



and differentiation. The work is part of a search for chemicals to serve as ripeners to enhance the production of sucrose in cane, which is in progress at the Tate and Lyle Research Centre. Mature maize plants were sprayed with an analogue of the plant growth inhibitor CCC (JF 2578, Plant Protection Ltd) and four days later some of the actively dividing tissue was removed from the leaves. This was fixed in 3 per cent glutaraldehyde in 0.33 M sorbitol and 0.001 M magnesium chloride, buffered with 0.05 M N-2-hydroxyethyl-piperazine-N'-2-ethane sulphonic acid, pH 7.0, and left overnight. The treatment was completed by immersion in 2 per cent osmium tetroxide and dehydration. Sections embedded in 'Araldite' were stained with uranyl acetate and lead citrate. The picture (approximate magnification 10,000) was taken by Dr J. Coombs of Tate and Lyle and Mr H. Edge of King's College, London.

LIQUID STRUCTURES

Particle Correlations Recalculated

AN experimental method which promises to make accessible for the first time the important three particle correlation functions relating the positions of particles in a liquid has been suggested by P. A. Egelstaff, D. I. Page and C. T. R. Heard (*Phys. Lett.*, **30**, 376; 1969). They have shown that by measuring variations with pressure of the structure factor in a

simple liquid, information about the three particle to triplet correlation function can be obtained directly for the important regions near the critical and triple points.

The triplet function is an important quantity in the theory of liquids. In both solids and liquids, the relative positions of atoms can usefully be described in terms of correlation functions. For solids, where atoms are located near known lattice sites, two particle correlation functions are sufficient. For liquids, however, the pair potential specifying the energy of interaction between particles is known to involve the three particle function and the prospect of being able to measure it instead of guessing at it is clearly exciting.

The standard approach has been to express the triplet function in terms of a product of two particle functions. Egelstaff *et al.* have shown, however, that the difference between the true and approximate expressions is significant for regions near the triple and critical points. They have shown that, for the grand canonical ensemble of particles in a simple liquid, the Fourier transform of this difference can be expressed directly in terms of the structure factor and its derivative with respect to pressure, both of which can be measured by conventional X-ray methods or slow neutron diffraction.

The formulation is entirely novel, and has been given a preliminary test with existing scattering data for liquid argon near the critical point and for liquid rubidium near the triple point. The outcome is quite encouraging. Although Egelstaff *et al.* have used crude estimates of the derivatives of the structure factor and even of the structure factor itself, they found that the difference between the true and approximated triplet functions was significant in both cases. For the region near the triple point, long range correlations were particularly in evidence, and for the region near the critical point, the difference was marked at distances of less than 7 Å.

Although what is measured in this new approach is an integral over the triplet function, it is possible by a judicious choice of experimental conditions to gain considerable information about the triplet function itself. From this, the pair potential for the liquid may be deduced, together with a host of thermodynamic quantities which also depend on the triplet function. To obtain the specific heats for the liquid it is necessary to know the four particle correlation function as well, however. A pair potential is known to be a fairly good description of the interparticle interaction for non-transition metals, for argon and for salts.

TRANSPLANTS

Elusive Antibodies

from a Correspondent

FEW would deny that a cellular immune reaction mediated by lymphocytes is important in the rejection of transplanted organs. But there is still the question of whether conventional antibodies formed in response to foreign tissue grafts also contribute to the rejection of large organ grafts. Mounting evidence, most recently that put forward by Williams, de Planque, Graham and Lower (*New England J. Med.*, **281**, 1145; 1969), suggests that they do.