

# Technology Review



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JULY 1990

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## *Images of America's Engineering Past*

PLUS:

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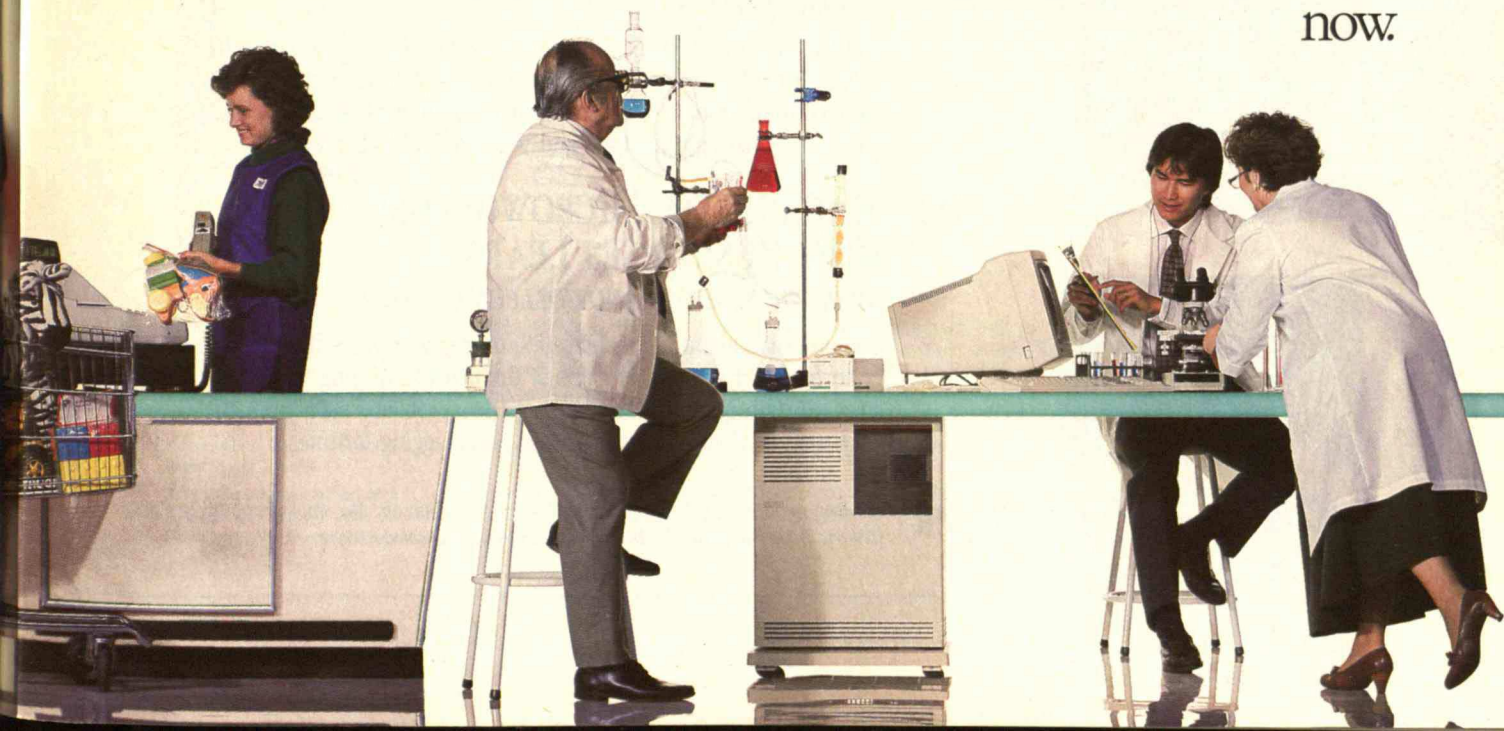
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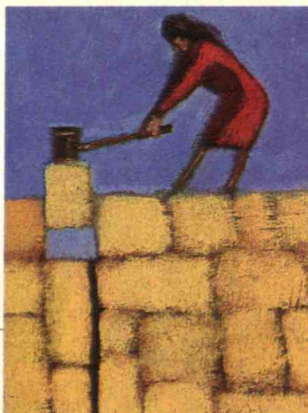
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# FirstLine

## The Volvo Syndrome

A Volvo ad in the mid-1970s claimed that half the cars the company had sold in this country were still on the road. That proportion may have changed (figures are no longer available), but the ad never told as much about the cars as about the psychology of the owners, which has remained constant.

