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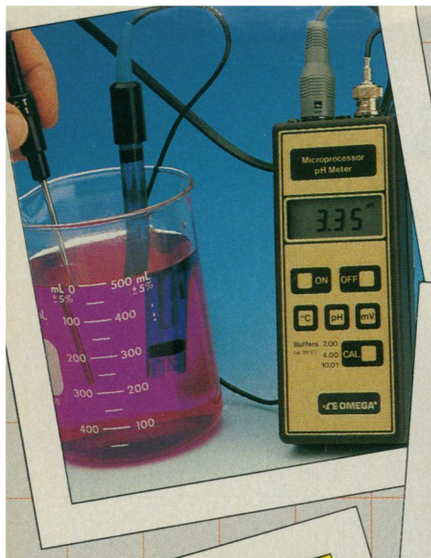

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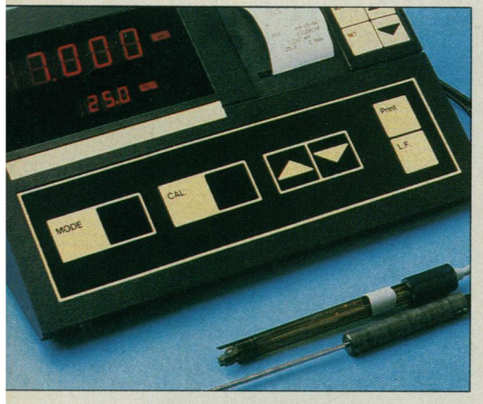

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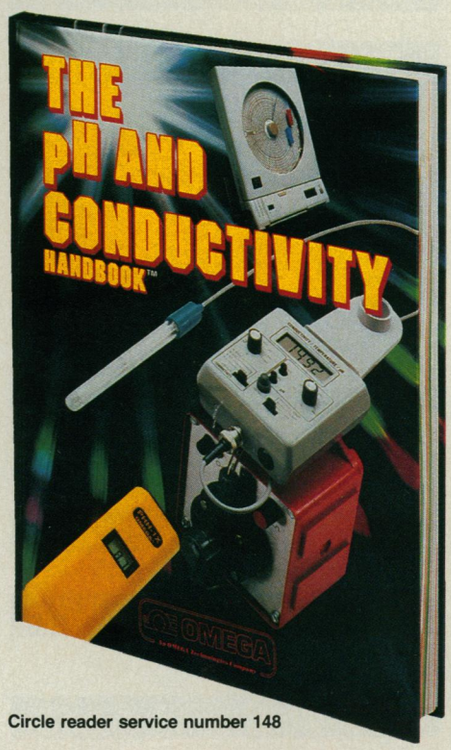

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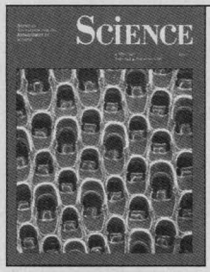

COVER Skeleton of a colony of the cheilostome bryozoan *Steginoporella magnilabris*. Features of individual modules (zooids, each about 1 millimeter long) that are preservable in the fossil record are sufficient to discriminate between morphospecies that breed true and are genetically distinct. Thus paleontologists can study evolutionary patterns at the species level in this group. See page 579. [Scanning electron micrograph by Susann Braden, National Museum of Natural History SEM Lab, Smithsonian Institution]

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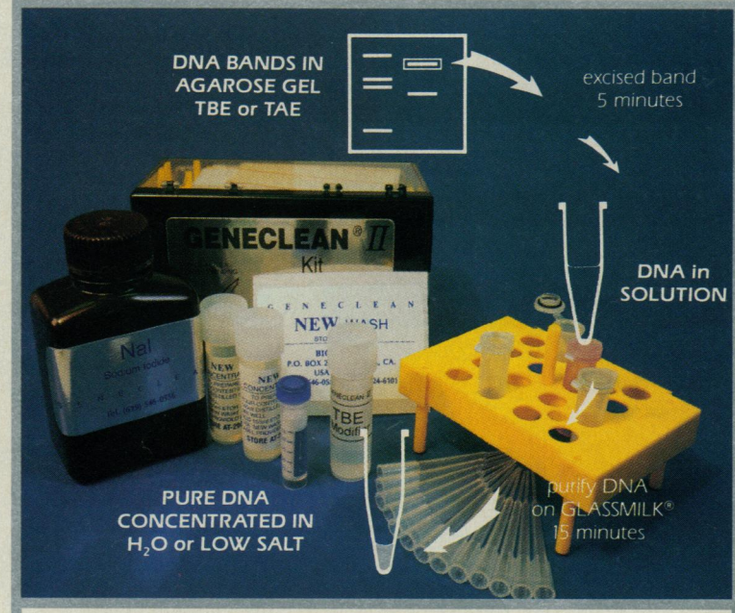

