
The Morphology of Steve

by Eugenie C. Scott[*], Nicholas J. Matzke[*], Glenn Branch[*], Stephen T. Abedon[S](\$), Stephen Addison[S] Stephen L. Adler[S] Stephen B. Aley[S] Stephen C. Alley[S] Steven I. Altschuler[S] Stephen Robert Anderson[S] Stephen W. Arch[S] J. Steven Arnold[S] Stevan J. Arnold[S] Steven N. Austad[S] Stephen Azevedo[S] Stephen Charles Bain[S] Stephen M. Baird[S] Steven A. Balbus[S] Steven W. Barger[S] Stephen John Barnett[S] Stephen Barrett[S] Steven J. Baskauff[S] Stephen Joseph Richard Battersby[S] Steven C. Beadle[S] Steven K. Beckendorf[S] Stephen Beckerman[S] Steven R. Beissinger[S] Steven M. Bellovin[S] Stephanie J. Belovich[S] Steve G. Belovich[S] Stephen P. Bentivenga[S] Steven Bergman[S] Steven Bart Bertman[S] Stephen Blackmore[S] Steven M. Block[S] Steven Bodovitz[S] Stephen A. Boffey[S] Stephen Patrick Bonser[S] Stephen H. Bowen[S] Stephen Bowlus[S] Steven G. Boxer[S] Steven E. Brenner[S] Steven D. Brewer[S] Stephen Brick[S] Steven Briggs[S] Steven Brill[S] Stephen Brown[S] Stephen Brown[S](!), Stephen L. Brown[S] Stephen R. Brown[S] Steven W. Brown[S] Steven B. Broyles[S] Stephen G. Brush[S] Stephen H. Bryant[S] Stephen Burke[S] Stephen Burnett[S] Stephen J. Burns[S] Stephen D. Busack[S] Steven W. Buskirk[S] Steve Butcher[S] Steven N. Byers[S] Stephen D. Cairns[S] Stephen Cameron[S] Steven K. Campbell[S] Steven Carlip[S] Stephen R. Carpenter[S] Steven A. Carr[S] Steven M. Carr[S] Steve Carroll[S] Steven B. Carroll[S] Steven B. Case[S] Steven L. Chown[S] Steven Chu[S](N), Steven E. Churchill[S] Steven Gerard Clarke[S] Steven Earl Clemants[S] Steven C. Clemens[S] Steven S. Cliff[S] Steven J. Collins[S] Steven C. Corbato[S] Steve Cox[S] Stephen H. Crandall[S] Stephen T. Crews[S] Steve Croft[S] Stephan G. Custer[S] Steven D'Hondt[S] J. Steven de Belle[S] Stephen M. Deban[S] Stephen J. DeCanio[S] Stephen B. Deitz[S] Steven J. DeMarco[S] Steven R. DePalma[S] Stephen H. Devoto[S] Steven P. Dettwyler[S] Stephen Dewhurst[S] Steve Dickman[S] Stephen P. DiFazio[S] Steven H. Dillman[S] Stephen G. DiMagno[S] Steve DiNardo[S] Stephen S. Ditchkoff[S] Stephen Kenneth Donovan[S] Stephen Q. Dornbos[S] Stephen M. Downes[S] Steven M. Drucker[S] Stephen A. Drury[S] Steven R. Dudgeon[S] Steven R. Dunn[S] Steven I. Dutch[S] Steven Eiger[S] Stephen T. Elbert[S] Stephen P. Ellner[S] Stefan Estreicher[S] Steven Neil Evans[S] Stephen E. Feinberg[S] Steven L. Forman[S] Steve Fornaca[S] Steven Freedberg[S] Stephen Freeland[S] Stephen R. Frost[S] Stephanie M. Fullerton[S] Steve Gaines[S] Stephen C. Gammie[S] Steven W. Gangestad[S] J. Stephen Gantt[S] Steven Garrett[S] Steve Gaulin[S] Stephen M. Gentleman[S] Stephen A. George[S] Steven F. Gessert[S] Stephen R. Getty[S] Steven R. Gill[S] Stephen Giovannoni[S] Stephen P. Goff[S] Steven F. Goldberg[S] Stephen D. Goldinger[S] Stephen W. Golladay[S] Steven C. Good[S] Stephen Bruce Goodwin[S] Stephen R. Graham[S] Stephen Grand[S] Steven Green[S] Steven Green[S](!), Stephen Gregory[S] Stephen Grill[S] Stephen W. Grimes[S] Steven P. Gross[S] Steve Guggenheim[S] Steven R. Gullans[S] Stephen B. Haber[S] Steven J. Hageman[S] Stephen B. Hager[S] Stephen J. Haggarty[S] Stephen R. Hahn[S] Steven E. Hall[S] Steve Halperin[S] Steven W. Hamilton[S] Stephen K. Hamilton[S] Steven C. Hand[S] Steven N. Handel[S] Stephen Hanzély[S] Stephen C. Harrison[S], Stephen D. Harrison[S], Steve E. Hartman[S], Stephen C. Harvey[S], Stephen T. Hasiotis[S], Stephen D. Hauschka[S], Stephen W. Hawking[S](%), Stephen C. Hawkins[S], Stephen B. Heard[S], Stephen M. Hedrick[S], Steven James Heggie[S], Stephen Henderson[S], Steve Henikoff[S], Stephen Henley[S], Steven J. Hoekstra[S], Steven L. Hopp[S], Stephane Marc Hourdez[S], Steven A. Hovan[S], R. Stephen Howard[S], Stephen P. Hubbell[S], Steve E. Humphries[S], Stephen C. Hurlock[S], Steve Huskey[S], Stephen T. Hyde[S], Steven Q. Irvine[S], Steven H. Izen[S],