The owners come in two types. The first type, at whom the ad was directed, can be considered rational though perhaps extravagant for buying new Volvos. They like the odometer that goes up to 999,999 miles but know full well that they will never take theirs much beyond 100,000. The second type, who made the ad true by ministering to the vehicles from there on, suffers from the Volvo syndrome. Owners of Dodge Darts or Land Rovers may also be sufferers if they have the ambition to nurse their cars forever.

I belong to this second type. I am not one of those people who maintain that cars are no longer as good as they used to be. Let me state plainly that new cars work better, get superior mileage, and pollute less. But I do see a virtue in old cars' simplicity. When they leave you stranded by the highway, you at least have a good chance of figuring out why. That does not necessarily mean you can do anything about it. Still, I find satisfaction in intellectual mastery over that exasperating necessity, my automobile, and I am always ready to roll up my sleeves and try to get the better of it.

I call my 1974 Volvo the Pumpkin, but others less charitably refer to it as the Orange Eyesore. The previous owner, a fellow syndrome sufferer, had paid dearly for it, put in a new transmission, and rebuilt the engine. He had a shop manual and all the receipts. He was asking \$1,800, but I knew a piece of junk when I saw it, so I offered him \$600. Weeks later when he came to me in desperation, I thought of shaving the price further. Why not \$300, \$200, \$100? Why not pay me to end it all? But

I took pity and gave him what I had agreed. I paid my mechanic more than I care to tally and had the pleasure of performing many other repairs myself.

The weirdest things go wrong with the Pumpkin. One time in western Massachusetts at dusk on a Sunday, every dashboard light that exists flashed on and the headlights dimmed. An apparently irrelevant piece of metal (I never did figure out where it came from) was lodged between the alternator housing and a bare stretch of the main positive wire, thus shorting out the entire charging system.

*When old  
cars break down  
you have the satisfaction  
of figuring out why.*

As I calculate it, of seven breakdowns last year, I managed to fix five. The sixth time I phoned my mechanic, a former Volvo syndrome sufferer, who counseled me to go get a beer. I had to walk several miles each way, but that was precisely his point. It was a hot day and the fuel pump had apparently given out. By the time I returned, it was dusk, I had cooled down, the pump had cooled down, and the Orange Eyesore started right up.

Time number seven was actually a series of incidents. My spouse, Suzanne, and I had a day to go from the northeast tip of Nova Scotia to the southwest, where we hoped to catch the car ferry back to Maine. By 8:00 AM we were hearing an inauspicious vibration but couldn't locate its source. When we stopped at a trash can with a panoramic view, the engine wouldn't start. The bright sun on the sea inspired confidence, and I smugly reattached a wire that I found loose. Later, after we got gas beneath gathering clouds, I turned the key and there wasn't a sound. I grimly reattached another wire, and off we

went. I knew we were in for it. Sure enough, with headlights dimming and hysteria mounting, we rolled into a gas station 60 miles short of the ferry.

The attendant reminded Suzanne of her father, a Detroit machinist who would tear anything apart. I did not necessarily see this as a virtue. He put one of those electrical diagnostic machines on the car and discovered that the voltage coming out of the alternator was much too high. Clearly, the voltage regulator was shot, we couldn't find another within 200 miles, and without it, we'd burn the electrical system out. I mapped my plan. We would install a new battery, bypass the alternator, and start the car at dawn. Without the need for headlights, you can make 60 miles on a good battery. Of course, we'd never start the engine to get off the ferry, but I figured ferry crews must be practiced in dealing with the Volvo syndrome.

Meanwhile, Suzanne and the garage attendant had decided that the fan belt was slack. I protested that that couldn't possibly make the electrical system overcharge, but he took a crow bar to the alternator to tighten the fan belt. A geyser spouted into the air. It was dark, but you could smell radiator fluid. I felt a calm such as descends on drowning people after they give up the struggle.

"What a lousy design," I said. "Who the hell would put a radiator pipe right next to the alternator?" That's where every backyard mechanic pries to tighten the fan belt.

