chloropyrimidine[6], though in these cases because of the symmetry of the molecules there are effectively only two atoms involved in the disorder—the chlorine and bromine atoms in the first case, and the chlorine atom and the methyl group in the second case.

An examination of the X-ray photographs showed no trace of additional layer lines and no diffuseness in the spectra, so that the possibility of a fault structure with blocks of the crystal containing molecules properly aligned in one direction and other blocks with molecules properly aligned in the other direction can be excluded. This is also the case with *p*-chlorobromobenzene and 2-amino-4-methyl-6-chloropyrimidine.

An electron-density projection on (010) for the revised structure is shown in Fig. 2. The similarity of this projection of a pair of statistically superimposed molecules to the electron-density projection given in our previous structure[1] is striking and explains the good structure-factor agreement obtained for that structure.

Because of the overlap of atoms the bond-lengths available from this study are of limited accuracy, but the central bond at 1·458 A. appears to be distinctly longer than the other bonds in the molecule. A more complete analysis of this structure will be described elsewhere.

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Presence of 1,2,3,4-Dibenzopyrene in Cigarette Smoke

In an investigation of the neutral fraction of cigarette smoke tar for the presence of carcinogenic hydrocarbons[1], the fluorescence spectra given by various chromatographic fractions were obtained. One of these (spectrum *h*) has been found to be identical with the spectrum given by a sample of pure 1,2,3,4-dibenzopyrene, which has since become available for reference.

The fluorescence spectrum of the compound in cyclohexane consists of a series of fine lines at 462, 470 and 478 mμ, the latter being of lower intensity than the first two. The absorption spectrum of the analytical sample gave all the features of the reference standard[2]. The chromatographic behaviour of both standard and analytical samples on columns of alumina was similar, elution occurring after 3,4-benzopyrene but before 11,12-benzofluoranthene. The latter two compounds, organic solvent solutions of which display a blue–violet fluorescence, occur widely in the combustion products of organic matter. The 1,2,3,4-dibenzopyrene is associated with a light green fluorescence.

The 1,2,3,4-dibenzopyrene was estimated by measurements of the peak height at 331 mμ. 1·6 μgm. was recovered per 100 cigarettes of average weight 1·1 gm., smoked to a stub length of about 1·5 cm. This is of the same order of concentration as that found for 3,4-benzopyrene.

Small quantities of 1,2,3,4-dibenzopyrene have been detected in petrol and the exhaust products of Diesel engines. It has not, however, been detected in a sample of general urban atmospheric soot, in marked contrast to 3,4-benzopyrene, which was found to occur there in a relatively high concentration[3]. Thus, it would appear that the urban-dwelling cigarette smoker has an exposure to 1,2,3,4-dibenzopyrene in a concentration not realized by his non-smoking neighbour.

As a result of preliminary tests, Bachmann *et al.*[4] and Cook and Kennaway[5] have described 1,2,3,4-dibenzopyrene as a carcinogenic agent of considerable potency.

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Radiometric Estimation of Unsaturated Fatty Acids on Chromatograms

A technique is desirable for estimating amounts of fatty acids separated by partition paper chromatography, without necessity for time-consuming elution, and free from inherent errors of strip photometry. Radiometric methods can meet these requirements, and in chromatographic applications have sometimes allowed accurate definition of spot geometry, which in some cases may be quantitatively related to spot content[1].

Kaufman[2] has determined the iodine number of unsaturated fats pipetted on to a paper support, using iodine-131 monobromide in absolute methanol. We have used iodine-131 to develop a method for quantitative estimation of unsaturated fatty acids separated by partition paper chromatography.

The acid mixture is revolved on 15 mm. × 280 mm. Schleicher and Schull 598 *L* paper strips, using a mixture of synthetic hydrocarbons of very low bromine number (0·16) and boiling point 180–190° C., called 'Mepasine' (Polish product, Ciech, Warsaw), as stationary phase, and 90 per cent acetic acid saturated with 'Mepasine' as mobile phase in ascending reversed-phase chromatography under nitrogen. 'Mepasine' is applied to the strips as a 20 per cent solution in freshly distilled ether free of peroxide, followed by evaporation of the ether.

The strip is dried after chromatography at 60° C. for 1 hr. in nitrogen. It is then immersed in 6·5 ml. of a solution of 0·0022 *M* sodium iodide, 0·0044 *M* sodium iodate, and containing about 5 μc./ml. iodine-131 as iodide. The solution is made 0·025 molar in sulphuric acid to liberate iodine. After immersion for 150 min., the strip is removed, and dried overnight at room temperature, during which time excess unbound iodine-131 is given off.