

SCIENCE NEWS®

The Weekly Newsmagazine of Science

A Science Service Publication
Volume 125, No. 25, June 23, 1984

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Subscription Department
231 West Center Street, Marion, Ohio 43302

Subscription rate: 1 yr., \$27.50; 2 yrs., \$47.50;
3 yrs., \$67.00. (Foreign postage \$5.00 additional per
year.) Change of address: Four to six weeks' notice is
required. Please state exactly how magazine is to be
addressed. Include zip code. For new subscriptions
only call (1) 800-247-2160. Printed in U.S.A. Second
class postage paid at Washington, D. C. Title
registered as trademark U.S. and Canadian Patent
Offices. Published every Saturday by SCIENCE
SERVICE, Inc. 1719 N St., N.W., Washington, D. C.
20036. (202-785-2255)
ISSN 0036-8423

Letters

Electric bacterium

In Dietrick Thomsen's article "Swimming for the Good Life" (SN: 5/12/84, p. 298), the question is raised as to how the bacterium "knows" it is going toward the attractant.

If one dropped the assumption that the message is chemical and considered the possibility that the message is electrical, would there still be a question? Interestingly, much of the mechanism described in the article is explained via analogy with electrical phenomena. Further, in the second to last paragraph, Berg, describing how the flagellum works, says "What makes the inner ring turn is *electric forces* supplied by protons moving through the wall of the cell in response to some *electrolytic difference* between inside and outside."

If the message were electrical (electrolytic) and the organism was "wired" to twist its flagellum one direction in response to a positive charge, and vice versa, there wouldn't need to be a "middle part."

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Have the attractants/repellants and their effects on the organism been examined with reference to their charge or electrolytic characteristics? This would seem easy enough to test.

H. Carol Murphy, RN
Madison, Wisc.

Science theory

The somewhat mixed decision of the book committee in Texas ("Texas book rule changed," SN: 4/21/84, p. 246) could be developed into an opportunity to develop materials on what scientific theory really means.... An understanding of the criteria for scientific theory is central to a realization that science is a *method* of discovering and organizing knowledge. It is easy for people to take the more general definition of theory as "a set of speculations" and mis-apply that meaning to scientific theory, which is quite rigorously defined when used correctly.

Scientific theory is the conceptual integration which establishes an explanatory base to knowledge, tying together and providing for the

relationships among a group of factual observations. The logic of the rules whereby one proposed theory is replaced by another is vital to scientific development: Just why *did* Einstein's theories replace Newton's? The importance of a theory's predictive ability becomes clear when remembering that atomic physics is mostly "just theory" with enough explanatory power to lead to a technology which could blow up a sizeable chunk of humanity; that and other theoretical formulations also provide many comforts and conveniences for all of us.

Science education badly needs to emphasize the philosophy and methods of science, and also to distinguish between (1) the methods, (2) the findings and theories derived from these methods, and (3) the technologies then derived from the findings and theories discovered. Materials to fill this need would be an elegant response to the decision in Texas and the pressures to legislate the misrepresentation of science in our schools.

Paula Rohrbaugh
Salem, Ore.

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