Steven Erik Jacobsen[S], Steven Robert Jayne[S], Steve Jeffery[S], Stephen H. Jenkins[S], Steven L. Jensen[S], Steven L. Jessup[S], Stephen D. Jett[S], Steve Jones[S], Steve Josephson[S], Steven A. Juliano[S], Stephen M. Kajiura[S], Steve Kane[S], Stephen A. Karl[S], Steve Karr[S], Stephen J. Kaufman[S], Stephen B. H. Kent[S], Stephen Kent[S], Stephen J. King[S], Steve King[S], Stephen T. Kinsey[S], Steven L. Kipp[S], Stefan Koenemann[S], Steven E. Koonin[S], Stephen Kowalczykowski[S], Stephen A. Kowalewski[S], Stephen J. Kron[S], Steven L. Kuhn[S], Stephen G. LaBonne[S], Stephen Laurence[S], Stephen E. G. Lea[S], Steven Bruce Legg[S], Steven L. Lehman[S], Stephen H. Lekson[S], Stephan A. Leslie[S], Stephen D. Levene[S], Steven P. Lewis[S], Steven L. Lima[S], Stefan G. Llewellyn Smith[S], J. Stephen Lodmell[S], Steven T. LoDuca[S], Stephen H. Loomis[S], Stephen C. Luce[S], Steven J. Luck[S], Stephen Andrew Lunn[S], Stefan Luschnig[S], Steven Raymond Lustig[S], Steven P. Lynch[S], Stephen P. Mackessy[S], Stephen Maddock[S], Stephanie Lee Madson[S], Steven Main[S], Stephen B. Malcolm[S], Stephen M. Marek[S], Stephanie Marin[S], Steven Mathews[S], Stephan Matthiesen[S], Steve Matzner[S], Steven S. Maughan[S], Stephen J. Maxfield[S], Stephanie Mayer[S], Steven McCommas[S], Steven P. McConnell[S], Steven McCullagh[S], Stephen M. McDuffie[S], Stephen T. McGarvey[S], Stephen A. Miller[S], Stephen M. Miller[S], Stephen J. Mojzsis[S], Stephen Mondy[S], Stephen Monismith[S], Steve Morris[S], Stephen A. Morse[S], Steve Moulton[S], Stephen M. Mount[S], Esteban Muldavin[S], Stephen S. Mulkey[S], Stephen J. Mullin[S], Stephen H. Munroe[S], Steven Murov[S], Steven F. Myers[S], Steven T. Myers[S], Steven A. Nadler[S], Steve Nahn[S], Steven L. Neuberger[S], Stephen Norley[S], Steven P. Novella[S], Stephen Nowicki[S], Stephen J. O'Brien[S], Steven Wayne O'Neal[S], Steven Orzack[S], Stephen Ousley[S], Steve Paddock[S], Stephen R. Palumbi[S], Stephen Park[S], Stephen M. Pasquale[S], Steven L. Peck[S], Steve Pells[S], Stephen W. Pierson[S], Steven Pinker[S], Steven Pirie-Shepherd[S], Steven M. Platek[S], Steven Samuel Plotkin[S], Stephen Pollaine[S], Steven E. Poltrock[S], Steve M. Potter[S], Steven J. Projan[S], Stephen James Prowse[S], Stephen Pruett-Jones[S], Stephen Quake[S], Steven Radosevich[S], Stefan Rahmstorf[S], Steve Reid[S], Steve Renals[S], Stephen M. Rich[S], Stephen M. Richard[S], Stephen Richards[S], Stephen Giles Richardson[S], Steve Rissing[S], Stephen John Roberts[S], Stephen P. Roberts[S], Stephen Robertson[S], Steven Robinow[S], Steven M. Roels[S], Steven H. Rogstad[S], Steve Roof[S], Stephen A. Rose[S], Steven Rose[S], Stephen Roser[S], Stephen T. Ross[S], Stephen M. Roth[S], Stephen Rothman[S], Stephen I. Rothstein[S], Steve Rounsley[S], Stephen M. Rowland[S], Steve Rowley[S], Steven W. Runge[S], Steve Salisbury[S], Steven L. Salzberg[S], Steve Saunders[S], Stephen G. Saupe[S], Stephen W. Schaeffer[S], Steven D. Schafersman[S], Stephen F. Schaffner[S], Steven Jay Scheinman[S], Steven J. Scher[S], Steven M. Schildcrout[S], Stephen E. Schneider[S], Stephen H. Schneider[S], Stephan Q. Schneider[S], Stefan Schnitzer[S], Stephan J. Schoech[S], Steven M. Schrader[S], Stephan Schulz[S], Stephen R. Schutter[S], Stephen M. Schwartz[S], Steve Schwartz[S], Steve Scofield[S], Stephen L. Scott[S], Steven Seavey[S], Steven Selden[S], Stephen J. Seligman[S], Steven Semken[S], Steven Shackley[S], Stephen J. Shawl[S], Steve Sheffield[S], Stephen Shennan[S], Steven Sherwood[S], Stephen B. Shope[S], Stephen M. Shuster[S], Steven Siciliano[S], Stephen C. Sillett[S], Stephen J. Simpson[S], Stephen T. Smale[S], Stephen J. Smith[S], Steve E. Smith[S], Steven Thomas Smith[S], Stefan Sommer[S], Stephanie Rena Songer[S], Steven Peter Souza[S], Stephen Spiro[S], Stephen Sprang[S], Stephen M. Stack[S], Stephen D. Stahl[S], Stephen E. Stancyk[S], Steven M. Stanley[S], Stephen C. Stearns[S], Stephen P. Stich[S], Steve Stowers[S], Stefan Strack[S], Steve Strand[S], Steve Strassmann[S], Steve Strauss[S], Stephen A. Stricker[S], Steven A. Sullivan[S], Steven M.

