

INSTRUMENTATION

Blood-pressure Recording During Anaesthesia.—Equipment is being developed to record blood pressures of patients undergoing surgical operations under anaesthesia. Changes in systolic and diastolic pressures under these circumstances provide the surgeon with a means of determining the patient's condition, particularly with respect to the incidence of shock.

Frost Alarm.—To protect fruitgrowers from serious losses due to frosts, a reliable temperature alarm is required. The requirements present considerable difficulties in instrument design—e.g., the alarm setting-point must be adjustable, the temperature-sensitive element should be installed in the orchard, while the instrument must give a visual indication as well as operate an alarm in a building some distance away, and the instrument must maintain its absolute accuracy to within $\pm 1^{\circ}\text{F.}$, even though subjected to heat during the day. An electrical resistance type of thermometer is being developed, and will be subjected to exhaustive laboratory and field trials. Assistance has been given to two New Zealand firms experimenting with frost alarms: one of the devices will receive field trials during the coming spring.

Aero-engine Temperature Measurements During Flight.—Assistance was given to the Civil Aviation Branch, Air Department, by the construction and installation of thermocouples in an aero-engine cylinder, together with the recording equipment for it.

Meat Refrigeration.—Equipment was designed, constructed, and installed in a freezing-works for measuring temperatures and air velocities in an experimental freezing chamber, and temperatures at various depths of carcasses in a series of "deep freeze" investigations. Information has been received that data of considerable value and interest have been obtained from the trials.

NUCLEAR PHYSICS

Measurement of Radioactive Paint.—Equipment has been supplied to the Paint Section of the Department that will enable the quantity of paint removed by weathering or other process to be determined. The paint is rendered radioactive, and gamma ray counting equipment was designed and constructed to enable the intensity of radioactivity to be determined at any time.

Geiger Muller Tubes.—New designs of Geiger Muller radioactive particle-counters are being worked on, together with the associated electronic equipment required to operate them.

Laboratory Monitors.—These instruments have been designed for making rough checks on radioactive contamination of operators' hands, clothing, and working surroundings.

Pulse-generator.—This has been built to generate electrical pulses of various shapes and frequency simulating the pulses received from Geiger Muller counters. The pulses are used to check the performance of radioactive particle-counting equipment.

GEOPHYSICS

Magnetic Susceptibility of Rock Samples.—Laboratory measurements of the magnetic susceptibilities of rock samples are now a routine matter, and an extensive catalogue of such data is being built up to aid the interpretation of magnetic surveys.

Fluxgate Magnetometers.—Magnetometers for portable field use and for field bases are being developed with the use of a wartime invention known as the fluxgate principle. The method is particularly suited to a great deal of magnetic survey work, including rapid field surveys, continuous recording, and for measuring fast changes in the earth's magnetic field.

Permanent Magnetization Equipment.—Equipment for measuring the permanent magnetization of rock samples, to aid the interpretation of survey data, is under construction.