used (Frank & Marion, 1956). The limitation of hordenine synthesis to the early stages of development after germination may thus rest on the availability of tyrosine from the endosperm (Folkes & Yemm, 1956) and its inhibition by intermediates in the synthesis of tyrosine and its conversion into other phenolics.

The work was supported by a Science Research Council studentship to J.R.G. The skilled technical assistance of Mr D. Bartlett is gratefully acknowledged.

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The Isolation and some Properties of a Factor causing Gelling in the Phloem Sieve-Tube Exudate of the Squash Plant (*Cucurbita pepo*)

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In a communication to a Meeting of the Society for Experimental Biology held at University College, Dublin, Irish Republic, in July 1970 T. S. Walker & R. Thaine established the presence in the phloem sieve-tube exudate from *Cucurbita pepo* stems of some glycolytic and respiratory dehydrogenases. In that communication and in a subsequent paper (Walker & Thaine, 1971) they reported the presence in the exudate of a protein factor that caused gelling and showed that the gelling reaction could be inhibited by the presence of 2-mercaptoethanol and other thiol compounds. This communication describes some properties of a homogeneous preparation of the gelling factor.

Exudate from the stems of mature *C. pepo* plants was collected into a buffered medium of 0.1M-Tricine-KOH, pH 7.5, containing 0.05M-2-mercaptoethanol, 0.2M-EDTA, 0.4M-mannitol and 0.1% of polyvinylpyrrolidone. The exudate was clarified by centrifugation, batch treated with DEAE-cellulose, and the gelling factor was isolated from the filtrate after Sephadex G-100 chromatography and CM-cellulose chromatography. The final peak eluted from the CM-cellulose column ran as one component on electrophoresis at different pH values and formed a gel when 2-mercaptoethanol was removed by dialysis.

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The gelling factor was found to be a basic protein with the following amino acid composition: lysine, 40; histidine, 10; arginine, 17; aspartic acid, 35; threonine, 7; serine, 20; glutamic acid, 46; proline, 14; glycine, 25; alanine, 14; valine, 33; methionine, 3; isoleucine, 38; leucine, 38; tyrosine, 14; phenyl-alanine, 22; cysteine, 6; tryptophan, 1; the minimum molecular weight was 43371.

The protein sedimented as a single boundary in the ultracentrifuge with a sedimentation coefficient, $s_{20,w}^0$, of 4.32S. A molecular weight of 127000 was derived from the sedimentation and diffusion coefficients.

The gelling phenomenon was found to be dependent on protein concentration, thiol concentration and dissolved O_2 in the collecting medium. The relative effectiveness of several thiols decreased in the order: 2-mercaptoethanol < dithiothreitol < cysteine < GSH. Cleland's reagents were only partially effective in preventing gelling in the crude exudate, since the reduced gelling protein was continually reoxidized by aerial oxidation.

The evidence indicates that, although the gelling factor is not the sole constituent of the phloem sieve-tube slime plugs in *C. pepo*, it alone may be responsible for the formation of the plugs.

The author held an Agricultural Research Council Research Fellowship during this work.

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The Effects of Depletion of Unsaturated Fatty Acids on the Energy-Dependent Reactions of Yeast Mitochondria

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Studies with a mutant of *Saccharomyces cerevisiae* that cannot synthesize unsaturated fatty acids have demonstrated that depletion of unsaturated fatty acids leads to a specific loss of mitochondrial oxidative phosphorylation both *in vivo* and *in vitro* (Proudlock, Haslam & Linnane, 1969, 1971; Haslam, Proudlock & Linnane, 1971). Mitochondria depleted of unsaturated fatty acids possess a full complement of cytochromes, oxidize both NAD-linked and flavoprotein-linked substrates at normal rates and have succinate dehydrogenase and malate dehydrogenase activities similar to those of mitochondria supplemented with unsaturated fatty acids. However, oxidative phosphorylation by the mitochondria is markedly affected by the fatty acid composition. Phosphorylative ability decreases progressively with the mitochondrial content of unsaturated fatty acids, and is completely lost in mitochondria in which less than 20% of the fatty acids are unsaturated. The incorporation *in vivo* of unsaturated fatty acids into the lipids of