

PSYCHOLOGY

Learning from Words

Robin Lakoff

Language comes naturally to humans, but understanding how it works, much less so. How come you can drive on a parkway, and park on a driveway, but not park on a parkway? Conundrums like this fill some of us with delight and others with unease: language should, some feel, work logically.

Both parties will find pleasure and elucidation in Steven Pinker's new book, *The Stuff of Thought: Language as a Window into Human Nature*. Pinker, a cognitive psychologist at Harvard University, brings an engaging and witty style to the study of subject matter that—were it not as important to us as it is complex—might otherwise be off-putting. His overall theme is the way in which linguistic forms are in some sense inevitable, rather than chaotic: intrinsically bound to the way our brains are wired.

In a sense, the work of Pinker and his colleagues is a continuation of Chomsky's revolution of a half-century ago. Chomsky, after all, famously called language a window into the mind, a statement Pinker's subtitle echoes. But where Chomsky justified his theories intuitively, creating his example sentences and testing their grammaticality in his own mind, Pinker and his colleagues are empiricists, proving their claims by experimentation.

Pinker discusses language at all levels, from sounds, to words and phrases, to larger units (sentences and beyond). There is a set of English words that begin with gl-: glare, glow, glass, gleam, and glimpse (among many others). Is the similarity due to mere coincidence? Pinker says that all such words have as part of their meaning the suggestion of "emission of light." Even in those areas that some might want to banish from the domains of orderly reason, like four-letter words, language works according to general principles. Pinker cites the work of the fictitious linguist Quang Fuc Dong (an alter ego of the very real linguist James D. McCawley), who argued against the common assumption that "Fuck you!" is an imperative. In a true imperative, a second-person direct object

The Stuff of Thought

Language as a Window into Human Nature

by Steven Pinker

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The reviewer is at the Department of Linguistics, 1203 Dwinelle Hall, University of California, Berkeley, CA 94720-2650, USA. E-mail: rlakoff@berkeley.edu



Alice finds Humpty Dumpty very clever at explaining words.

must be reflexive: yourself, not you. Of course, this discussion (in the chapter "The seven words you can't say on television") is good clean (if titillating) fun, but Pinker deepens the discussion to illustrate important properties of language. The fun aspects of linguistic theory are inseparable from its deeply serious nature. This necessary connection between depth and wit is echoed in Pinker's style. Where the discussion might bog down of its own weight, he leavens the dough with humor: quips, anecdotes, jokes, and comic strips. Chomsky and other cognitive theorists are often cited, as we would expect; but so, to good effect, are Groucho Marx, Lewis Carroll, and Dorothy Parker.

The chapter "Games people play" looks at some of the larger and more abstract uses of language: the way we use it interactively, choosing to be direct or indirect, polite or

rude—that is, to behave as proper (or not) social beings. Just as language is rigorously rule-governed at the sound and word levels, our brains impose predictability on our decisions at this more abstract level as well. How do you get someone to lend you money? Some of us might adopt a strategy of indirect pessimism: "I don't suppose you'd be able to lend me some money?" Whereas others might use direct camaraderie: "I know I can count on you to help me out with some money." Cultures, and the individuals within them, have preferences, depending on speakers' assessments of the social and psychological contexts in which they are trying to meet their needs. Although Pinker's discussion of this topic is generally informative and engaging, here is one place where he might have gone beyond the fields in which he claims expertise. Interactional sociolinguists like John Gumperz, Deborah Tannen, and Deborah Schiffrin have had a great deal of interest to say on these topics. Likewise, the work of William Labov in a great many areas of sociolinguistics would provide Pinker with additional evidence of the rationality and logic of linguistic choices. But the book is curiously lacking in any discussion of sociolinguistics whatsoever.

Although the author generally shows a perfect intuition for how much to say about complex topics, occasionally he falters. His discussion of meaning and naming in the chapter "What's in a name?", while useful in leading up to his detailed examination of naming conventions of all kinds, goes into too much formal detail, at least for my taste. On the other hand, despite its length his discussion of politeness and indirectness, as noted above, oversimplifies the questions it explores.

But these are mere quibbles when discussing such an inviting and important

book. Everyone with an interest in language and how it gets to be how it is—that is, everyone interested in how we get to be human and do our human business—should read *The Stuff of Thought*.

