

## DISCUSSION

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*(Author's reply to discussion by S. S. Manson and C. R. Ensign, see p. 69)—*  
The data presented by Messrs. Manson and Ensign are interesting and are in qualitative agreement with our results. We agree completely with their first conclusion. If the first level is too small, there will be insufficient local plastic strain present to introduce local residual stress. If the second level is too large, local cyclic plastic strain will be present and will cause local residual stresses to relax to zero. As a result, the maximum effect is seen when the two load levels are widely separated.

The second conclusion is verified by their 7075-T6 aluminum-alloy data. We caution against generalizing this conclusion to other metals, specimen geometries, and types of loading until more data are available.

The third observation that the 4130 steel is less sensitive to residual stress than the 7075-T6 aluminum alloy probably results because the 4130 steel is the more ductile of the two alloys. Sufficient plastic strain may have been present at the lower stress level to cause relaxation of residual stresses. We suspect that the 4130 steel would have shown an increased sensitivity to residual stress if the second load level had been lower.

The above comments are qualitative because we have not developed a method which overcomes the mechanics difficulties in determining stresses in low-cycle fatigue-bending tests.