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SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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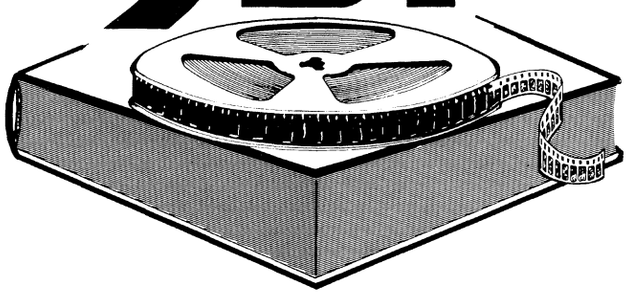

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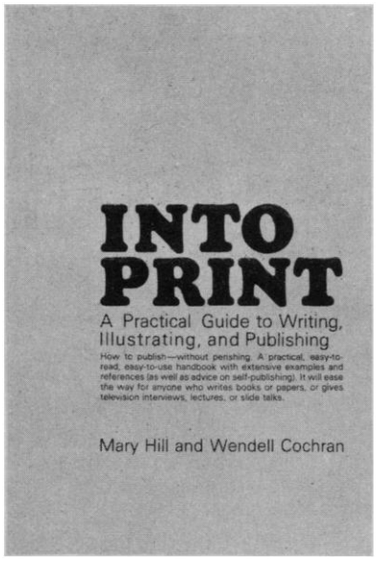

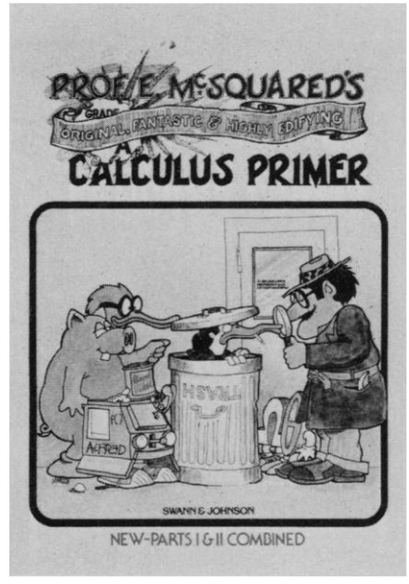

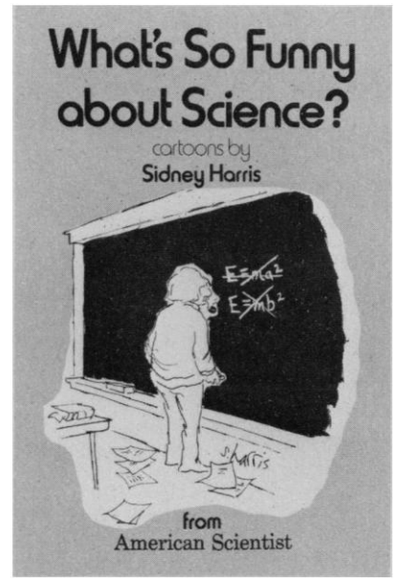

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SCIENCE

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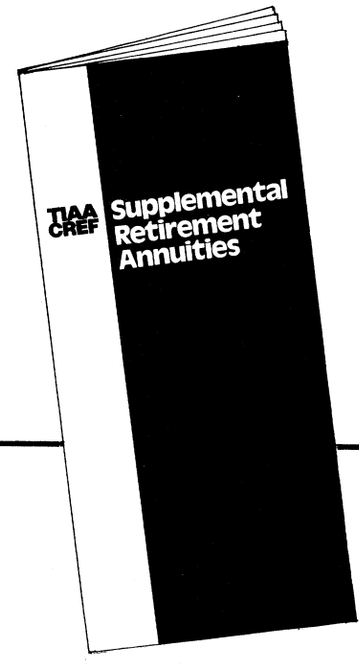
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Simultaneous demonstration of catecholamines and neuropeptides-rhesus monkey supraoptic nucleus. A technique for the simultaneous demonstration of monoamines and neuropeptides was used to visualize catecholamine varicosities (blue) which appear to contact the soma and dendrites of a neurophysin-containing neuron (orange). The method is applicable to numerous neuropeptides, including GnRh, vasopressin, somatostatin, and others (about ×750). See page 1461. [T. H. McNeill and J. R. Slakek, Jr., University of Rochester School of Medicine, Rochester, New York]

TIAA-CREF Supplemental Retirement Annuities



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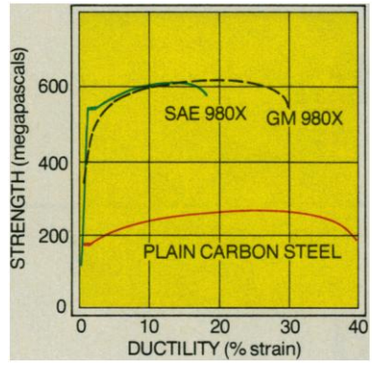
Putting the heat on high-strength steel to make it shape up.

Why all the interest in using high-strength, low-alloy (HSLA) steel in the automobile? To help cut weight and thus conserve fuel.

Not that HSLA steel is lighter than other steels. It's not. But it can do an equivalent job in a thinner gauge.

Until recently, however, HSLA steel was limited in use to simple shapes because of its poor ductility, or formability. A discovery by our metallurgists here at the General Motors Research Laboratories changed all that. They found that contrary to traditional belief, ductility can be greatly increased without sacrificing strength.