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GEOSCIENCE

Dancing Continents

Kevin Burke

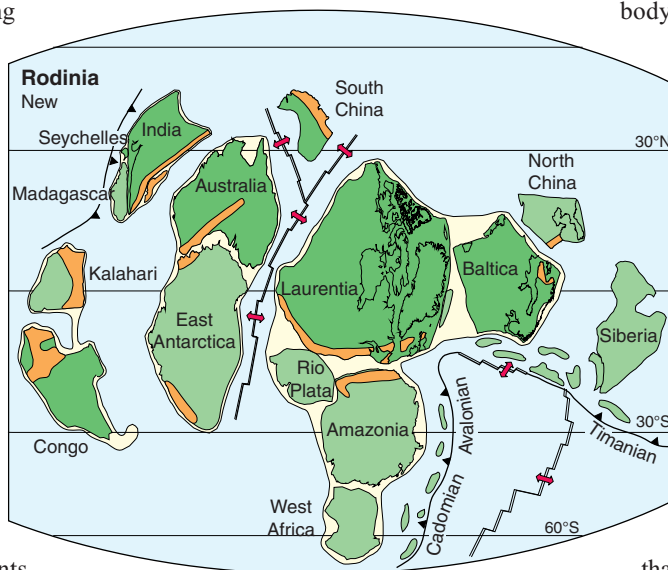
Some of the world's ocean basins, like the Atlantic, are currently opening, while others, like the Pacific, are closing. Plate tectonic data recording the rotation of rigid objects across Earth's surface mean that we can analyze the plate motions associated with these openings and closings. Forty years ago, Tuzo Wilson pointed out that because similar analyses are impossible for times before the age of the oldest ocean floor, the best we can do is to interpret the older geological record in terms of cycles (now called Wilson cycles) of the opening and the closing of ocean basins (1).

The way of describing how and when continents were broken up and younger continents or supercontinents were later assembled has been to map and date sutures within continents that mark the places where ancient ocean basins have opened and closed. Ted Nield's imagination has been captured by one aspect of these cycles. He writes: "The Earth's landmasses are locked in a stately quadrille that geologists call the Supercontinent Cycle, the grandest of all the patterns in nature." I have too many astronomer friends to be able to accept that, but it does show that the idea of supercontinents has hooked Nield, and it accounts for the book's title being in the singular.

Nield (the editor of the Geological Society of London's magazine *Geoscientist*) has responded to being hooked by writing a book that is both informative and entertaining. He has thought well outside any academic box, touching on a huge diversity of topics. He writes of a future Earth with a single supercontinent visited by a spacecraft from far in the galaxy (that accounts for his book's subtitle), and he tells of fictional and postulated

continents as well as their colorful and, in some cases, disreputable protagonists. Nield relates many subjects that are currently major foci of research in Earth history to his theme. For example, he provides clear and well-informed treatments of evidence from Australia for the existence of abundant continental material about four billion years ago; evidence for a snowball Earth, at the end of the Proterozoic; and evidence for the, very likely related, origin of complex life forms after the end of that extraordinary episode of cooling.

Although I enjoyed the book and learned much from it, I remain puzzled about how to recognize a supercontinent. I came to the book assuming that supercontinents contain all the continental crust of the Earth. The illustrated future example, boldly constructed by Roy Livermore, contains all continental material in



Rodinia reconstruction.

a single roughly elliptical body, and Nield describes Pangea as a supercontinent that contained nearly all continental crust. Imagine my surprise when I read: "Pangaea consisted of two smaller supercontinents joined at the hip in the region of the Equator: Laurasia in the Northern Hemisphere ... and Gondwanaland in the Southern..." I was left asking what a supercontinent is. I do not think it is simply something assembled from smaller continental blocks, because that would make all continents supercontinents. Even Greenland (only two million km²) is crossed by two sutures, which indicate its assembly from three smaller

continental blocks. I suggest a testable property for identifying supercontinents would be "contains nearly all extant continental crust."

Rodinia has been suggested to have been a supercontinent assembled through collisions of various fragments with an already-ancient Laurentia about one billion years ago, although my estimate of the area of its assembled blocks makes it only about half as large as the younger Pangea. Nield writes a lot about Rodinia, mostly emphasizing its breakup, but does not include a map of it—perhaps because there is no consensus about what Rodinia looked like. Assembled continental fragments have been arranged around Laurentia in a variety of ways; the figure shows a version drawn by Trond Torsvik (2).

The difficulties in recognizing ancient supercontinents involve not only estimating how much of then-extant continental crust was incorporated into the newly assembled body but also obtaining high-resolution age determinations and distinguishing other convergent plate boundary phenomena from continental collisions. An even harder problem is determining where the objects involved in an assembly were, not only with respect to each other but also with respect to Earth's spin axis. Ancient latitudes and longitudes are essential. There has been progress in estimating ancient latitudes using paleomagnetism; thus a few continental blocks now have credible poles for as long ago as one billion years. But resolving ancient longitudes is not yet feasible.

Nield has not persuaded me that there is yet a case for the existence of ancient supercontinents (other than Pangea) that contained all of the Earth's continental crust—let alone evidence of cycles of supercontinent assembly. Nevertheless, I think that *Supercontinent* is a good book because of its lively and stimulating perspective on many topical aspects of Earth's history. A robust foundation is not, after all, essential for a good book: Proust's masterpiece rested on no more than the smell of a pastry fragment soaked in tea.

References

1. J. T. Wilson, *Proc. Am. Philos. Soc.* **112**, 309 (1968).
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The reviewer is at the Department of Geosciences, SRIL, University of Houston, Houston, TX 77204-5503, USA. E-mail: Kevin.Burke@mail.uh.edu