

was completely fluid at 80° C., cooling to a lustrous brown solid. The chemical and physical examination of this wax is now being carried out. That the abnormal character of this soil is probably due to the wax is indicated by the fact that a sample of the soil which had been exhausted by alcohol and subsequently thoroughly dried wetted easily on contact with water, which spread rapidly throughout the mass. Again, if an alcoholic solution of the wax were added to the dry wax-extracted soil and the whole dried, the waterproof nature returned and the soil could not be wetted by mere contact. If kneaded in a mortar with water the original dry soil became thoroughly wetted; on drying it on the water-bath the difficulty in wetting it returned.

The most interesting point about this research is the origin of the wax, which may be due to one of a variety of dissimilar sources, probably of a vegetable nature, such as from algæ, diatoms, or bacilli. As, however, the wax in this case occurs on the surface soil the possibility of it being derived from higher vegetation must not be excluded. Virgin portions of the drained swamp at Ruakura at present grow a dense thicket of manuka (*Leptospermum*, family Myrtaceæ), as well as rushes, sedges, mosses, liverworts, and similar swamp-loving plants. Since the swamp has been drained bracken fern (*Pteris esculenta*) has taken possession of certain areas, while huge logs occurring throughout the swamp indicate that such swampy forest-trees as kahikatea or white-pine (*Podocarpus dactyloides*), pukatea (*Laurelia novae-zealandiae*), occurred; and the smaller growth of such plants as phormium (family Liliaceæ), a strong wax-bearing plant, toetoe (*Arundo conspicua*), bullrush (*Typha*), and cabbage-tree (*Cordyline australis*, family Liliaceæ) is also indicated.

Since receiving this Ruakura soil a yellow humus subsoil occurring near the sea in the far south under a peaty soil has also become the subject of investigation. Upon this subsoil nothing would grow. On ignition in a closed crucible the dried sample lost 34 per cent. of matter, burning off with a white flame (the "hydrocarbons" of the coal analyst). It yielded to alcohol and to ether a much greater quantity of extract than did the Ruakura soil (as much as 4 per cent.), and then still contained volatile matters which could be distilled at a gentle heat.

This being probably the first occasion on which these abnormal constituents have been noticed in New Zealand soils, it is deemed advisable to publish this preliminary notice, as the result of the investigation may be found to throw some light on one theory of the origin of petroleum, while the discovery of the occurrence of wax in such quantity may have a decided economic value.