Table 1. Concentrations of Sodium, Potassium and Chloride in Beet Mitochondrial Pellets in m.mole/l. Means, with standard errors and number of observations given in brackets

Na^+ concentration		K^+ concentration		Cl^- concentration	
External	Internal	External	Internal	External	Internal
0–6	22·8 ± 2·6 (12)	0–6	11·0 ± 0·8 (17)	0–2	4·9 ± 0·6 (11)
7–13	39·6 ± 3·9 (16)	7–13	20·6 ± 1·9 (5)	5–12	11·7 ± 0·7 (11)
		14–20	21·3 ± 1·6 (5)	13–20	16·9 ± 0·6 (18)
79–85	88·1 ± 2·6 (4)			45–47	38·7

The high concentration of mobile cations can be explained by a Donnan equilibrium with the immobile anions (proteins, phospholipids, etc.) in the mitochondria. Such an equilibrium would be accompanied by a lower internal concentration of chloride unless there were: (*a*) combination of either the mobile cations or mobile anions so that they are removed from solution; (*b*) two distinct phases, one with the mobile cations held by immobile anions and another with mobile anions held by immobile cations; or (*c*) a mechanism dependent on the oxygen uptake to accumulate the chloride against the concentration gradient.

While (*a*) and (*b*) cannot be excluded, (*c*) was investigated by comparing concentration of chloride maintained in the steady state with the oxygen uptake of the mitochondria. With no added substrate there was a positive correlation ($r = 0{\cdot}913$, $p < 0{\cdot}01$). Further, by using the apparent diffusion constant, the leakage-rate for a given concentration difference and hence the accumulation-rate required to maintain the concentration difference can be calculated. A concentration difference of 3 m.mole/l. would require an accumulation-rate of $4{\cdot}5 \times 10^{-6}$ gm. mol. chloride ion/pellet of 0·14 gm./hr. The oxygen uptakes observed were of the right order of magnitude to maintain this accumulation-rate if one anion was accumulated each time an electron traversed the cytochrome system, that is, about 1×10^{-6} gm. mol. oxygen/pellet/hr.

Thus the results are consistent with the hypothesis that the anions in the mitochondrion might be accumulated by the electron carrier of respiration acting as the anion carrier of accumulation. The mitochondria in the intact cell, capable of accumulating anions themselves, could act as vehicles for the passage of ions from cell-surface to vacuole.

This work was part of the joint programme of the Division of Food Preservation, Commonwealth Scientific and Industrial Research Organization, and Botany School, University of Sydney, and a fuller account will be published elsewhere[8].

R. N. Robertson
Marjorie J. Wilkins
A. B. Hope

Plant Physiology Unit,
Division of Food Preservation and Transport,
Commonwealth Scientific and
Industrial Research Organization,
and Botany School,
University of Sydney.
Dec. 9.

[1] Lundegårdh, H., *Ann. Agric. Coll., Sweden*, **8**, 234 (1940).
[2] Robertson, R. N., and Wilkins, M. J., *Aust. J. Sci. Res.*, **1**, 17 (1948).
[3] Robertson, R. N., "Ann. Rev. Plant Physiol.", **2**, 1 (1951).
[4] Bartley, W., and Davies, R. E., *Biochem. J.*, **52**, xx (1952); **57**, 37 (1954).
[5] Macfarlane, M. G., and Spencer, A. G., *Biochem. J.*, **54**, 569 (1953).
[6] Stanbury, S. W., and Mudge, G. H., *Proc. Soc. Exp. Biol. and Med.*, **82**, 675 (1953).
[7] Farrant, J. L., Robertson, R. N., and Wilkins, M. J., *Nature*, **171**, 401 (1953).
[8] Robertson, R. N., Wilkins, M. J., Hope, A. B., and Nestel, L., *Aust. J. Biol. Sci.* (in the press).

Occurrence of the Black Rat in Sewers in Britain

It had been supposed for a long time that the ship or 'black' rat, *Rattus rattus* L., did not occur in sewers in Britain. There was a record from the sewers of Lima, Peru[1], but no such records existed for the United Kingdom.

Recently, *R. rattus* has been taken alive from the sewers of three localities in England. The first of these was in Wandsworth Metropolitan Borough in the County of London. Sewermen had known for the past two years that "some of the rats down there were like bats without wings", and recently two live ship rats were caught and their identities confirmed.

I then suggested that the lack of records might be fortuitous, due merely to the lack of observation, and that other records would be made if a definite search were undertaken. Shortly after this, another live ship rat was taken from the sewers of Liverpool County Borough, and within the past few weeks, two live ship rats have been trapped in the sewers of Ramsgate Municipal Borough. Remains of dead ones have also been found.

Thanks are due to the local authorities mentioned, for their co-operation with this Ministry's staff.

R. A. Davis

Infestation Control Division,
Ministry of Agriculture and Fisheries,
Hook Rise,
Tolworth, Surrey.
Dec. 7.

[1] Eskey, C. R., Epidemiological Study of Plague in Peru, U.S.A., Pub. Health Rep., **47**, 2191–2207 (Nov. 18, 1932).

The Rostrum of *Centrocnemis* Signoret 1852

In the classification of the group Heteroptera, the number of segments in the labium was formerly considered to vary. Closer investigation has revealed, however, that all Heteroptera possess a labium composed of four segments.

In the Reduviidae all genera, with one exception, so far as is known, have only three visible segments in the labium, the first segment (or actual basal segment) being very feebly sclerotized and concealed within the head. The exception is the genus *Centrocnemis* Signoret (Hemiptera–Heteroptera: Reduviidae–Reduviinae). In this genus the basal segment is relatively large, strongly sclerotized and distinct. There are tubercles on it which may possibly be vestigial labial palpi. The labrum, moderately long and narrowly triangular, extends to just beyond the base of the second rostral segment. Its base is almost concealed by two of the tubercles on the first rostral segment, which converge over it.

Centrocnemis is included, at present, in the subfamily Reduviinae. In a forthcoming revision, I propose to remove it and to create a new subfamily for its reception, since, apart from its distinctive