based on the normal water contents of the products.

Since this work was completed, Andrews, Boyd and Terry[5] have published results for the riboflavin content of different cereals, using apparently the original Snell and Strong procedure, but no details of the medium are given. With the exception of patent flour, their results are all much lower than those now reported. One explanation for these low figures is that their extracts were too concentrated (5–10 gm. made up to 100 ml.). In my experience there is always a falling off in estimated riboflavin content if the extract is too concentrated. The extracts used in the present investigation were always made up to 500 ml., and in some cases, for example, germ, to 1,000 ml.

It is of interest to note that Miss Copping[6] (see also in this connexion Bacharach[7]), using a biological method, obtained values of the order of 2–3 γ per gram for a National wheatmeal, or of the same order as those reported here. A further proof that the microbiological method is specific is shown by the fact that for milk the values obtained by me (1·4–1·5 γ/ml.) are practically identical with those obtained by the fluorometric method[7].

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Disappearance of the Ascorbic Acid in Raw Cabbage after Mincing or Chopping

PYKE[1] has lately stated that when raw savoy cabbage was shredded by means of household shredders part of the ascorbic acid disappeared during the ensuing 5–10 minutes and thereafter no further loss occurred during three hours standing; the extent of the initial loss of ascorbic acid varied with the type of shredder used. His explanation is that the initial loss of ascorbic acid is essentially due to the mechanical rupture of the cells, and will therefore vary with differing types of shredder or grinder.

As mentioned previously[2], we have been working on similar lines and have sought to find a correlation between mechanical breakage of cells and loss of ascorbic acid. It would appear that the amount of liquid which can be squeezed from shredded cabbage would be indicative of the breakdown of cell tissue, and we have proceeded on this line of attack. *Inter alia* we have confirmed Pyke's results.

In Fig. 1 the concentration of ascorbic acid in minced cabbage, expressed as a percentage of that originally present, is plotted against the time of standing after mincing. The curves show that the concentration of ascorbic acid falls rapidly during the first 10–15 minutes. The steady value reached remains constant for periods up to thirty hours (provided that the cabbage be kept cool, at, say, 15° C.). The extent of the initial loss of ascorbic acid varies with the type of mincer used.

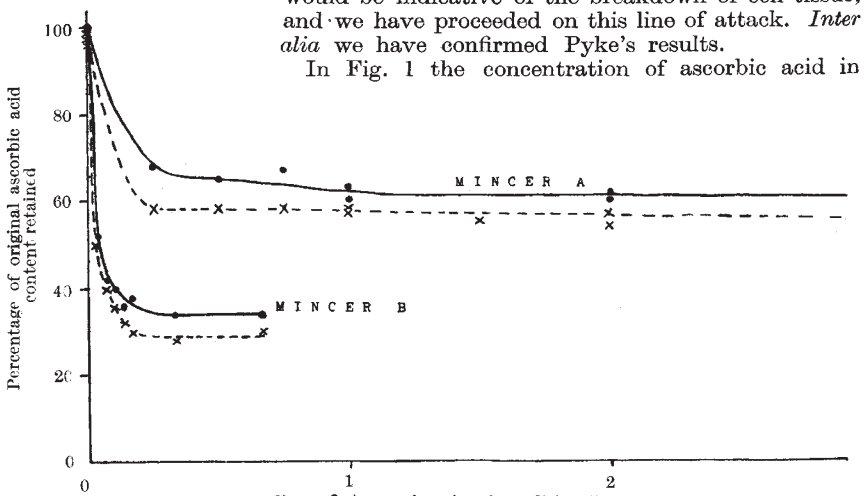

Fig. 1.
●——● total ascorbic acid; ×- - - - - ×, reduced ascorbic acid.

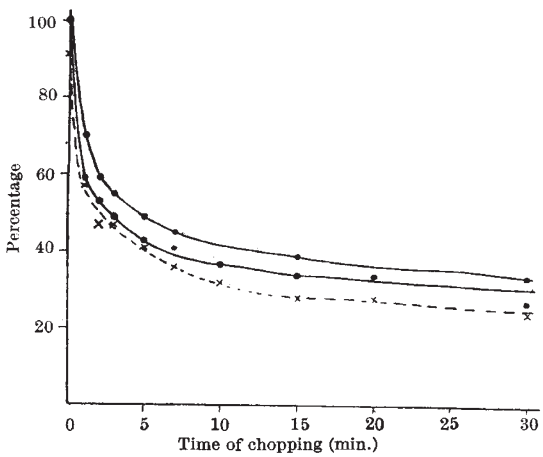

Fig. 2.
●——●, total ascorbic acid. ×- - - - ×, reduced ascorbic acid.
Uppermost curve, percentage of residue from pressing; other two curves, percentage of original ascorbic acid retained.
All samples allowed to stand for 2 hr. after chopping.

