LETTERS

edited by Jennifer Sills

Evolution of the Monkey Crouch

T. PFAU *ET AL*. ("MODERN RIDING STYLE IMPROVES HORSE RACING times," Brevia, 17 July, p. 289) nicely document the effectiveness of the "monkey crouch" riding style on race times and horse-jockey biomechanics. This style produced measurable speed benefits to winning race times at the English Epsom Derby Stakes (1900–1910).

The change in riding style across a decade of different jockeys prompts the question: How did the monkey crouch originate? Many authors credit two American jockeys—Willie Simms and Tod Sloan—with bringing this style to England in 1895 and 1897, respectively. However, English rider Harding Cox claimed to have adopted the monkey crouch still earlier. Cox even described how he developed the style and what benefits it conferred: "When hunting, I rode very short, and leant well forward in my seat. When racing, I found that by so doing I avoided, to a certain extent, *wind pressure*, which … is very obvious to the rider. By accentuating this position, I discovered that my mount had the advantage of *freer hind leverage*" (original italics) (*1*). Measurements taken by Pfau *et al*. support Cox's impressions.

Did Cox intend to design his new riding position? Did he purposefully reposition himself on his horse after painstaking mathematical calculations? Did he record wind pressure scores or take biomechanical readings to assess his new riding style? Probably not. It is more likely that he merely proceeded by trial and error, much as did Olympic champion Dick Fosbury when he invented his famous high jumping "flop" (*2*).

Inventive behavior is often attributed to creativity or to genius when a simpler explanation suffices. The origin of the monkey crouch perfectly fits the Law of Effect: Successful behavioral variations are retained and unsuccessful variations are not. This positively Darwinian process works for human inventions just as it does for earthly organisms—mechanically and without design or purpose.

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Energy Strategies and Efficiency

J. E. CAMPBELL *ET AL*. ("GREATER TRANSPORTation energy and GHG offsets from bioelectricity than ethanol," Reports, 22 May, p. 1055) compared the efficiency of using biomass to power vehicles through either ethanol production or electricity production (for electric vehicles). However, it is premature to conclude that biomass use should focus on the latter simply because it boasts greater overall efficiency.

Some energy uses, such as air travel and long-distance shipping, require fuel with high energy density, which current and foreseeable batteries cannot achieve. Those applications will continue to require a liquid hydrocarbon fuel to meet their needs. Currently, our only viable nonfossil option for satisfying that demand is biofuels. If biomass that could be turned into biofuels is instead burned to produce electricity, our ability to reduce petroleum usage in areas that require fuels with high energy density will be greatly diminished.

Our ultimate goal should be to transition completely away from fossil fuels. To do that, we need to look at each type of energy use and assess how best to meet that demand. While producing electricity from biofuels to power electric vehicles may be a more efficient use of that biomass itself, we have many other options available for producing nonfossil electricity (such as nuclear, geothermal, wind, and solar power). However, those options cannot be as easily used to create high energy density fuels. Biomass can meet that need, and therefore would be most wisely used to fill that need, rather than to produce electricity (*1*).

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Response

BRIGGS ARGUES THAT ENERGY STRATEGIES should not focus exclusively on efficiency. We agree and explicitly state a wide range of criteria in our Report. Briggs also argues that biomass should be dedicated to liquid fuel production to allow for a complete transition away from fossil fuels, whereas other renewables should be used for electricity. His argument would be compelling if the complete transition away from fossil fuels were within reach in the near term.

Instead, we expect the transition away from fossil fuels to be more gradual. In the meantime, we must find the mix of fossil fuels, biomass energy, and other renewables that best meets the interacting goals of energy independence, climate mitigation, economic competitiveness, and clean air. Multiple forms of biomass energy could contribute to this mix, but much of the current policy focus is limited to liquid fuels (such as ethanol mandates in the United States and other countries). The

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efficiency advantages of bioelectricity (*1*) and bioheat (*2*) provide a strong motivation for broadening the research and evaluating these applications along with liquid fuels.