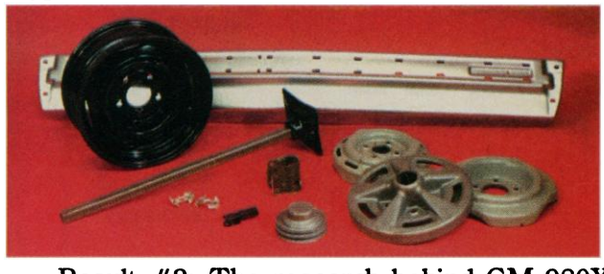


How? By heat treating. The treatment is applied to commercial SAE 980X steel. It improves ductility as much as 50% by dissolving brittle carbide particles in the microstructure and then introducing a strong but ductile second phase (martensite) through controlled cooling.

Result #1 was a new steel called GM 980X. Although weakened by annealing, which enables it to form into complex shapes, it recoups its high strength during forming.

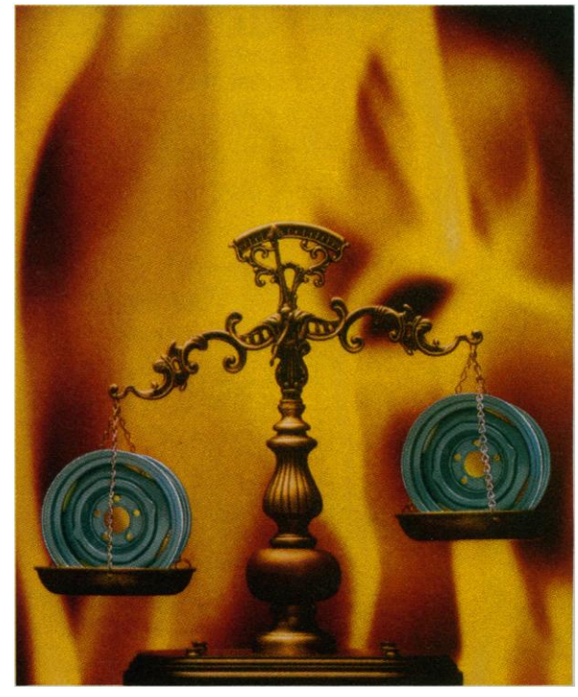
Significantly, steel companies can employ our heat treatment with their existing annealing facilities to make this more ductile HSLA steel. And they are now doing so.

Result #2: GM 980X is already being used to stamp lighter weight parts for production and prototype automobiles.



Result #3: The research behind GM 980X has stirred considerable activity in the steel industry, at universities, and in independent laboratories throughout the world to develop additional HSLA steels having better strength-ductility properties.

All in all, just part of GM's continuing effort to help America meet the growing energy challenge.



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Back to Structure

There can be little doubt that the movement to return to a more structured curriculum on the campus is gaining momentum. Far less clear is the overall implication of the recent return to more required courses, more requirements per course, greater reliance on grades, and so on. Does it simply reflect a return of the pendulum, which swung far into left field during the rebellious 1960's and early 1970's? Or will the main result be an even greater confusion of purposes, a mix of anarchy here and requirements there, with standards differing widely from department to department, tightened up one year, loosened again the next? Or will a new synthesis arise out of the thesis of rigid codes and antithesis of unbounded liberties, a new approach to higher education, clear in its purpose but not without opportunity for change, neither lax nor formless?

That the trend is away from anarchy is evident from top to bottom. In terms rarely used in nearly two decades, the U.S. Commissioner of Education, Ernest L. Boyer, has strongly challenged educational practices that were until recently viewed by many as either "liberating" or "necessary" so as not to alienate the student body. Boyer bemoans the fact that "on the vast majority of campuses, required courses have been dropped, and the ones which remain reveal a staggering incoherence of purpose." He is equally critical of the intellectually undemanding way in which requirements for courses in humanities might be met by "twelve nights of Marx Brothers and the aesthetics of 'Casablanca' " and "a natural science requirement . . . by doing work for a season in the Galapagos." For undergraduates, Boyer defines as essential a required course in Western civilization, a course in communications ("to master the written and spoken word"), and courses aimed at developing the capacity to understand and criticize.

The students are not far behind. Although the majority (50 percent) of a national sample of undergraduates would have abolished grades in 1969, by 1975 this position was favored by only about one out of three undergraduates (32 percent). Only 19 percent of the 1977–1978 freshmen endorse this position.

Many universities are "restructuring." A 2-year study of the undergraduate curriculum at Harvard seeks to "balance" the "legitimate claims of individual interest and aspiration" with the need to ensure that those who graduate will be properly educated. It seeks to move away from random selection of courses by students, and instead to specify course load requirements and course combinations that make sense. The Amherst faculty rejected a proposal to endorse the system of electives that arose in the 1960's. Expressing dissatisfaction with the absence of a "shared educational purpose," it voted 78 to 25 to form a core curriculum. Stanford is reported to have established a new Western culture requirement. City University of New York has replaced open admission with minimum requirements in reading, writing, and mathematics. Similarly, California State University and Colleges voted in March 1977 to require all students to take an English placement exam. The University of Wisconsin reportedly began testing juniors for writing proficiency in fall 1976.

While the retreat from curriculum anarchy is clearly under way, it is much less obvious where it will end up. Colleges are not highly planned entities with powerful "steering mechanisms," able to set and stick to a consistent new course against all opposing currents. The tendency is to compromise, to gradually blend the new (or renewed) orientations into yesteryear's fashions. Adoption of rigid, mostly required rather than elective, lockstep curricula is most unlikely. The main alternatives are having a patchwork of requirements here and sizable pockets of disorganization there, or making a systematic effort to define where structure is needed and where free choice and opportunity to define new directions are called for.—AMITAI ETZIONI, *Professor of Sociology, Columbia University, and Director, Center for Policy Research, Inc., New York 10027*