This Week in Science

Editorial

9 Scare of the Week

Letters


News & Comment

20 Valdez: The Predicted Oil Spill
21 Ellis Rubenstein Named News Editor
22 Long, Slow Recovery Predicted for Alaska ■ The Legacy of Past Spills
24 Bevill Wants Foreign SSC Funding Up Front
DOE Boosts Research for Defense Cleanup
Somali Scientists Freed
Truly in Line for NASA Post
25 Navy Relents in Battle Over Mapping Sea Floor
26 Soviet Failure at Mars a Reminder of Risks

Research News

27 Fusion Followup: Confusion Abounds
29 Telescope Collapse Unraveled
30 A New Way to Forecast Next Season's Climate
31 Gazing into the Interior of the Sun
32 How to Get Plants into the Conservationists' Ark

Articles

35 Mimicking Photosynthesis: D. GUST AND T. A. MOORE
41 The Purine Path to Chemotherapy: G. B. ELION

Research Articles

48 On Finding All Suboptimal Foldings of an RNA Molecule: M. ZUKER

Reports

53 Cretaceous Cold-Seep Communities and Methane-Derived Carbonates in the Canadian Arctic: B. BEAUCHAMP, H. R. KROUSE, J. C. HARRISON, W. W. NASSICHUK, L. S. ELUIK
56 Dynamics of Liquefaction During the 1987 Superstition Hills, California, Earthquake: T. L. HOLZER, T. L. YOUD, T. C. HANKS
60 Skeleton of the Oldest Known Pinniped, Enaliarctos mealsi: A. BERTA, C. E. RAY, A. R. WYSS

---

SCIENCE is published weekly on Friday, except the last week in December, and with an extra issue in February by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005. Second-class postage (publication No. 484460) paid at Washington, DC, and at an additional entry. Now combined with The Scientific Monthly, Copyright © 1989 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): $75. Domestic institutional subscription (51 issues): $120. Foreign postage extra: Canada $46, other (surface mail) $46, air mail via Amsterdam $85. First class, airmail, school-year; and student rates on request. Single copy sales: Current issue, $3.50: back issues, $5.00: Biotechnology issue, $6.00 (for postage and handling, add per copy $0.50 U.S., $1.00 all foreign); Guide to Biotechnology Products and Instruments, $18 (for postage and handling add per copy $1.00 U.S., $1.50 Canada, $2.00 foreign). Bulk rates on request. Change of address: allow 6 weeks; giving old and new addresses and 11-digit account number. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of $1 per copy plus $0.10 per page is paid directly to CCC, 21 Congress Street, Salem, Massachusetts 01970. The identification code for Science is 0036-8075/83 $1 + .10. Postmaster: Send Form 3579 to Science, P.O. Box 1722, Riverton, NJ 08077. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes. The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

64 Central Synaptic Inputs to Identified Leech Neurons Determined by Peripheral Targets: C. M. Loer and W. B. Kristan, Jr.

66 *elk*, Tissue-Specific *ets*-Related Genes on Chromosomes X and 14 near Translocation Breakpoints: V. N. Rao, K. Huebner, M. Isobe, A. Ar-Rushdi, C. M. Croce, E. S. Reddy

70 Immune Response to Cholera Toxin Epitope Inserted in *Salmonella* Flagellin: S. M. C. Newton, C. O. Jacob, B. A. D. Stocker

72 Heritable Allele-Specific Differences in Amounts of apob and Low-Density Lipoproteins in Plasma: D. Gavish, E. A. Brinton, J. L. Breslow


79 Odor-Induced Membrane Currents in Vertebrate-Olfactory Receptor Neurons: S. Firestein and F. Werblin


86 1989 Council Meeting: M. White ■ Resolution on U.S. Return to UNESCO ■ Global Change and the Franklin Lecture ■ The New Genetics at the Old University ■ Technology for Biotechnology

89 Minds at War, reviewed by W. A. Schwartz and Charles Derber ■ Ideas and Information, D. L. Goodstein ■ Some Other Books of Interest ■ Books Received

