bicyclic systems. A considerable amount of work has been done on the effect of aliphatic substituents and the incorporation of heteroatoms, triple bonds, and double bonds on the formation of medium rings by the acyloin condensation; however, there apparently is no information available regarding the effect on the reaction of a bridging aliphatic chain, as encountered in the formation of a bridged bicyclic molecule. Also, the acyloin condensation has apparently not been explored previously as a method for synthesizing bridged-aliphatic, bicyclic systems. The bicyclo[6.2.1]undecanes are of interest both from the standpoint of their possible synthesis by means of the acyloin condensation and because of their stereochemistry.

It was, therefore, the goal of this research to investigate the acyloin condensation of the esters 39 and 41 (R=CH₃ or -CH₂CH₃) of the cis- and trans-1,3-cyclopentanedicarboxylic acids to the corresponding cis- (40) and trans-bicyclo[6.2.1]undecane (42) derivatives (R'=H, -OH; =O) and to obtain information regarding the chemistry and stereochemistry of 40 and 42. The dipropionic esters 39 and 41 were chosen since it was believed that the side chains might be of sufficient length to allow cyclization of both cis and trans isomers.

In the course of this investigation it was necessary to characterize the previously unknown, isomeric cis- (39)