

Similarly, multiplying (11) and (4) we obtain

$$\frac{S_3 \rho_3 W_3}{S_1 \rho_1 W_1} = \frac{\rho_2 / \rho_1}{\phi_2 / \phi_1} \quad (13)$$

Before we can plot the want curve for food we need to get ϕ_3 from the budget tables; and before we can do the same for rent we need similarly to find ρ_1 .

Suppose we find $\phi_3=30\%$ and $\rho_1=24\%$; we now have all the data needed for calculating and plotting the two want curves (for food and shelter). All our data may be tabulated for reference as follows:

$S_1 = \$1000$ per year	$S_2 = \$600$ per year	$S_3 = \$1440$ per year
$\phi_1 = .40$	$\phi_2 = .50$	$\phi_3 = .30$
$\rho_1 = .24$	$\rho_2 = .20$	$\rho_3 = .25$
$F_1 = \$1.33\frac{1}{3}$ per "lb."	$F_2 = \$1$ per "lb."	$F_3 = \$1.33\frac{1}{3}$ per "lb."
$R_1 = \$3$ per "sq. ft."	$R_2 = \$1$ per "sq. ft."	$R_3 = \$3$ per "sq. ft."
$W_1 = .75$ wantabs	$W_2 = 1$ wantab	$W_3 = .33\frac{1}{3}$ wantabs

In this table the four *given* magnitudes are S_2 , F_2 , R_2 , W_2 , all in the middle column and three of them being the units of measurement assumed.

The remaining magnitudes are all calculated from these four, or obtained from budget tables or from our assumed conditions.

We could now easily plot the quantity of food and its want-ability from

$$\frac{S_1 \phi_1}{F_1} = \frac{1000 \times .40}{1.33\frac{1}{3}} = 300.00$$

$$W_1 F_1 = .75 \times \$1.33\frac{1}{3} = 1.00$$

these two being the "latitude and longitude" of one point (that for Case 1); and, likewise plot the analogous quantity and want-ability for Case 3:

$$\frac{S_3 \phi_3}{F_3} = \frac{1440 \times .30}{1.33\frac{1}{3}} = 324.00$$

$$W_3 F_3 = .33\frac{1}{3} \times \$1.33\frac{1}{3} = .44.$$

Such a curve would be none other than the "curve of diminishing utility of food" used in our text books but not hitherto reducible to statistics.

The figures show that (according to our purely illustrative data) if the quantity (or, more strictly, index) of food consumed is increased from 300 to 324 the want-for-one-more unit of it decreases from 1.00 to .44 wantabs.