Object and Scope:

Experiments were undertaken to find new and convenient routes for the elaboration of isopropenyl and isopropylidene groups, so often encountered in terpenoids, and put to use along with other well-known reactions in completing the unambiguous and facile syntheses of some naturally occurring terpenes.

Findings and Conclusions:

Two routes were explored.

1. The following three step sequence of reactions starting from an aldehyde yielded the $\gamma,\delta$-unsaturated aldehyde in which the double bond is trans as shown by the NMR spectrum of the synthesised trans, trans-farnesol which showed signals at $\delta$ 8.34 and 8.41 with relative intensities of 1:2 respectively (150).

Based upon this approach, the syntheses of trans,trans-farnesol,
trans-nerolidol, trans-2,6,10-geranyl-geranol and trans-geranyl-linalool have been accomplished which constitute Sections III, IV, V and VI respectively of Chapter 3. Thus in a simple sequence of reactions it is possible to synthesise a number of isoprenoid and non-isoprenoid compounds having double bonds arranged on the above pattern.

2. Lithium diisopropenyl copper, prepared by the reaction of cuprous iodide on isopropenyl-lithium in dry tetrahydrofuran under nitrogen atmosphere, has been found to be a good reagent for the fixation of isopropenyl group in certain terpenoids. The usefulness of this new reagent has been demonstrated by achieving new syntheses of β-terpineol, dl-carvestrene, dipentene and dl-4-methyl-isopropenyl cyclohexene through simpler and shorter routes in contrast to those utilised by the earlier workers (168, 91, 56, 89). The syntheses of all these terpenes have been placed in Chapter 4.

An unambiguous and straightforward synthesis of β-elemene has been accomplished through the cyclisation of 2,8-dimethyl-5-isopropenyl-undeca-trans-2,6-diene-1,10-dibromide (XX) with nickel carbonyl in dry dimethyl formamide according to the conditions described in the literature (100). This has been included in Chapter 4.

A new synthesis of dl-β-bisabolene has been effected which involves the preparation of the intermediate ketal (XXX) through
two different pathways based upon the application of Wittig reaction (43) with methylenetriphenylphosphorane and isopropylidetriphenylphosphorane on (XXVI) and (XXXIX) respectively as the key steps. This has been discussed in Chapter 2.