

LABORATORY OF THE INLAND REVENUE DEPARTMENT.

OTTAWA, September 4, 1903.

THOMAS MACFARLANE, Esq., F.R.S.C.,
Chief Analyst.

SIR,—I have the honour to hand you, in tabular form, with appended notes, the results of work upon a large number of samples of flavouring essences; as also upon two samples of cochineal extract, which does not properly come under this head, being used for colouring rather than for flavouring.

Since no generally accepted standards exist for the preparation of these substances, I have thought it sufficient to ascertain the absence of matters dangerous to health; and I find nothing that can be condemned on this score. The question of foreign colouring matter, in its relation to health, must be considered an open one for the present.

The small quantity of material at my disposal has prevented fuller investigation in certain directions. In the event of another collection of like kind, I beg to recommend that officers be instructed to confine their samples to one particular essence or extract at a time, so that fuller justice may be done to it.

In the work recorded I have received very material help from Mr. Lemoine and Mr. Valin.

I have the honour to be, sir,
Your obedient servant,

A. MCGILL.

COMMERCIAL EXTRACT OF LEMON.

Essence of Lemon.—The B. P. defines a tincture of lemon to be prepared from fresh lemon peel and alcohol of 90 per cent. The finished product would contain about 70 to 80 per cent alcohol by volume.

The U. S. P. defines an essence or spirit of lemon to be made from oil of lemon and lemon peel, macerated with alcohol of 95 per cent. The finished product would in this case contain a somewhat higher percentage of alcohol; probably from 80 to 90 per cent by volume.

Extract of lemon, as used for flavouring pastry, custards, &c., is a preparation which, so far as I know, has no legally defined composition. It is popularly supposed to be prepared like the pharmacopoeal tinctures, by extracting lemon peel with alcohol, or by dissolving oil of lemon in alcohol.

Oil of lemon is the oil expressed from fresh lemon peel. It consists chiefly of hydrocarbons of the terpene series, but its characteristic flavour is due mainly to an aldehyde, or to a mixture of aldehydes, present to the extent of from 4 to 8 per cent. The principal aldehyde (citral) occurs in commerce under that name; and much of the lemon extract sold for flavouring purposes is made directly from citral. A very small quantity of citral suffices to give the lemon flavour and an economy of alcohol results from the substitution of citral for oil of lemon; this last requiring strong alcohol for its solution.

Commercial citral contains a trace of oil of lemons. A sample reported in the accompanying table contained 0.5 per cent. This minute amount of oil of lemon, accidentally present, cannot be held to make the use of citral equivalent to the use of oil of lemon in the manufacture of extract or essence of lemon. While the flavour of lemon is chiefly due to the citral which it contains, it is certain that other substances are involved in the total natural flavour, and these must, of course, be absent from a so-called extract made from citral. A German Imperial patent (No. 134,788)¹ recently granted to Heine & Co., prepares an artificial oil of lemon "by adding to a mixture of