Natural Radio

News, Comments and Letters About Natural Radio

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I have been without Internet service at home for the past week and now without a telephone. The only upside is that with the line totally dead maybe, just maybe, the phone company can track down the problem I've had with noise on the line for the past year and stop telling me the problem is in my house.

Fortunately, I have broadband service at the office but I don't feel like driving back here every time I want to look at something on the net. You don't quite realize your dependence on a service until you lose it. We had a line of severe storms with tornados move through last night and listening to the alerts on NOAA Weather Radio was like taking a step back into the past, since I normally use the Chicago weather radar to precisely pinpoint and track an approaching storm.

Another service I use that was sorely missed is called Dropbox. This service lets me automatically sync a set of files online between home and office. In the past I did this with a USB Flash Drive, often mixing up versions of files. Now, files I want to sync are put into the Dropbox folder on either computer and then mirrored on the other, as well as being backed up online, giving me access to all my data from both locations and letting me start a job at one and finish it at the other. How did we get along in pre-Internet days?

The phone company's automated computer has promised me that the problem will be fixed by 8:30 pm tomorrow. We'll see.

Dr. Robert Helliwell Passes – For those of us involved in Natural Radio, our definitive reference source is Robert Helliwell's book, *Whistlers and Related Ionospheric Phenomena,* originally published by Stanford University Press in 1965 and more recently reprinted by Dover Publications in 2006.

I received word via the VLF_Group that Dr. Helliwell passed away on May 3 in Palo Alto, California. He was 90. Helliwell received his bachelor's, master's and doctoral degrees from Stanford and became a member of the faculty in the Department of Electrical Engineering in 1946.

There is an interesting story is told about Helliwell's early days as a young professor at Stanford. In 1950, one of his graduate students, Jack Mallinckrodt, approached him after hearing strange whistling tones in the radio that he was using to monitor distant lightning. As documented in his October, 1982, article in the *Stanford Engineer,* Helliwell's response was "I suggested that if he took a short vacation perhaps the sounds would go away, but he didn't and they didn't. My curiosity was finally aroused and I spent a late night with Jack at the receiving station." And that night they heard whistlers and Helliwell began down the path of study into this strange new phenomenon.

And strange it was. In his introduction to *Whistlers and Related Ionospheric Phenomena*, he wrote, “To many first-time observers these phenomenons seem almost unbelievable. To others they suggest supernatural origins. During the early phases of research on whistlers at Stanford University, the subject was of great interest to newspaper reporters. Articles entitled “Voices from Outer Space” stimulated a substantial flow of fan mail from many parts of the world.”

After describing some of the more colorful correspondence he went on to say, “As the occult aspects of the subject faded away, ordinary scientific curiosity began to produce information that has resulted in a fairly complete and understandable picture of whistlers.”

In the years before scientific satellites, this knowledge gained from whistlers not only allowed scientists to understand them, but allowed them to deduce information about the structure of the magnetosphere .

In 1957, The International Geophysical Year (IGY) was the catalyst that accelerated research into whistlers and the magnetosphere. Until that time, whistler research was done by measuring naturally occurring whistlers and lightening pulses. The use of man-made signals was introduced that year by Helliwell when whistler-mode signals broadcast from the U.S. Navy station NSS at Annapolis, Maryland were received by a receiver placed in Cape Horn, Chile. (Helliwell and Gehrels, 1958) The results of this research were documented in 1965 in the aforementioned book.

In that book, Helliwell also described another class of natural VLF signals, VLF Emissions. These are naturally occurring signals and less understood than whistlers. One of these is “triggered emissions’, a VLF emission that is triggered by another signal.

The first VLF "triggered emissions" were recorded in November 1959 by one of Helliwell’s receivers located in Wellington, New Zealand [Helliwell et al., 1964]. The emission was triggered by US Navy VLF transmitter NPG, located in Jim Creek, Washington.

This led Helliwell and his group at the Stanford Radio Science Laboratory to build a VLF transmitter and 21.2 km dipole antenna at Siple Station in Antarctica. Stanford and NSF funded the triggered emission experiments that were conducted there from 1971 until it closed in 1988. Such a large volume of data was collected that it is still being analyzed today by Stanford graduate students in the VLF Group.

Helliwell was awarded the Antarctic Service Medal in1966 and Appleton Prize of the Royal Society in 1972. He was the author of over 90 scientific and technical papers and one book.

Helliwell is survived by his sons Bradley, David and Richard and daughter, Donna. His wife Jean (née Perham) of 59 years was Stanford University’s first woman fencing coach and coached both the men's and women's fencing teams, joining the Stanford coaching staff in 1964 and retiring after 18 years in 1982. She died in 2001.

It is a fitting tribute to Dr. Helliwell and his research that 46 years after its first publication, his book is still the premier reference work in the field of whistler studies.