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Reasoning risk

With the proliferation of low-level risk warnings overwhelming our perceptions with an excess of minute detail (for example, in California products that expose consumers to an annual cancer risk of 1 in 7 million must carry warnings), the course toward intelligent risk reduction is not self-evident. Individuals, corporations, and governments have tended to respond to risks arbitrarily, whether because of media attention, scientific investigation, or the development of new technologies. Zeckhauser and Viscusi call for systematic strategies to assess and respond to these risks, endorsing informed choice for the individual and suggesting that governments focus less on microscopic contingencies and more on human mistakes and misdeeds (page 559). Risks of commission are found to be regarded as much more serious than risks of omission, as suggested with the assertion that, in screening, the U.S. Food and Drug Administration is more concerned about regulating harmful new drugs than about missing opportunities for reducing risk that are offered by new pharmaceutical products.

A star is born

In our galaxy, most stars whose masses are close to that of the sun evolve within cold clouds primarily composed of molecular hydrogen; the clouds also contain significant amounts of interstellar dust, and are permeated by magnetic fields. Radio observations reveal dense clumps or cores in these clouds; only within such cores do stars condense. Technological advances during the last 20 years have provided astronomers with the ability to observe the mid- and far-infrared wavelength emissions resulting from the absorption and reradiation of the dust-enshrouded stars' visual and ultraviolet light. Ensuing observational data and accompanying theory suggest that embryonic stars surrounded by flat disks form from slowly rotating magnetic cloud cores; these systems avoid the problems of previous models (page 564). Lada and Shu chart the seeming emergence of a comprehensive picture of low-mass star formation, where the generation of an intense stellar wind appears necessary both to allow star formation to proceed and to provide a natural mechanism for the reversal of infall, enabling the ultimate emergence of a young stellar object from its dusty womb.

Promoter-enhancer communication

The process of transcriptional activation of promoters by proteins that bind to distant sites on DNA is called enhancement and the corresponding DNA sites are called enhancers. Enhancers were first identified in eukaryotes; it turns out that they also have roles to play in the regulation of prokaryotic RNA synthesis. An example of the progress toward an understanding of how prokaryotic enhancers work is described on page 573, where Herendeen *et al.* analyze transcription of the bacteriophage T4. The so-called late genes of phage T4 are activated only after viral DNA has started to replicate. In vitro, transcriptional enhancement has previously been shown to require three viral DNA replication proteins binding to promoter-distal sites that act as enhancers. Transcriptional enhancement is now shown to require a virus-encoded protein that acts as the link between replication proteins bound at the enhancer and the transcription initiation complex at the promoter. Also performed is the dissection of the simple competition mechanism that restricts transcriptional enhancement to T4 late promoters. The issue of promoter specificity versus promoter diversity is another current focus of interest in the analysis of eukaryotic enhancers.

Punctuated equilibrium

A controversial theory of evolution, the punctuated equilibrium model, assumes the relatively stable continuation of a species marked by sudden, concentrated outbursts of change. The distinctly different shapes of many invertebrate species in the fossil record, with little indication of transitional forms, seem to support this theory. Yet because the evidence is restricted to preservable skeletal features, uncertainties are likely to arise: a species defined only by shape (morphospecies) might describe two or more similarly shaped but genetically different species, or one species might have many different shapes. Jackson and Cheetham couple breeding experiments with protein electrophoresis to test heritability and genetic independence of cheilostome Bryozoa morphospecies (page 579). They demonstrate that the kinds of skeletal details that are typically found in fossil material are enough to discriminate biologic species of living cheilostome Bryozoa (see cover). Thus paleontologists are encouraged to study the evolution of this group at the species level and to accept previously observed patterns suggesting punctuated speciation in cheilostomes.

