

misinformation. Watson and Perlman stated: "There has been an attempt at Stanford University to induce laser action in such a device . . ." [a helical magnet]. I wish to point out that, contrary to the implication of the article, the "attempt" was successful. The free-electron laser has been run successfully both as a laser amplifier (1) and as a laser oscillator (2, 3). Perhaps the most noteworthy result of the experiment was the power output, which exceeded the spontaneous synchrotron radiation by a factor of 10^8 when the laser was run above threshold. We note that these results were reported in the reference (2) to the free-electron laser cited by Watson and Perlman.

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References

1. L. R. Elias, W. M. Fairbank, J. M. J. Madey, H. A. Schwettman, T. I. Smith, *Phys. Rev. Lett.* **36**, 717 (1976); *Phys. Today* **29**, 17 (February 1976).
2. D. A. G. Deacon, L. R. Elias, J. M. J. Madey, G. J. Ramian, H. A. Schwettman, T. I. Smith, *Phys. Rev. Lett.* **38**, 892 (1977).
3. *Sci. Am.* **236**, 63 (June 1977).

Curve-Fitting

The rather fanciful curve-fitting of Roubik (Reports, 15 Sept., p. 1030, Fig. 1) has prompted me to propose an alternative interpretation of his data (see below).

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I applaud Hazen's skepticism about the validity of the fitted curve. The curve is a broken line. Conventionally, this means that it is not a statistically significant predictor of the exact value of the y -variable as a function of the x -variable, as stated in my reference 7. The utility of this graph is certainly not to be found in the expected wide values it generates, but rather in the biological information it contains.

The statistical facts on which my conclusions rest are given as the results of the analyses of variance of forager numbers in patches of flowers in my experiments. Supplemental information is provided in the graph of bee abundances on *Melochia villosa*. This is useful because it (i) shows the numbers of bees actually counted; (ii) gives the reader a picture of forager dynamics on this flowering plant; (iii) contrasts with the straight lines, fitted by using the same computer program, to bee abundances where analysis of variance did not reveal the effect of competition; and (iv) provides a fitted curve that shows the general trend in the scatter of points.

My intention was to present the facts in a straightforward manner, not to give a mathematical formula to predict the densities of bees in this patch of flowers. When confronted with an array of points with a line drawn through it, I too am thoughtful about the significance of that line. Graphical analysis is a heuristic tool. And, judging from the alternative interpretation of my data given by Hazen, it is often most reasonably performed with the aid of a computer.

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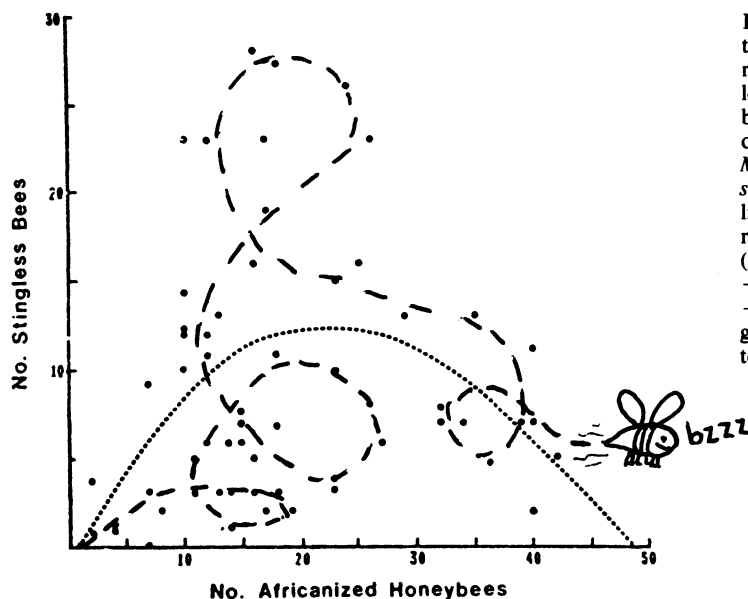


Fig. 1. The relations of Africanized and stingless (meliponine) bee abundances on flowering *Melochia villosa*. The dashed line is a quadratic polynomial (given by $y = -0.516 + 1.08x - 0.023x^2$) which gave the best fit to the points (7).

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