Table 1

The dimensions of organisms of HD 20 under various growth conditions. Cultures were grown in the stated medium to exponential phase at 25 °C and then where necessary for $2^1/_2$ hr. at 42 °C. $\bar{V}$ and $\bar{L}$ were then determined on these cultures (see Methods) and diameters estimated from these parameters assuming the cells to be cylinders. RCV and RCL were calculated from the increase in cell number and $\bar{V}$ and $\bar{L}$ (see below). In the case of each medium the values for the various parameters are adjusted to 1.00 for the control culture and values for other cultures are given in terms of this value. RCV $= \frac{\bar{V} \times n}{\bar{V}_0 \times n_0}$ where $\bar{V}$ is the average cell volume and n the total cell number after the stated period at 42 °C and $\bar{V}_0$ and n_0 are the values of these parameters at the time of the shift to 42 °C. RCL is defined similarly in terms of average length $\bar{L}$ as $\frac{\bar{L} \times n}{\bar{L}_0 \times n_0}$

Growth conditions	Average cell volume $\bar{V}$	Average cell length $\bar{L}$	Estimated average cell diameter	RCV	RCL
25 °C broth	1.00	1.00	1.00	1.00	1.00
42 °C broth	7.79	2.86	1.65	10.80	3.97
42 °C broth + 12% sucrose + 6 mM $MgCl_2$	3.64	3.56	1.01	17.20	16.73
25 °C MM	1.00	1.00	1.00	1.00	1.00
42 °C MM	3.22	2.39	1.19	4.27	3.00
25 °C YE Cas MM	1.00	1.00	1.00	1.00	1.00
42 °C YE Cas MM	7.28	2.97	1.57	8.70	3.55

diameter increases approximately 1.65 × after $2^1/_2$ hours at 42 °C in broth. On the other hand, in MM the increase in diameter at 42 °C was about 1.2 × in $2^1/_2$ hours and in YE Cas MM about 1.5×. Electron micrographs of negatively stained preparations confirm these changes in diameter (see Fig. 1 for broth grown cells).

Sucrose and magnesium ions which together partially correct the division lesion (SHANNON *et al.* 1974) also allow cells to grow without increased diameter at 42 °C (Table 1).