

## Women Making Strides in Big Pharma

AS FEMALE SCIENTISTS IN LEADERSHIP POSITIONS at a large pharmaceutical company, we disagree with the conclusion that “It’s still a man’s world at the top of big pharma research” (J. Mervis, Special Section on Drug Discovery, News, 29 July, p. 724). There are numerous examples suggesting that this notion is more than a bit outdated. Of additional concern is the superficial analysis that led to the conclusion that childcare issues hold women back in the field of discovery research.

Certainly, we would all like to see more women at the heads of research organizations, but we have observed significant progress over the past 10 years and believe that the future looks bright. There are now many women leading the science and influencing research directions in pharmaceutical R&D organizations. They and, increasingly, their male colleagues manage the demands of child-rearing while achieving significant career growth in this profession.

Women across professions—law, academic, science, and corporate—and their families continue to successfully manage the challenges presented by raising children and growing careers at the same time. Women with careers in discovery research are no exception. We believe that pharmaceutical companies, large and small, are great places for women to pursue careers as research scientists and regret that *Science* did not look at this area more broadly before drawing the unfortunate conclusion to the contrary.

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## The Importance of Origins?

IN HIS ESSAY “SCIENCE IN THE ARAB WORLD: vision of glories beyond” (3 June, p. 1416), W. Mazziak states that “[o]ne [of the knowledge shocks that ignited the Renaissance] was delivered by Ibn-Sina (Avicenna, 980 to 1037), whose Kitab Al-Shifa (“The Book of Healing”) introduced medieval Europe to the principles of logic and their use to gain knowledge, and placed science and religion on equal terms as sources of knowledge and understanding of the universe.” However,

Avicenna was not an Arab. He was a Persian scientist who spoke the Persian language as his mother tongue and who wrote in both Persian and in Arabic. Mazziak also implies that the well-known Persian scientists and philosophers (Al-) Razi’s (Rhazes) (1, 2) and (Al-) Khwarizmi (Kharazmi) (3) in the 9th and 10th centuries were also Arabs. Although the genuinely sincere attempts by Mazziak to offset contemporary ignorance of and/or bias against the important role played by Asian and Middle-Eastern scientists is to be commended, his misrepresentation of the history and science does not help.

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### References

1. L. Richter-Bernburg, *Med. Secoli* **6**, 377 (1994).
2. L. F. Haas, *J. Neurol. Neurosurg. Psychiatry* **54**, 483 (1991).
3. K. C. Ryding, *Ambix* **41**, 121 (1994).

IN HIS ESSAY “SCIENCE IN THE ARAB WORLD: vision of glories beyond” (3 June, p. 1416), W. Mazziak describes the challenges facing the Arab world in their quest to realize scientific prosperity. Mazziak makes an error: Razi, Ibn-Sina, and Khwarizmi were Iranian scientists—not Arab scientists.

The “Arab-Islamic” label or even “Islamic” label is also misleading because not all of the scientists of the era were even Muslim (1). For example, Khwarizmi was also known as Al-Majusi (the Magus), which suggests that he was Zoroastrian.

One could appropriately argue that ethnicity is unimportant and what matters is the contribution of any scientist to the advancement of knowledge for humankind. However, wouldn’t any reader have had a similar reaction while reading an article that described Sir Isaac Newton as a Frenchman and Marie Curie as a Spaniard?

Lumping these scientists into the culturally narrow label of “Arab-Islamic” is historically inaccurate. This label does not recognize the rich diversity of Eastern scholars that contributed to science in an era where science was essentially nonexistent in the Western world and was later invaluable to its Renaissance.

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### Reference

1. B. Broumand, K. Zandinejad, *Am. J. Nephrol.* **16** (no. 6), 550 (1996).

## Response

THE LETTER WRITERS DWELL ON THE NATIONALITY and religion of scholars of the golden era of Arab-Islamic civilization. I did not indicate or mean to imply that early scholars of the golden era were all Arabs or Muslims. The figure legend referring to Avicenna as an Arab scientist and philosopher was inserted by the editorial staff, and I did not pay attention to this mistake when I revised the final version.

This Essay, if read as a whole, is a critical account of the current status of science in the Arab world. History was used briefly as a background to show that when tolerance and embracement of science prevailed, science moved forward. The fact that some of the great figures of the golden period were not Arabs or Muslims or worked in other languages such as Syriac, Hebrew, or Persian is a clear demonstration of this notion. I wrote that “scholars of

every color and creed traveled to Damascus and Baghdad to study and work.” The sociopolitical environment of the state, or for that matter the Abbasid Caliphate, provided the required catalyst for people of every background to investigate and excel. It was within that nourishing and tolerant melting pot that ancient knowledge was preserved and new knowledge was produced, a dynamic that proved instrumental to the European Renaissance. This is the context most relevant, in my opinion, to the prospects of science advancement in any society today, and this is the context I tried to reflect.

