Let k be the group (expenditure) weight for the seasonal group—*e.g.*, the annual total consumer expenditure on items in this group per £1,000,000 of all consumer expenditure represented in the index.

Let $f(m)$ be some function (to be defined) of m, subject to the condition that $f(1) = \Sigma q_1 p_1$.

It is further assumed that—

(i)
$$\frac{f(m)}{f(1)} = 1 + (m-1)T, \text{ where}$$

$$T = (\text{say}) \tfrac{1}{36} \left\{ \frac{\Sigma q_{12} p_{12}}{\Sigma q_{12} p_0} + \frac{\Sigma q_1 p_{13}}{\Sigma q_1 p_1} + \frac{\Sigma q_2 p_{14}}{\Sigma q_2 p_2} - 3 \right\}^*$$

(ii)
$${}_1\dot{i}_m = \frac{f(m)}{f(1)} \times 1000$$

(iii)
$${}_m\dot{i}_{12y+m} = \frac{\Sigma q_m p_{12y+m}}{\Sigma q_m p_m} \times 1000$$

(iv)
$${}_1\dot{i}_{12y+m} = \frac{{}_m\dot{i}_{12y+m} \times {}_1\dot{i}_m}{1000}$$

(v)
$${}_{12r+a}\dot{i}_{12y+m} = \frac{{}_1\dot{i}_{12y+m}}{{}_1\dot{i}_{12r+a}} \times 1000$$

It then follows that

$${}_{12r+a}\dot{i}_{12y+m} = \frac{{}_m\dot{i}_{12y+m} \times {}_1\dot{i}_m}{{}_a\dot{i}_{12r+a} \times {}_1\dot{i}_a} \times 1000$$

$$= \frac{\Sigma q_m p_{12y+m}}{\Sigma q_m p_m} \times \frac{\Sigma q_a p_a}{\Sigma q_a p_{12r+a}} \times \frac{1+(m-1)T}{1+(a-1)T} \times 1000.$$

Let the expression

$$\frac{k}{\Sigma q_a p_{12r+a}} \times \frac{\dfrac{\Sigma q_a p_a}{1+(a-1)T}}{\dfrac{\Sigma q_m p_m}{1+(m-1)T}}$$

be written as $\phi(m)$; this is independent of y, also k, r, a, and T are constant for all values of m.

Further, let Q_n, Q'_n, Q''_n, &c., be written for $\phi(n)q_n$, $\phi(n)q'_n$, $\phi(n)q''_n$, &c., respectively.

It follows that

$${}_{12r+a}\dot{i}_{12y+m} = \frac{\phi(m)\, \Sigma q_m p_{12y+m}}{k} \times 1000$$

$$= \frac{\Sigma Q_m p_{12y+m}}{k} \times 1000.$$

In either of these last two forms the formula is well adapted to numerical evaluation for any month by using the set of weights (q_m, &c., or Q_m, &c.) appropriate to that month (there are only twelve sets of weights, corresponding to the twelve possible values of m, of which a is one) and the current monthly prices (p_{12y+m}, &c.).

More logically, however, it may be written

$${}_{12r+a}\dot{i}_{12y+m} = \frac{\phi(m)\, \Sigma q_m p_{12y+m}}{\phi(a)\, \Sigma q_a p_{12r+a}} \times 1000$$

$$= \frac{\Sigma Q_m p_{12y+m}}{\Sigma Q_a p_{12r+a}} \times 1000.$$