Proof. Let K be the disjoint union of the $K(G_i, 1)$ for $i \in I$ and form the open wedge K^+ (i.e. add an arc to an external basepoint for each component) and then construct L, a $K(G,1)$, by attaching cells to K^+.

Let $\widetilde{L}$ be the universal cover of L and $\widetilde{K}$ the inverse image of K in $\widetilde{L}$ (which comprises a number of disjoint copies of universal covers of the $K(G_i, 1)$'s). Then form $\widehat{L}$ by squeezing each component of $\widetilde{K}$ to a point. Then, since we are squeezing contractible subcomplexes, $\widehat{L}$ is contractible and G acts freely off the 0-skeleton. Further the stabilisers of the vertices are the conjugates of the subgroups G_i, so we have to prove that each finite subgroup F of G has a global fixed point.

To do this we use Theorem 1.1 with $Q = \widehat{L}$. The space $\widehat{L}$ is contractible, so we have hypothesis (a). We have to check (b).

Now if H is a subgroup of G then $\widehat{L}/H$ is formed from a cover of L by squeezing components of the preimage of K. But the cohomology hypotheses lift to any cover (since they are given "for any G-module") so $\widehat{L}/H$ is formed by squeezing a subspace which carries all but finitely many of the cohomology groups and hence by excision it has finite (co)homological dimension. Thus we have hypothesis (b) of Theorem 1.1.

REMARK 4.2. The Global Fixed-Point Theorem is stronger than needed to prove the Bogley-Pride or Serre theorems. In these applications Q was contractible instead of just $\mathbf{Z}/p\mathbf{Z}$-acyclic for certain p and $Q/\langle g \rangle$ was either finite dimensional or had finite homological dimension with all coefficients.

REFERENCES

[1] BOGLEY, W. A. and S. J. PRIDE. Aspherical relative presentations. *Proc. Edinburgh Math. Soc. (2) 35* (1992), 1–39.

[2] BREDON, G. E. *Introduction to Compact Transformation Groups.* Pure and Applied Mathematics *46*. Academic Press, New York – London 1972.

[3] BROWN, K. S. *Cohomology of Groups*, corrected reprint of the 1982 original. Graduate Texts in Mathematics *87*. Springer-Verlag, New York 1994.

[4] FORESTER, M. and C. ROURKE. Diagrams and the second homotopy group. *Comm. Anal. Geom.* to appear, arXiv: math.AT/0306088.

[5] FORESTER, M. and C. ROURKE. The adjunction problem over torsion-free groups. *Proc. Natl. Acad. Sci. USA 102* (2005), 12670–12671.

[6] HUEBSCHMANN, J. Cohomology theory of aspherical groups and of small cancellation groups. *J. Pure Appl. Algebra 14* (1979), 137–143.

[7] SWAN, R. G. A new method in fixed point theory. *Comment. Math. Helv. 34* (1960), 1–16.

(Reçu le 24 juin 2005)

Max Forester

Department of Mathematics
University of Oklahoma
Norman, OK 73019
U.S.A.
e-mail: forester@math.ou.edu

Colin Rourke

Mathematics Institute
University of Warwick
Coventry, CV4 7AL
UK
e-mail: cpr@maths.warwick.ac.uk