

## Lasers speed up conversion of vitamin D

A breakthrough in laser technology by the National Research Council (NRC) could revolutionize the production of vitamin D, one of the key ingredients in animal feed.

The development promises to reduce vitamin D production costs dramatically and could make Canada the first country to use laser technology in a chemical factory.

In the latest issue of *Science Dimension*,

NRC says the discovery "may herald the introduction of a whole range of laser applications in industrial chemistry". NRC has applied for patents on the process in both the United States and Canada.

Vitamin D is required by all animals, including humans, for healthy formation of bones. Rickets, a severe malformation of bone structures, results from a deficiency. Under normal circumstances, sunlight converts matter in the skin into a

substance that is later turned into vitamin D by body heat. The key to the process is the substance created by the action of the sun on the skin. It is known as previtamin D.

The conversion rate to previtamin D is 100 per cent in the human body but the rate drops to a maximum of about 30 per cent in the industrial process.

The breakthrough for the research council was discovering that lasers could be substituted for a mercury lamp to produce a conversion rate of nearly 100 per cent, using a two-stage process. A krypton fluoride laser, used in the first stage, converts the starting material to previtamin D at a rate of 26 per cent. This is lower than the current industrial process but it paves the way for the second stage by creating, at a rate of about 70 per cent, a byproduct known as tachysterol. This can then be converted completely to previtamin D.

## Christmas stamps

Canada's Christmas stamps for 1982 feature nativity scenes assembled with figurines from a Christmas crèche. The first such crèche is attributed to St. Francis of Assisi, who is alleged to have created a manger scene with animals in a cave at Greccio, Italy, where he celebrated Christmas in 1223. This year marks the eight-hundredth anniversary of the birth of this saint.

St. Francis was born in Assisi, Italy, in 1182, the son of a wealthy textile merchant. He devoted his youth to riotous living; however, a period as a prisoner of war and a serious illness changed him. He eventually gave up his possessions and lived a life of poverty and service to God. He soon began to attract a group of followers. Indeed, by the time he died at Assisi in 1226, Franciscan missions had reached England, France, Germany, Hungary, Spain, Morocco, Turkey, and the Holy Land; and less than 20 years after his death, two Franciscans arrived at the Mongol court.

A group of Franciscans known as Récollets were the first missionaries in the St. Lawrence River area. Four arrived there with Champlain in the spring of 1615 and built a house with a chapel at what is now Quebec City.

One of their members, Father Le Caron, quickly visited the Huron territory to be the first to proclaim the name of God in those parts. In 1616, with a view to converting the Indians, the Récollets proposed a threefold policy of settling Europeans in Canada, recruiting missionaries, and informing authorities in France of developments in Canada. These policies influenced New France for many years.

Against a backdrop of traditional Christmas colours, these three stamps tell part of the nativity story — the shepherds tending their sheep the night of the birth; the wise men bringing gifts from afar; and Mary and Joseph and the infant Jesus in the manger.

Mrs. Hella Braun of Kitchener, Ontario, created these figurines over 30 years ago for a single crèche. They were photographed by Bert Bell of Toronto. Jonathan Eby, also of Toronto, designed the stamps.



## Canada-Brazil study to locate mineral resources

An important geophysical and geochemical study, carried out jointly by the Geological Service of Canada and by the National Department of Mineral Production of Brazil, was recently completed in Brazil.

The project, supported by the Canadian International Development Agency, was financed with the help of a \$4.4-million loan from the Canadian Fund of the International Development Bank.

According to Brazil's National Department of Mineral Production, it was the most important geophysical and geochemical study ever carried out in Brazil. It provided basic data that is expected to be of great value in locating mining resources in the west-central part of the country, including parts of the states of Goiás, Pará, Mato Grosso and Maranhão.

Activities carried out included aerial surveys, geophysical, geological and geochemical analysis, and the preparation of maps and reports. In addition, a Brazilian aircraft was equipped with the latest geophysical mapping resources and technicians were trained in their use.

Work on the project started in 1975 and the first data results were obtained two years later. In the ensuing five years the region has become the section of the country where the greatest number of mineral prospecting concessions have been extended.