Canadians help search cause of space-sickness

On July 15, 1980, Spacelab will be launched from Cape Canaveral. Among the many tests that will take place during its seven-day flight will be a series of vestibular experiments developed by a group of researchers from the Massachusetts Institute of Technology, a Toronto medical institute and Montreal's McGill University. Their purpose is to study otolith function in a weightless environment to determine the cause of space-motion sickness, a condition from which the majority of astronauts and cosmonauts have suffered.

Anyone who suffers from car sickness or air sickness knows the definition of true misery. But at least those who are subject to motion sickness – and they are only about 5 per cent of the population – usually have to endure it for only a few hours at a time. Imagine two consecutive days of motion sickness! This is what many of the astronauts and cosmonauts have suffered.

The prevention of space-sickness has become a priority for the U.S. National Aeronautics and Space Agency (NASA). With Spacelab, the joint venture involving NASA and the European Space Agency, scheduled for launch in 1980, work in this area is being stepped up and NASA is funding a number of projects dealing with motion sickness.

One of these involves McGill physiologists Dr. Douglas Watt and Dr. Geoffrey Melvill Jones, members of McGill's Aviation Medical Research Unit. They are collaborating with Dr. Larry Young and Dr. Chuck Oman of the Massachusetts Institute of Technology (MIT) and Dr. Ken Money and Dr. Dick Malcolm of the Defence and Civil Institute of Environmental Medicine in Toronto. Dr. Young of MIT is the project leader.

Cause unknown

Motion sickness has been with us since man first started to build boats. In fact, the word 'nausea' is derived from the Greek word for ship. Yet, little is known of its causes. Scientists generally believe it is linked to the vestibular system, that part of the inner ear which is responsible for balance. Motion sickness results from a conflict between visual information, which is accurate, and the vestibular signals which are being sent to the nervous system, which are inaccurate. Why this conflict produces nausea is unknown.

The purpose of the work which will be carried out by Dr. Watt and his colleagues is to determine if space sickness is a form of motion sickness (U.S.S.R. scientists, for example, believe that it is not a vestibular problem) and to study some of the basic mechanisms of the condition. They will do this by carrying out tests on the Spacelab astronauts before, during and after the seven-day flight. They will be one of three groups – the others are a European group and an American group based in Houston – who will be carrying out vestibular experiments in Spacelab.

Dr. Watt and his colleagues are particularly interested in the otolith apparatus, the part of the inner ear which senses linear acceleration. Their subjects will be the two payload specialists, who along with the mission commander, the pilot and the mission specialist will make up the five-member crew. The other crew members may participate if time permits. So many studies will be carried out on the first Spacelab flight that only eight hours out of the seven-day mission have been allotted for the performance of all the vestibular experiments.

The preliminary experiments prior to takeoff will provide the research team with their baseline data. Based on the assumption that these pre-flight tests will show normal otolith function, they will have the subjects perform the same tests from time to time during the actual flight and after the return to earth. This will show how the otoliths adapt to the changing situation. The researchers hypothesize that their data will reveal that otolith activity is suppressed after a couple of days in space. This would explain why astronauts have not been bothered by motion sickness after the first two days of their mission. They also believe that the re-adaptation of the otoliths to the ground-based environment will take several days.

Much of the researchers' work over the next three years will involve adapting their experiments from a ground-based environment to the weightlessness of space. Dr. Watt will be primarily concerned with the measurement of otolith function through leg movement. The astronauts will be trained in the use of electrodes which they will affix to their calf muscles and will be instructed in the performance of certain tasks to elicit electrical activity in the muscles.

Weightlessness simulation

The main problem in this type of work is ensuring that the experiments will be successful in space. This involves simulating weightlessness on earth. Dr. Watt plans to do preliminary tests at McGill by suspending subjects horizontally from a high ceiling with cables and having them hop up and down, for example, on the adjoining wall, using a system of springs and elastics. There are the first in-space life-science experiments in which Canadian scientists have become involved.

Kidnap victim free – abductors still loose

The longest kidnapping for ransom in Canadian history remains a mystery for Quebec police. The drama, which began on August 6, with the abduction of Charles Marion, 56, of Sherbrooke, Quebec, ended with his release 83 days later on October 27, following the delivery of $50,000 in ransom money.

Fascinated journalists learned of cryptic messages to local broadcasters, a dynamite blast in a nearby supermarket, and a bomb scare at the University of Sherbrooke, but ended their long vigil with no idea of the identity of the men who captured the loans manager of a caisse populaire from his cottage in Stoke, Quebec.

Mr. Marion's ordeal was nearly ended several times as the original demand for $1 million was gradually reduced and various rendezvous points between police and abductors were established. Transfer attempts were marred, however, by the accidental appearance of people unrelated to the case and by one attempt to substitute paper for money.

Nearly 24 hours after the successful delivery, Charles Marion, 26 pounds lighter, was able to describe to his son the conditions of his captivity – chained to the cement floor of an eight-by-seven-foot underground chamber, equipped with a mattress, a sleeping bag, a few candles, a pail and a container of biscuits and meat, he had, as his only constant companions, rodents and bugs.

A physical examination revealed no signs of physical abuse, but doctors are monitoring his emotional condition closely. Police investigation has intensified since the victim's release.