Support for future research and policy analysis should be broad enough to encourage serious exploration of the prospects for electrifying vehicles, including the potential rate of adoption, cost, range, and the kinds of vehicles compatible with electrification. The situation to avoid is one in which strong starting assumptions about the limited potential of vehicle electrification create so much momentum for liquid fuels from biomass that we forgo the option that makes the most efficient use of the biomass energy.

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Defining Language Boundaries

THE NEWS FOCUS STORY "HOW MANY LANguages? Linguists discover new tongues in China" (M. Erard, 17 April, p. 332) discusses an important challenge: defining accurate language boundaries. I encountered this issue while working on United Nations conflict prevention and resolution initiatives in ethnically diverse regions where success is determined by reliable communication. Although the strict criteria described by Sun Hongkai constitute one approach to delineating language boundaries, the degree to which speakers of one language or dialect can understand speakers of another—mutual intelligibility—remains the ultimate test for defining languages for the purposes of practical application to work such as mine.

Unfortunately, determining mutual intelligibility can be complex and burdensome, and the techniques used to test it are not applied universally. The task of identifying boundaries could benefit from the establishment of a simple and reliable technique that would determine where efforts are needed to ensure communication across language barriers. Assigning definitive language codes is premature until mutual intelligibility criteria and techniques have been applied consistently. This would require a cooperative effort among linguists in all countries, along with the necessary financial support.

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Note

1. The author and Sun Hongkai have published a monograph together.

Plagiarism: Transparency Required

J. COUZIN-FRANKEL AND J. GROM ("PLAGIarism sleuths," News Focus, 22 May, p. 1004) suggest that "[r]epetitious reviews and incremental reports are part of an accepted tradition." Accepted when and by whom? The International Committee of Medical Journal Editors (ICMJE) has for many years included a detailed section on overlapping publications in its "Uniform requirements for manuscripts submitted to biomedical journals" (*1*). The need for transparency, both to editors and readers, is a paramount concern. Nowhere in the ICMJE document is there an exemption for any particular type of manuscript, including reviews and translations. Essentially all journals include in their instructions to authors a statement such as that provided by *Heart Failure Reviews*: "Submission of a manuscript implies that the work described has not been published before and that it is not under consideration for publication anywhere else." Many require a signed declaration. Nevertheless, the authors of many reviews, editorials, and textbook chapters fail to disclose the inclusion of substantial sections of text lifted largely verbatim from previously published or simultaneously submitted material.

One of the authors apparently unhappy about inclusion in the Déjà vu database is quoted as saying "[t]here's going to be redundancy [in review articles], but I don't think that's scientific misconduct." Without appropriate permission from all the relevant editors, as well as the inclusion of an overt notice in the later publication to inform readers, it is deception and therefore is indeed misconduct; copyright may also be a problem if it has been assigned to the original publisher. Moreover, if the second submission occurs with a declaration—signed, implied, or otherwise—that none of the material has been or will be published elsewhere, it amounts to outright fraud.

Authors who have sought editorial permission and been transparent when reusing material have nothing to fear from inclusion in Déjà vu. They may ultimately point to the entry as independent confirmation of their integrity.

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1. International Committee of Medical Journal Editors, "Uniform requirements for manuscripts submitted to biomedical journals: Writing and editing for biomedical publication" (www.icmje.org).

Plagiarism: Consider the Context

THERE SHOULD BE NO DOUBT THAT ANY form of covert duplication of data represents a serious threat to the integrity of the scientific record ("Plagiarism sleuths," J. Couzin-Frankel and J. Grom, News Focus, 22 May, p. 1004). Duplication and other types of redundancy (such as "salami publication") are a source of great concern for science journal editors (*1*). In that regard, Skip Garner's eTBLAST and his Déjà vu site should be viewed as a welcomed addition in the arsenal to combat and prevent possible scientific misconduct.

The issue of wholesale reuse of an author's previously published text is slightly more nuanced. It is understandable when non-native authors with limited English skills engage in this behavior, particularly when they have received poor relevant guidance. While adhering to a single set of clear, ethical standards equally applicable to all, we also must recognize that each case is unique and should be treated accordingly. In contrast, substantial text reuse by experienced authors who hold a full command of the language is inexcusable and should not be tolerated. An exception might be made for methodology sections because these contain very complex, technical descriptions of materials and procedures that are often difficult to paraphrase (*2*). Even

slight changes to the wording of these sections could potentially lead to subtle misinterpretations of how an experiment was conducted. However, the underlying assumption in this argument—that previously published methods sections are so well written that they cannot possibly benefit from additional clarification or elaboration—is often unwarranted (*3*).