The garage attendant agreed. Then he took his crowbar again, jammed the copper pipe carrying radiator fluid back in place, threw in some water and \$10 worth of stuff to plug holes, tightened the fan belt—carefully—and gave us a jump start. The radiator held, the alternator charged.

That vibration had apparently shaken the alternator loose. The electrical diagnostic tool had been just plain wrong. A week later my mechanic tightened one obscure bolt and stopped the vibration. Old cars are such fun. ■

JONATHAN SCHLEFER

# "Model Eleven...Exquisite Sound...Dwarfs Any Portable Stereo...A High Tech Wonder."

Doug Simmons—*The Village Voice*



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The drivers used in Model Eleven's two-way satellite speakers are no-compromise, high-performance components—just like you'd expect to find in the finest home speaker systems.

nent systems. And because we market it directly from our factory, it costs hundreds less than it would in stores.

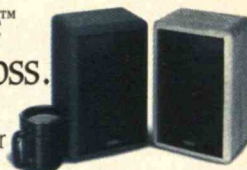
Model Eleven's three speakers are designed to work with a room's acoustics to create seamless, musically accurate sound virtually identical to our critically acclaimed Ensemble® speaker system. And it can be used anywhere in the world—115- or 230-volts AC, or 12-volts DC. It fits under an airline seat (or can be checked as baggage) so you can take it anywhere. But Model Eleven's sound is so good, so "big," you may want to keep it home. At \$599† we know of no music system near its price (transportable or not) that approaches its sound quality.



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\*\*CD player not included in Model Eleven system.

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David Clark—*Audio Magazine*

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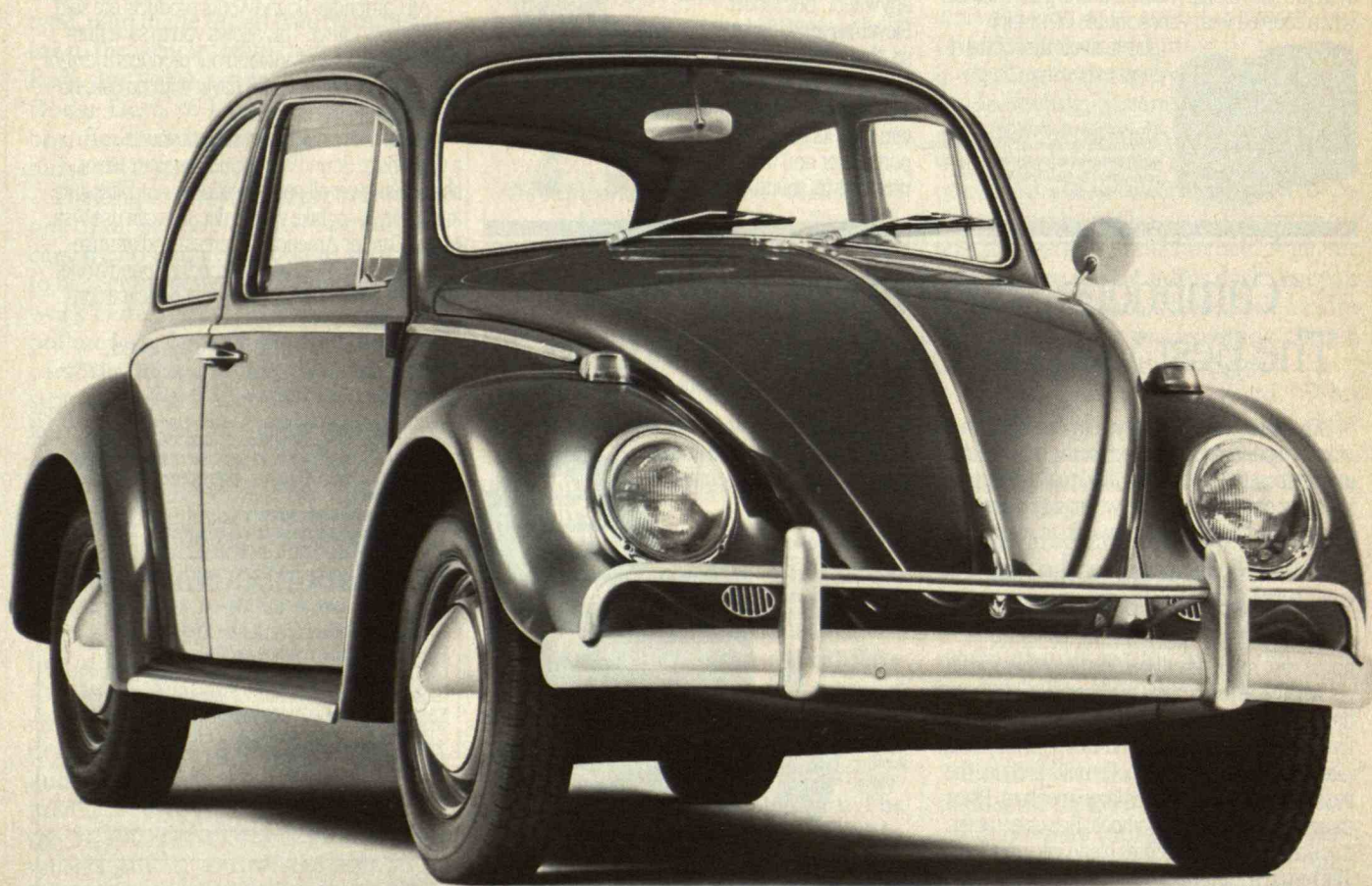
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**NORTHWEST AIRLINES**



