A new spectroscopic laboratory has been established in which interesting studies are proceeding on the structure of atoms and molecules on the basis of their spectra. A 21-foot grating spectrograph has been built and is in operation.

Investigation of the infra-red spectrum of isocyanic acid (HNCO), has shown that the three atoms NCO are very nearly in a straight line while the H atom is off that line. Other molecules are at present under investigation.

Recently, cosmic ray photographs have been obtained using a special emulsion that is sensitive to light particles produced by cosmic rays. These emulsions have been carried in aircraft of the British Overseas Airways Corporation, and in this way given prolonged exposures to cosmic radiation at high altitudes. Many cosmic stars have been recorded.

Continuous cosmic ray measurements have been taken at Ottawa throughout the year and a station was established in the Arctic at latitude 74° 41′ N, longitude 94° 55′ W, which has been operating since Sept. 1, 1949. Analysis of the results is giving information on the influence of meteorological effects on the various components of cosmic rays.

As an aid to marine navigation, work is being carried out in the acoustics laboratory with a view to improving the efficiency of fog horns; the efficiency of a type B horn has been increased from 0·2 to 10 p.c.

Problems in the heat laboratory vary from tests on the thermal conductivity of furs to friction of synthetic and natural rubber tires on ice. The Katz-Katzmann portable carbon monoxide detector is still being tested as an instrument for measuring air changes, as for instance in theatres. Thermal and electrical conductivity of metals, vapour migration through wood and studies on moisture in wheat, form a group of very practical investigations on which useful results of industrial value are being secured.

Work on industrial radiology has been expanded considerably. Studies have been made of radium standards, including international comparisons, and new radiation standardization equipment is being installed. Work is proceeding on X-ray standards and on the protective qualities of armour plate glass against X-rays. Data for the industrial use of Cobalt 60 have been compiled and published.

Fundamental research is proceeding in X-ray crystallography, particularly on the structures of minerals. A file of standard X-ray powder patterns is being set up to improve the services of the laboratory in identification problems. The electron microscope is being used in a study of a special bacterium of interest to the food biology section.

A dozen or more researches are in progress in optics. Much of the work relates to photographic problems, particularly those concerning aerial photography—cameras, emulsions used on films, investigation of distortions on films and in printing and also in photographic systems. In the colour laboratory numerous studies are being made in telephometry by examination of the spectra of distant lights. Development of high-speed motion-picture cameras has been proceeding for some time and prototypes have been constructed.

A new temperature and radiation laboratory has been set up with apparatus for the testing of thermocouples and pyrometers in accordance with the International Temperature Scale. In metrology a large part of the work consists in