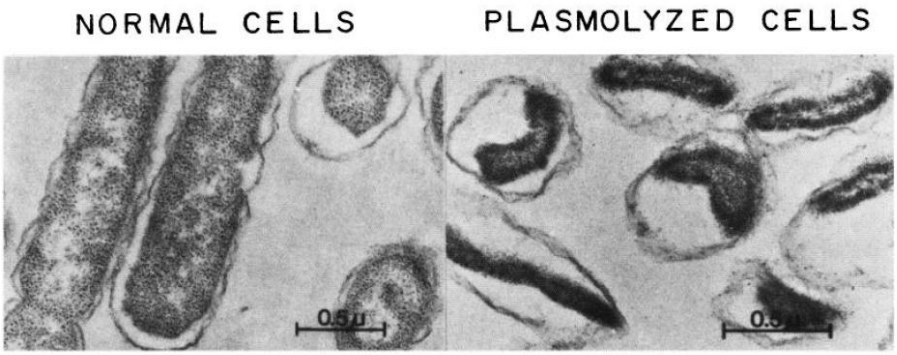

Method of estimation	Periplasmic fraction of total cell volume	
	Normal cells	Plasmolyzed cells
Electron microscopy	0.36	0.69
Solute distribution measurements	0.34	0.77

FIG. 5. Comparison of *Salmonella typhimurium* LT2 compartmental structure as determined from electron micrographs and solute distribution measurements. Cells were grown in Medium 63 containing 0.2% D-glucose, harvested, and washed with Medium 63. One-half was then suspended in Medium 63 (normal cells), and one-half was suspended in Medium 63 containing 1 M sucrose (plasmolyzed cells). A fraction of each of these suspensions was fixed by the glutaraldehyde procedure described under "Electron Microscopy." Electron micrographs showing over 50 distinct cell cross-sections were prepared for each kind of cell (examples shown in the figure). Photographic paper not containing cellular images was removed from the micrographs, and the cell cut-outs thus produced were weighed in two batches, one for each type of cell examined. These cut-outs were then trimmed so that only the cytoplasmic portions of the cells remained, and the photographic paper which constituted the trimming was weighed. For each kind of cell, the ratio of the weight of the intact cell cut-outs to the weight of the corresponding periplasmic trimmings was taken as a measure of the fraction of total cell volume occupied by periplasm. Cell compartmentation was estimated from solute distribution data as outlined in Fig. 1. [^{3}H]Water and inulin-[^{14}C]carboxyl or [^{14}C]sucrose were added to 2-ml suspensions of normal or plasmolyzed cells. Final sucrose concentrations were 1 mM and 1 M, respectively. After a 15-min incubation, the distributions of these labeled compounds were determined by the centrifugation method.