# Letters



## ASPARTAME CONTROVERSY

According to "The Price of Sweetness" by Steven Farber (*TR* January 1990), "No studies show that average consumers who supplement their normal diet with aspartame either lose weight or maintain their current weight." But Mr. Farber has overlooked some important studies conducted since 1987. Our own research on obese men and women demonstrates that consuming aspartame-sweetened foods and beverages in conjunction with a sound weight-management program leads to significant weight loss with no clinically significant adverse effects.

In our first study, 59 obese free-living men and women were placed on a 12-week low-calorie diet as part of a comprehensive weight-control program that either was supplemented with aspartame-sweetened foods and beverages (for the experimental group) or was not (for the control group). Both diets were high in complex carbohydrates (49 percent) and protein (27 percent) and low in fat (24 percent); each participant attended weekly one-hour support-group sessions in which the topics for discussion included nutrition, exercise, and behavior modification. The men achieved a clinically significant weight loss in both study groups; the women lost an average of 16.5 pounds in the experimental group, compared with 12.8 pounds in the control group. A four-pound difference (30 percent) over such a short period is clinically significant. One year later, when we obtained follow-up data on 46 of the original 59 patients, we found that those who had maintained their weight loss had sustained a higher consumption of aspartame. They showed an increased level of physical activity and a decreased desire for sweets as well. Among the men there was a strong negative correlation between consuming aspartame and regaining weight.

In addition, our data do not bear out Mr. Farber's statement that "aspartame might stimulate people to want more carbohydrates and subsequently gain

weight." And in a study by another research group, in which normal-weight volunteers were given equal amounts of either low-calorie or high-calorie puddings or gelatins, all volunteers ate about the same amount at a lunch one to two hours later. Further, there were no significant differences between the groups' hunger, fullness, or desire to eat. In a similar study on the effect of consuming high- and low-calorie sweeteners on a lunch two hours later, a third team of scientists reported no difference in subjective hunger ratings or in food intake among children. However, in general, eating behavior is complex and therefore difficult to attribute to any single nutrient or substrate.

We and other investigators have supported the hypothesis that aspartame may facilitate weight loss and long-term weight control. One group gave free-living normal-weight male and female volunteers 40 ounces per day of soda sweetened with either aspartame or high-fructose corn syrup to consume as part of a normal diet. In one of the three successive three-week periods over which the study was conducted, no additional beverage was consumed. Aspartame-sweetened soda was shown to lessen calorie intake significantly (by 7 percent) and to reduce body weight slightly. Soda sweetened with high-fructose corn syrup increased calorie intake significantly (by 13 percent); body weight went up as well.

Finally, with regard to the effect of aspartame on brain chemistry, Mr. Farber has failed to recognize exhaustive experiments clearly showing that the effect of dietary amino acids on circulating amino acids is minor. The major sources of circulating amino acids, which come from the breakdown of body protein, are the ones that dominate the amino-acid pattern crossing the blood-brain barrier and thus directly affect brain chemistry and metabolism.

