particular years because of changing rates in HIV testing. To identify where the HIV epidemic is moving, we need data on HIV prevalence and incidence rates for specific populations that exhibit high-risk behaviors. Only by understanding where new infections are occurring can we cost-effectively allocate HIV prevention dollars.

With regard to heterosexuals at risk, the Job Corps and military applicants studies provide the best long-term surveillance data on HIV prevalence. Both studies reflect population segments having demographic characteristics associated with high-risk behavior and HIV cofactors. A substantial proportion of Job Corps participants are female (~35%) and African American (~50%), thereby allowing analyses of HIV prevalence trends by gender and ethnicity. Valleroy and colleagues (*1*), for instance, reported significant downward trends in HIV prevalence for both African-American men and women in the Job Corps study. A third, now discontinued, surveillance study, the Survey of Childbearing Women (1989 to 1995), represents a segment of sexually active women age 15 to 44 years who were pregnant in the preceding year. Pregnant women are less likely to have used birth control, including condoms, in the year or years before or during pregnancy; consequently, this study might indicate the level of HIV infection in the absence of adequate condom use. Trends analysis revealed that HIV prevalence levels in this survey did not change substantially over time (*2*), suggesting that even with little protection HIV levels did not increase significantly among the larger population of heterosexual women in the first half of the 1990s. In general, these various surveillance studies may be biased because they are based on opportunistic rather than probability-based samples. If, however, we discount the results of these studies, we are then left with the disturbing possibility that we've lost track of the HIV epidemic among heterosexuals.

As for funding distributions, we agree that increases for HIV prevention are important. However, even with more funds, allocations and priorities should be established on the basis of reliable data that show where new infections are occurring.

Behrman also refers to information about global HIV/AIDS prevalence and possible implications for the United States, but it seems unlikely that the current HIV epidemics in Africa and Asia presage a similar epidemic in the United States. For instance, research on sexual mixing in the United States suggests, although not unambiguously, that many large segments of the population are "sexually isolated" (*3*), which may prevent a large-scale heterosexual epidemic. There may be, however, localized outbreaks of HIV infection among U.S. heterosexuals that occur in areas with high rates of intravenous drug use and a high prevalence of syphilis infection. These are relatively rare circumstances; nevertheless, this is not a reason to discontinue or limit support for prevention programs. The results of the Job Corps and military applicants studies provide a basis for encouraging increased support for such prevention efforts.

"...problems with generalizing trends in AIDS cases to the underlying distribution of HIV infection..."

In response to Mokotoff, HIV infection trends that are based on reporting systems in place in the United States are problematic with respect to validity (*4*). For instance, prior research has shown that more than half of infected persons find out that they are infected only within 1 year of their diagnosis with AIDS, nearly 10 years after infection, and about one-third discover that they are infected with HIV at the time they are diagnosed with AIDS. Thus, HIV surveillance systems that depend on self-referral cannot reflect where in the population new HIV infections are occurring nor provide unbiased trends data. These systems reflect the time that individuals chose to be tested rather than when an individual became infected. Although surveillance windows based on opportunistic sampling and self-referral are manageable, low-cost systems that may be easier to maintain, they need to be validated by studies based on methodologies that provide representative samples (that is, based on probability sampling techniques) from at-risk populations.

JOSEPH A. CATANIA,* STEVE MORIN, THOMAS COATES, LANCE POLLACK, JESSE CANCHOLA, JASON CHANG
Center for AIDS Prevention Studies, AIDS Research Institute, University of California, San Francisco, CA 94105, USA
*To whom correspondence should be addressed. E-mail: jcatania@psg.ucsf.edu

References
1. L. A. Valleroy *et al., J. Acquir. Immune Defic. Syndr. Hum. Retrovirol.* **19**, 67 (1998).
2. P. Armitage, *Biometrics* **11**, 375 (1955); *StatXact 4 for Windows User Manual* (Cytel Software Corp., Cambridge, MA, 1996), pp. 511–520.
3. E. O. Laumann *et al., The Social Organization of Sexuality: Sexual Practices in the United States* (Univ. of Chicago Press, Chicago, 1994).
4. Committee on HIV Prevention Strategies in the United States, Division of Health Promotion and Disease Prevention, Institute of Medicine, *No Time to Lose: Getting More from HIV Prevention*, M. S. Ruiz *et al.*, Eds (National Academy Press, Washington, DC, prepublication copy, p. 13).

Helminthic Infection and HIV Vaccine Trials

CLINICAL AIDS IN RHESUS MONKEYS WAS prevented, as D. H. Barouch and colleagues report in their research article (20 Oct., p. 486), when a DNA vaccine was used in conjunction with an adjuvant consisting either of a fusion protein of interleukin-2 (IL-2) and the Fc portion of immunoglobulin G (IgG), or of a plasmid encoding IL-2/Ig (*1*). The adjuvant augmented the protective immune reaction, apparently by boosting the virus-specific response from cytotoxic T lymphocytes (CTLs) that was elicited by the vaccine. This CTL response is critical for controlling replication of HIV-1 in humans (*1*).

