

TOXICOLOGY

Poisons detected in police exhibits included arsenic, barbitone, barium carbonate, carbon monoxide, chloroform, disinfectant, mercuric chloride, nembital, petroleum distillate, phenobarbitone (three cases), sodium cyanide and sodium salicylate.

Arsenical weedkiller was responsible for two accidental deaths and arsenical fly-poison for one.

Arsenic was found in the viscera of a poisoned dog.

Urine and blood from the victims of traffic accidents were examined for the presence of alcohol.

A laxative compounded by an amateur with fatal results was found to consist of about equal parts of Epsom salts and mercuric chloride (corrosive sublimate) which was supplied by mistake for mercurous chloride (calomel).

Death occurred through a mistake in administering 300 grains of sodium salicylate in mistake for glucose.

OIL, BITUMEN, AND TAR

The samples examined numbered 416, and included 264 samples of aviation fuel. Other examinations included lubricating-oils (including aero and Diesel lubricating-oils), anti-corrosion oils, dashpot relay oils, Diesel fuels, spray oils, tanning-oil, turbine oils, transformer oils, regenerated lubricating-oils, used oils, varnish-thinners, crude petroleum, and turbo-fuels for jet aircraft.

The desirability of revising existing specifications for lubricating-oils was examined.

A rich-mixture supercharged C.F.R. engine for the determination of the knock rating of aviation fuels has been ordered to supplement the engine already in use.

Highways work has included the routine analysis of tars, bitumens, bitumen emulsions; road oils; cut-backs, and tar primers. Various New Zealand tars were examined for suitability for use as road-making materials.

BUILDING-MATERIALS

(See Building Research report, p. 7.)

PHYSICAL CHEMISTRY

The main work in spectrochemical analysis was the examination of metals. The type of work has changed since the war ended. There were very few examinations of metals for compliance with specifications, but spectrographic examination of metals was frequently required in the investigation of faults or failures. Much of this work was directly for industry. It included tin from tinning pots, badly annealed copper tubing, gold too brittle to work, aluminium alloy for permanent mould casting, bronze for propeller shafting, zinc ingot, and platinum wire. The preliminary spectrographic examination of alloy steels is proving useful, as it frequently eliminates the need for chemical analysis.

Spectrographic and chemical determinations of the corrosion product from steam-turbine blades was against the presence of appreciable residues from sea water, which had at first been suspected.

On 0.2 mg. of a black deposit from an electric meter it was shown that it was mainly platinum, with some iridium. It was suggested that on this alternating-current circuit, silver or silver-alloy contacts might be more suitable.

Only two investigations were made of organic material: samples of dried yeast were examined for traces of metals and citrus leaves for the cause of chlorosis.

In the only example of forensic work which arose during the year it was desired to prove whether a red spot on a tire was due to paint similar to the red paint contained in a tin. The material (half a millionth of an ounce) recovered from chemical tests was examined spectrographically, and it was found that tests on the material from the spot agreed with tests made on paint from the tin.

The quartz spectrograph with photometer accessory was used for the determination of vitamin A in fish-liver oils and for the determination of transmission curves for visible light of colorimetric filters.