construct a bond-order – bond-length curve for NN and NO bonds. On this basis we can make the following comparison :

Bond	Bond-order calculated	Bond-length (A.) calculated	Bond-length (A.) observed
ON	1·45	1·32	1·36
	1·40	1·33	
NN	1·72	1·30	1·30
	1·76	1·29	

The undistorted angle N′N″O should be close to 90°, and we suggest that the observed angle of 117° arises because of the strong repulsion between the negatively charged oxygen atoms.

The same treatment can be applied to the dimethylnitramine structure[4], and, although owing to hyperconjugation with the methyl groups the simplifications are less justified, the results do reveal strong double-bond character in both the NN and the NO bonds.

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Crystal Structure of 'Gammexane'

The crystal structure of γ-benzenehexachloride, the insecticide 'Gammexane', has been determined by X-ray analysis (Weissenberg diagram) in the usual way of trial and error, starting from Patterson data and supported by repeated Fourier syntheses. Cell dimensions : $a = 8{\cdot}5$ A. ; $b = 10{\cdot}3$ A. ; $c = 13{\cdot}9$ A. ; $\beta = 121°$. Space group $P2_{1/c}$; four molecules per cell.

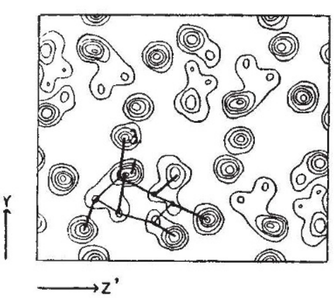


Fig. 1. Projection of the electron density on a plane perpendicular to the a-axis. ($z' = z \sin \beta$)

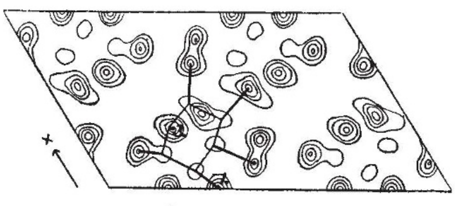
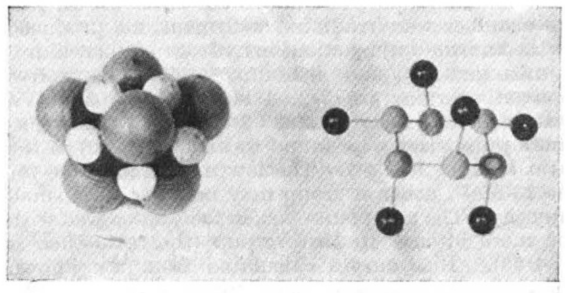


Fig. 2. Projection of the electron density along the b-axis

Figs. 1 and 2 give the Fourier map of the 100 and 010 projections. The carbon ring is of the 'chair'-form and the configuration of the chlorine atoms proves to be of type εεεκκκ (in the nomenclature of Hassel[1]), as is seen in Fig. 3.



A B

Fig. 3. Atomic models of the 'Gammexane' molecule. *A*, All dimensions to scale (small white balls represent hydrogen atoms). *B*, Schematic (hydrogen atoms omitted)

Thus the molecule of the insecticide is shown to be not isomorphous with the molecule of meso-inosite (type εκκκκκ), contrary to a suggestion by Slade[2]. Moreover, it has been generally supposed that steric hindrance should not allow chlorine atoms in 1,3 positions both to have the ε-configuration[2,3].

This, too, is disposed of by our result. The steric hindrance causes only a slight bending apart of the 1,3 C—Cl bonds in question (see Fig. 2, where the projections of these bonds are not of equal length). The number of isomers is now no longer restricted to five ; and as a matter of fact, Hassel quite recently announced the preparation of a sixth isomer[4].

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A High-Pressure Hydrogen-filled Ionization Chamber

Electron collection has been obtained in hydrogen up to pressures of about 90 atmospheres. To get the very pure hydrogen needed, a cylindrical ionization chamber was made of glass (12 cm. long ; 5 cm. diameter), with an axial wire (0·2 mm. diameter), for the collecting electrode ; a coating of 'Aquadag' on the outside of the glass formed a convenient high-voltage electrode. The chamber was very carefully evacuated, baked, sealed off, and then placed in a steel container in which the pressure of hydrogen was slowly raised at the rate of one atmosphere per hour. By means of two heated palladium tubes sealed into the glass chamber, the chamber was slowly filled with purified hydrogen.

The size of recoil proton pulses produced by neutron irradiation was found to decrease with increase in pressure. At 60 atmospheres and 4,000 volts, the