ANDEX INTERNATIONAL

Volume 22, No. 6
November-December 1995

INSIDE:

Solar Eclipse DXing

Annular eclipse of April 29, 1995, approaching maximum.

The eclipse at maximum.

by Rich McVicar

In April, three broadcasters from HCJB were thrilled to be on their way to southern Ecuador to view an annular eclipse of the sun.

Solar eclipses occur when the moon comes directly between the sun and the earth and, from a perspective on a specific location on earth, covers up part or all of the sun. The most spectacular eclipses are total, where the sun is completely covered by the moon's disk. These are also the rarest types of eclipses. A partial eclipse occurs when the moon covers only part of the sun.

An *annular eclipse* is a type of partial eclipse. As with a total solar eclipse, the sun, moon and earth are all perfectly lined up so that the moon is directly in front of the sun. However, because the moon is a little further from the earth than it is during a total eclipse, its disk is not big enough to completely cover the sun. The result is that, at the eclipse's maximum, there is still a "ring of sun" around the moon. *Annular* comes from the Latin word *annulus*, which means "ring."

On April 29, 1995, an annular eclipse was taking place on a narrow path stretching from the Pacific Ocean west of South America through the border area between Ecuador and Peru and ending far to the east in the Amazon area of Brazil. Calculations determined that the famous southern Ecuadorian town of Vilcabamba would be within that narrow path.

Vilcabamba, in Loja province, is best known for the *ancianos* (elderly people). People in that region claim life spans reach 120, even 130 years. We were told that although there are people who still claim to be that old, the true *ancianos* have all passed away.

Tourism in that area is growing, with the lure of the "Sacred Valley of Youth" and its healthy water and plants. HCJB broadcasters Allen Graham and myself as well as Christian Center of Communications

Solar Eclipse DXing

(cont. from p. 1)

student Armin Eitzen stayed at the *Hostel Madre Tierra* (Mother Earth Hostel), where we met many Israelis, Germans, Canadians, an Alaskan and one traveler from Belgium. Also there was a troop of British jugglers, who travel to remote areas of the planet to view eclipses and earn their way with juggling displays!

April 29 began partially cloudy, which made us wonder if we'd be viewing the eclipse later on or be praying vigorously for high winds to take the clouds away. Allen, Armin and I drove into town and set up a few microphones and tape recorders in the town square. Allen quickly made friends with the children, sharing a *pancito* (bread) and showing them how to safely view the upcoming event.

Allen Graham interviews children in the town square in Vilcabamba.

My plan was to monitor the lower shortwave frequencies to detect if and how the eclipse would affect propagation. In 1991, during a total eclipse in Colombia, my wife, Lisa, and I noticed how during the mid-afternoon, tropical band stations in neighboring countries would fade in during the initial partial phases of the eclipse and slowly fade out as the eclipse tracked eastward.

Allen Graham shares a pancito (bread) *with one of the children in Vilcabamba, showing him how to safely view the eclipse.*

The same phenomenon occurred with this eclipse, but not with the same starkness as noticed on July 11, 1991. This time it occurred with stations ranging from northern to mid-Peru. These stations would either be in the annularity path or up to several hundred km to the south of it. As an example, one station which was actually in the annularity path was Radio Eco in Iquitos, Peru. Radio Eco was heard with a weak signal at 11 a.m. As the eclipse approached, the signal slowly improved. By mid-eclipse, at 1236 p.m. EST, Radio Eco's signals were quite strong. After mid-eclipse, the signals remained strong as mid-eclipse approached Iquitos itself at 1258 EST. (Iquitos is located several hundred km east of Vilcabamba.) After 1 p.m., signals from Radio Eco slowly weakened. Why? What happened?

For a signal on 60 meters to travel from Iquitos to Vilcabamba (about 650 km), it bounces once off of the E-layer of the ionosphere. As the ASAPS computer propagation program shows, signals are there during the hours around midday, but they are not very strong. At night, signal levels increase greatly. This is due to the existence of a lower layer of the ionosphere, called the *D-layer*. The D-layer is formed by direct rays from the sun and therefore exists only during daylight hours. On lower frequencies, such as those in the 60 meter band, the D-layer absorbs most of the signals, not allowing them to reach the higher layers to be bent back to earth.