Tick anticoagulant

In order to ensure that blood will flow smoothly during ingestion, ticks produce anticoagulant substances that prevent clotting by inhibiting platelet aggregation and enzymes in the coagulation cascade. Waxman *et al.* (page 593) fractionated a crude soluble extract of whole ticks and found a component composed of large molecules that inhibits thrombin and platelet aggregation, while a component containing smaller molecules inhibits an enzyme called factor Xa. Increased concentrations of the factor Xa inhibitor also prolonged clotting time in several human plasma-based assays. This inhibitor appears to be specific for factor Xa (it had no effect on various other hemostatic factors), as opposed to the Kunitz-type inhibitors that have been found in cows and snails, which have a broad specificity. Structural differences between the two may lead to different approaches towards making factor Xa-specific inhibitors.

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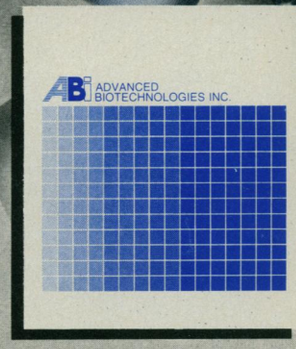

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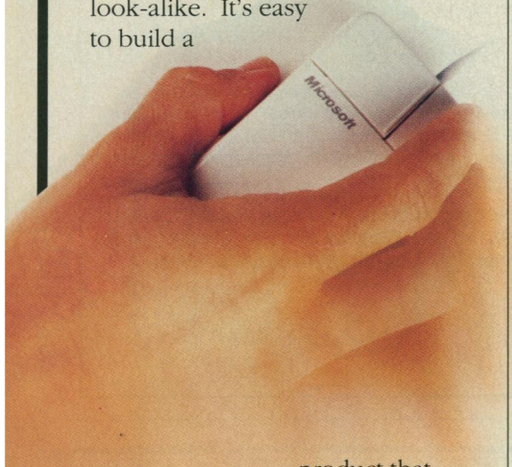

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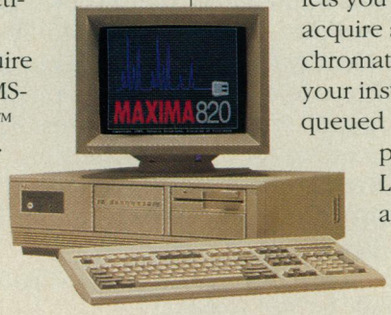

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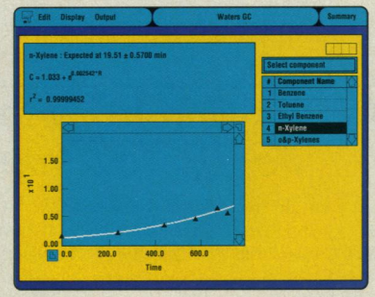

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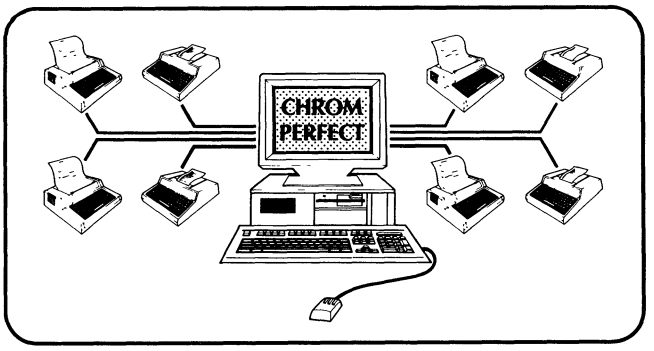

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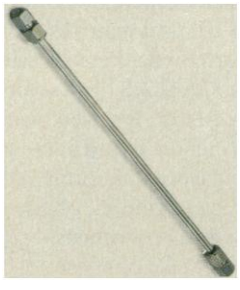

