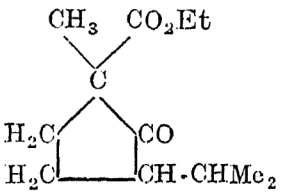
Synthesis of Thujane.

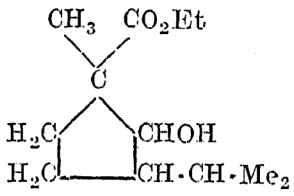
THE synthesis of thujane, the parent hydrocarbon of the naturally occurring bicyclic terpenes of this group, was undertaken simultaneously in this laboratory by two different methods: *viz.*, (i) starting from a *cyclo*hexane derivative having two bromine atoms in positions 2 and 4, a methyl group in position 1, and an isopropyl group in position 4, and (ii) from a *cyclo*pentene derivative possessing a methyl group in position 1, a double bond between the carbon atoms in positions 2 and 3, and an *iso*propyl

group in position 3. Our first scheme resulted in the synthesis of thujane starting from menthol.[1]

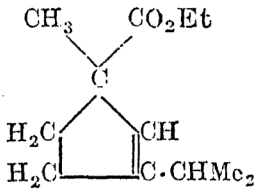
In the present communication, we are going to describe the synthesis of thujane according to our second scheme starting from ethyl 1-methyl-3-isopropyl*cyclo*pentane-2-one-1-carboxylate (I). This compound was prepared according to the method of Kotz and Schuler[2] starting from diethyl adipate. Compound (I), b.p. 133°/12 mm., was reduced with sodium amalgam to the corresponding secondary alcohol (II), b.p. 153–56°/11 mm. (phenyl urethane derivative, m.p. 144–45°) which in its turn was converted into the *cyclo*pentene derivative (III, (b.p. 114–15°/11 mm.) by the action of phosphorus pentoxide in benzene solution. The unsaturated compound (III) reacts with diazomethane on being allowed to stand in ethereal solution at 0° during two weeks to yield the bi*cyclo*-0 : 1 : 3-hexane derivative (IV, b.p. 130–32°/12 mm.) giving on hydrolysis with 5 per cent. KOH the corresponding croboxylic acid (V), m.p. 93–94° ; Eq. Wt. found 180·9 ; required 182. The acid on being distilled with soda lime under reduced pressure gives thujane (VI), b.p. 155–56° ; n_D, 1·4400 ; d_{26}^{26}, 0·8143, the corresponding values of thujane as given by Semmler and Feldstein[3] being b.p. 156–57° ; d_{21}^{22}, 0·8158 ; n_D, 1·44121.



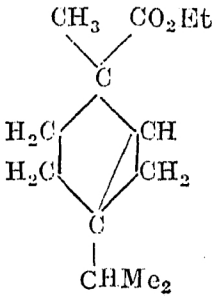
(I)



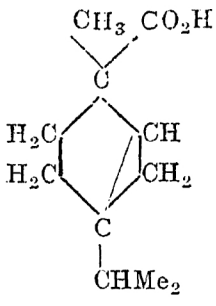
(II)



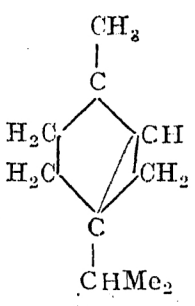
(III)



(IV)



(V)



(VI)

P. C. Guha.
S. Krishnamurthy.

Department of Organic Chemistry,
Indian Institute of Science,
Bangalore,
July 31, 1937.

[1] *Ber.*, 1937, **70**, 931.
[2] *Annalen*, 1906, **350**, 226.
[3] *Ber.*, 1914, **47**, 387.