bromide on 1 of levulinic acid. The lactone distilled at 76–78° under 5 mm. pressure; yield, 35.1%. Grignard and Moissan[2] obtained the same compound from ethyl levulinate. Their product boiled at 105–106° under 18 mm. pressure, with a yield of 35%.

DEPARTMENT OF CHEMISTRY
UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS
PHILIP K. PORTER
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Determination of Formic Acid.[1]—Jones[2] has described a method for determining formic acid by oxidation with standard potassium permanganate in a solution made alkaline with sodium carbonate. The solution was made acid, excess of standard oxalic acid added and the excess titrated with standard permanganate. This method was tested by using solutions of known concentration, with the results shown in Table I.

TABLE I

EFFECT OF TIME OF OXIDATION ON PERMANGANATE CONSUMPTION BY FORMATES

Time allowed for oxidation, min.	...	under 1	under 1	under 1	2	5	15	20	20	35
0.05 *N* $KMnO_4$ consumed, cc.	calc. 20.00	13.94	15.87	14.33	17.38	17.98	19.51	20.07	20.08	19.93

The results show that at least 20 minutes should be allowed for the completion of the oxidation. Jones probably allowed this time to elapse, but neglected to mention this detail in the description of his method.

RESEARCH LABORATORIES
DAIRY DIVISION
UNITED STATES DEPARTMENT OF AGRICULTURE
E. O. WHITTIER
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NEW BOOKS

The Theory of Emulsions and Emulsification. By WILLIAM CLAYTON, D.Sc. Foreword by Professor F. G. DONNAN, Ph.D., D.Sc. P. Blakiston's Son and Company, 1012 Walnut Street, Philadelphia, 1923. viii + 160 pp. 22 figs. 14 × 22.5 cm. Price $3.00.

This is probably the most comprehensive book on emulsions available, although Bancroft and Fischer have written rather extensively on the subject. One of the most acceptable features of the book is the rather full bibliography of some two hundred references. Chapters are given on Emulsions and Emulsifying Agents; The Properties of Emulsions; Earlier Theories of Emulsions; Adsorption at Liquid-Liquid Interfaces; Dual

[2] Grignard and Moissan, *Compt. rend.*, **135**, 629 (1902).

[1] Published by permission of the Secretary of Agriculture.

[2] Jones, *Am. Chem. J.*, **17**, 540 (1895).