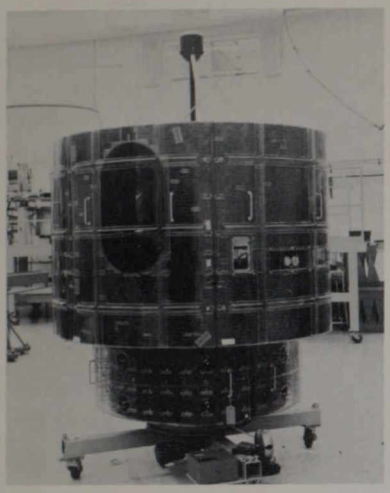

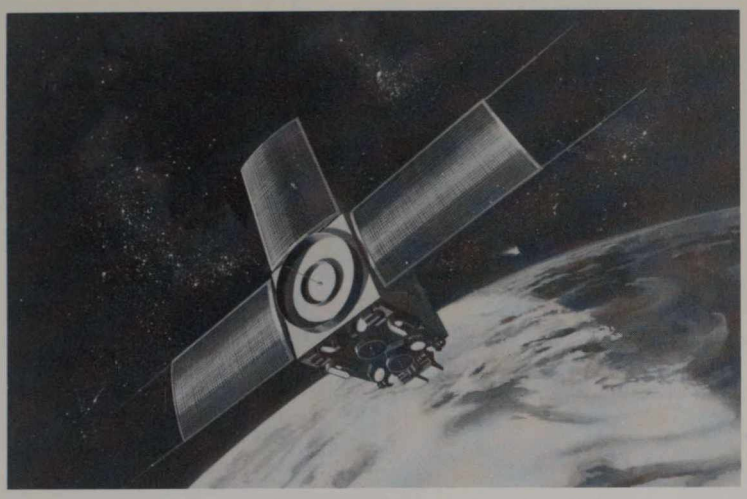

spectral scanner (MSS) on the bottom scans the earth's surface with an oscillating flat mirror, which reflects light from below to glass fibers and then through filters. The filters separate it into four bands on the colour spectrum—two in the visible range and two in infrared, which is not visible to the human eye. The bands can be analyzed separately or in combinations. One band of infrared light, coming from the sun, is strongly absorbed by clean water and little or none of it is reflected. A picture from this infrared band shows clear, deep water as black, in sharp contrast to vegetation on the shore, which reflects the infrared light strongly.

By using colour filters in various combinations, maps (such as those in this issue of CANADA TODAY/D'AUJOURD'HUI) can be contrived which emphasize particular conditions. Clear water can be easily distinguished from turbid water, and (since the satellite pictures are used in many scientific disciplines) sick corn can be distinguished from healthy and limestone beds from glaciated areas.

Pictures taken of the Great Lakes show, in contrasting shades, clear areas, natural turbidity and sources of municipal and industrial effluents. They show, in the form of long straight lines, areas where surface water is sinking to mix with water in the deeper layers.

This is a wide view of Ontario rocks and waters as they were on October 9, 1973, with Lake Simcoe at the lower left. The enhanced colour shows the value of the satellites to mineral hunters. Mineral deposits are often indicated by the juxtaposition of different rock formations. The Laurentian uplands—old primeval rock—show yellow; the limestone beds in the middle, reddish brown; the glaciated area to the south is a mixture of red, blue and green.

All colour photographs and the NASA Landsat photograph are courtesy of the US Geological Survey, EROS Program. All other photographs are from the US Department of Commerce, National Oceanic and Atmospheric Administration.

[NOAA]

NOAA-4 which looks like a flying air conditioner with three fixed, unflappable wings, circles the earth at an altitude of 902 miles once every 114 minutes. It passes over the polar regions and —since the earth is rotating beneath it—moves always to the west.

Each NOAA-type satellite carries a basic scanning radiometer (SR), a scanner which measures radiation precisely over a limited area (the very high resolution radiometer or VHRR) and one which gives a vertical temperature profile (VTPR).

The VHRR can be used to measure the area of snow cover in critical areas, such as the St. John River Basin of New Brunswick, to prepare for spring flooding. VTPR data helps in the prediction of rainfall.

[GOES]

NOAA's GOES satellites (Geostationary Operational Environmental Satellite) are way out. Two are positioned 22,300 miles above the equator (one above the western Atlantic, one the eastern Pacific), and since their orbital movements are synchronized with the earth's rotation, they seem to stay still. Each is shaped like two drums, a bass on top of a snare. Sensors are lined around the big drum's circumference—earth sensor, x-ray sensor, energetic particle sensor and infrared spin-scan radiometer. A magnetometer sensor, shaped like a bass drumstick, is perpendicular to the top drum's flat surface. GOES take the big picture—they provide visible and infrared pictures of all of North and South America every thirty minutes and are particularly useful in monitoring the weather and warning of hurricanes and other dangerous storms.