

lower boiling point. Rittmann & Dean¹ found that California, Oklahoma, and Pennsylvania crude petroleums do not begin to crack below 325°C., but some careful tests with samples 1156, 1292 and 1293 (see pages 62, 63, and 66) showed that considerable cracking occurred with these oils below 300°C. In these cases the divergence between the results of the different methods was very considerable.

Petroleum Products. The International Petroleum Congress in 1912 officially adopted the Ubbelohde continuous method, but many modifications are in common use. These vary in the rate of heating, position of thermometer bulb, employment of a still head, etc. Thus in Dean's modification² the distillation rate is 4-5 c.c. per minute, and the condenser is ice-jacketed. Some results taken from Lomax³ illustrate the variations to be expected in the results on gasoline with the method employed.

TABLE II.

Method.	1	2	3
Volatile below 100° C.....	8.5	17.0	21.5% by volume
“ 125° C.....	58.0	64.5	64.0
“ 150° C.....	88.5	92.0	90.5
Total distillate.....	98.5	98.5	97.5
Residue.....	1.4	1.2	2.1
Loss.....	0.1	0.3	0.4

Method 1: Redwood, continuous. Method 2: Engler, intermittent (slightly modified). Method 3: Lomax, fractionating, continuous.

Most samples of oil, whether crude or refined, examined in the Fuel Testing Laboratories at Ottawa, were distilled in an Engler apparatus, having a metal flask and condenser, either by the continuous or intermittent method as stated.

¹ Rittmann & Dean: The Analytical Distillation of Petroleum, U.S. Bureau of Mines, Bul. 125, p. 14.

² Motor Gasoline, by E. W. Dean, U.S. Bureau of Mines, Tech. Paper 166.

³ Testing and Standardization of Motor Fuels. The Petroleum World, Vol. XIV, No. 206, Nov. 1917.