Taffet[S], Stephen J. Tapscott[S], Steve Taylor[S], Stephen Harrold Tedder[S], Stephen Temperley[S], Stephen M. Theberge[S], Stefan Thor[S], Stephen Thorsett[S], Stephen G. Tilley[S], Steven Timbrook[S], Stephen S. Tobe[S], Stephanie Toering[S], Stephen T. Toy[S], Steven E. Travers[S], Stephanie Tristram-Nagle[S], Stephen C. Trombulak[S], Stephen J. Trumble[S], Stephen T. Trumbo[S], Stephen W. Tuholski[S], Stephen Urquhart[S], Stephen Garrett Vail[S], Steven M. Vamosi[S], Steve Vander Wall[S], Steven Verhey[S], Steven E. Vigdor[S], Steven B. Vik[S], Stephen P. Vives[S], Steven Vogel[S], Stephen F. Walker[S], Stephen Walton[S], Stephen Jay Warburton[S], Stephen R. Wassell[S], Steven Alexander Wasserman[S], Steve Waters[S], Steve Weaver[S], Stephen Webb[S], Stephen C. Weeks[S], Steven Weinberg[S],[N], Stephen Weiner[S], Stephen H. White[S], Steve R. White[S], Steven C. Wiest[S], Stephen J. Willson[S], Stephen W. Wilson[S], W. Stephen Wilson[S], Steven J. Wolf[S], Stefan Leo Wolff[S], Stephen M. Wolniak[S], Stephen D. Wolpe[S], Stephen A. Wood[S], Stephen C. Wood[S], Steven T. Wooldridge[S], Stephen Wroe[S], Stephen L. Wust[S], Stephen John Wylie[S], Stephen P. Yanoviak[S], Steven Yantis[S], Stephen M. Yezerinac[S], Steven L. Youngentob[S], Stephan A. Zdancewic[S], Stephan I. Zeeman[S], Stephen L. Zegura[S],¹

