

Direct Evidence of Dislocations Pre-dates 1953 Bell Labs Work

To the Editor:

I very much enjoyed reading Harry Leamy and Jack Wernick's article on the history of semiconductor silicon, in the May [1997, page 47] issue [of *MRS Bulletin*]. I've just one small quibble, and that is based on my personal experience. The authors say that the revelation of discrete etch pits by etching a sub-boundary in a germanium crystal, published in 1953 by a group at Bell Labs, was the "first direct evidence of dislocations in crystals." Not so. In 1947 I published (in the proceedings of a conference held in Bristol, England) an outline account of etch-pits in sub-boundaries in single crystals of zinc which had been plastically bent and then annealed, which "polygonized" (straightened) the curved lattice planes and caused some of the dislocations to migrate and assemble. The resultant sub-boundaries consisted of dislocations, which were then revealed as etch-pits. The observations were published more fully (with the addition of studies on aluminum crystals) in 1949, in the *Journal of the Institute of Metals* (London).

I believe that the Bell Labs observations of 1953 were the next to reveal dislocations in crystals, and soon after that, in the mid-1950s, there was a flood of evidence from investigators such as Dash at GE (silicon), Mitchell in Bristol (silver chloride), and a number of others who all "decorated" dislocations, isolated or grouped, in different ways to render them visible under an optical microscope.

Robert Cahn
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Reply

I confess to having been unaware of Professor Cahn's publication of 1949, and respect his desire to set straight the record on this important and historic first. Jack Wernick and I warned in the article that it was Bell Labs-centric, and so it proved to be. I am happy to learn of Professor Cahn's prior work.

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Scientific Communication and the Role of Editors

To the Editor:

In April 1997 the *Electrochemical Society Journal* carried a tribute to its reviewers. The editor, Paul Kohl, described them as praiseworthy custodians of the quality and integrity of scientific standards. Mr.

Kohl should have added a kind word for journal editors, who, after all, assume ultimate responsibility for the quality of publications and the integrity of the peer-review process.

An editor's job is not easy. Consider the logistics of arranging reviews, scheduling publication, and editing texts for clarity and conciseness. To these must be added several complications that derive from the modern scene. First, there is the explosive growth in the number of authors and profusion of their output (c.f., David Goldstein's "The Big Crunch" in the October 1995 [page 7] issue of *MRS Bulletin*), with some scientific journals now serving more authors than readers—as pointed out by A.K. Christensen in *J. Microscopy Society of America* 2 (3) (1996, page Nc17). Second, English is now lingua franca to the scientific commonwealth which encompasses diverse peoples with varying mastery of this difficult language. The sharp dichotomy between English usage in America (with its egalitarian and improvisational attitude to vocabulary and sentence structure) and elsewhere in the world is especially noteworthy. Allied to that is the creeping stultification from the English of TV movies and talk shows, which is heavily influenced by celebrities who may lack the benefit of rigorous education.

Editors are the moderators of the discourse among scientists. They straighten out kinks, loops, and splices in the texts submitted to them by diverse writers and this policing effort keeps the discourse from degenerating into a babble. A conference speaker may tell us about "one criteria" used, "one ionic specie" found, or "one phenomena" observed but an editor should not permit the same slipshod constructions in a journal article. Sometimes editors fail in that duty. Until recently the grotesque phrase, "functionally gradient material," was allowed to jar our sensibilities with the spectre of an adverb modifying a noun; and *MRS Bulletin* even featured baffling letters from some people who professed to see "creativity" in FUNCTIONALLY GRADIENT! Similarly, the adjective **schematic** now seems to stand proxy for **schematic diagram** or **schema**. Presumably these are promoted by those who forget that we are scientists and not innovators of English. (While Webster's *Third New International Dictionary* recognizes **antibiotic** and **schematic** as nouns, the *Oxford English Dictionary* does not; so one might look on those usages as more a matter of style than of grammar.)

Conversely, editors should know when not to meddle. It is not their duty to force

a conformity in writing style. I prefer to say "The curve fitted the data" or "None of them is..." rather than "The curve fit the data" or "None of them are...." If a writer's expression is correct and clear but differs from what an editor (or reviewer) prefers, the writer's preference should prevail since the paper will bear his/her name. A vexed example is punctuation. For instance, "Tom, Dick, and Harry" is preferable to "Tom, Dick and Harry." Without that last serial comma, the connotation is that two parties are involved rather than three.