There is certainly evidence that IL-2 has a therapeutic effect in humans when injected into patients with AIDS (*2*). Together, these findings highlight a potential problem associated with the fact that worm infections of various kinds are widespread among inhabitants of sub-Saharan Africa, a situation that does not occur in most developed countries (*3*). Helminthiasis results in an impaired T helper cell type 1 (T_H1) response (which is characterized by production of IL-2, among other effects) to tetanus toxoid and to *Bacillus Calmette-Guérin* vaccination against tuberculosis (*4*). Consequently, a question must be asked: Could helminthic infestations, if not treated before anti-HIV vaccination, similarly compromise the efficacy of particular types of HIV vaccines? Prevention of helminthiasis is another option if worms do, in fact, represent a complication in relation to vaccination against HIV. We suggest that unless the immunological implications of helminthiasis and other preexisting infections are taken into account, HIV vaccine trials in Africa and certain other parts of the world may in some instances be seriously flawed.

This helminth, *Ascaris lumbricoides* (egg shown with a larva), parasitizes 25% of the world's population.

CREDIT: DPDX, THE CDC WEB SITE FOR PARASITOLOGY DIAGNOSIS.

MILES B. MARKUS
Parasitology Research Program, University of the Witwatersrand, Private Bag 3, Wits 2050, South Africa. E-mail: milesm@iafrica.com
JOHN E. FINCHAM
Medical Research Council, Post Office Box 19070, Tygerberg 7505, South Africa. E-mail: jfincham@mrc.ac.za

References
1. D. H. Barouch *et al., Science* **290**, 486 (2000).
2. N. Imami *et al., Clin. Exp. Immunol.* **118**, 78 (1999); S. Emery *et al., J. Infect. Dis.* **182**, 428 (2000).
3. Z. Bentwich, *et al., AIDS* **14**, 2071 (2000); M. B. Markus and J. E. Fincham, *Science* **288**, 2131 (2000).
4. M. B. Markus and J. E. Fincham, *S. Afr. J. Sci.* **96**, 368 (2000).

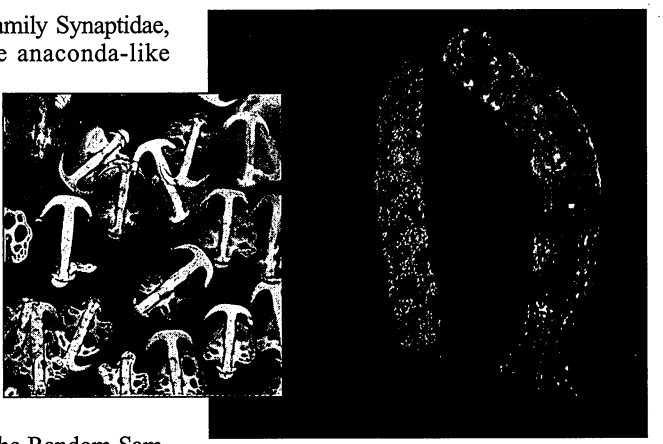
Response

MARKUS AND FINCHAM RAISE AN IMPORTANT issue regarding HIV vaccine trials in Africa. Although currently there is no data to support their concern, it certainly warrants investigation, given the potential scope of the problem. A possible solution to this problem might be to coadminister cytokines such as IL-2 or IL-12 with candidate HIV vaccines to drive the vaccine-elicited T_H1 immune responses, perhaps by using a protocol similar to the one we reported in our research article.

DAN H. BAROUCH,* NORMAN L. LETVIN
Department of Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, 330 Brookline Avenue, Boston, MA 02215, USA
*To whom correspondence should be addressed. E-mail: dan_barouch@hotmail.com

That's No Worm...

THE NAME "MEDUSA WORM" THAT IS USED to describe a prize-winning photo in the Random Samples item "Micro cosmos" (24 Nov., p. 1495) is aquarium trade jargon that obscures the identity and attributes of the organism photographed. The organism is a holothuroid (sea cucumber), a member of the singularly interesting family Synaptidae, some of which reach the anaconda-like length of 5 meters. The individuals pictured here are *Synaptula hydriformis* (*1*), typically a few centimeters in length. This species is probably a self-fertilizing hermaphrodite. Viviparous, matrotrophic individuals brood more than 200 embryos at a time in their body cavities. The microscopic objets d'art pictured in the Random Samples item (and here) are not "actually the skin," as stated, but the skeleton, composed of microscopic ossicles that lie within the sea cucumber integument. Moreover, the "fanciful mushroom designs" mentioned in the account are the aptly termed anchor ossicles articulating on their supporting plates. Unique to synaptids, anchor ossicles stand in for adhesive tube feet that are completely lacking in the group. The hooked anchors, present in densities up to 1500 per centimeter, provide extraordinary gripping power. Protruding and retracting in the skin as peristaltic waves traverse the sea cucumber's body wall, they create the traction required for locomotion.



Microscopic anchor-shaped bones (insert) embedded in the sea cucumber's skin serve in locomotion.

CREDIT: (LEFT) C. GAUTIER; (RIGHT) G. HENDLER

GORDON HENDLER
Natural History Museum of Los Angeles County, 900 Exposition Boulevard, Los Angeles, CA 90007, USA. E-mail: hendler@nhm.org

References
1. The image is adapted from figure 176 in G. Hendler, *et al.*, *Sea Stars, Sea Urchins, and Allies, Echinoderms of Florida and the Caribbean* (Smithsonian Institution Press, Washington, DC, 1995).