* – National Center for Science Education, <http://www.ncseweb.org>
 S – Project Steve “Steve”, <http://www.ncseweb.org/article.asp?category=18>
 N – Nobel laureate
 % – Appeared on *The Simpsons*
 \$ – Ordered 16 Project Steve t-shirts in order to outfit all of the staff in his lab
 ! – Not to be confused with the preceding Steve with the identical name

This report is part of Project Steve.² Project Steve is, among other things, the first scientific analysis of the sex, geographic location, and body size of scientists named Steve. We performed this research for the best of all reasons: we discovered that we had lots of data. No scientist can resist the opportunity to analyze data, regardless of where that data came from or why it was gathered.

The Steve Data

This analysis is based on data given to us by 284 scientists whose name is either Steve or some cognate of Steve (Stephanie, Stephan, Esteban, etc.). The scientists perhaps unintentionally provided the data because they wanted us to send them



Figures 1a and 1b. Experimental Steveometry apparatus, front and back.

Project Steve t-shirts. We thus obtained complete data about each Steve’s geographic location, sex, and shirt size.

Using our pioneering experimental Steveometry apparatus (see Figure 1) in combination with the shirt sizes requested by each of the individual Steves, we estimated each Steve’s body size on an ordinal scale that ranges from one to four; these values correspond to shirt sizes Medium, Large, X-Large, and XX-Large.

We derived each Steve’s geographical location from the address to which he or she asked us to send the shirt. The

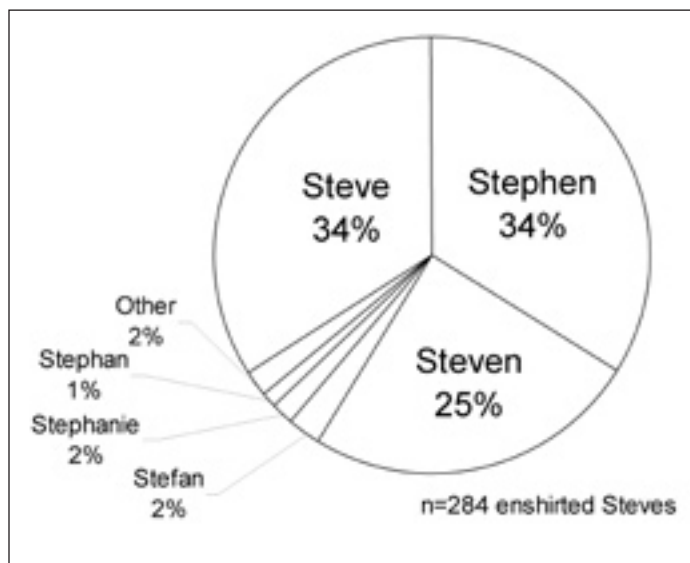


Figure 2. Even Steves.

are thus the first to validate the reality of the concept of “even Steven.”

GEOGRAPHICAL DISTRIBUTION. We analyzed the geographical distribution of the U.S. Steves, tabulating the number of these Steves within each five-degree band of longitude. Most of them are clustered on the east and west coasts (see Figure 3). As can be seen in Figure 4, there is a Mid-Continental Steve Deficit, unrecognized prior to our discovery of it.

PHYSICAL SIZE. We were curious as to whether domestic Steves are physically larger or smaller on the average than foreign, wild Steves. Figure 5 presents the breakdown of Steves by country, and Table 1 presents the mean and standard deviation for these data. Israel, the Netherlands, and South Africa, collectively contributing four Steves to the project, are grouped as “random little countries.” Their Steves, however, are second only to Germans in body size. The U.S. Steves fall in the middle of the distribution, which we attribute to the melting-pot nature of American demographic history, and to the homogenizing effect of gene flow.

