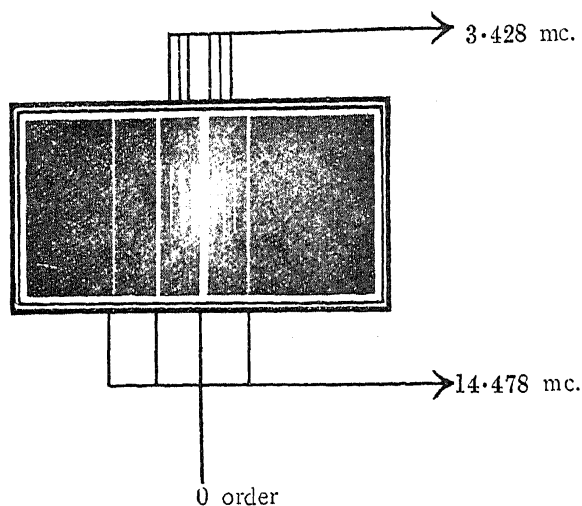


accurately in each case by a precision wave-meter.

The accompanying photograph shows the diffraction spectra at 3.428 mc. and 14.478 mc. taken with toluene as the liquid.



Diffraction spectra in toluene.

Experiments were carried out with the above arrangement on six liquids. While toluene and *m*-xylene show no dispersion within the range investigated, benzene, carbon tetrachloride and tetralin show a definite increase in velocity at 14.5 mc. and amyl-acetate a decrease in velocity.

The following table gives the experimental results:—

Liquids	Temp. in °C.	Sound velocity in m./s.	
		at 3.5 mc.	at 14.5 mc.
1. Benzene ..	26.8	1284	1290
2. Toluene ..	30.9	1272	1272
3. <i>m</i> -Xylene ..	27.1	1302	1302
4. Tetralin ..	30.3	1430	1434
5. Carbon tetrachloride ..	27.6	907.4	912.4
6. Amyl-acetate ..	27.2	1190	1179

A detailed paper will be published elsewhere.

S. PARTHASARATHY.
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July 15, 1937.

¹ P. Biquard, *Thesis*, Paris, 1935.

R. Lucas and P. Biquard, *Trans. Farad. Soc.*, 1937, **33**, 130.

J. Clæys, J. Errera and H. Sack, *ibid.*, 1937, **33**, 136.

C. Sörensen, *Ann. Physik.*, 1936, **26**, 121.

² E. Hiedemann, N. Seifen, and E. Schreuer, *Naturwissen.*, 1936, **24**, 681.

S. Parthasarathy, *Proc. Ind. Acad. Sci.*, 1936, **4**, 17.

The Condensation of Resacetophenone with Open-chain and Cyclic β -ketonic Esters.

RESACETOPHENONE condenses with ethyl-acetoacetate in the presence of phosphorus oxychloride with the formation of 4-methyl-6-acetyl-7-hydroxycoumarin, (50% yield), which has already been isolated (in a small yield) by Jimaye and Gangal¹ from the Frie's migration product of 7-acetoxy-4-methylcoumarin. The condensation does not take place in the presence of either concentrated sulphuric acid or sodium ethoxide. The reaction can be applied to all the unsubstituted and mono-substituted open-chain, as well as cyclic β -ketonic esters, and we have already obtained a number of this type of coumarins and studied their properties. Full details will be shortly submitted for publication in the *Proceedings of the Indian Academy of Sciences*.

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July 8, 1937.

¹ *Rasayanam*, 1936, **1**, 15.

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 cyclohexane 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 cyclopentene derivative possessing a methyl group in position 1, a double bond between the carbon atoms in positions 2 and 3, and an isopropyl

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-isopropylcyclopentane-2-one-1-carboxylate (I). This compound was prepared according to the method of Kotz and Schuler² 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 cyclopentene 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 bicyclo-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_{20}^{20} , 0.8143, the corresponding values of thujane as given by Semmler and Feldstein³ being b.p. 156-57°; d_{21}^{22} , 0.8158; n_D , 1.44121.

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Department of Organic Chemistry,
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July 31, 1937.

¹ *Ber.*, 1937, 70, 931.

² *Annalen*, 1906, 350, 226.

³ *Ber.*, 1914, 47, 387.

Occurrence of Rotenone in *Millettia pachycarpa*.

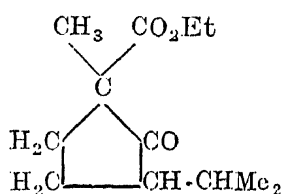
THE importance of rotenone as an insecticide is now well established and the demand for rotenone-bearing plants is daily increasing. In a previous communication¹ we had reported the discovery of the rotenone-bearing *Derris elliptica* in India. Since then we have continued our exploratory work on other fish poison plants and we are now able to report the presence of rotenone in *Millettia pachycarpa* (N. O. Leguminosæ).

These samples of roots were obtained from two different localities, Kalimpong and Gauhati and from both of these we have isolated 4% total resins and 1.2% of pure crystallised rotenone. Presence of one per cent. rotenone in *Millettia* does not, however, make it an important source of the insecticide but, in view of the fact that the plants investigated were wild and of very uncertain age, the results are encouraging and lead to the hope that on cultivation and proper harvesting the amount of the insecticide might increase. Furthermore, the interest in this finding lies in the fact, that some of the *Millettia* species are pests in some of our forests and a systematic investigation might lead to an economic use being found for them.

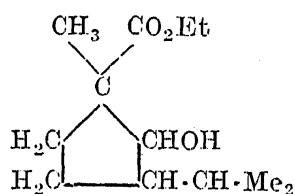
T. P. GHOSE.
S. KRISHNA.

Forest Research Institute,
Dehra Dun,
July 8, 1937.

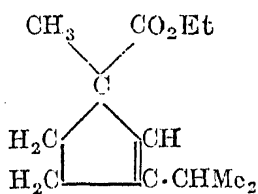
¹ *Curr. Sci.*, 1936, 4, 857.



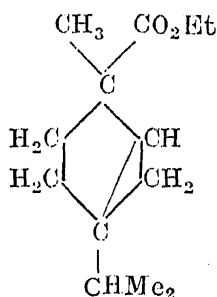
(I)



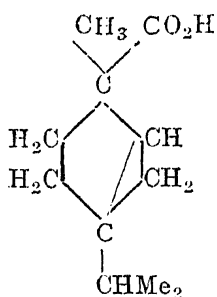
(II)



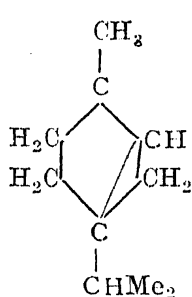
(III)



(IV)



(V)



(VI)