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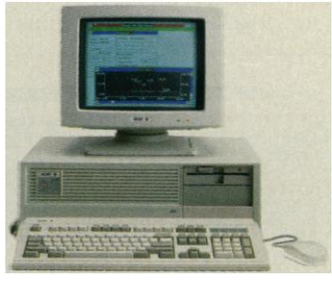

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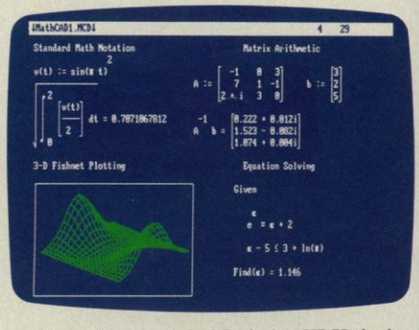

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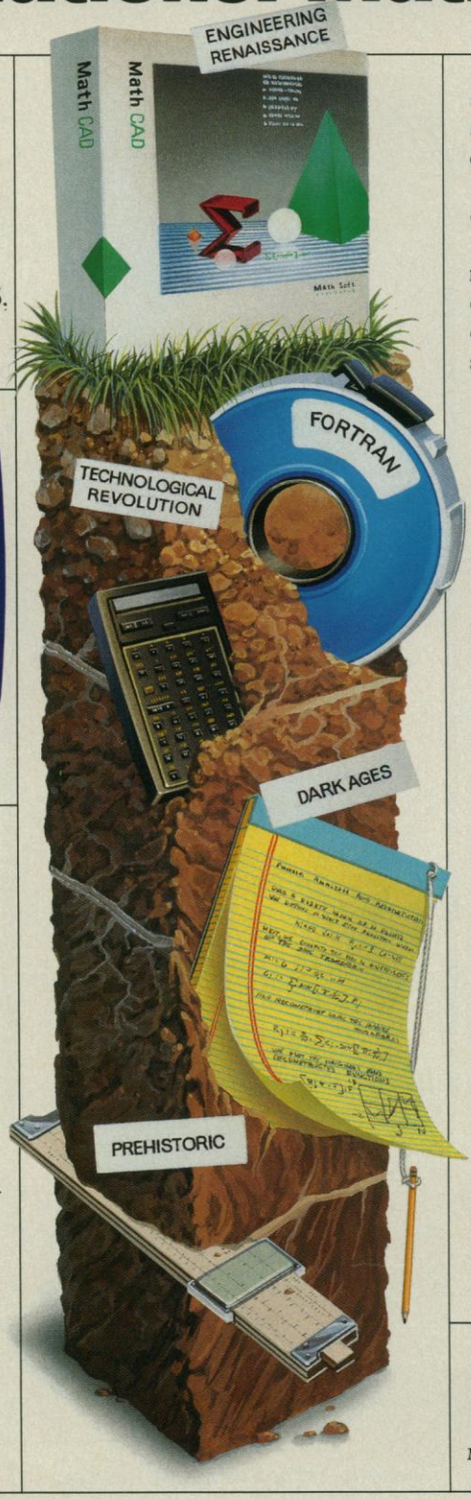