Country	Mean size	Standard deviation
Aussies	2.13	0.99
Brits	2.27	0.72
Yanks	2.41	0.75
Canadians, eh?	2.43	0.98
Random little countries	2.75	0.96
Germans	3.00	1.00

Table 1. Steves by National Origin: Mean, Standard deviation.

BIOLOGICAL ANALYSIS. We hypothesized that the morphology – the body sizes– of Steves would reflect the biological laws that are known to affect other large-bodied mammals. Therefore, we analyzed the data to see how well Steves correspond with generally known population patterns that reflect sexual dimorphism, Bergman’s Rule, and island-biogeographical influence. We were unable to perform analyses for Allen’s Rule (relating appendage length to latitude), as all the shirts were short-sleeved

SEXUAL DIMORPHISM. Unlike other social mammals, Steves and Stephanies do not demonstrate the expected sexual dimorphic pattern wherein males tend to be larger than females. This blew our first hypothesis all to smithereens. Unhappily, we must report that Stephanies have a larger average shirt size than do Steves (see Figure 6), a factor we blame upon the 20 percent of the Stephanie sample who ordered an XXL shirt, a garment approximately the size of a small tent.

majority of Steves are located in the United States. In performing our various numerical analyses, we contrasted the U.S. domestic Steves (N = 234) with wild Steves (N = 50) for some analyses. Wild Steves come primarily from Canada, Great Britain, Australia, and Germany; smaller numbers of them come from Israel, the Netherlands, and South Africa. (NOTE: for some analyses, we combined the data from some of these wild Steves.) We determined the sex of each Steve by examining his or her name: there were five Stephanies; we not arbitrarily classified them as female. The remaining 279 Steves in the database were, accurately or not, classified as male.

Patterns in the Steve Data

SPELLING. We examined the data to see if there were any patterns in the various spellings of the name Steve. Indeed, there were (see Figure 2). The percentages of individuals who identify themselves as “Stephen” and “Steve” are each exactly 34%. To our knowledge, we



Figure 3. Geographical distribution of Steves.

birds and mammals generally shows agreement with Bergman's Rule, with large-bodied populations within a species being located closer to the poles, and smaller-bodied members of a species being located closer to the equator.

To test whether the Steves data obey Bergman's Rule, we plotted body size by latitude. Surprisingly, we found no relationship. Larger-bodied Steves do not, in fact, occur more commonly in colder environments. This analysis can be interpreted in only two ways: either (1) the confidence physiologists have placed in Bergman's Rule is misplaced, or (2) Steves are a unique warm-blooded life form that does not follow the rules that characterize most other species. Either case is disturbing.

ISLAND-BIOGEOGRAPHICAL CONSIDERATIONS. In the context of island biogeography, Steves do appear to conform to general principles that have been seen in other warm-blooded species. Many large mammal species show dwarfing – that is, they tend to be physically much smaller – in island populations compared to populations on the mainland. This is true of mammoths, hippos, and red deer. It is true of Steves as well. Insular Steves (Great Britain, Australia) indeed have smaller body size than do mainland Steves, thus confirming the biological principle of stunted growth in island populations (see Figure 7 and Figure 8). We extrapolate from these data to hypothesize that the peoples of Great Britain and Australia may be suffering

We charitably hypothesize that the reason Stephanie made this choice was to provide comfortable sleeping apparel rather than the deplorable possibility of a conscious attempt to skew the results of a scientific investigation. We hope she is satisfied.

BERGMAN'S RULE. Bergman's Rule suggests that warm-blooded animals of the same species will tend to have larger body sizes at higher latitudes. The mathematical foundation of this relationship is the law of squares and cubes. (Surface area increases as the square of a linear dimension, whereas volume increases as the cube. Large-bodied animals, therefore, have less surface area for their body mass, and are more heat-efficient in cold climates.) In numerous studies, body size in