When we see what blind politics, business,

and ideologies have made of our world today, it becomes clear that cross-national and cross-cultural relations between people of science, arts, and reason have become an urgent need to reduce tension, avert conflicts, and lobby for a more humane world. Sacrificing some of our group-pride, no matter along what lines the group is defined, seems to be the price we ought to pay for a more peaceful and prosper-



Scientist and philosopher Ibn-Sina (Avicenna) surrounded by his students.

ous coexistence. Carl Sagan wrote, “Whenever our ethnic or national prejudices are aroused, in times of scarcity, during challenges to national self-esteem or nerve, when we agonize about our diminished cosmic place and purpose, or when fanaticism is bubbling up around us, habits of thought familiar from ages past reach for the controls. The candle flame gutters. Its little pool of light trembles. Darkness gathers. The demons begin to stir.” [(1), pp. 26–27].

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#### Reference

1. C. Sagan, *The Demon Haunted World* (Ballantine Books, New York, 1996).

## Firearms, Violence, and Self-Protection

THE ASSOCIATION THAT J. B. BINGENHEIMER *et al.* have found between exposure to firearm violence and subsequent perpetration of violence (“Firearm violence exposure and serious violent behavior,” Reports, 27 May, p. 1323) may well reflect a causal effect of prior victimization, but I believe they have misread what is being caused. They classified a subject as a “perpetrator of serious violence” if she or he reported being threatened or attacked by another or had “been in” a gang fight, but also if the subject had “carried a hidden weapon.” Their dependent or outcome variable is problematic partly because it makes no distinction between defensive, even lawful, violence and offensive violence. More importantly, this variable probably reflects just one type of behavior, carrying weapons for self-protection, which should not be described as violent behavior.

The authors report that 12.6% of their sample of (roughly high school age) youth were classified as perpetrators of serious violence, but do not say what share of these were so classified solely because the person had carried weapons for self-protection. But there is strong reason to believe that this share is over half and could approach 100%. A survey of Chicago high school students conducted by the U.S. Centers for Disease Control and

Prevention [(1), p. 26] in the same year as the present study, 2001, revealed that 21.2% had carried weapons (6.3% had carried guns) in the previous 30 days. Thus, one would expect that at least 21% of the present study’s sample would report defensive weapon carrying alone, easily enough to account for all of the 12.6% classified as “violent perpetrators.”

If most of the variation in the outcome variable is really variation in defensive weapon carrying, it means that all the authors have really discovered, or rediscovered, is the rather banal fact that people who have reasons to believe they are likely to be victimized in the future are more likely to carry guns for defensive purposes (2).

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#### References

1. Centers for Disease Control and Prevention, “Youth risk behavior surveillance—United States, 2001,” *Morbid. Mortal. Weekly* 51, 1 (28 June 2002).
2. G. Kleck, M. Gertz, *J. Res. Crime Delinquency* 35 (no. 2), 193 (1998).

## Response

### WE APPRECIATE KLECK’S THOUGHTFUL LETTER.

It is true that carrying a concealed weapon was the most commonly reported of the behaviors that make up our measure of violent behavior. Nearly 10% of adolescents in our sample reported carrying a concealed weapon in the year prior to their Assessment 3 interview, compared with 4% who reported participating in a gang fight, 2% who reported attacking someone with a weapon, 1% who reported shooting at someone, and less than 1% who reported shooting someone.

Contrary to Kleck’s conjecture, however, we believe that it is reasonable to include carrying a concealed weapon in our index of serious violent behavior. Weapon carrying is a logical prerequisite to several explicitly violent acts and is indicative of a certain degree of willingness or intent to engage in violence. Moreover, carrying a hidden weapon is strongly associated with all of the other behaviors included in our measure. Compared with those who denied carrying a hidden weapon, subjects who reported doing so were over 23 times as likely to report attacking someone with a weapon, some 27 times as likely to report shooting at someone, and nearly 10 times as likely to report being in a gang fight. Although almost 70% of those who reported carrying a concealed weapon also reported another violent behavior, less than 3% of those who denied carrying a concealed weapon reported other forms of violence.

Furthermore, the relationships we found between exposure to firearm violence and our index of violent behavior are also evident when

## Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 months or issues of general interest. They can be submitted through the Web ([www.submit2science.org](http://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.

