media led us to consider that they could occur in the living leaf in the form of a soluble precursor.

Parsley leaf extracts prepared in water kept at boiling point do not gel on cooling. Gel formation is initiated by addition to the cooled extract of either parsley leaf press juice or a protein fraction precipitated by 30–55% saturation with respect to $(\text{NH}_4)_2\text{SO}_4$. The activity is thermolabile and was assumed to be enzymic. It was also found that gel formation is accompanied by acid production. Diffusible free acids in the boiling-water extracts were removed by prolonged dialysis against water and, after concentration at reduced pressure, the extract was passed down columns of Sephadex G-10. Brown phenolic materials, which neither gelled nor produced acid in the presence of the enzyme, appeared in the first column fractions and were discarded. The later yellow glycoside fractions were concentrated, and acid production was followed by autotitration with NaOH at constant pH. At completion of the enzyme reaction 95% of the total flavone, determined spectrophotometrically (Mabry *et al.*, 1970), could be recovered as a gelatinous pellet in the centrifuge and 0.66 acid equiv. had been generated/mol of total flavone.

Chromatography of the gel fraction on paper showed it to consist principally of apiin and graveobioside B. Examination of the organic acid content of the supernatant fluid by paper chromatography suggested that malonate is produced in the enzyme reaction, and this was confirmed by g.l.c. and mass spectrometry of trimethylsilyl and propyl esters of the acid.

Malonate as a major constituent of leaves is known to occur sporadically in the Umbelliferae, Leguminosae and Graminae (Bentley, 1952), and from *Trifolium* spp. Beck & Knox (1971) have isolated and characterized three flavone glycosides malonated on the 6"-position of the glucose moiety. In preliminary studies we have isolated an enzyme from leaves of another legume, *Cicer* sp. (chick pea), that liberates malonate from crude glycoside fractions from the same plant and is also active towards the parsley extracts. Parsley enzyme is likewise active towards *Cicer* glycosides. In contrast, spinach (*Spinacea oleracea*) and *Phaseolus vulgaris* do not possess a similar enzyme, nor do their glycoside fractions produce malonate in the presence of the pea or parsley enzymes.

We thank Mr. J. F. March and Mr. R. Self for their assistance with the g.l.c. and mass spectrometry respectively.

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Configuration of Soil Arabinose

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Arabinose and xylose are as abundant in soil polysaccharide as galactose or mannose, yet the pentose formed when readily available carbohydrate is metabolized by soil micro-organisms is only one-tenth of the hexose (Cheshire *et al.*, 1971). It is possible that the pentoses are present in the residues of plant material. By using ^{14}C -labelled rye straw it has been shown that about 30% of both the glucan and the xylan in the straw can persist in soil for 14 months (Cheshire *et al.*, 1972).

This could explain why there is so much of the pentose xylose in the soil, but plants generally contain much less arabinose than xylose. Another means of distinguishing the source of the arabinose is by its configuration. Arabinose in plants is in the L-form, except in a few species not found in such northern latitudes as Britain. Arabinose in micro-organisms occurs in both D- and L-forms, depending on the type of organism.

Treatment of an arable soil derived from a granitic till by cold 12M- H_2SO_4 followed by dilution to 0.5M- H_2SO_4 and heating released (i) 1.5 mg of arabinose/g of soil. Hot 0.5M- H_2SO_4 alone released (ii) 1.3 mg/g of soil. A polysaccharide, extracted from the same soil by dilute alkali, hydrolysed by heating with 0.5M- H_2SO_4 yielded (iii) 0.17 mg/g of soil.

In each case the arabinose was isolated by adsorption chromatography on a charcoal–Celite column and by partition chromatography on Whatman no. 1 paper. The sugar was shown to be pure by g.l.c. of the alditol acetate derivative.

The yields of pure arabinose were (i) 13%, (ii) 2.0% and (iii) 2.9%. Measurement of the optical rotation showed that the arabinose was composed of (i) 90%, (ii) 87% and (iii) 93% of the L-form.

This strongly suggests that the greater part of the arabinose is directly derived from plant sources, although the only firm conclusion that can be drawn is that at least 10% of the soil arabinose has a microbial origin.

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