However, during a solar eclipse, the sun's ultraviolet rays are blocked in the very small region of the ionosphere which is in the moon's shadow. In this region, the D-layer is weakened, allowing low frequency signals to pass through and be bent by higher layers. The reason

(cont. on p. 6)

My Favourite QSL

Franz's favorite QSL card, from Slovak Radio.

Silhouette of Bratislava Castle and skyline.

Franz Schwartz, Jr., (Andex # 322) writes: "Ever since I first started listening to shortwave radio in the 1950s, I have been fascinated by this thing called QSL. Since that time I have probably collected several thousand cards from hundreds of stations and from almost two hundred different countries.

"But my favorite QSL did not arrive until 1994. It is from Slovak Radio in Slovakia. The reason it's my favorite QSL is because the silhouette of the Bratislava Castle and the Bratislava skyline is pictured below the words, 'Good Listening and 73.'

"I was born and raised, until 10 years of age, right outside of Bratislava. I remember seeing this silhouette on clear days from the farm fields where I used to accompany my parents. My place of birth was approximately 14 km from Bratislava. Little did I know then that someday I would live in the United States and listen to a station from Slovakia and receive a card called "QSL," picturing that lovely silhouette of the castle and the skyline that I so fondly remember from my childhood.

"I would like to hear from ANDEX members who have had this same experience," says Frank.

DXer of the Month

Congratulations to **James Falleni** (Andex #8863), **DXer of the Month!**

James Falleni, whose equipment includes a Sono Vox stereo recorder, Sony ICF SW 7600 receiver and a Sharp Nicam stereo VCR.

"I am 78 years of age," James says.

"Prior to retirement I worked as a chemist.

"My hobbies include electronics, radio and TV.

"I have installed a 25-inch Phillips TV Nicam Stereo TeleText and am in the process of connecting a Nicam Stereo-VCR and trying a new aerial system."

If you'd like to write to James, his address is: 253 Victoria St. West, Pukekohe 1800, Auckland, New Zealand.

HIGH in the Clouds

by Allison Pollock

It had rained on and off during the night, and a thick fog encompassed the campers and their tents. Small trees and shrubs that no one noticed the night before were more visible against the dense backdrop. It was as if they sprang up overnight. Wild horses were faint shadows as they moved closer, seemingly unaware of the people sitting around the fire eating breakfast. Except for the occasional bird or the voices of campers in between bites of food, there was a peaceful quiet. As I looked around me during the early morning hours at Cotopaxi National Park, named for the volcano, I couldn't see more than about 100 feet (approximately 30 meters) away. In fact, I would have guessed that God had picked up the mountains and moved them while we were asleep.

Summer missionary trip to Mt. Cotopaxi.

After breakfast, the eight of us--mostly summer missionaries--gathered around the fire for a short devotional. I thought about the settings where Jesus had taught his disciples. Perhaps they, too, had sat around a fire in the early morning fog. I felt closer to God for those few moments, while sitting outside surrounded by His creation, learning about Him.

The fog slowly lifted, and we could see the bright tents of other campers off in the distance. The horses had left, perhaps because the fog could no longer hide them. The mountains still were not visible, but it was early. The sun began its journey from behind the clouds.

Despite the fact that we hadn't seen Cotopaxi yet, we knew it was there, and some of us wanted to hike to the refuge. The four of us got in the van with Duane Birkey, our summer missionary coordinator, and drove to the other side of the snow-covered volcano. The sun was no longer hiding, and it reflected off the snow, creating a scene that no photograph can give justice to.

After driving as far up as we could, the four of us brave (maybe crazy) souls got out of the van. The air wasn't as cold as I had expected. Perhaps the adrenalin and anticipation of climbing were keeping me warm.

People of all ages were attempting the climb on that beautiful day. It was amazing to see the various types of clothing the hikers were wearing--some ladies had skirts and dress shoes on, some were bundled in full winter-weather gear, ready for ablizzard. One person even wore shorts. All of them were going up.

I will admit the climb was not easy. I am not one who does a lot of hiking, certainly not at 14,000 feet (approximately 4,270 meters). The surface reminded me of walking on a beach. It was covered with lava debris which is soft and slippery. I was determined to make it to the refuge because I didn't know if I would ever have the opportunity to climb Cotopaxi again. It was a slow process. Raquel Reyes recalls, "It was a breath-taking experience ... we were like the little turtle in the story going at a slow pace. But we eventually got there." We just walked a bit, stopped and took some deep breaths. Then we walked a bit, stopped and took more deep breaths. Slowly the four of us climbed our way up to heights we had not reached before on foot.

