Vancouver Distinguished Lecture

On 21 September 2005, I spoke to a joint meeting of the IEEE Aerospace and Electronic Systems Society (AESS) and the IEEE Geoscience and Remote Sensing Society (GRSS) chapters in Vancouver, British Columbia. Thirty people attended, half being IEEE members. The meeting was held at the MacDonald-Dettwiler facility (MDA) in Richmond, a suburb of Vancouver. MDA integrates radars into vehicles including some spacecraft. They have a contract to design the robotic servicing module that might repair the Hubble telescope if no Shuttle flight does so (or perhaps from Shuttle as an automated repair experiment). MDA has approximately 2,500 people at its offices in Toronto, Vancouver, the UK, and USA. They provided refreshments for the 6:00 pm meeting.

The lecture was organized by Rob Leitch (pronounced Leach) of MDA who is the chairman of the Vancouver joint chapter of AESS and GRSS. Following the lecture, Rob graciously treated my guest, Camille McCarthy, and me to dinner at a fine restaurant near the old cannery row in Steveston, another suburb of Vancouver. Also at dinner were Jerry Lim, who was my host in Vancouver when I lectured in 2002 and former chairman of the Vancouver AESS and GRSS, and Gerry Masuda. Figure 1, a photo by Mrs. McCarthy, shows Rob and me at the lecture.

I began by talking about IEEE and AESS. I showed some membership statistics for Region 7 and Vancouver that were furnished by Barbara Della Salla of the IEEE staff. I discussed the functions of Societies in general.

The "Avionics for Manned Spacecraft" lecture took more than one hour. I described the chronology of manned spacecraft from X-15 to the Space Station. Then I described the state-of-the-art of avionics just prior to the space age. I described the navigation, communication, and attitude control equipment used in typical ballistic and winged spacecraft using block diagrams and 35-mm slides. I showed how equipment evolved from analog early spacecraft to centralized digital avionics to the distributed digital systems of today. I then projected the avionics for the Shuttle replacement, the return to the Moon, and a manned mission to Mars, though I am not a member of any NASA committee. I described some issues in erecting and collecting data from a backside Lunar Observatory (see AES Magazine, November 2005).

As I've said on these pages before (AES Magazine, January 2005), Canada is a fascinating country that few foreigners know much about. In that article, I summarized the early history of eastern Canada, revolving around French and British attempts to control the St. Lawrence, Ohio, and Mississippi River valleys in the 18th century. The earliest European explorations preceded 1500.

By contrast, Vancouver City and Vancouver Island are new. The area was settled by European fur trappers, loggers, and gold miners prior to the 1850s. Vancouver was sandwiched between the USA on the south and Russia on the north. The US settlements in San Francisco and the Astoria Fur Company on the Columbia River threatened to expand north while the Russian fur traders in Alaska pushed south (as far as northern California). Thus, the British created a colony in 1849 on Vancouver Island to establish their own presence on the Pacific Ocean. The colony was induced to join the Canadian Confederation in 1871 by offering them a transcontinental railroad in exchange for locally-built naval docks to service the British Pacific fleet. Once the railroad reached the Vancouver area, prairie agricultural products could be exported to the orient, thus beginning the vibrant trade economy that occupies Vancouver today. The city is heavily high-rise with extensive rail yards, grain silos, container ports, and cruise ship docks. A two-line rapid transit railway is supplemented by a SeaBus ferry to North Vancouver. Figure 2, by Mrs. McCarthy, shows the author standing in front of a tugboat dock in North Vancouver.

Canadians call their Indians "First Nations people," the distant descendants of the Siberians who crossed the Bering Strait and filled the Americas starting 20,000 years ago. In the Vancouver area, the inland Indians were nomadic, wore raw animal skins in the cold months, hunted game, and picked roots and berries. The coastal Indians were among the few people on Earth who built settled communities without knowledge of agriculture or animal husbandry. Their
complex society was built on abundant salmon, herring, trout, and sea mammals. They fished the rivers that flow from the mountains and the protected waters of the Georgia Strait in dugout canoes made from the abundant large trees close to the water. They picked berries and roots to diversify their diet.

The coastal Indians developed a complex social structure typified to tourists by the totem poles that show the ancestral histories of important families, usually traced back to a mythical tribal animal. Photos and sketches of villages prior to the 1850s show one or two poles in front of ragged wooden buildings. As the Indians became rich by trading fur with Europeans, the quality of painted wooden buildings improved and the number of totem poles greatly increased.

Visitors should see the Maritime Museum that focuses on the Canadian presence in the Arctic, and the Cannery Museum, newly opened to show the importance of the salmon and herring industries before overfishing required a moratorium.

I recommend that IEEE members worldwide visit the Pacific northwest, ride the ferries, and partake of Canada's unique history.

— Myron Kayton