Again, in tests with mice, food containing encapsulated alphachloralose was more readily eaten than that containing the pure compound ($P < 0.01$; $N_1 = N_2 = 20$), and, despite the relatively lower toxicity of the encapsulated compound, mortality was consistently greater (Table 3).

These results are sufficiently promising to warrant further study of the possible exploitation of micro-encapsulation techniques in the field of rodenticide formulation. With this approach, compounds desirable as rodenticides because of species specificity, non-persistence or the availability of an effective antidote but debarred on grounds of unpalatability, too rapid toxic action, low stability or high dermal toxicity might be brought into use.

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Sampling the Transpiration Stream in Woody Plants

Morrison[1] has suggested that the content of sap exuding from decapitated root stumps is unrepresentative of that of the transpiration stream. This suggestion arose from the finding that sap exuding from decapitated rooted cuttings of *Salix vitellina* which had been supplied with phosphorus-32 had levels of radioactivity up to about seven times those of the sap sucked by Bollard's method[2] from the corresponding stems. Furthermore, while the stem sap contained only inorganic phosphorus-32, chromatograms of the sap exuded by the root stumps gave substantial peaks of radioactivity frequently found as running behind the inorganic phosphorus-32 (ref. 1).

This communication reports an investigation to determine whether Morrison's suggestion holds for apple and pear trees—a preliminary to a programme concerned with the content of exudates from roots of fruit trees.

All leaves, blossom or fruitlets were removed from eight composite pear trees and one composite orchard apple tree (see Table 1 for age and composition of the trees). The pear trees were cut down immediately above or below the graft unions and the apple tree immediately above the interstock. The sap which exuded from the decapitated trees was collected as previously described[3] between 0·5 and 3·0 h after removing the shoots. Immediately after removal from the trees, xylem sap was extracted by Bollard's method from the portion of the pear stems above the graft unions. Only a portion of apple stem, from 5 yr old wood out to the new growth was extracted, within 15 min of cutting from the tree. All sap samples were stored at $-16°$ C until used.

The concentrations of phosphorus, nitrogen, potassium and calcium in the sap samples were estimated as follows. Aliquots of 1–2 ml. were digested with sulphuric acid, perchloric acid and hydrogen peroxide (4 : 4 : 1), and after cooling were diluted to 10 ml. Total phosphorus, nitrogen (excluding nitrate), potassium and calcium were determined on a Technicon autoanalyser. Nitrogen was determined by reaction with alkaline phenol and sodium hypochlorite[4], phosphorus by the reduced molybdenum blue method[5] and potassium and calcium by flame photometer methods.

Table 1. CONCENTRATIONS OF ELEMENTS (p.p.m.) IN STEM AND BLEEDING SAP FROM PEAR AND APPLE TREES

Tree	Stem sap P	N	K	Ca	Bleeding sap P	N	K	Ca
1	47	140	—	—	50	167	—	—
2	28	177	—	—	40	187	—	—
3	32	200	—	—	20	148	—	—
4	29	—	410	180	29	—	320	150
5	30	—	450	140	30	—	400	120
6	18	—	300	—	23	—	200	—
7	20	—	130	—	18	—	180	—
8	13	—	130	—	15	—	180	—
9	25	230	—	110	20	270	—	120

Tree 1–5, 4 yr old 'Conference' pear/'Quince *A*', that is, 'Conference' pear scion grafted onto stem of 'Quince *A*' rootstock 6 in. above ground level. Cut below graft union in June. Bleeding sap collected within 3 h of cutting. Tree 6–8, 3 yr old 'Williams' pear/'Quince *A*', that is, 'Williams' pear scion grafted onto stem of 'Quince *A*' rootstock 6 in. above ground level. Cut above graft union in April. Bleeding sap collected within 1 h of cutting. Tree 9, 8 yr old 'Cox's Orange Pippin'/*M*.II with 'Crab *C*' interstock, that is, 'Cox' scion grafted onto 2 in. piece of 'Crab *C*' stem which was grafted 6 in. above ground level onto the stem of *M*.II rootstock. Cut above interstock in May. Bleeding sap collected within 0·5 h of cutting.

The results of the analyses (Table 1) indicate that the xylem sap samples are similar in composition whether obtained as exudate from decapitated plants or sucked from stems. This conclusion is supported by results similar to those of Table 1 obtained by analysis of sap from another ten pear trees, and the demonstration of similar gibberellin-like activity in apple stem xylem sap and exudate from decapitated apple trees[3]. Thus Morrison's findings do not seem to apply generally and for apple and pear trees at least, analysis of sap exuding from decapitated plants seems to offer a valid method of determining the content of the transpiration stream.

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Apparent Destruction of Nisin by the Producer Organism before Initiation of Growth in *Streptococcus lactis*

When a stationary phase culture of *Streptococcus lactis* is inoculated into fresh medium, the concentration of the protein antibiotic nisin, carried over with the inoculum, diminishes and a minimum value is reached at the end of the lag phase 1–3 h after inoculation[1]. We have recently found a direct correlation between the cellular nisin concentration and the duration of the lag-phase[2] and so it is possible that the cells have to inactivate the nisin they contain before initiation of fresh growth. This communication deals with the mechanism of the apparent destruction of nisin. Nisinase has been reported in a great variety of micro-organisms[3] and Jarvis[4] suggested that some bacilli contain a non-proteolytic enzyme which converts nisin *A* into less effective antibiotics (nisin *C* and *E*). My results suggest that the inactivation of nisin by the producer organism may not be entirely enzymatic.

Fig. 1 illustrates the apparent destruction of nisin by cells of *Streptococcus lactis* in culture. The *p*H of the culture was kept constant at 6·8 by the addition of 5 N NaOH; after 11 h no further NaOH was required and maximum dry weight had been reached. At 17 h, when the culture was used to inoculate a fresh fermentation vessel, it had been in stationary phase for 6 h and 1·3 per cent of the dry weight of the cells seemed to be nisin. Immediately after inoculation, the concentration of nisin fell to 0·13