

Two accidental deaths investigated were due to the use of common bottles to contain dangerous substances.

A large number of samples of blood and of urine from victims of traffic accidents, from suicides, and from a person suspected to have been murdered were examined for the presence of alcohol.

OIL, BITUMEN, AND TAR

The highways work is still largely confined to routine examinations of road tars and bitumens. Samples of petroleum and bituminous products examined included aviation petrol, jet-engine fuel, petrol, lubricating oils and greases, Diesel fuels, kerosene, &c.

PHYSICAL CHEMISTRY

The most useful field for spectrography is, in general, in qualitative analysis, but a recent development has made possible semi-quantitative analyses. This has been used for the preliminary examination of alloy steels prior to chemical analysis. It has also been used in examining magnet steels, alloys of aluminium, certain house-construction materials, boiler scales, and lead compounds for ceramic firing ovens.

Phormium tenax (native flax) leaves and roots were examined for trace-element deficiency in connection with yellow-leaf disease. No deficiencies were found.

Much information was supplied to industry by means of circulars and letters, particularly on plating problems.

METALS AND CORROSION

About half of the work performed by this section was of direct assistance to New Zealand industries.

Materials of which analyses were made included carbon steels, alloy steels, alloy cast iron, magnet alloys, arc-welding materials, solder-type metals, bearing-metals, brasses, bronzes, aluminium alloys, zinc dross, boiler plate, boiler tubes, and turbine blading.

In corrosion problems the main physical and chemical factors causing the corrosion are determined. From information available or from actual tests remedies are then recommended. These may take the form of improving the environment of the metal, replacing the metal by a more corrosion-resistant material, or using a suitable protective coating.

Problems included the corrosion of domestic electric hot-water systems, welded stainless-steel plate, high-tension transmission condensers, steam-turbine economizer, trawler-engine, tank-periscopes, and grenade components.

Corrosion investigations and pipe-line protection work have resulted in the discovery of two areas in the North Island where the ground waters are highly aggressive. These waters may cause serious deterioration of buried concrete and metal structures, and investigations to prevent this are under way.

COAL SURVEY

The Coal Survey Laboratory has continued to co-operate with the field staffs of the Geological Survey and the Mines Department in the physical and chemical survey of the coal resources of the Dominion.

Analysis of samples has included the following: coal, mine air, briquettes, coke, shale, and petroleum.