Further comparisons have been made between fresh ragwort and similar material included in an ensilage stack and recovered eight months later. The alkaloid content of various samples decreased by amounts varying from 50 per cent. to 60 per cent. of the total. Similar experiments in 1937 showed a decrease of about 90 per cent. in the alkaloid content four months after the making of the ensilage. It seems probable that the decomposition of the alkaloid depends on the type of ensilage and the method of making. Experiments on similar lines are being made with ragwort hay.

Analyses have shown that plants collected in December, from the rosette to the early flowering stage, all contained 0·2 per cent. of alkaloid in the leaves; plants in full flower at this time contained 0·17 per cent. in the leaves (values expressed on dry weight). The alkaloid content of all leaf samples was about one-third higher than that of the stalks. Ragwort seeds contained only 0·04 per cent. alkaloid.

A supply of the pure alkaloid is being accumulated with a view to carrying our feeding trials on farm animals.

Medicinal Plants grown in New Zealand.

Digitalis purpurea. Material collected from the Hutt Valley was assayed by the chemical method of Knudson and Dresbach and gave the following results (expressed in International units per gram of dry powder): Leaves, 9·8 to 10·3 units; flowering stalks, 14·0 units. Digitalis of the British Pharmacopœia contains 10 units per gram.

Datura stramonium.—Material growing in Wellington contained 0·34 per cent. of alkaloids calculated as hyoscyamine. The stramonium of the British Pharmacopœia contains not less than 0·25 per cent. of alkaloids calculated in the same manner.

Gentiana corymbifera.—This plant is a native of New Zealand and has been compared with the official *Gentiana lutea.* From the young roots the extractives either with alcohol or water amount only to some 20 per cent., but the aqueous extract is about three times as bitter as an extract from the same weight of the official drug. The native species contains a new glucoside which is being examined further.

Spraying Materials.

Analyses have been carried out as a check on the quality of certified spray products. In all cases samples conformed to the requirements. Derris samples were tested for ether extract and for rotenone; the latter was determined by extraction with cold chloroform, crystallization from carbon tetrachloride, and purification with alcohol. Three samples submitted contained only 0·06 per cent. rotenone, and the crystallization of the rotenone from these three samples could only be obtained after addition of pure rotenone. Other samples varied from 0·2 per cent. to 1 per cent. of rotenone.

Further work was carried out on sixty samples of pyrethrum flowers, the content of pyrethrins I and II varying from 0·4 per cent. to 1·8 per cent. Mercury seed dusts were also examined.

Analyses of samples of colloidal sulphurs (original sulphur content of 25 per cent.) which were collected in orchards served to show that there is a grave risk of inadequate mixing of bulk samples in orchard practice. One sample taken from a half-emptied keg of colloidal sulphur showed 55 per cent. of sulphur, while another sample from a previously unopened keg which was shaken for one minute, gave a sulphur content of 22·5 per cent. Hence adequate mixing prior to use in the orchard is a very important factor in securing satisfactory control.

Thermal Regions, White Island.

During April, two members of the staff made a visit to White Island, again in co-operation with Dr. P. Marshall. On this occasion five days were spent on the island. Samples of gases, condensed steam, and waters were brought back for analysis. A method had been devised for collecting samples of gas from fumaroles, and this was found to work satisfactorily. The presence of hydrochloric and hydrofluoric acids in the magmatic steam, as indicated by the analyses of samples from fumaroles, would make difficult the utilization of steam obtained by boring for the evaporation of sea-water to produce salt.

Library.

Facilities have been considerably improved during the year by the provision of another room to house bound volumes of periodicals. The former congestion has been to a large extent relieved, and facilities for reading and writing provided for the staff.

Accessions for the year have been fewer than usual, both owing to restrictions in funds and to the fact that a large proportion of foreign literature is no longer available. Books received during the year total about 100, while the number of periodicals (including annual reports and bulletins) regularly received is 91.

The subject index of articles from journals, books, periodicals, and other information now amounts to over seven thousand entries. The compiling of a catalogue and shelf-list is being undertaken.

A monthly list of publications received in the library is now circulated to all members of the staff.

Increased co-operation has been made possible between the Laboratory library and that of Head Office following on the appointment of a librarian to the latter.

Service on Committees and Consulting Work.

Several senior members of the staff represent the Laboratory on various inter-departmental committees, according to their specialized knowledge, and undertake their full share of the work and responsibility involved. They also deal with numerous requests for information on scientific and industrial matters, many from the general public, and furnish reports when required. In such work the library is proving invaluable.