

# SCIENCE NEWS®

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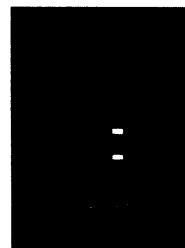
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Cover: The recent explosion of interest in the reverse engineering of software represents a recognition of the obstacles facing anyone trying to understand how a large, complex computer program, written years ago by programmers no longer available, really works. This illustration shows the output from one example of software developed to aid this process. (Illustration: McCabe & Associates, Columbia, Md.)



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**Science Service**, which publishes SCIENCE NEWS, is a nonprofit corporation founded in 1921. It gratefully accepts tax-deductible contributions and bequests to assist its efforts to increase the public understanding of science, with special emphasis on young people. More recently, it has included in its mission increasing scientific literacy among members of underrepresented groups. Through its Youth Programs it administers the International Science and Engineering Fair, the Science Talent Search for the Westinghouse Science Scholarships, and publishes and distributes the *Directory of Student Science Training Programs for Precollege Students*.

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## Letters

### Precision wise, accuracy foolish

Atomic clock NIST-7 may be wonderfully precise, but it will never achieve an accuracy of less than 1 second gained or lost in the next million years, as claimed ("Starting up an improved atomic clock," SN: 5/1/93, p.276). Mechanical failure, loss of funding, earthquake, civil war, and so on pretty much guarantee that this clock will not be operating in 1,000 years, and probably not in 100. Most likely it will be shut down within 20 years and replaced by an even more precise timepiece. Over a million years, then, it will lose nearly a million years.

Like the clock, your article was very precise but terribly inaccurate.

George Waxter  
Wauwatosa, Wis.

### Should we let Big Brother eavesdrop?

"Encrypting Controversy" (SN: 6/19/93, p.394) has it backwards when describing public-key encryption as a system in which "the

user has one key — kept secret — for encrypting the message and the recipient has a different . . . key to decrypt the message."

Your private (secret) key allows you to decrypt messages sent to you, while your public key allows anyone to send you encrypted messages. It is also possible to use your private key as an encryption device to electronically "sign" your messages; since your "signature" can be decrypted only by your public key, anyone can verify that you authored the message.

As for the controversy over whether the government should, in effect, have a master key to enable law enforcement agencies to intercept messages, the answer is clearly yes. An unbreakable encryption system available to criminals would be far, far more dangerous than an eavesdropping mechanism available to the state. Unbreakable encryption is no more necessary to ensure our privacy than the marketing of machine guns is to safeguard our right to bear arms.

Robert Pels  
Burlington, Vt.

A number of experts consulted by Ivars Peterson appear to share the premise that there is a legitimate law enforcement or national security interest in preventing people from writing down messages in such a way that the government can't read them if it wants to.

In my opinion that assumption is completely bonkers. Must I leave duplicate keys to my house or safety deposit box down at the police station just in case they someday have some reason to use them?

Daniel D. Polsby  
Kirkland & Ellis Professor of Law  
Northwestern University School of Law  
Chicago, Ill.

I must take exception to Lance Hoffman's statement that "for the first time in history, we have a situation in which individuals can use cryptography good enough that even governments can't read [the encrypted messages]."

This statement is false. Worse, it is misleading: It suggests that governments might be

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# Books

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**Commonsense Outdoor Medicine and Emergency Companion: The Essential Medical, First-Aid, and Survival Guide for Backpack, Home, Boat, Airplane, Camp, Car, and RV** — Newell D. Breyfogle. If you weren't a scout growing up or need a refresher course on basic first-aid and survival skills in the wilderness, then this guide will be an asset on hikes, canoe trips, and other outdoor adventures. Includes a vast array of first-aid techniques for a variety of circumstances ranging from bites to acute mountain sickness. Also discusses how to find food, shelter, and direction in the wilderness. A very competent travel companion. Ragged Mountain Pr, 1993, 432 p., b&w illus., paperback, \$14.95.

**The Island Press Bibliography of Environmental Literature** — Joseph A. Miller, Sarah M. Friedman, David Grigsby, and Annette Huddle, eds. The editors used resources from the Yale School of Forestry and Environmental Studies to compile a wealth of sources for information on a variety of environmental topics, from wildlife management to technical advances. Includes more than 3,000 references for books, monographs, journals, conference proceedings, and government reports. Invaluable for researchers, students, and professionals in the field. Island CA, 1993, 396 p., hardcover, \$48.00.

**Medicine, Money, and Morals: Physicians' Conflicts of Interest** — Marc A. Rodwin. Medicine, unlike other public services, has no public policy to ensure that its practitioners work in the best interest of their clients. The author contends that physicians, like lawyers and financial professionals, should be subject to fiduciary laws to ensure that they uphold high ethical standards. This would also promote overall financial savings in a field burdening the entire country, he argues. Rodwin cites a number of potential conflicts of interest for physicians, such as kickbacks from pharmaceutical companies and referrals to facilities where the referring physician has a financial interest. Finally, he outlines a potential solution by suggesting the creation of an SEC-like bureau to regulate the medical profession. Oxford U Pr, 1993, 411 p., hardcover, \$25.00.