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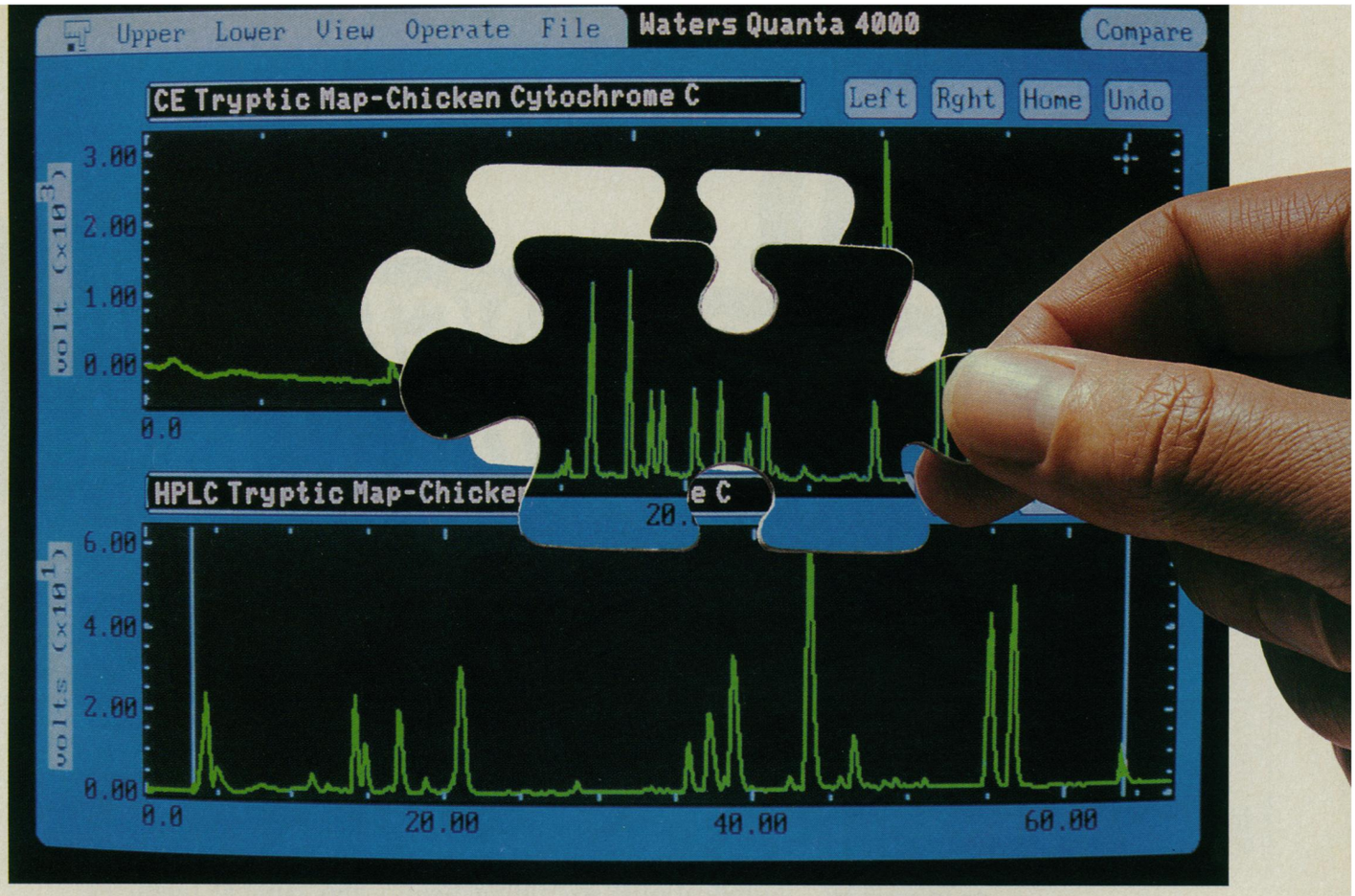

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1990 AAAS-WESTINGHOUSE SCIENCE JOURNALISM AWARDS

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The 1990 contest year is July 1, 1989 through June 30, 1990.

All entries must be postmarked before midnight, July 14, 1990.

For 39 years the AAAS–Westinghouse Science Journalism Awards have recognized outstanding reporting on the sciences and their engineering and technological applications, excluding health and clinical medicine. Awards honor science reporting in newspapers and general circulation magazines and on radio and television.

Entries are judged on the basis of their initiative, originality, scientific accuracy, clarity of interpretation, and value in promoting a better understanding of science by the public.

Five awards of $2,500 each are made in the categories of: newspapers with daily circulation of over 100,000, newspapers with circulation of under 100,000, general circulation magazines, radio, and television.

The 1990 Awards will be presented at the National Association of Science Writers' banquet during the Annual Meeting of the American Association for the Advancement of Science in Washington, DC, February 15–20, 1991.

The Awards are administered by the American Association for the Advancement of Science under a grant from the Westinghouse Foundation.

For further information and entry forms, contact the AAAS Office of Communications, 1333 H Street, NW, Washington, DC 20005, or call (202) 326-6440.

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