Practices such as patchwriting and authors' recycling of their previously published text should not just be regarded as questionable—they should be unequivocally classified as inappropriate scholarship (*4*). **MIGUEL ROIG**

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Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 3 months or issues of general interest. They can be submitted through the Web (www.submit2science.org) or by regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.

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4. M. Roig, "Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing" (U.S. Department of Health and Human Services, Office of Research Integrity); http://ori.hhs.gov/education/products/plagiarism/.

No Paradox for Invasive Plants

THE PERSPECTIVE "AN INVASIVE PLANT PARADOX" by M. E. Rout and R. M. Callaway (8 May, p. 734) overgeneralizes the effect of invasive plants on the nitrogen cycle. An invasive plant's impact on nitrogen cycling is based on plant identity rather than origin. Invasive nitrogen-fixing plants can increase nitrogen cycling in a newly invaded ecosystem, but this does not apply to all functional groups of invasive plants. Mechanistically, it is difficult to imagine how non–nitrogen-fixing plants could enhance total nitrogen pools in the ecosystem, unless they did so by affecting free-living nitrogen-fixing microbes. Furthermore, the effects of invasive plants on nitrogen fluxes are site-dependent (*1*, *2*). To avoid the confounding effects caused by site, we need experimental studies that can unequivocally separate causes from consequences. We agree with Sax and Brown (*3*) that there is no paradox of invasion. Indeed, there are underlying mechanistic explanations for each species in its new environment. A general pattern of enhanced nitrogen cycling does not exist for plant invaders.

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Clarifying Coals

R. A. KERR'S NEWS FOCUS STORY ABOUT THE peak coal controversy, "How much coal remains?" (13 March, p. 1420), did not distinguish between the challenges of mining bituminous compared with sub-bituminous coal. The older mining literature indicates that a large fraction of the bituminous coal resource should be minable to a depth of at least 1200 m. The situation for the globally substantial sub-bituminous and brown coal resource is more complex.

The Royal Commission coal report of 1903 to 1905 (*1*, *2*) showed that for typical U.K. geological conditions, recovery ratios of 80 to 90% were achievable for bituminous coal with the labor-intensive mining technology of the time. Similar arguments apply to the global bituminous resource, given that coal-bearing, post-Devonian strata are too young to have a high probability of being strongly tectonized or metamorphosed. The early- to mid-20th-century mining literature contains numerous examples of very high extraction ratios for thick seams and in multiseam mining (*3*–*5*) to depths of about 1200 m. Later 20th-century mines went deeper [for example, to 1450 m at Monceau-Fontaine (*6*)]. New technologies may enhance productivity of labor-intensive, high extraction percentage, longwall mining. Thus, the ultimate extraction ratios for bituminous coal could well be high.

The situation is less clear for sub-bituminous coal (which forms an important part of the global coal resource). Rock strengths range from similar to those in bituminous coal to an order of magnitude weaker, depending on the basin burial history. The depths at which the rocks become overstressed will be lower. This applies even more strongly to less indurated brown coals. However, the available English literature describing the relationship between pressure temperature history and mechanical properties of such rocks is limited, as is that relating mining problems to overstress and coal/rock mechanical properties. The ultimate extraction depth for brown coal and sub-bituminous coal will depend on the burial history statistics of these materials.

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CORRECTIONS AND CLARIFICATIONS

News Focus: "Bringing hominins back to life" by M. Balter (10 July, p. 136). The name of the *National Geographic* science editor was misspelled. It is James Shreeve.

News Focus: "Private money, public disclosure" by J. Kaiser (3 July, p. 28). The article may have inadvertently given the impression that Stanford psychiatrist Alan Schatzberg failed to report some of his outside financial interests to his university. All income discovered by Senator Grassley had been disclosed to Stanford. Also, the amount of Dr. Schatzberg's equity in Corcept Therapeutics was not initially disclosed to Grassley, but was always disclosed to Stanford.

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