Along the way we touched patches of snow. I would never have thought I'd see snow in the middle of summer, let alone touch it. In Raquel's words, she was able to "see snow for the first time." For her it was "indeed awesome!" Cherie Munson recalls, "It really hit me how big a God we have ... the plains seemed to go on forever, yet it looked like you could reach out and touch them ... I've never seen anything like it."

Oh, the joy of reaching the refuge! According to Jonathan, the climb was "harder than it looked, but it was rewarding." I could only stop and take a deep breath while taking in the view. Not everyone has the opportunity of seeing parts of Ecuador from that elevation.

The climb down was not as easy as it looked as it was hard to get good footing on such a steep, slippery slope. I wonder how well a sled would have worked? I can just picture the four of us piled on a snow disc, zooming over lava debris, bypassing all the other hikers on our way to the bottom. Unfortunately, snow discs don't usually work on anything but snow!

Allison Pollock was a recent summer missionary in HCJB's public information department.

Merry Christmas

Because Christ came,

ANDEX INTERNATIONAL staff

Person to Person

I have been thinking a lot about geographical extremes lately. After all, HCJB is heard in many remote parts of the world, and we receive letters from people at the extreme ends of the earth.

Recently my wife, Polly, and I visited the truly gorgeous town of Ushuaia, Argentina. Get out your atlas and check out its location--at the end of the earth in Tierra del Fuego. Ringed by breathtaking snow-covered mountains, it is the southernmost town in the world. On the main street through Ushuaia is the local outlet LRA-10, an affiliate of *Radio Nacional.* Its official name is *Radio Nacional Ushuaia e Islas Malvinas,* and it can be heard throughout Patagonia, out to the Malvinas (or Falkland) Islands, and perhaps beyond, on its 780 frequency.

Ken MacHarg, director of HCJB's English Language Service, stands in front of LRA-10, Radio Nacional Ushuaia e Islas Malvinas, *the world's southernmost radio station.*

It was exciting to stand on the shore of the Beagle Channel and listen to that station--so remote, yet so vital to its listenership. Certainly we sensed the presence of God in those beautiful surroundings. As I contemplated how far I was from Quito, where I live, or the United States where my children and grandchildren live, I was reminded that God is everywhere and never leaves us nor is beyond our reach. The poet of the Bible wrote in the Psalms:

At the end of the world, Ken MacHarg's wife, Polly, stands beside a sign in Ushuaia, Argentina, just on the shore of the Beagle Channel.

Where can I go from your Spirit?
Where can I flee from your presence?
If I go up to the heavens, you are there;
if I make my bed in the depths, you are there.
If I rise on the wings of the dawn,
if I settle on the far side of the sea,
even there your hand will guide me,
your right hand will hold me fast."
(Psalm 139, verses 7-10)

Even there, in the "uttermost part of the world," I knew that God was with me and would be with me anywhere, in any circumstances, at any time.

One name often used for Jesus Christ is "Emmanuel," which means "God is with us." Through Jesus Christ, God has entered our world and our lives, sharing our common lot. I trust that you can sense God's presence with you, especially at this Christmas season when we celebrate the birth of Jesus Christ.

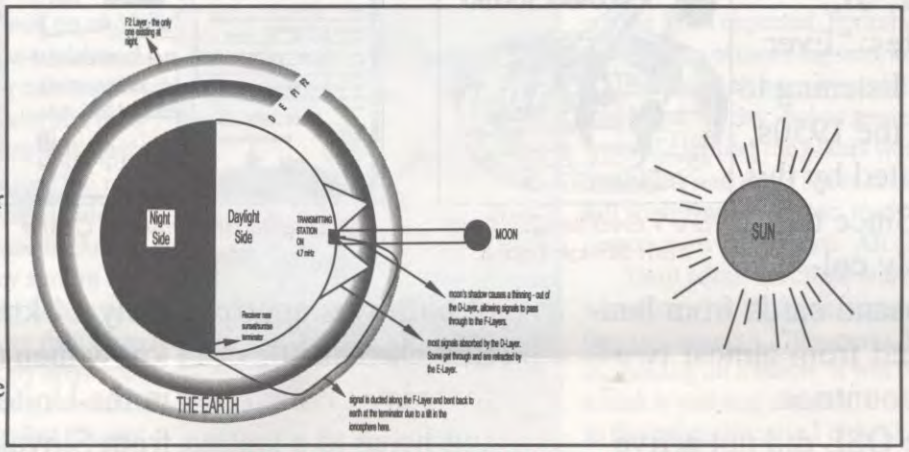
Merry Christmas!