**The New Careers Directory: Internships and Professional Opportunities in Technology and Social Change** — Barry Lasky, ed. Published by Student Pugwash, an organization dedicated to educating young people about the global relevance of science and technology, this reference includes data on 300 organizations in more than 45 states offering paid and unpaid internships and entry-level jobs. Fields include communications, energy, environment, food, agriculture, general science, health and medicine, peace, security, population, and development. The directory also emphasizes organizations offering programs that target women and minorities. Student Pugwash USA, 1993, 325 p., paperback, \$20.00.

**Vital Signs 1993: The Trends that Are Shaping Our Future** — Lester R. Brown, Hal Kane, Ed Ayres. This grouping of 42 global environmental indicators, compiled by researchers at the Worldwatch Institute, spotlights important trends affecting our decisions over the next year. The good news here is that production of ozone-depleting CFCs has been cut by half and the use of wind power is increasing. The bad news is that grain production and the sea catch are down and population is rising at an alarming rate. A useful overview of economical and environmental issues. Norton, 1993, 150 p., paperback, \$10.95.

**The Woman's Heart Book: The Complete Guide to Keeping Your Heart Healthy and What to Do If Things Go Wrong** — Fredric J. Pashkow and Charlotte Libov. Even though heart disease is the leading cause of death among American women, most clinical studies on it have focused on men. This book offers basic information about heart disease for women of all ages, including those going through pregnancy or menopause and those with congenital heart defects or conditions such as mitral valve prolapse. Also provides suggestions for maintaining a strong heart through diet and exercise and for what to expect from surgery and treatments. Foreword by Bernadine Healy. Dutton, 1993, 358 p., b&w illus., hardcover, \$22.00.

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justified in taking steps to control individual use of cryptography.

David Kahn's book *The Codebreakers* (Macmillan, 1967) gives the history of cryptography for the last 4,000 years. In all of this history, it is the rule rather than the exception that cryptographic systems were invented and used first in the private sector and that individuals have had and used strong cryptography — that is, cryptography as strong as that used by the military and diplomats of the time. Cryptography is clearly a dual-source and dual-use technology and always has been.

It is vitally important that we not give away the right we have always had to use our own strong cryptography and to keep it private — even from the government — just when we start to need it most.

*Carl M. Ellison  
Cambridge, Mass.*

**Dorothy Denning's belief** that citizens do not have "an 'absolute right' to a private conversation" is downright Orwellian.

Government abuses of existing surveillance capabilities (for example, the illegal wiretapping of the late Dr. Martin Luther King's conversations by the FBI) are too well known and extensive to bear repetition here. The Denning-government initiative would exponentially increase such abuses.

*William J. Wilson  
Huntsville, Ala.*

## Additional aspects of alcoholism

"Alcoholics Offer Surprises in Long Run"

(SN: 6/5/93, p.356), while reporting several interesting hypotheses, does not mention the one most apparent to common sense. It says that the city men "from some of the poorest parts of Boston . . . tended to descend into alcoholism between age 21 and 30," whereas the Harvard men succumbed two decades later.

Doesn't this suggest that distinctions in economic class were significant? In spite of the conclusion that "depressed people rarely resort to uncontrolled alcohol use," might not a similar but more gradual wearing away have been in operation? Clearly, the city men faced a harder economic reality than the more buffered Harvard men, and some of them may have succumbed earlier to personal desperation.

*Seth Zimmerman  
San Jose, Calif.*

*George Vaillant describes class and cultural influences on alcoholism in his two samples in The Natural History of Alcoholism (Harvard University Press, 1983). But despite their poverty or affluence, men studied by Vaillant usually developed alcoholism first and serious depression later.*

—B. Bower

**Hereditary causation** is discussed, and family environment is discussed — but as if they were in different classes. Few commentators ever point out that we inherit not our genes only, but our family environment as well. If one or both parents are alcoholic, the environment will shape the child's lifelong psychology — in different ways for different people, but inevitably for all.

*C. Lee Hubbell  
Chicago, Ill.*

*George Vaillant makes this point explicitly in his research. I omitted it, with reservations, because of space constraints.*

—B. Bower

**You make statements** about alcoholics in general on the basis of a study using entirely male samples. My experience as a member of Alcoholics Anonymous, however, has suggested that there are significant differences between female and male alcoholics. This is particularly noticeable with regard to the incidence and severity of depression.

*Anita A.  
Brooklyn, N.Y.*

*There are as yet no comparable long-term studies of female alcoholics to support or refute your experience. However, I recently wrote a story on alcoholism ("Abusive Inheritance," SN: 11/14/92, p.332) that mentions emerging work on women.*

—B. Bower

## Early memories recalled

I was delighted by your reporting of the research findings regarding the earliest memories of young children ("Some lasting memories emerge at age 2," SN: 6/12/93, p.372). People have always thought odd my insistence that I could recall V-J Day festivities in the streets of Machias, Maine. I was born in February 1943 and so at the age of 2 could quite possibly remember an event as gala and raucous as that — a day just about as rowdy as the folks Down East are ever apt to allow.

I've got the memories. Thanks for the (possible) validation.

*Keith A. Dobbins  
Richmond, Va.*