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#### References and Notes

1. Office of Research on Women's Health (<http://orwh.od.nih.gov/index.html>).
2. The authors are all directors or co-directors of NIH/ORWH Specialized Centers of Research on Sex and Gender Factors Affecting Women's Health (SCORs) funded by ORWH and sponsoring NIH institutes.

## The Nonscientist Science Adviser

E. KINTISCH'S NEWS FOCUS STORY ("BENDING the president's ear," 2 January, p. 28) on the role of the science adviser to the president contains an important historical error: The first science adviser, James Killian, was not an electrical engineer. In fact, Killian was not a scientist or engineer at all. His academic training was in management and administration, and his experience included serving as the president of the Massachusetts Institute of Technology and on a number of government advisory committees (*I*). That the first science adviser was not a scientist is not widely appreciated, and it is not widely advertised in the science community that Killian did not earn a doctorate. Killian had been awarded an honorary doctorate from Middlebury College in

1945 (2), and he was later awarded honorary degrees from Union College, Drexel Institute of Technology, and the College of William and Mary (3). That the first science adviser—often held up as the exemplar of the role—was a management expert should not be overlooked (*I*).

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## The Enduring Spoken Word

IN HIS PERSPECTIVE ("UNLOCKING THE potential of the spoken word," 26 September 2008, p. 1787), D. W. Oard describes how writing caused a landslide in humanity's cultural landscape, in large part because it was a findable, permanent record. He suggests that today's speech recognition and recording technologies may mean that the comeback of the spoken word is upon us. However, Oard's argument suggests a radical turn where there is none,

for the simple reason that speech has never left our side.

The invention of writing allowed information to be stored reliably in a medium other than human memory. Speech processing technology is just a variation on that theme. Oard highlights the potential of the spoken word for information retrieval purposes. In no sense does this bring us to “the threshold of a new era”; it merely dusts off the worn-out view of the spoken word as mere vehicle for transporting ideas (1).

The full potential of the spoken word has always been more complex than the words themselves; the speaker and listener jointly construct meaning guided by common ground, social relationships, gestures, body language, and facial expressions as much as by the auditory signal (2–5).

Discourse over the past 50,000 years has encompassed a lot more than neat text ready to be data-mined. Unlocking its full potential requires a richer and more dynamic view of language than that espoused by Oard.

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3. D. Tannen, *Talking Voices: Repetition, Dialogue, and Imagery in Conversational Discourse* (Cambridge Univ. Press, Cambridge, ed. 2, 2007).
4. H. H. Clark, *Using Language* (Cambridge Univ. Press, Cambridge, 1996).
5. N. J. Enfield, S. C. Levinson, *Roots of Human Sociality: Culture, Cognition, and Human Interaction* (Berg, Oxford, 2006).

#### Response

RATHER THAN ARGUING THAT SPEECH WOULD overcome writing in another radical cultural shift, my intent was to suggest that speech would reemerge to stand side by side with writing as a conduit for transporting ideas with permanence and findability. As M. Dingemanse observes, speech can be so much more than a mere conduit, and I would agree that we are far from being able to build machines that can reasonably model the full richness of human expression, whether spoken or written. Many of our most widely used machines for processing language (such as search engines and translation systems) rely

on fairly shallow representations of meaning, and predicting fundamental changes in that situation would seem to me highly speculative. Machines are merely tools, however—it is we, not our machines, who must ultimately make sense of what we see, hear, and read. But we should not underestimate the importance of having machines that can help us to find what we need. Dingemanse’s critique reminds us that change and continuity coexist, and that although permanence and findability can help us to use speech in new ways, many of the ways speech presently pervades our lives will surely also remain with us.

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#### CORRECTIONS AND CLARIFICATIONS

**News Focus:** “Astronomy hits the big time” by A. Cho and D. Clery (16 January, p. 332). The first observation of a very high-energy gamma-ray source was not the work of the H.E.S.S. telescopes in 2004, as stated, but was made some 20 years earlier by a collaboration using the Whipple Observatory’s 10-meter optical reflector in southern Arizona. More than 10 sources had been established before 2004, including a number of extragalactic sources.