for several years with local experts in the southern Argentine city of Rio Gallegos to gather and collate information on the ozone hole.

Their headquarters are five converted shipping containers located on a remote airfield chosen because of the frequent cloud-free nights which allow the laser experiments to be held unimpeded. The multi-million dollar, highly sensitive spectral radiometer was shipped in 2010 during a hazardous days-long journey from neighboring Chile.

Together with other sophisticated equipment the radiometer has helped turn "a dream into reality" for scientific researchers according to Dr. Jacobo Omar Salvador who has spent six years working in this "container world" and has also undergone advanced training in Japan.

In addition to its purely scientific research, the JICA project, which finishes during 2011, also helped develop a warning system against unnecessary exposure to UV light for Rio Gallegos and nearby residents and an educational program for local schools.

In front of the city's environmental center a device which acts in the same way as a traffic light flashes green when intensity levels are normal, but red or purple signals the need to take protective measures. Sensor readings are available on line.

The dangers are real. One female volunteer at the environmental center said, "We are very aware of the problem. I and several of my friends have developed skin problems." A 57-year-old who worked for several years at the local garbage dump points to his very red nose and told a visitor: "This is the result of the UV problem. It is an everyday worry."

The hole owes its origins to the development in the 1920s of non-toxic, non-flammable refrigerants from chlorofluorocarbons. A major adverse side effect was an attack on and a gradual breakdown of the ozone layer in the presence of high frequency UV light.

This chemical process works best in cold conditions with the resultant ozone hole over Antarctica. ■

The 'Kissing Bug'

WHEN CHARLES DARWIN launched the science of evolution following his famous global voyage on the ship HMS Beagle in the 1830s one unwelcome species he carried back with him to England was a parasite known as trypanosoma cruzi.

These blood sucking triatomine insects cause chagas disease, sometimes known euphemistically as the 'kissing bug' because of its method of transmission. But despite that benign designation, it has caused widespread death and destruction through South and Central America for centuries.

Darwin reputedly was a notable victim but it has only been in the last few decades that concerted efforts have been made to combat the disease which is endemic in 21 Central and South American countries.

Until recently as many as 50,000 mainly poor, rural people were dying each year, the number of new victims increased by 700,000 annually and the economic costs to the region were counted in billions of dollars.

JICA, working with the World Health Organization (WHO), the Pan American Health Organization (PAHO), national governments and local communities, has helped

engineer a major turnaround in the battle against a disease which is five times more harmful even than malaria in affected areas.

From 1991 through 2014 the Japanese development agency allocated a total of 2.26 billion yen to help Guatemala, Honduras, El Salvador, Nicaragua and Panama in a variety of activities.

They include conducting initial surveys on the scope of the problem, dispatching dozens of long-term and short-term experts and volunteers to the region,

training national and community officials, financing such practical projects as widespread insect extermination operations and education awareness campaigns and establishing a surveillance system to prevent new outbreaks of the disease.

The results have been encouraging in the fight against a disease which was largely ignored for decades by local and international organizations and not even known by its victims.

There are an estimated 10 million people infected by chagas worldwide and an additional 25 million people 'at risk.'

But significantly the anti-chagas campaign is now well organized and coordinated and the number of new cases each year has dropped from around 700,000 to some 41,000 and the number of deaths from as many as 50,000 to around 10,000. ■



Raising awareness of the kissing bug

FROM THE BELLY OF A CONVERTED WHITE shipping container a razor thin green laser beam shoots vertically into the icy but clear skies near the tip of South America.

The 10 mm diameter beam can reach heights of 80 kilometers and is help-



Special billboards warn children of the dangers of UV light

ing to unlock the secrets of the so-called 'ozone hole' - a tear 1 1/2 times the land mass of the United States in the earth's protective ozone layer which gyrates annually over Antarctica and the extremes of the southern continent.

The ozone hole, first discovered in the late 1970s by startled scientists, allows damaging high-energy radiation to freely bombard the earth beneath, and



Checking for early signs of chagas

