"document" HOWL. Historically, work in this field was limited almost exclusively to trigrams ($n = 3$), which typically support reconstruction of less than 10% of the text, so skepticism is understandable. A categorical dismissal based on "the inadequacy of the n-gram text representation method," however, is unwarranted. No such reconstruction is possible based solely on a word list.

The system described in my article is not speculative; Acquaintance has been successfully applied to a wide variety of difficult tasks since 1991. Its demonstrated competence, language independence, and garble resistance should answer any concerns about "disaster."

The approach taken by this system—involving an unfamiliar combination of n-gram processing and vector-space transformation—may well be counterintuitive. Also, performance tradeoffs differ somewhat from those normally encountered in this field. My hope is that serious discussion of these matters will lead to a fuller understanding of how such techniques can complement more familiar approaches.

Marc Damashek
Department of Defense,
Fort George G. Meade, MD 20755, USA

Amateur Fossil Hunting

I read Carol Potera's article "Amateur fossil hunters dig up trouble in Montana" (News & Comment, 14 Apr., p. 198) with concern. While the specific incident described is troubling, tens of millions of dollars worth of one-of-a-kind fossils sit in museums throughout the world because of the generosity of many amateur fossil hunters. Untold other fossils sit rotting in the sun because of their location on government controlled land and the fact that collecting by amateurs is illegal. If it weren't for an amateur fossil hunter and her rock shop, Jack Horner might not have achieved such prominence as a paleontologist.

Don Miller
2615 Longwood Drive,
Wilmington, DE 19810, USA

■

High-Frequency Outer Hair Cell Motility: Corrections and Addendum

In our report "High-frequency motility of outer hair cells and the cochlear amplifier" (31 Mar., p. 2006) (*1*), we proposed an answer to the question of what powers the cochlear amplifier (*2*) at high frequencies. In subsequently analyzing a generalized network representing n excited and m nonexcited outer hair cells (OHCs) in the electrical environment of the organ of Corti, we obtained some unexpected results that make it necessary to correct our report and to offer new information.

The voltage representing the intracellular potential of an excited OHC is inversely proportional to n and has a steep midfrequency drop off with a high-frequency terminal slope of unity (approximately 6 decibels per octave). Simple unity slope is obtained only if $n = 1$, that is, if there is only one active hair cell in the network. It has been argued (*3*) that this assumed unity-slope high-frequency roll off of the cell's receptor potential makes it difficult to see how the voltage-driven electromotility might be expressed at high frequencies. We now see that the midfrequency roll off is, in fact, faster, and the response is smaller than that expected for a single cell. As a consequence, it would appear even less likely than previously assumed that high-frequency electromotility driven by the cells' own receptor potential is the basis of the cochlear amplifier. In line with our previous argument, the voltage gradient between the extracellular fluid spaces of the scala media

and the organ of Corti is demonstrated to possess wider band width, and it becomes substantially greater than the intracellular receptor potential at mid- to high frequencies. However, as this voltage gradient appears across the motor-bearing basolateral membrane of passive (nonexcited) hair cells, it will be less than the receptor potential produced by a solitary hair cell, and its magnitude is inversely related to m. This means that, for a favorable case of $n \gg m$, the driving voltage to the motors of a passive cell approaches the hitherto assumed single cell response, while the driving voltage to the motors of an active cell becomes small. In general, the ratio of driving voltages in passive and active cells has a horizontal asymptote at low frequencies; the ratio rises in the mid-frequencies and approaches n/m at high frequencies.

The consequences of these findings are several. Voltage drops produced in passive hair cells by extracellular potentials resulting from a group of active cells will be attenuated at high frequencies with unity slope. Thus, these voltages would be unlikely to produce motility at ultrasonic frequencies, as we assumed. However, these voltages are greater at high frequencies than the intracellular receptor potentials in the active hair cells by a ratio of n/m. This means that, at least in the approximate frequency range of 5 to 20 kilohertz, there is a potential of induced electromotility in hair cells that are removed from the region of peak excitation. The mediator for this motility is the extracellular potential gradient generated by hair cells in the region of maximum excitation (n). Induced electromotility apical to the peak excitation cannot feed back to the vibration of the basilar membrane because of the low-pass filtering of the traveling wave. Electrical potentials spreading basalward, however, can produce feedback from OHCs in a limited spatial extent (m). This displacement of the feedback region from the peak of the traveling wave is as postulated by modelers of the cochlear amplifier (*4*). The displacement also helps explain high-side two-tone suppression phenomena. Finally, the reactive voltage divider feature of epithelial cells subjected to external voltage commands, as in current injection experiments with the cochlea (*5*), studying isolated cells in the microchamber (*6*), or in situ in electroreceptors (*7*), permits high-frequency stimulation, as we suggested.

Peter Dallos
Burt N. Evans
Auditory Physiology Laboratory,
Northwestern University,
Evanston, IL 60208, USA

References

1. P. Dallos and B. N. Evans, *Science* **267**, 2006 (1995).
2. P. Dallos, *J. Neurosci.* **12**, 4575 (1992).
3. J. Santos-Sacchi, *ibid.*, p. 1906.
4. S. T. Neely and D. O. Kim, *Hearing Res.* **9**, 123 (1983); E. deBoer, *J. Acoust. Soc. Am.* **73**, 567 (1983).
5. A. E. Hubbard and D. C. Mountain, *Science* **222**, 510 (1983).
6. P. Dallos, B. N. Evans, R. Hallworth, *Nature* **350**, 155 (1991).
7. C. D. Hopkins, *Am. Zool.* **21**, 211 (1981).

Corrections and Clarifications

In the Table of Contents of the issue of 19 May (p. 950), the Policy Forum "Environmental implications of electric cars" by L. B. Lave *et al.* should have been listed as appearing on page 993, not page 995.

In the report "Crystal structure of DCoH, a bifunctional, protein-binding transcriptional coactivator," by J. A. Endrizzi *et al.* (28 Apr., p. 556), figures 2A and 2C on page 557 were inadvertently transposed.

In Daniel E. Koshland Jr.'s editorial of 28 April, "Noitall seeks new horizons" (p. 479), it was incorrectly suggested that the world's human population is 4.2 billion. It currently exceeds 5.6 billion.