II. NOTE ON CONSTITUENTS OF THE WAX FROM ALKANET ROOT.

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The roots of alkanet are known to contain a colourless wax which is extracted by petrol along with the colouring matter, alkannin. Liebermann and Römer (*Ber.*, 1887, **20**, 2428) first mentioned it as a colourless waxy substance, m.p. 76°, which on prolonged treatment with alkali gave an inert compound and an acid. As alkannin is a fat-soluble dye exceedingly sparingly soluble in petrol, and the wax is slightly more soluble, it is considerably more convenient to extract and purify the former. But the wax is not present in quantity sufficient to enable the whole of the alkannin to be extracted by petrol, a considerable amount of this dye remaining in the root with anchusin, the second colouring matter of alkanet, to be described in a later communication. A preliminary examination of the wax shows that it is principally an ester of carnaubyl alcohol and cerotic acid.

EXPERIMENTAL.

The petrol extract of powdered alkanet root was evaporated to dryness and the residue treated with cold acetone, when a white wax tinged with red remained ; the crude wax was dissolved in methyl ethyl ketone and boiled with animal charcoal during four hours. The filtrate on concentration gave apparently crystalline flakes, recrystallising from ethyl acetate in white flakes m.p. 78° (Found : C, 81.95 ; H, 13.51 per cent.). The wax (yield, 0.18-0.2 per cent.) gave the following constants :—

$d^{30°}$	...	...	0.9676
$n_D^{80°}$	...	...	1.438
Saponification value	...	...	69.16
Acid value	...	...	12.92
Unsaponifiable matter	...	...	58.56
Iodine value	...	...	12.2
Molecular weight of mixed acids		...	380

The wax was saponified with an alcoholic solution of sodium hydroxide, the soap extracted with ether to remove unsaponifiable matter and the acids regenerated from the salts by acidification with hydrochloric acid. Two acids were isolated : (*a*) m.p. 68° (very small

quantity) ; (*b*) cerotic acid, m.p. 76° with equivalent, 393.4 ; $C_{26}H_{52}O_2$ requires 396.

Unsaponifiable Matter.—The ether extract from the sodium salts was evaporated to dryness and the residue crystallised from alcohol several times. The m.p. 68° indicates carnaubyl alcohol (Found : C, 81.28 ; H, 14.2. $C_{24}H_{49}.OH$ requires C, 81.35 ; H, 14.12 per cent.). The alcohol was oxidised with chromic acid in acetic acid solution, the white product crystallising from ether and melting at 72° in agreement with carnaubic acid (Found : C, 78.33 ; H, 13.16. $C_{24}H_{48}O_2$ requires C, 78.26 ; H, 13.05 per cent.).

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