- by Ken MacHarg

Solar Eclipse DXing *(cont. from p.2)*

the eclipse phenomenon was more dramatic in July 1991 was probably because that eclipse was 100 percent total and lasted for seven minutes, meaning the D-layer was weakened to a further extent than with the shorter annular eclipse of April 29, 1995.

A fascinating experiment would be for a DXer to try to see if he could hear a station on the opposite point of the earth which was in the eclipse path.



Could this happen during an eclipse?
(not drawn to scale)

The DXer would be in darkness trying for a station in a part of the earth usually in total daylight, thus usually impossible to hear. However, if because of the eclipse, a station's signal made it through the D-layer to the higher E and especially F layers, it would be fascinating to learn if the signals ducted all the way over to the dark side of the planet and were refracted down to a DXer's receiver location. It might be more advantageous for the DXer to be experiencing sunrise or sunset conditions at the same time as the distant eclipse. *(For more on the ducting of tropical band signals, refer to the Proceedings articles mentioned at the end of this article.)*

Of course, this might work both ways. That is, a DXer in the eclipse path itself might be able to hear tropical band signals originating from the opposite side of the earth during the eclipse--signals usually impossible to hear during midday. During the eclipse on July 11, 1991, and the one on April 29, 1995, I could hear nothing further on the tropical bands than signals in neighboring countries where eclipse effects were also experienced. For example, I could hear nothing from Asia or East Africa, which were already in darkness.

However, during a solar eclipse on February 26, 1979, I could hear such signals from my listening post in Ontario. Several stations in Europe faded in, albeit weakly, on the 49 meter band during eclipse time (around noon EST) and faded out again after about 20 minutes. I believe there is a reason for some success in hearing more-distant signals during that eclipse. The eclipse took place during a winter month at my location in Ontario. The sun's rays were not as strong as they are during the summer, resulting in a weaker (and less-absorbing) D-layer. Even though the eclipse was partial at my location, the sun was blocked sufficiently to weaken the D-layer somewhat ... just enough to allow a few 49 meter band European signals through. In Colombia and Ecuador, however, the sun's rays are always fairly direct, meaning a thick D-layer. Perhaps even a seven-minute total eclipse is not enough to weaken it sufficiently to allow passage of F-layer tropical band signals from the other side of the planet.

Bibliography:

Bryant, John and Clark, David. "Additional Notes on Tropical Band Propagation," PROCEEDINGS 1991, Fine Tuning Special Publications, Stillwater, OK, 1991.

Bryant, John and Clark, David. "Notes on Tropical Band Propagation," PROCEEDINGS 1991, Fine Tuning Special Publications, Stillwater, OK, 1990.

Clark, David and Ward, Tony. "Tropical Band Propagation From Asia, the Long and the Short of It," PROCEEDINGS 1994-95, Fine Tuning Special Publications, Stillwater, OK, 1994.

McNamara, Leo F. Radio Amateurs Guide to the Ionosphere, Krieger Publishing Company, Malabar, Florida, 1994.

Rich McVicar is HCJB's frequency manager and an English programmer.

The last chance to experiment with solar eclipse DXing until 1997 occurred on October 24, 1995, when a total solar eclipse passed through an area extending from Iran through South Asia to the Pacific Ocean. There were exciting results, which we'll announce in an upcoming ANDEX.

ANDEX INTERNATIONAL
is the official bimonthly publication of *Andes DXers International*, a listeners' club operated in conjunction with the DX Partyline broadcast on HCJB.

World Radio Missionary Fellowship, Inc., P.O. Box 39800
Colorado Springs, CO 80949-9800

HCJB, Casilla 17-17-691
Quito, Ecuador

ANDEX Managing Editor Ken MacHarg
Editor Ruth Ann De Flon