Fig. 2. Electrical activity of neuromuscular spindle. Extra-fusal junctions blocked by curare. A single sensory unit was left intact. Upper records in A and B, intracellular lead from a single intrafusal muscle fibre. Lower records, extracellular electrodes from the nerve. Simultaneous intra- and extra-cellular records.

A, Preparation at rest and under light tension. Resting membrane potential 87.7 mV. Lower record shows no baseline discharge. B, After a single nerve shock an action potential of 119.3 mV. is recorded from an intrafusal fibre. Lower record shows artefact plus nerve action potential ($S + N_1$) followed by one sensory discharge (N_2) 15.6 m.sec. after the shock

to the nerve produced action potentials of 84–119.3 mV. and always presenting a positive overshoot of 12.5–31.6 mV. at 21° C. The presence of this spike was always concomitant with an increase in the frequency of sensory discharges (Fig. 2). The characteristics of the action potential indicate that the intrafusal bundles are formed by twitch fibres, innervated by large-diameter motor axons. Nevertheless, the presence of some slow muscle fibres, innervated by the small-nerve motor system, has not been excluded.

This work was financed in part by grants from the Rockefeller Foundation (New York) and the Fundación Gildemeister (Santiago).

CARLOS EYZAGUIRRE
JUAN D. VIAL

Laboratory of Neurophysiology and
Department of Anatomy,
Catholic University of Chile,
Santiago, Chile.
April 24.

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Occurrence of Leuco-anthocyanin in Pears

THE anthocyanin pigments of plants may occur in two possible colourless forms, as the pseudo-base and as leuco-anthocyanins^{1,2}. In both cases conversion to the corresponding anthocyanin occurs on acidification, but is slower in the latter case. Although leuco-anthocyanins have been isolated only from cacao beans³ and Australian heartwood of *Acacia melanoxylon*⁴ their occurrence is implied on the basis of the vanillin test and chromatographic identification of anthocyanins^{2,5}. The occurrence of leuco-anthocyanins in pears (*Pyrus communis*) was suggested by Joslyn⁶ to explain the reddening that occurs in tinned pears stacked before they are completely cooled, and by Bate-Smith¹ to explain the reddening of stewed

pears. Kiesser *et al.*⁷ reported the occurrence of leuco-anthocyanins in perry pears on the basis of chemical and chromatographic examination of the insoluble matter causing haze and turbidity and depositing as a sediment in perry. The red pigment obtained by treatment of the sediment with warm dilute acid was found to contain small quantities of phloroglucinol, protocatechuic acid, catechol and cyanidin but was composed chiefly of complex leuco-anthocyanins related to cyanidin. We have recently examined Bartlett pears for the occurrence of leuco-anthocyanins and found evidence for the presence of the leuco-anthocyanin related to cyanidin.

Halved ripe California Bartlett pears tested with vanillin reagent⁵ gave a strong positive test for leuco-anthocyanin in the core tissue surrounding the seeds and particularly strong reaction in the seeds. The tissue surrounding the seed receptacle gave a less intense and more diffuse reaction. For this reason, the core tissue was separated, ground and extracted first with boiling water, then with absolute methanol. The residue was then extracted with methanol containing 1 per cent hydrochloric acid. This extract, strongly positive to the vanillin test, was brought to 5–10 per cent hydrochloric acid and heated for 5–10 min. The red pigment so obtained was identified by paper chromatography with several solvent systems. The R_F values obtained with butanol-acetic acid-water, butanol-2 *N* hydrochloric acid and acetic acid-hydrochloric acid-water respectively were: 0.24, 0.47; 0.69; 0.49; respectively. The R_F values reported for cyanidin in these solvents are: 0.24; 0.69; 0.50. Robinson's ferric chloride test was applied to extracts, in *iso*-amyl alcohol containing 1 per cent hydrochloric acid, of pear core tissue, after conversion to anthocyanidin by boiling with added acid. On addition of water, sodium acetate and a small amount of ferric chloride and shaking, the organic solvent layer turned blue just as cyanidin does. The anthocyanidin obtained from pear core and pear seed was stable to oxidation, as is cyanidin. The only anthocyanidin obtained from pear tissue thus is similar in R_F value and other properties to cyanidin.

M. A. JOSLYN

RICHARD PETERSON

Department of Food Technology,
University of California,
Berkeley 4, California.
May 2.

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Apparatus for Aeration and Sampling of Bacteria during Growth and Metabolic Studies

THE need frequently arises for the sampling of bacterial cultures during aerated growth, or of non-proliferating bacterial suspensions in the course of metabolic studies under aerated conditions. Methods requiring the use of a pipette for the withdrawal of samples are somewhat unsatisfactory because the aeration arrangements, usually capillary tubing or tubing carrying a sintered glass distributor disk, are