In response to an earlier letter, a physiologist says that the name "Henneman's Size Principle" is "rightfully referred to." On the topic of "UFO research," a scholar says that "science is legitimized by its methodology, not the subject matter it investigates." And whether a "racial divide on the Internet" exists is debated.

UFOs and the Scientific Method

The article "Panel says some UFO reports worthy of study" by David Kestenbaum (News of the Week, 3 July, p. 21) describes one critic who "worries that the report will unjustly legitimize UFO research" and notes that some scientists "have a record of enthusiasm for these exotic topics." Is it the topic under investigation that determines whether or not research is legitimate? Does a researcher's passion for his subject makes its legitimacy suspect?

JOURNAL OF SCIENTIFIC EXPLORATION

Could this be your thesis?

At a time when media attention and public interest in anomalous phenomena seem to be at a peak, should we not demonstrate that science is legitimized by its methodology, not the subject matter it investigates? And do we really expect to attract potential scientists to the calling with the message that they must be dispassionate? If lack of passion is the criterion by which a researcher's work is to be validated, how much research qualifies?

It is, of course, appropriate to make personal judgments about how fruitful UFO research is likely to be, or to decide (as a physicist cited in the article concludes) that UFO research may be "just a total waste of time." But such conclusions should be based on an examination of the evidence itself.

Stuart Appelle
School of Letters and Sciences, State University of New York, Brockport, New York 14420, USA. E-mail: sappelle@po.brockport.edu

Henneman's Size Principle: The Right Name

In their letter "Renaming the 'Henneman Size Principle'" (26 June, p. 2031), J. A. Vilensky and S. Gilman correctly point out that Denny-Brown and Pennybacker (*1*) made a landmark observation in the 1930s when they showed that mammalian motor units tend to be activated in a fixed sequence from the weakest to the strongest units. This finding, however, does not represent the "size principle" as Vilensky and Gilman suggest; rather, it describes the phenomenon of orderly recruitment. It was not until the seminal work of Elwood Henneman in *Science* (Reports, 27 Dec. 1957, p. 1345) that the neural mechanisms underlying orderly recruitment began to be revealed.

On the basis of innovative experiments and biophysical reasoning, Henneman and his colleagues proposed that the amount of excitatory input required to activate a motoneuron is directly related to its size (surface area of soma and dendrites). It was argued, therefore, that activation of motoneurons should proceed from smallest to largest as the broadly distributed excitatory input to a pool of motoneurons (*2*) increases. Moreover, smaller (and more excitable) motor neurons have thinner axons that give rise to proportionately fewer terminal branches, which in turn innervate smaller numbers of muscle fibers. Consequently, recruitment progresses "automatically" from weak to strong muscle units.

These ideas, rightfully referred to as "Henneman's size principle," not only explain the phenomenon of orderly recruitment originally observed by Denny-Brown and Pennybacker, but also represent one of the few parsimonious and testable hypotheses describing the functional organization of any population of neurons.

Andrew J. Fuglevand
Department of Physiology, College of Medicine, University of Arizona, Tucson, AZ 85721, USA. E-mail: fuglevan@u.arizona.edu

References
1. D. Denny-Brown and J. B. Pennybacker, *Brain* **61**, 311 (1938).
2. L. M. Mendell and E. Henneman, *J. Neurophysiol.* **34**, 171 (1971).

The seminal importance of the Denny-Brown and Pennybacker paper (*1*) was discussed in several reviews of the historical development of the "size principle" (*2*). Moreover, Henneman and his co-workers were aware of the Denny-Brown and Pennebacker observations as evidenced by this paragraph from a 1968 paper (*3*):

> Denny-Brown and Pennebacker [*4*] and Norris and Gasteiger [*5*] also observed orderly recruitment, although they did not carry out a statistical analysis of their data. They attributed this recruitment to properties of the motor neurons and suggested that the larger motor neurons may have higher thresholds and innervate larger motor units. Although the evidence to support these suggestions was not available, their observations are in harmony with ours and their suggested interpretation, in view of later developments, is remarkably prescient.

Henneman, of course, did not give the "size principle" its commemorative moniker. Nonetheless, he was reproved more than once for not giving Denny-Brown more credit in the development of his ideas. I know from conversations with Henneman that he regretted having done so.

Marc D. Binder
Department of Physiology and Biophysics, University of Washington School of Medicine, Seattle, Washington 98195–7290, USA. E-mail: mdbinder @u.washington.edu

References
1. D. Denny-Brown and J. B. Pennebacker, *Brain* **61**, 311 (1938).
2. R. M. Enoka and D. G. Stuart, *Trends Neurosci.* **7**, 226 (1984).
3. C. B. Olsen, D. O. Carpenter, E. Henneman, *Arch. Neurol.* **19**, 591 (1986).
4. D. Denny-Brown and J. B. Pennebacker, *Brain* **61**, 311 (1938).
5. F. H. Norris and E. L. Gasteiger, *Electroencephalogr. Clin. Neurophysiol.* **7**, 115 (1955).

Division on the Internet?

In their Policy Forum "Bridging the racial divide on the Internet" (17 Apr., p. 390), Donna L. Hoffman and Thomas P. Novak present data on computer access and use as well as purchase intentions among white and black Americans. They find that overall, blacks are less likely to own computers or to have used them recently for Internet access, and that they are more likely to want to buy one. Hoffman and Novak call for improvements of "educational opportunities for African Americans." This suggestion is good, but unrelated to the data. As they are presented and analyzed, the data cast more shadow than light on this important topic.

The study apparently has no hypotheses. blacks and whites are grouped eight different ways and their responses to 13 items (for example, "own home computer") are compared by tests of statistical significance. Of the 104 tests, 42 are significant, and 33 of those indicate greater "digitality" among whites. It is difficult to say whether this is a large number of significant results because few of the comparisons are independent. If one looks only at the primary variables for ownership, purchase intentions, and Web use, for example, only 6 of the 11 significant differences favor whites.