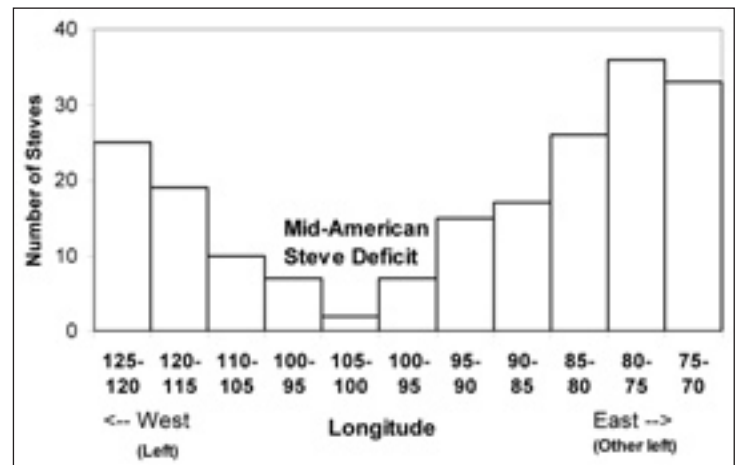


Figure 4. The Mid-Central Steve Deficit.

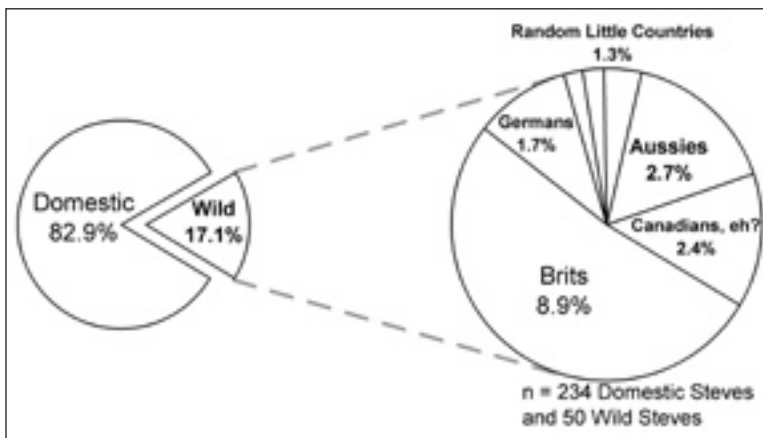


Figure 5. Steves by National Origin: Domestic and Wild Steves.

are now co-authors with Stephen Hawking and Nobel laureates Steven Weinberg and Stephen Chu, and we expect that many will proudly add this publication to their vitae. Vita building and rank also explains why E.C. Scott, director of NCSE, is first author, rather than N. Matzke, who did the actual analyses, or G. Branch, who first commented that in processing the requests for t-shirts, he had become an "expert on the morphology of Steve," thus giving us the idea for the study.

Conclusion

Clearly, there is much more to be learned about the morphology and other biological characteristics of Steve. The authors understandably (and predictably) conclude that more research needs to be done. We encourage all qualifying Steves, Stephanies and other cognates to participate. For information, see the Project Steve web site at <http://ncseweb.org/article.asp?category=18>. And please request a t-shirt.

Notes

1. The fourth through 443th authors were not consulted concerning the use of their names in this article. They can thank us at their leisure. After all, they

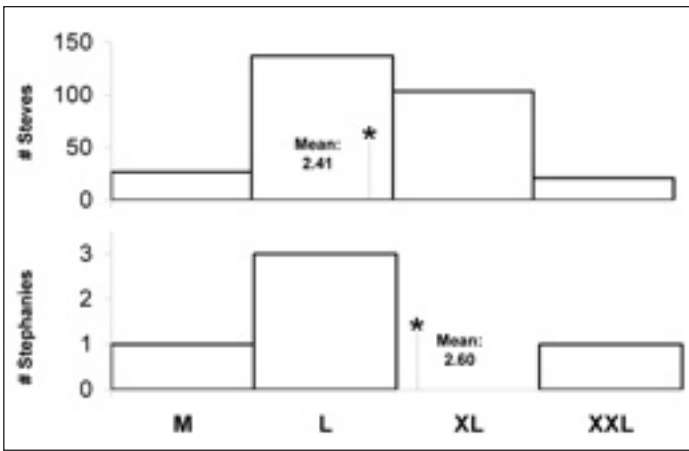


Figure 6. Sexual Dimorphism of Steves and Stephanies.

statement about the importance of evolution to science (you can see it at http://www.ncseweb.org/resources/articles/3541_project_steve_2_16_2003.asp), and collected the signatures of about 200 scientists – all of them named “Steve” (or cognates Stephanie, Esteban, Etienne, etc.) The choice of name honored the recently-deceased paleontologist Stephen

Jay Gould, and also took advantage of the iconographic, all-American status of the name Steve. Because Steve and cognates comprise about 1% of American names, assuming that there is no bias for or against the name Steve when it comes to getting a science Ph.D., each Steve would represent 100 scientists. As it happened, Steves kept coming in over the transom, and as of July 2004, there are 440 NCSE Steves. All of the creationist lists put together have, at last count, nine Steves. Pretty pitiful. More on Project Steve can be found at <http://ncseweb.org/article.asp?category=18>. More on the ID creationists’ “scientists doubting Darwin” campaign can be found at http://www.ncseweb.org/resources/articles/9763_doubting_darwinism_through_cre_4_8_2002.asp.

