the voids have been eliminated. It has also become apparent that it is important to make samples that are defect-free as formed, rather than to try to anneal defects out after the sample has been made.

We have been able to follow the band edge as the density of these microvoids is reduced from 10% or 15% to close to zero. In this range, the band edge remains sharp but moves by tenths of an eV.[3] The band gap is approximately 0.7 eV for amorphous Ge, which approaches the ideal Polk model[4] in which all covalent bands are satisfied and no microvoids are present. By extrapolation, we suggest that the sharp edge is completely lost if the microvoid density becomes sufficiently high.

Thus, there seems to be increasingly good agreement between experiment and theory. In amorphous samples of good perfection, one has sharp edges, in agreement with Weaire; as the microvoid density is greatly increased so that the samples become much less perfect, one loses the sharp edge and finds an increased number of states in the gap, in accord with the work of Morrel Cohen.[5] The cardinal result, though, is that the destruction of long-range order does not necessarily result in the destruction of sharp band edges.

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DENIS WEAIRE COMMENTS: John Ziman's letter appears to imply that the model that I used was such as to ascribe purely bonding and antibonding wave functions to the valence and conduction bands respectively. If such were the case, it would indeed be merely "begging the question" of the existence of a gap—but it is not the case.[1] This is not to say, however, that the question has been answered in full, as we ourselves[2] and others[3] have repeatedly emphasized. A rigorous theoretical demonstration of the existence of a gap in these systems, starting from something like first principles, still eludes us all. If James Phillips[3] is correct in his suggestion that such an explanation will have to incorporate subtle considerations of stability, we are in for a hard time in trying to produce one. Among other things we will need much more information regarding the details of the structure, from studies of the kind that Donovan and Spicer mention, *inter alia*.

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CARLTON LOWENBERG
San Francisco

Tachyon question

Some time ago, you published a discussion of tachyons. I have a simple question about tachyons, which I have not seen discussed in print, and which might be of interest to some of your readers.

The question is: What is the form of the trajectory of a charged tachyon?

Straight-line motion at constant velocity is ruled out by momentum conservation, since Cerenkov radiation is expected. Accelerated motion along a straight line (the tacit assumption of some published discussions) is not a relativistic concept; what one observer sees as accelerated rectilinear motion will appear as curvilinear motion to