More problematic is the practice of omitting the hyphen, a useful punctuation mark that is going the way of the adverb in American English. (Omit the hyphen and most people cannot pronounce *acoustooptic* properly or make sense of the statement, "We sell demand and supply statistics.") Many editors insist that the acronym CVD be written out in full, and this is attended with much confusion. Various punctuation schemes have appeared in different journals. This is an important issue, for phrases of the sort "Chemical-Vapor-Deposited Material" abound in the materials literature; other examples include Low-Cycle-Fatigue Life, Thermal-Shock-Tested Sample, etc. "Chemical-vapor-deposited material" has to be rendered with both hyphens; it features the same grammatical and syntactic structure as the phrase "ten-year-old child." Omitting the hyphens and changing the phrase to "Chemically Vapor Deposited Material" (as one sees now and then) creates the same monstrosity we saw in "Functionally Gradient Material." Implied hyphens are just as important when scientific units are involved. "A 50h anneal" means a fifty-hour anneal; it is 50 h (fifty hours) long. There is no gap between "50" and "h" in the former case, where the "h" serves as a qualifying noun. Similarly, a \$10 (ten-dollar) book costs ten *dollars* and a six-foot boy is six *feet* tall—contrary to spreading colloquialism.

Finally, it seems imprudent that editors usually instruct reviewers to correct errors of English in a manuscript. It can muddy things by injecting the viewpoint of a third prima donna in matters of style. (Everyone has a big ego in this business.) "He that has one clock knows the time; he that has two is never sure." The fact is, while some authors write with lyrical eloquence, we are not certified meddlers in the English language. Second, the reviewer's judgment is redundant if the editor is going to cleanse the manuscript anyway. Finally, it can do harm. If a reviewer opines that my grasp of thermodynamics is shaky and my English stinks, I might be emboldened to challenge his authority

on thermodynamics as well if I find it is his English that needs a tune-up.

One can go on about the innumerable indicators of literary decline in scientific publications, but this is not a tutorial on English. (Nor am I qualified to give one.)

Suffice it to say that editors have an unenviable duty to toe the line in policing scientific discourse. They should ensure that texts are (made) intelligible to the average reader. Nevertheless, there is a broad spectrum of writing styles and in that

regard the author should get the benefit of any clash of preferences.

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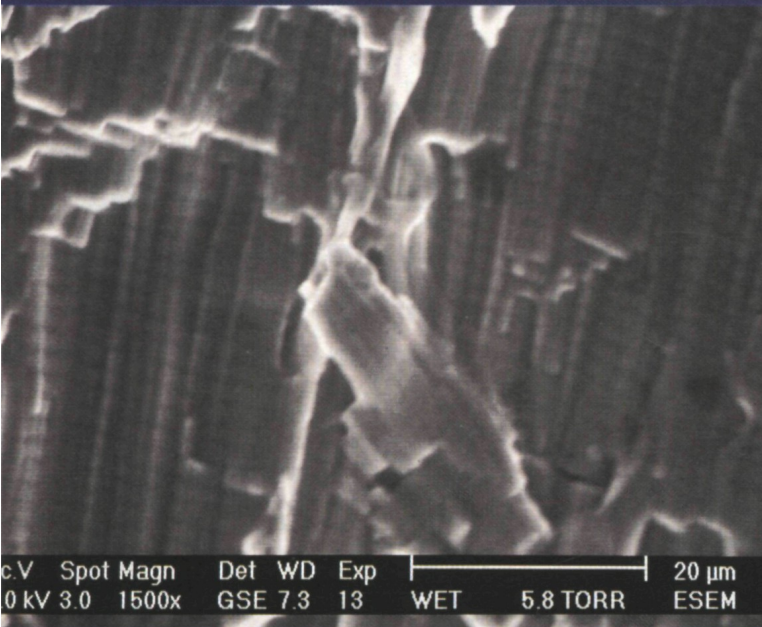
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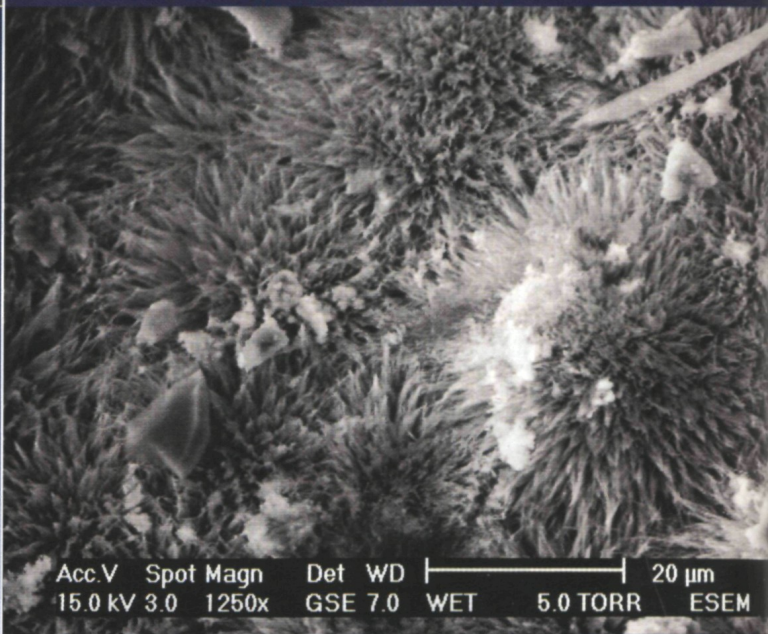
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