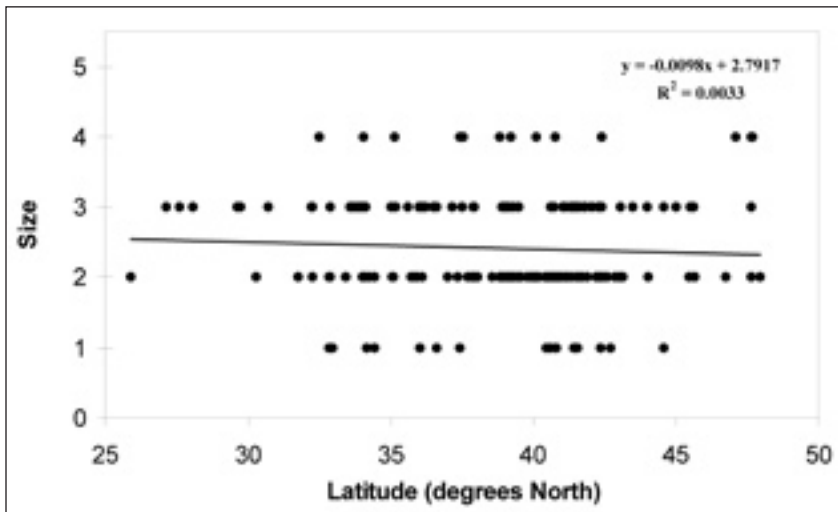


Figure 7. Disproving Bergmann's Rule: Steve Size by Latitude.

For press accounts, see e.g. Steve Mirsky, “Bringing in the Steves,” *The Scientist*, Feb. 17, 2003, <http://www.biomedcentral.com/news/20030217/07/>, “Antigravity,” *Scientific American*, May, 2003, <http://www.sciam.com/article.cfm?articleID=0002A329-740E-1E90-8EA5809EC5880000&catID=2>; “Stevolution,” *HHMI Bulletin*, June, 2003, p. 33, <http://www.hhmi.org/bulletin/pdf/june2003/Stevolution.pdf>; Stephen Evans, “Pitt Prof Among 200 to Sign Evolution Agreement,” *Pitt Chronicle*, Feb. 24, 2003. Journalists not named Steve also covered the story; details at http://www.ncseweb.org/resources/articles/3563_project_steve_in_the_media_2_17_2003.asp.

3. Googling “culinary traditions of Great Britain” returned only one hit; Googling “culinary traditions of Australia” returned none.

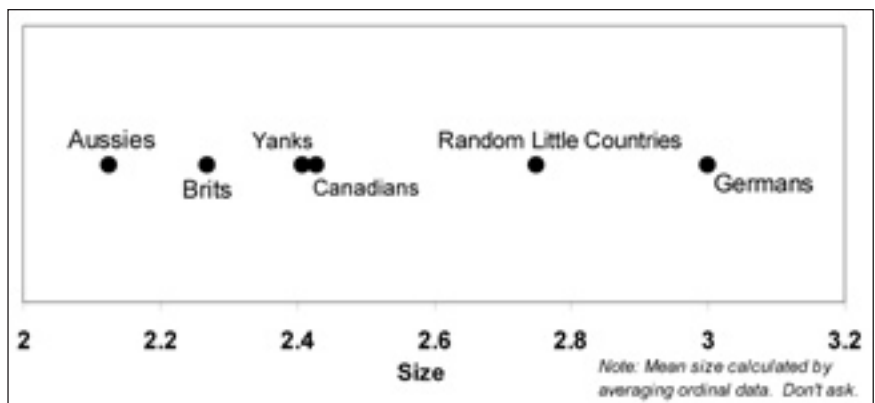


Figure 8. Island Biogeography: Insular Dwarfism of Steves.