While we agree with Mr. Farber that aspartame by itself cannot be expected

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to lower body weight, food intake and body-weight regulation are complex phenomena. State-of-the-art treatment of obesity requires a multidisciplinary approach such as that described in our study of aspartame and weight control. To the extent that aspartame can help overweight people adhere to a diet, it may prove beneficial.

GEORGE L. BLACKBURN  
PHILIP T. LAVIN  
BEATRICE S. KANDERS  
Boston, Mass.

*George L. Blackburn and Philip T. Lavin are associate professors of surgery at Harvard Medical School. Beatrice S. Kanders is an instructor in surgery there.*

*The author responds:*

Dr. Blackburn and his colleagues correctly note that there are a few studies where aspartame consumption has appeared to be effective in losing weight. However, these experiments have been performed under unnatural laboratory conditions, so the relevance to individuals who freely choose their food is, at best, unclear. In studies in more natural environments, researchers have tended, almost without exception, to conclude that aspartame is not beneficial for weight control. Furthermore, one of the pieces of evidence Dr. Blackburn cites—the one in which aspartame is substituted for high-fructose corn syrup—is not a formal, peer-reviewed study but a preliminary conference abstract.

While consumption of artificial sweeteners has increased enormously in the United States, there is little indication that Americans are getting any slimmer. In fact, an American Cancer Society survey of 78,000 women found that the rate of weight gain for aspartame users was "significantly greater" than for non-users among those who gained at least 10 pounds in a given time interval. Also, Dr. Blackburn's own research does little to advance the argument that aspartame is useful in reducing weight. The average weight of his



female subjects was approximately 220 pounds, or between 140 and 225 percent of their ideal body weight, and although the women who received aspartame lost an average of four pounds more than those in the control group, such a difference is hardly meaningful for people who are that overweight. Moreover, Dr. Blackburn himself admits in his study that statistically the difference is not significant. He fails to note in his letter that males lost an average of four pounds more in the control group than in the aspartame group.

A number of other researchers have shown that substituting low-calorie sweeteners for sugar is an ineffective and possibly counterproductive weight-control strategy. Richard Foltin and co-workers at Johns Hopkins University School of Medicine have placed subjects on a diet that allowed them to choose the amount and type of food they ate. A baseline level of calorie intake was determined for each subject. Then, after six days, the subjects' diets were covertly manipulated so that artificially sweetened, low-calorie items replaced a percentage of high-sugar foods. Foltin found that subjects immediately and completely compensated for the reduction of calories by eating more. He also found that after sugar was secretly returned to the diet in the last three days of the study, subjects unknowingly consumed more calories than they did at the start of the study.

As for the effect of aspartame on brain chemistry, it is unclear what "exhaustive experiments" Dr. Blackburn is referring to when he says that dietary amino acids have a minor effect on circulating amino acids. I am unaware of any experiments in which patients given either single amino acids or protein have

not had corresponding increases in levels in the blood. Lewis D. Stegink of the University of Iowa has found that administering single amino acids or a variety of protein meals can lead to a peak change in circulating amino-acid levels 26 hours after consumption. Furthermore, Timothy Mayer and Richard J. Wurtman of MIT and G. Harvey Anderson and Edmond Li of the University of Toronto have shown that consuming dietary amino acids can result in an approximate doubling of circulating amino acid levels.

Dr. Blackburn concludes by stating that "aspartame by itself cannot be expected to lower body weight." Yet the 100 million consumers who spend millions on low-calorie products are given no indication that they need to do anything other than substitute aspartame for sugar. There is an implicit unsubstantiated claim associated with these products that consuming aspartame is useful for weight control.

### ENDANGERED EARS

I agree with Alice Suter ("Noise Wars, *TR* November/December 1989) that noise is a serious problem in today's society. I have suffered the consequences of tinnitus for 25 or 30 years and now need a hearing aid to recover the high-frequency end of the audio spectrum.

We do need to reduce work-related and other ambient noises, but I wonder why no one has done anything about the havoc that loud music wreaks on the younger generation. I have been to a couple of rock concerts and had to leave because the noise level was physically painful. I am sure the screaming and playing reaches levels of 120 decibels at such events. It must be doing permanent

