spreading; droplets of solution left behind when the column is emptied do not distribute evenly in a short enough time.

(*b*) Surface-active agents which may reduce surface tension of the liquid phase and thus facilitate the spreading of the liquid. The favourable effect of products like 'Alkaterge *T*' reported by Averill[5] may be due partly to this phenomenon.

(*c*) In general, roughening the wall of the capillary will decrease the contact angle and may be used to advantage.

(*d*) On the contrary other surface-active agents may be adsorbed on the surface of the capillary and in some cases reduce the solid–liquid adhesion. Owing to the viscosity, the slowness of coalescence may, however, give time for desorption of the surface active agent. Compounds of this kind may be expected mainly from the sample under analysis and, in spite of the small quantity present, may reach a concentration large enough to produce a local disturbance of the liquid film, travelling with the solute; a monolayer may be sufficient. This may produce a gradual alteration of the column with consequent loss of efficiency.

Measurements of contact angle and surface tension were made in air by photographing the profile of sessile drops. The nature of the carrier gas is not likely to alter appreciably the value of the critical tension.

We are extending this study to temperatures often met with in gas chromatography (50°–150° C).

We thank Miss M. Raison for some confirmatory measurements made by the dipping-plate method.

F. Farré-Rius
J. Henniker
G. Guiochon

Centre d'Etude des Matières Plastiques,
13, rue Pierre Curie,
Montrouge, Seine.
Ecole Polytechnique,
17, rue Descartes, Paris.

[1] Giddings, J. C., *Anal. Chem.*, **34**, 458 (1962).
[2] Farré-Rius, F., and Henniker, J. (to be published).
[3] Shafrin, E. G., and Zisman, W. A., *J. Phys. Chem.*, **64**, 519 (1960).
[4] Deacon, R. F., *Trans. Farad. Soc.*, **53**, 1014 (1957).
[5] Averill, W., *Third Symp. Gas Chromatography; Instr. Soc. Amer.*, East Lansing, Mich. (1961).

Unpaired Electron in Nitroso-*bis*(dimethyldithiocarbamato)iron(II)

We have examined the electron spin resonance spectrum of $[Fe(NO)\{S_2CN(CH_3)_2\}_2]$ to investigate how the unpaired electron, which is in an antibonding orbital in free nitric oxide, distributes itself in a metal complex. The magnetic moment of a powdered sample at room temperature is 2·24 B.M., which shows the complex to have one unpaired electron with an appreciable orbital magnetic moment. The electron spin resonance spectrum of a benzene solution consists of three equally intense lines with a separation of 0·0011 cm^{-1}. This triplet structure arises from an interaction between the unpaired electron and the nitrosyl nitrogen atom and indicates that the unpaired electron is in an orbital which embraces the nitrosyl group. This interaction is greater than that in free nitric oxide[1] in which the splitting is 0·00099 cm^{-1}.

Single crystals of this complex have also been studied by electron spin resonance and the dependence of the spectrum on the orientation of the crystal with respect to the field has been determined.

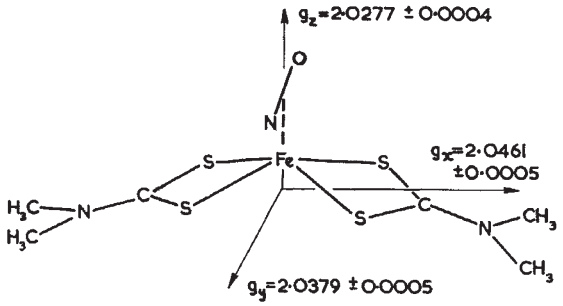

Fig. 1

Since the structure of the isomorphous $[Co(NO)\{S_2CN(CH_3)_2\}_2]$ is known[2] it is possible to determine from these results the directions of the principal *g* values with respect to the molecule. These are shown in Fig. 1. It is seen that the N—O direction is not important in determining the directions of the principal *g* values, as it would be if the unpaired electron were associated only with the nitric oxide ligand[3]. Instead the principal *g* directions are determined by the ligand field at the iron atom produced by the dithiocarbamate groups.

Our results indicate, therefore, that the unpaired electron is not entirely on the nitrosyl group, but is in a molecular orbital which includes both the iron atom and the nitrogen atom of the nitrosyl group, and which has the symmetry of the environment of the iron atom. Further experiments with more sensitive apparatus are planned to investigate whether the unpaired electron is also associated with the sulphur atoms.

J. F. Gibson

Imperial Chemical Industries, Ltd.,
Heavy Organic Chemicals Division,
Akers Research Laboratories,
The Frythe, Welwyn, Herts.

[1] Beringer, R., and Castle, J. G., *Phys. Rev.*, **78**, 581 (1950).
[2] Alderman, P. R. H., Owston, P. G., and Rowe, J. M., *J. Chem. Soc.*, 668 (1962).
[3] cf. Griffith, J. S., *Proc. Roy. Soc.*, A., **253**, 23 (1956).

BIOCHEMISTRY

Chemistry of a Case of Juvenile Amaurotic Idiocy

Chemical analysis which would give a hint of the nature of juvenile amaurotic family idiocy is still lacking. The condition is considered to be a metabolic disorder because of the abnormal intracellular deposits in the ganglion cells. Klenk[1] found no increase in the total amount of gangliosides; but Cumings[2] reported an increase in the neuraminic acid level in the cortex in adult cases of amaurotic family idiocy. Tingey[3], in his routine carbohydrate analysis of the brain of the present case (a 15-year-old boy), found no increase in neuraminic acid and no significant abnormality. The present investigation was conducted primarily to examine the nature of the glycolipids and polysaccharides present both in the brain and the liver.

The method used to fractionate the liver was a modification of that previously used[4] in an investigation of glycogen storage disease. In the present case extraction with M sodium chloride and cold N sodium hydroxide failed to extract any detectable glycogen. The very small amount present was presumably