depends largely upon the duration of a combination of favourable conditions in the endemic areas and in the southern portions of the State. A detailed study of the ecology of the species is in progress.

JAMES DAVIDSON.

Waite Research Institute,
University of Adelaide.
June 15.

¹ J. C. Faure, *Bull. Entom. Res.*, **22**, 393; 1932.

² J. Davidson, *Aust. J. Exp. Biol. and Med. Sci.*, **11**, 59; 1933.

Trans. Roy. Soc. South Australia, **58**, 33; 1934.

³ J. A. Prescott, *Trans. Roy. Soc. South Australia*, **58**, 48; 1934.

Wood Hemicelluloses

SINCE the isolation of 'starch' from wood¹ another product has been obtained from the cell walls of oak sapwood which, instead of giving the usual blue colour with iodine, gives a royal purple colour reverting to blue on standing. This latter substance is more closely allied to hemicellulose A² than the starch of the cell contents since it appears to be made up of:

Uronic and aldobionic anhydride residues. (14 per cent approx.)
in addition to—
Anhydro-xylose (10 per cent approx.)
and
Anhydro-glucose residues . . (75 per cent approx.)

Attempts are now being made to prepare starch from oak leaves in quantities sufficient for analysis. A small sample already obtained has yielded on hydrolysis with 12 per cent hydrochloric acid an amount of carbon dioxide corresponding to 24.4 per cent of uronic anhydride. These results appear to permit of the formulation of the hypothesis that certain of the hemicelluloses of oak wood are derived from starch in a series of steps involving the oxidation of primary alcoholic groups and the subsequent formation of anhydro-xylose residues by decarboxylation. If the hypothesis is correct, the term 'hemicellulose' can no longer be applied to the acid polysaccharides in question, and the alternative general term 'amylo-uronides' is therefore suggested. If the furfuraldehyde-yielding complexes associated with the cellulose of wood are derived therefrom by a similar series of reactions, the term 'hemicellulose' might still be reserved for them.

W. G. CAMPBELL.

Department of Scientific and Industrial Research,
Forest Products Research Laboratory,
Princes Risborough, Aylesbury, Bucks.
July 6.

¹ Campbell, *Biochem. J.*, **29**, 1068; 1935.

² O'Dwyer, *Biochem. J.*, **29**, 2116; 1934.

Amorphous Antimony

In a previous letter¹, I showed that a thin layer of antimony produced by distillation in a high vacuum is amorphous. This conclusion was drawn from the fact that the electron diffraction pattern consisted of broad bands always showing exactly the same appearance (width, intensity, etc.); this could scarcely be understood if the state were only colloidal. The following researches corroborate and extend this view:

When such an amorphous layer is heated to 120°–150° C. (the thinner layers requiring the higher temperatures), the diffraction pattern changes into the

ordinary powder diagram of antimony, consisting of a large number of sharp rings. If the original layer was *very* thin, the rings after heating remain more or less broad as a consequence of the small size of the crystallites; the difference from the original amorphous pattern is, however, unmistakable even in this case. In all cases the crystallites produced by heating are oriented at random, differing in this respect from those formed by spontaneous crystallisation at room temperature, described previously.

These results throw a new light on the so-called 'explosive' state of antimony, discovered by Gore almost a century ago. As is well known, this state is obtained by electrodeposition; in this case there is no upper limit to the thickness of the deposit obtainable. The diffraction patterns of such layers² proved to be identical with those of amorphous antimony described above. *This shows that Gore's explosive antimony is essentially identical with our pure amorphous antimony.* Explosive antimony is known, however, to include some 10 per cent of the salt electrolysed; this may be present as thin films (probably monomolecular) surrounding small quantities of pure amorphous metal, thereby inhibiting their crystallisation.

From this picture, it may be expected, for example, that the electric resistance of explosive antimony will not be determined by the metallic parts but mainly by the salt films³. Experimentally, I have found values for the resistivity about 100 times that of ordinary antimony, and other observers⁴ even give a factor 1000. These high values, as well as their irreproducibility, are arguments in favour of the view put forward above. Other properties, however, might be less sensitive to the presence and quantity of inclusions, and should then be the same as for pure amorphous antimony. As such we shall here consider the diamagnetic susceptibility and the

It is well known that the diamagnetic susceptibility of crystalline antimony is much less explosively than that of the amorphous state. This 'explosive' change in susceptibility on heating to the point of crystallisation has been noted by Cohen and Cohen⁵. This is a consequence of the change in the point (24 ca) of the diamagnetic susceptibility of antimony is brought about by the change in the diamagnetic susceptibility at the melting point. It is suggested that the explosive change in the diamagnetic susceptibility is the supercooled liquid state.

The experiments were made by Mr. P. Teunissen in the laboratory. The full paper is to appear in *Phys.*

Natuurkundig Laboratorium
der Rijks-Universiteit,
Groningen.
July 22.

¹ NATURE, **131**, 760; 1933.

² I took photographs with copper K-radiation; see also H. Kersten, *Physica*, **2**, 276; 1932.

³ Included impurities may exert an analogous effect in sputtered layers, described by H. Zahn and J. Kramer, *Z. Phys.*, **86**, 413; 1933.

⁴ H. v. Steinwehr and A. Schulze, *Z. Phys.*, **63**, 815; 1930.

⁵ *Z. phys. Chem.*, **52**, 129; 1905.

⁶ G. Tammann und W. Müller, *Z. anorg. u. allg. Chem.*, **221**, 109; 1934.