Some confirmation of the theory that the extent of initial loss varies with the extent of rupture of cells has been obtained by chopping cabbage in a machine primarily used for chopping sausage mixes. The material to be chopped is placed in a bowl which revolves beneath a set of rotating knives; for short

periods of chopping the degree of comminution obtained is considered to be roughly proportional to the time of chopping. Samples were withdrawn at intervals and allowed to stand. The concentration of ascorbic acid was determined in these samples after two hours, when a steady state had been reached, and again after twenty-two hours. At the same time the amount of juice which could be pressed from each sample under certain conditions was determined. The results are plotted in Figs. 2 and 3 and

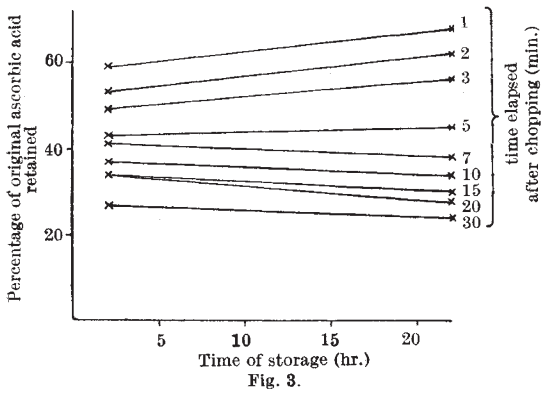

Fig. 3.

indicate that the longer the time of chopping the greater the percentage of ascorbic acid lost and the greater the amount of juice which may be obtained by pressing. In Fig. 2 the correspondence between the curves for the percentage of ascorbic acid lost and the percentage of residual material after pressing may be fortuitous.

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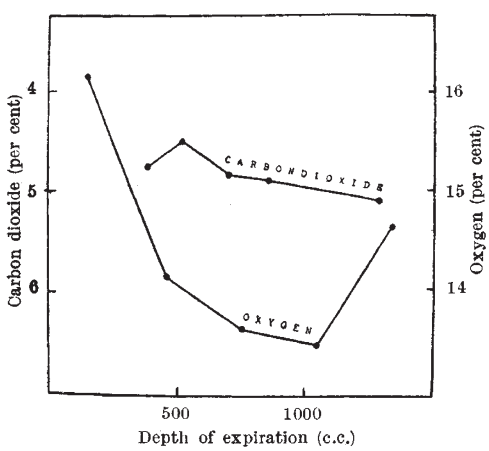
The 'Oxygen Trough' of Expiration

I have been unable to confirm[1] the presence of an alveolar air plateau as described by Haldane[2]. Two of the subjects investigated gave paradoxical results in that the ultimate alveolar sample had a lower carbon dioxide tension than the penultimate. In a paper presented at the same time, Cotton[3] examined the oxygen percentages, and demonstrated what he later described as the "oxygen trough of expiration". His oxygen figures were in harmony with my results; that is, the percentage of oxygen of the ultimate sample was higher than that of the penultimate.



The oxygen results from one of the subjects used by me are given in the accompanying graph. They confirm the findings of Cotton.

No satisfactory explanation of this phenomenon, which has recently been confirmed by Marenzi and Costoya[4], is at present available. It seems reasonable to assume that it is due to inequality of ventilation, or inequality of the blood-flow to the different parts of the lung.

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Crystal Dynamics of Rocksalt

THE early X-ray experiments of James, Firth and Waller[1] on the modification of the diffracting power of crystals of sodium chloride due to thermal vibrations of the atoms dealt only with the reduction in intensity of the Bragg reflexions at different temperatures, and could therefore only give average root mean square amplitudes, but the more recent diffuse spot methods promise to give information concerning the whole frequency spectrum. By observation of the position, shape and intensity of the diffuse spots when the crystal is turned into a succession of reflecting positions, the effect of vibrations travelling in different directions, polarized in definite ways and with frequencies within known limits, can be traced[2,3,4].

The above interpretation of the diffuse spot photographs has, however, been challenged by Sir C. V. Raman[5], and one of his colleagues, Dr. C. S. Venkateswaran[6], has published experimental results for sodium chloride crystals which are claimed to be inconsistent with the thermal (Faxén-Waller) theory. Since the challenge includes a denial of the validity of the Born theory of lattice dynamics, it is important that the experimental evidence should be carefully examined.

Venkateswaran's observations are as follows: (1) variation of diffuse spot intensity with temperature (one crystal setting, three temperatures); (2) comparison of diffuse spot and Laue spot intensities for three different irradiated volumes of crystal, using a slightly divergent beam; (3) measurements of relative sharpness; and (4) intensity, of 200, 400, 600 reflexions (molybdenum unfiltered radiation, one crystal setting); (5) comparison of 111, 222 reflexions; (6) measurement of the 'drift' of the diffuse maxima towards the Laue spots as the crystal rotates.

Every one of these experimental observations is either inaccurately performed or wrongly interpreted. The main criticisms are as follows:

(1) Venkateswaran has neglected the falling off of