94 Programmable Mixer ■ Protein Purification System ■ Top-Loading Microbalance ■ Oligosaccharide Reference Standards ■ Diode Array Detector for HPLC ■ Inert Autosampler Vials ■ Polymer-Coated Glassware ■ Electrophoresis Gel Documentation ■ Basic Laboratory Balance ■ Nonmetallic Liquid Chromatograph ■ LC-MS-MS System ■ Chemical On-Line Search Software ■ HPLC Pump ■ HPLC System ■ Circular Dichroism Spectrometer ■ Magnetic Sector Mass Spectrometer
Scare of the Week

The fable of the boy who cried wolf is as pertinent today as it was in Aesop's time. We are being subjected to the scare of the week. Some of these scares may reflect real dangers, but they are becoming obscured by a cacophony of false or exaggerated ones. Two that hit the headlines recently illustrate quite different problems.

The first was a highly publicized announcement by the Natural Resources Defense Council that Alar-treated apples would cause thousands of cancer deaths to children. The reaction was predictable: school districts quickly canceled apple distribution and the fruit piled up on grocery shelves. The facts came more slowly. Only 5% of apples are treated with Alar, and in that 5% the levels of Alar are well below conservative Environmental Protection Agency tolerances. Even in a worst case scenario the probability of cancer among the affected group would change from 25% to 25.025%. When health commissioners announced the facts, the country returned to normal and apples were returned to school districts and grocery shelves. However, serious psychological and financial damage was sustained.

It is time to recognize that public interest groups have conflicts of interest, just as do business groups, even though their public positions are orthogonal. Businesses prefer to be out of the limelight; public interest groups like to be in it. Because they are selling products in the marketplace, businesses downplay discussions of hazard. Because public interest groups acquire members by publicity, they emphasize hazards. Each group convinces itself that its worthy goals justify oversimplification to an "ignorant" public. Businesses today have product liability and can incur legal damages if they place a dangerous product on the market. Public interest groups have no such constraints at the moment; it may be time to develop appropriate ones so that victims of irresponsible information have redress. Public interest groups, as well as apple growers, contribute importantly to our society, but both groups should be accountable for their acts.

The second scare was the banning of Chilean grapes after a terrorist threat and the finding of traces of a little cyanide in two grapes. On the surface it resembles the Alar scare: the amounts of cyanide were found to be negligible, so the job losses and the ensuing ill will created among Chilean farmers seemed disproportionate in retrospect. The difference is that eating too much cyanide can cause instant death, whereas Alar presents a possible danger only over a lifetime of consumption and that scare required no instantaneous action. Although the Chilean grape scare may have been more justifiable, a reevaluation suggests that a less extreme reaction would have been more appropriate.

The overreaction in these cases has as its background the present climate in our society in which complete safety without cost is seen as a feasible goal. The possibility of danger, therefore, is perceived to result from chicanery, negligence, or incompetence. In such a climate, officials respond with extreme measures. Because increased costs in either the affected products or in taxes are not obviously linked to these official actions, the system becomes tilted to overreaction. A certain balance is necessary to prevent the costs of legitimate safety measures from becoming prohibitive. A graphic illustration of this problem surfaced recently with the arrest in Los Angeles of a person who admitted having made about a hundred bomb threats to airlines, all false, each of which had been investigated by authorities. If every threat causes flights to be canceled or fruit to be removed from grocery shelves, terrorists and psychotics will soon be able to grind society to a halt. On the other hand, the alternative of broadcasting each threat, caveat emptor with a vengeance, would soon cause all warnings to be ignored.

To thread our way between real dangers and false alarms, we must often let officials decide which terrorist threats deserve wide publicity, and the public must be understanding of risk as well. Because these officials cannot always be right they deserve to be judged on an overall record, not from the certainty of hindsight. The public must recognize that a risk-free society is not only impossible, but intolerably expensive. At some point the real danger of too much pesticide must be balanced against the value to poor people of cheaper fruit. There are numerous deaths from falls down stairs in the home every year, but we do not advocate that all staircases be replaced by elevators. Scares of the week are in the same category. We cannot afford to be complacent about real threats, but we must remember that to be alive is to be at risk.—Daniel E. Koshland, Jr.