(82 per cent yield) of crude trans-1,3-cyclopentanedi-
butyric acid (85). An analytical sample of 85, m.p. 118-
120°C., was prepared by three recrystallizations from a
large volume (250 ml./g.) of 5 per cent acetic acid.

**Anal.** Calcd. for C_{13}H_{22}O_4: C, 64.44; H, 9.15.
Found: C, 64.26; H, 9.23.

**Dimethyl trans-1,3-cyclopentanediibutyrate (86).-**
Crude trans-dibutyric acid 85 (5.6 g., 0.23 mole) was re-
acted with 3.2 g. (0.1 mole) of reagent grade methanol and
1.4 g. (0.8 ml.) of concentrated sulfuric acid in 12 ml.
of benzene. Workup in the usual manner and purification
of the product by chromatography on activity I alumina
gave 4.4 g. (70 per cent yield) of pure dimethyl trans-1,3-
cyclopentanediibutyrate (86), n_\text{D}^20 1.4579.

**Acyloin Reactions in Xylene**

I. **Acyloin condensation of diethyl cis-1,3-cyclopentanedi-
propionate (69)**

cis-Bicyclo[6.2.1]undecan-4-ol-5-one (73).-The
apparatus described by Prelog and co-workers^{34} was em-
ployed, and the workup procedure was that of Cram and
Steinberg.^{53} A 250-ml., three-necked flask was equipped
with a high-speed stirring motor (20,000 RPM) connected