

92 parts of limonene and phellandrine, a mixture of citral, linal, geraniol, geranyl acetate, linalool and linalyl acetate, also 1 part of a mixture of nonyllic and octylic aldehydes. The exact amount of the aldehydes depends upon the character and strength of the lemon odour desired.' I quote this formula in order to emphasize the fact that it is not alone to citral that lemon extract or essence owes its true flavour.

A recent decision in the Supreme Court of Michigan, rendered April 7, of this year, reversed a decision of a lower court, by which a so-called extract of lemon, made from citral, and artificially coloured, had been held to be adulterated. The manufacturers of terpeneless extracts claim better keeping qualities for such preparations, and less tendency to oxidize, thus developing disagreeable taste. It is also claimed that the full characteristic flavour of the lemon is conserved. Final opinion in this matter lies beyond the domain of the chemist, and an appeal must be made to the palate of the connoisseur. But it will be seen, from the accompanying tables, that whenever any considerable amount of oil of lemon is present at least 75 per cent of alcohol is present. This alcohol is the chief item of cost in manufacture, and it is reasonable to infer that the disuse of oil of lemon is at least in part accounted for by the possibility of employing weaker alcohol.

Most of the samples examined are coloured by coal-tar dyes—chiefly naphthol yellows and tropaeolin. A normal extract of lemon has little or no colour, and it is regrettable that there should be a popular demand for lemon extract of a decided yellow. While I have no proof that these dyes, used in the minute amounts necessary to colour the extracts, are actually injurious to health, it has been clearly proven (Bulletin 83, p. 14) that they are poisons in considerable doses.

A. J. Windowgradow (*) has demonstrated by recent experiments that so little as 1 milligramme (= 0.015 grain) of certain coal-tar dyes entirely prevents the digestion of egg albumen by pepsin.

*Pharmaceutical Review, 1908, p. 24.

(*) Zeitschrift, Untersuchung Nahr. u. Genussmittel 1908, 580-592.