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ELECTRONIC MAIL COMES TO GALÁPAGOS

By: Jim Pinson

[*Electronic mail (e-mail) is a mailing system that works through telephone lines connecting a network of computers (the Internet, a.k.a. the Information Super Highway). It allows mail to be sent around the world to anyone with a computer connected to the network. It is much faster than postal mail and often instantaneous. E-mail conversations can be carried back and forth almost as quickly as if talking over the phone. However, unlike the telephone, service costs for long-distance e-mail service are subsidized by participating governments. E-mail messages are stored so that the recipient need not be sitting at his or her computer when the originator sends the message. This storage system also prevents loss of messages in the event of a power outage or breakdown of a computer.* - Editorial Staff]

Two years ago, electronic mail (E-mail) seemed like only a dream for the Charles Darwin Research Station (CDRS). The station's existing communication system desperately needed improving. The phones seldom worked, and long distance service was unreliable and expensive. Postal mail was slow and also unreliable. Use of satellite dishes was prohibitively expensive. A fast, reliable and affordable means of communicating with the rest of the world seemed out of reach. Those of us who were accustomed to using E-mail dreamed of having it in Galápagos.

Prospects for getting E-mail improved one day in October 1992, with an unexpected visit to the station by Xavier Baquero, from the Banco del Pacifico (BP), Ecuador, and Steve Goldstein of the National Science Foundation (NSF) of the United States of America. As a service to the community, the Banco del Pacifico was offering free Internet access to nonprofit organizations. The staff at CDRS needed little convincing and readily accepted the generous offer.

E-mail did not become a reality at CDRS until May, 1993. Although the Banco del Pacifico in Puerto Ayora would provide access to the Internet, the station had to find a means of connecting with the bank about 1 km away. The most obvious method was to dedicate a phone line for the purpose, but that would be expensive and unreliable.

David Anderson, a long time proponent of E-mail at CDRS, searched for both the the appropriate technology and the necessary funds. He found that NSF could fund the equipment, but only if it was added as a special request to a pre-existing NSF grant. Howard Snell came to the rescue by offering to buy two radio modems on his NSF grant. These modems would provide fast and reliable communication to the bank. Dave Anderson hand carried the modems and antennas to the station on his next research trip. The modems were soon installed, and the antennas aligned by two communications specialists from BP. At long last the station was on-line!

After a few months, it because obvious that the original system of software wasn't filling the needs of the station. Because I had experience in computer programming for networks, I was drafted to design a new system. Galápagos Mail, or G-Mail is the result. It is a fusion of the original system with two free software packages. The Pegasus mailer was linked to the Ham radio package KA9Q using special software developed at the station.

G-mail has the special ability of allowing messages to be created and read on a floppy diskette. The diskette must then be taken to the computer center at the station in order to actually send and receive the messages. Mail stored on the diskette can then be read and new messages can be composed on a computer outside the station if need be This system is especially useful for visiting scientists. Mail messages can be written on a personal laptop computer in the field, then copied onto a diskette which can be sent by boat to the station, from where they can be mailed. Conversely, incoming mail can be copied onto a diskette and returned to the scientists in the field where it can be read on their personal computer.

E-mail quickly became a part of every day life at the station. Scientists used E-mail to arrange trips with the

staff, communicate with field camps and send data overseas. Staff members at the station were able to consult with colleagues around the world. The importance of and dependence on E-mail at the station became obvious when the modem failed and the station was without E-mail contact for over a month. It was quite a relief when a spare modem was brought to the station to prevent E-mail from vanishing again. As with so many things, you don't appreciate something until it is gone.

The E-mail system at the station continues to evolve. A UNIX server, designed to handle mail more reliably, has just been installed. A more extensive network is currently being installed, providing Internet access to several more computers at the station. Soon the staff will be introduced to the "World Wide Web" (WWW), an information network offering access to libraries, scientific data sets, and news on the latest developments in science from around the world. Not only can this service be used from CDRS to obtain information from around the world but CDRS plans to eventually become a WWW site itself, contributing information about the station, personnel, research projects, and even select data sets. The next time you venture on the "Information Super Highway", keep your eyes open for a giant tortoise, moving slowly but surely forward.

Jim Pinson, Charles Darwin Research Station, Isla Santa Cruz, Galápagos, Ecuador.

FUNDAMENTALS

By: Godfrey Merlen

The eruption on Fernandina Island that occurred toward the end of January 1995 was a spectacular event. For the first time in many years, a large number of people were able to witness a geological "hot spot" in action. The copious quantities of lava that reached the ocean to the west and the interconnecting rivers of fast-flowing molten rock left all who saw it with a powerful image of light and energy. At night, the lurid red clouds painted against the dark sky gave the impression of a penetrating ball of light. Perhaps even Benjamin Morrell would have been impressed by this awesome sight. Unfortunately, pitch is not a chandler's item these days and it was not possible to repeat his observations of 1825!

I visited the area on three separate occasions (January 27-30, February 6-7 and March 18-19). I was authorized to land with André Mauchamp on the second trip and with Mitsuaki Iwago and Kiyoshi Yokokawa from NHK (Japanese National Television) on the third trip. I plotted positions of the forming fissures, cones, and lava flows using a portable GPS (Global Positioning System) instrument because observational satellites are out of commission and no aerial photographs of this event will be forthcoming.

On the night of February 6, while near the source of the eruption, I noticed that a strong flow had developed south of the general pattern of lava channels to the west. This new flow headed with unerring accuracy toward the landing at Cape Hammond. On the morning of the 7th, I crossed a smoky lava field to Iguana Hill, part of an old cone surrounded by new lava, and climbed to its top. The hill is about 1 km from the "source". At the foot of the hill, the flow diverged and huge quantities of molten rock rushed westward in fast-flowing rivers. These rivers occasionally became dammed with enormous, semi-solid boulders the size of houses. On breaking free, the magma surged down steep lava falls with the fluidity of water. Vegetation vanished in spurts of flame and puffs of smoke.

The huge red flows were a striking contrast to the silver-grey palo santo trees on top of the hill, many of which had been felled every-which-way by the initial release of pressure from the eruption. Behind me, the center of the growing source cone displayed a continuous fountain of molten material, falling as scoria hundreds of meters away. By day, the fountain was blood red; by night, a golden arc.

Upon descent, I found that the lava flow had cut off my easy retreat across a large pahoehoe field. Its length was about 4 km, leaving over 1 km between its front and the landing at Cabo Hammond. This front has not advanced, but that day I could see the white-hot interior through cracks between boulders, indicating some movement was still occurring. Several smaller flows have since moved in the same direction between February 6 and March 6, but no more than about 1.5 km from the cone.

Cape Hammond offers a refuge from the swells that continuously batter the coastline from the south. It is the only protected landing between Cape Douglas in the north and Punta Mangle to the east, since wave action has produced vertical cliff faces on the west and south sides of the island. The small bay at the landing is thus a unique feature of this coast and is the result of previous lava flows to the south; an accident of time and place. The bay, with its two boulder beaches and a sandy beach behind a shallow protected pool, is a haven for endemic fur seals, flightless cormorants, marine iguanas, and penguins. Even