## LETTERS

each behavior is analyzed as a separate outcome. We reported in our paper that subjects who reported exposure to firearm violence at Assessment 2 were over three times as likely to report some form of violent behavior at Assessment 3 [odds ratio (OR) = 3.71,  $\chi^2 = 41.99$ ,  $P < 0.001$ ]. Breaking this down by behavior, exposed subjects were more likely than unexposed subjects to report carrying a concealed weapon (OR = 3.47,  $\chi^2 = 31.36$ ,  $P < 0.001$ ), being in a gang fight (OR = 3.74,  $\chi^2 = 16.73$ ,  $P < 0.001$ ), attacking someone with a weapon (OR = 9.77,  $\chi^2 = 21.62$ ,  $P < 0.001$ ), or shooting at someone (OR = 11.40,  $\chi^2 = 13.18$ ,  $P < 0.001$ ). Within the analytic propensity strata, those who were exposed to firearm violence were approximately twice as likely to report some form of violent behavior (OR = 2.43,  $\chi^2 = 11.76$ ,  $P = 0.001$ ) and were also more likely to report carrying a concealed weapon (OR = 2.34,  $\chi^2 = 9.00$ ,  $P = 0.003$ ), shooting at someone (OR = 2.78,  $\chi^2 = 1.62$ ,  $P = 0.204$ ), being in a gang fight (OR = 3.27,  $\chi^2 = 7.95$ ,  $P = 0.005$ ), and attacking someone with a weapon (OR = 8.10,  $\chi^2 = 9.06$ ,  $P = 0.003$ ). These unadjusted and propensity-stratified analyses show that our original results apply not only to weapon carrying but also to other forms of violent behavior.

As Kleck suggests, some of the violent behaviors reported by participants in our study may have been motivated in part by self-defense. Yet motivations can be complex, and people often delude themselves and others about the reasons for their actions. Ours is a study of behavior, and our data on adolescents living in Chicago in the late 1990s strongly support the conclusion that exposure to firearm violence increases the likelihood of violent behavior.

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## The Sight of Violence and Violent Action

**IN THEIR REPORT "FIREARM VIOLENCE EXPOSURE and serious violent behavior,"** (Reports, 27 May, p. 1323), J. B. Bingenheimer *et al.* show a causal effect between exposure to firearm violence and subsequent perpetration of violence. This result was foreseen by Shakespeare nearly 400 years ago: "How oft the sight of means to do ill deeds/Makes ill deeds done!" (*I*). Almost three millennia ago, Homer, too, reached a similar conclusion:

"[T]he very presence of a weapon provokes a man to use it" (2). It appears as though the mind files away any "useful" information (device or action), and recalls its "usefulness" at appropriate times.

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#### References

1. W. Shakespeare, *King John*, Act IV, Scene II.
2. Homer, *The Odyssey*, translated by E. V. Rieu (Penguin, New York, 1992), p. 252.

## Mistakes in a Map

THE ESSAY "ASCENT OF NANOSCIENCE IN China" by C. Bai (1 July, p. 61) is an articulate overview of the main achievements and progress of nanoscience and nanotechnology in China. On page 61, there is a map with a patch highlighted in orange. This is apparently meant to be a map of China, but there are several errors. Mongolia is highlighted, but it has been an independent country since 1921. Hainan and Taiwan are not highlighted on the map, but they are both provinces of China. I am quite surprised at finding these errors in *Science*.

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### Response

THE EDITORS APOLOGIZE FOR INCLUDING A map in which Mongolia is highlighted in such a way as to indicate that it is a part of China. As for the non-highlighting of the islands of Taiwan and Hainan, we assure readers that this does not indicate a *Science* policy on the Taiwan question. *Science* has no such policy.

DONALD KENNEDY

#### TECHNICAL COMMENT ABSTRACTS

### COMMENT ON "Grain Boundary Decohesion by Impurity Segregation in a Nickel-Sulfur System"

W. T. Geng, J.-S. Wang, G. B. Olson

Analysis of the binding energies calculated by Yamaguchi *et al.* (Reports, 21 Jan. 2005, p. 393) shows that their proposed microstructure of sulfur aggregation at nickel grain boundaries is unrealistic. Our analysis shows that a different configuration of segregated sulfur atoms is more stable and that the grain boundary volume expansion is only half of what was originally proposed.

Full text at [www.sciencemag.org/cgi/content/full/309/5741/1677c](http://www.sciencemag.org/cgi/content/full/309/5741/1677c)

### RESPONSE TO COMMENT ON "Grain Boundary Decohesion by Impurity Segregation in a Nickel-Sulfur System"

M. Yamaguchi, M. Shiga, H. Kaburaki

We estimated the segregation concentration of sulfur atoms at a nickel grain boundary using the average binding energy of sulfur atoms. Geng *et al.* question our interpretations of the binding energies and suggest that a different configuration of sulfur atoms from the one we proposed is more stable. We show that the two configurations have the same structure and energy.

Full text at [www.sciencemag.org/cgi/content/full/309/5741/1677d](http://www.sciencemag.org/cgi/content/full/309/5741/1677d)

#### CORRECTIONS AND CLARIFICATIONS

**News Focus:** "Ready or not? Human ES cells head toward the clinic" by G. Vogel (10 June, p. 1534). The story should have stated that work by Fred Gage and Ajit Varki indicates that human ES cells can acquire non-human sugar molecules from "serum replacement" media as well as mouse feeder cells. In that team's work, levels of the foreign molecule decreased, but were not eliminated, by growing the cells with heat-inactivated human serum.

**Reports:** "The optical resonances in carbon nanotubes arise from excitons" by F. Wang *et al.* (6 May, p. 838). In the sixth line of the abstract, the word "bond" should instead be "band."

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