Figure. State suicide death rate and altitude.

South Dakota, Texas, and Washington) and the states with the lowest altitude (Delaware, Louisiana, Florida, Rhode Island, and New Jersey).

Our data show that the suicide death rate in the Rocky Mountain states remains higher and that the greatest differential was between the mountain states and the lowest altitude states. We then plotted state altitude to state suicide death rate and performed regression analysis to get a correlation coefficient of $r = 0.76$ (Figure). A literature search shows that mood state is worsened with incremental hypobaric hypoxia, and that the higher the altitude the lesser the duration needed to produce mood change.²⁻⁴ Also, literature shows that oxygen supplementation improves mood at altitude.⁵ While altitude-induced hypoxia can worsen mood leading to an increased suicide death rate in mountain states, the exact biochemical mechanism for producing this association between altitude and suicide death rate remains unknown.

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In Response to "The Impact of Footwear and Packweight on Injury and Illness Among Long-Distance Hikers"

To the Editor:

I found the article "The Impact of Footwear and Packweight on Injury and Illness Among Long-Distance Hikers"¹ interesting, but I feel more questions were raised than answered. I submit the following for consideration with the hope that the raw data may reveal additional useful correlations, possibly establishing specific recommendations or outlining new areas for meaningful research.

What was the relationship between packweight and footwear? Did people wearing the heavier pack have the heavier shoes?

Was there a relationship between packweight and other problems? For example, was a very light pack associated with wilderness-associated diarrhea? Paring down packweight may have significant trade-offs, not just comfort.

What was the average of consecutive days hiked for those with different packweight or footwear? I find it hard to imagine that someone with a pack of 10 to 20 pounds trekked as much at one time as someone with a heavier pack or that someone with sandals hiked as far as someone with different footwear.

By not establishing a relationship to the site of paresthesias the article loses some punch, since it is likely that a heavier pack causes the paresthesias to occur in the upper extremities.

What about the age of individuals as related to the various complaints? Was there an age difference in those carrying different weight packs or using heavier footwear?

I realize that some answers, to be scientifically valid, may require a much larger number of respondents than available at present, but it seems that the entire topic deserves the effort. I also wonder if the Army or Marines have data, though admittedly they use different packs/weights, and footwear. Would they be interested in assisting in gathering data?

There are several articles that these authors can write, and I look forward to them.

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Reply to Dr. Bogdasarian's Letter

To the Editor:

We thank Dr Bogdasarian for his interest in our article and the many thoughtful questions that he raises. Fundamentally, we agree that research using more rigorous methods will be required to understand the effects of ultra light hiking techniques on illness and injury experienced by long-distance hikers. There are limitations to our use of a structured cross-sectional survey instrument to assess some of the associations between footwear, packweight, and illness and injury experienced by long-

distance hikers in a single year. Although we did inquire about diarrhea, we did not include this in our final report because there were concerns with our ability to adjust for many factors that could be associated with this disorder, such as type and frequency of water purification, water sources, and hygiene to name a few. We did not explore the association between diarrhea, packweight, and footwear because the association would be ambiguous at best.

We re-examined our data to see if there was a relationship between age, footwear, and packweight. An association was found with younger hikers carrying less weight and wearing less rigid footwear (running shoes). Of note, there were not many hikers in the over 50 age group, which limits our ability to judge how age could have affected injury patterns. Dr Bogdasarian suggests that hikers carrying heavier packs would be able to travel for longer periods of time; however, it is the authors' experience that the opposite would be true. Hikers carrying less weight are able to spend their energy on walking rather than hauling unnecessary gear.

We are unaware of any studies that have examined military experience with packweight, footwear, and illness and injury. Although military as opposed to recreational hiking differs in the need to carry supplies and protective equipment, it would be of interest to know whether there are any data that have examined the association between use of different packs, weights, and footwear on important health outcomes. Ultimately our study suggests the need for multiyear prospective cohort studies using a method such as routine diary or electronic outcome monitoring to characterize predictors of and protectors from illness and injury among long-distance hikers.

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