employed for international broadcasting be substantially increased;

- additional radio spectrum be provided for Canadian and international requirements for radiocommunications by satellites;
- additional spectrum be provided for the amateur radio service.

Four new commemorative stamps

Depictions of the works of two Canadian authors, Frederick Philip Grove and Emile Nelligan, are featured on two new postage stamps released on May 3. The Grove stamp, from a wood engraving, shows a solitary ploughman behind two horses, which is a scene from his novel *Fruits of the Earth.* The Nelligan stamp, a golden ship on a stormy sea with a profile of the face of the author, illustrates his most famous poem *Le vaisseau d'or.*

Two other commemorative issues released May 11 honour Colonel Charles-Michel d'Irumberry de Salaberry and Colonel John By.

De Salaberry saved Montreal

Charles-Michel d'Irumberry de Salaberry was born in 1778 at Beauport, Quebec. Commissioned in the British Army in 1794, he campaigned overseas and returned to Lower Canada in 1810. In 1812, de Salaberry raised a provincial corps of light infantry, which fought at the Battle of Lacolle in November 1812. They and 300 Caughnawaga Indians repulsed the advance guard of an American army of 6,000, causing the entire army to retreat. De Salaberry's most famous victory came at the battle of Châteauguay in 1813 when, though vastly outnumbered, he repulsed an American contingent attempting to seize Montreal.

John By, born in England in 1779, was commissioned in the Royal Artillery in 1799, but soon transferred to the Royal Engineers. From 1802 to 1811 he worked in Canada on the fortifications of Quebec City and a canal at Les Cèdres. In 1826 the British Government despatched him once again to Canada to supervise construction of the Rideau Canal. Military planners hoped the canal would guarantee communication between Montreal and Kingston in the event of war with the United States. Colonel By and his men overcame rapids, thick brush, swamps, flies and malaria to create the imposing monument which still exists today.

Carbon chemist to receive award

Professor J. Gilbert Hooley of the University of British Columbia (UBC) will receive one of the top honours of the American Carbon Society in June at Pennsylvania State University.

He will accept the Charles E. Pettinos Award for "continued pioneering contributions" to a long-neglected area of carbon research. The award carries with it a cash prize of $1,000 and a plaque citing Dr. Hooley's achievements.

Professor Hooley says the research for which he will be honoured began in 1955 when his curiosity was piqued by a short article he read in a British journal called *Fuel,* which described the chemical phenomenon known as "intercalation".

Intercalation occurs when a wide range of materials, including metals such as sodium and potassium, the element bromine, acids such as sulphuric and nitric, and some 25 metal chlorides such as aluminum chloride and ferric chloride are absorbed into carbon or graphite.

Absorption of the intercalating materials into graphite results in their forming a bond with the carbon atoms. More important, the properties of the intercalated graphite are radically altered, both mechanically and in terms of the material's ability to conduct electricity.

"Think of the graphite as a textbook of 1,000 pages lying on its side, with each page representing a layer of carbon atoms," says the professor. "What I've shown is that the intercalating material diffuses through the graphite a layer at a time, beginning with the first and last layers, or the first and last pages of the textbook, as it were. As intercalation continues the materials are bonded to the graphite layer by layer until they reach the central layer."

Intercalation will actually double the thickness of a graphite sample, and it's this phenomenon that has made Dr. Hooley's research of interest to the aluminum industry, which manufactures the metal in carbon pots at very high temperatures.

There has also been much excitement recently on the use of intercalated carbons as a catalyst in a process for making gasoline from coal. The fuel sciences division of the Alberta Research Council has already enlisted the aid of Dr. Hooley.

Another aspect of his research has been the intercalation of carbon fibres,

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