

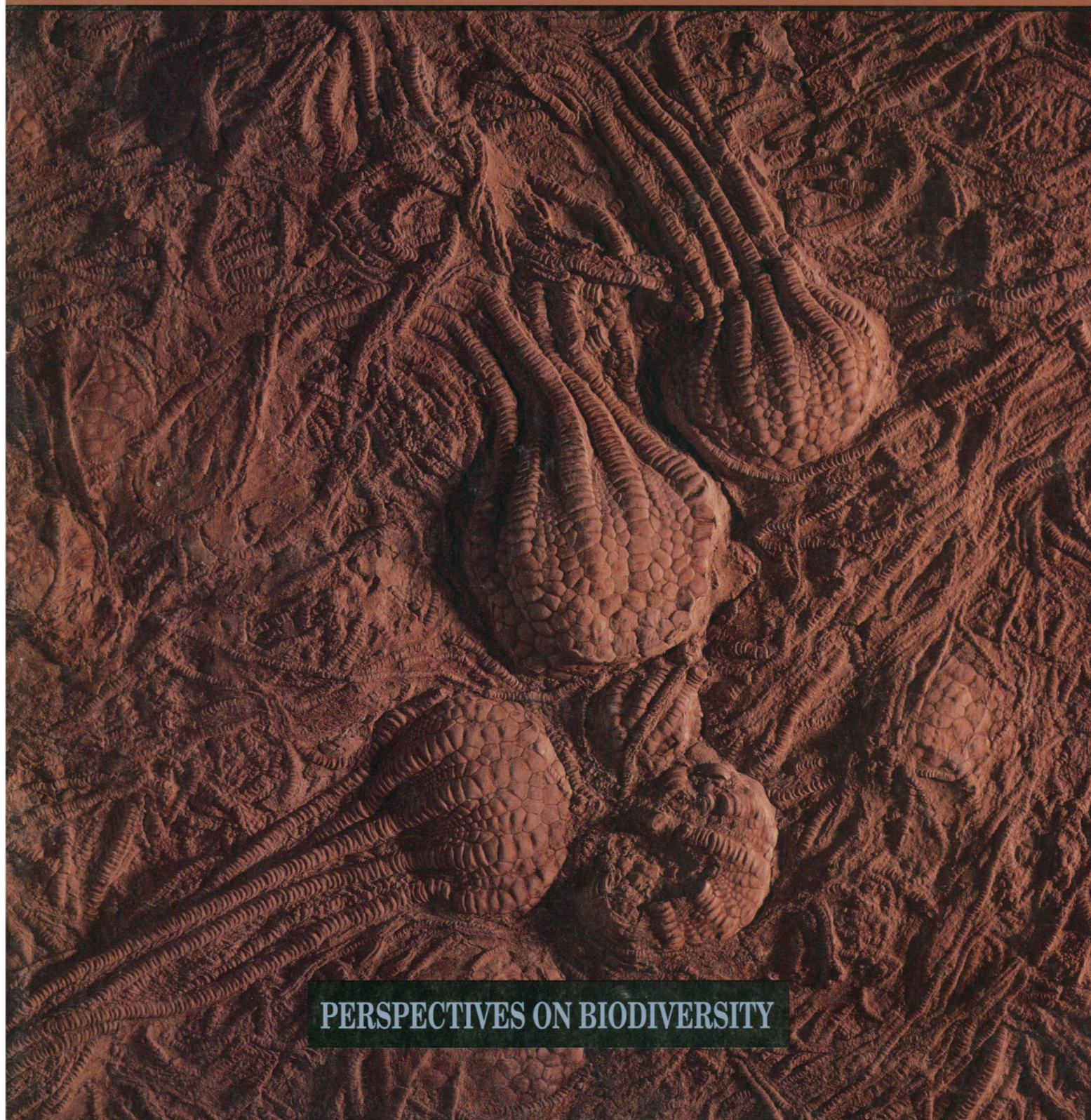
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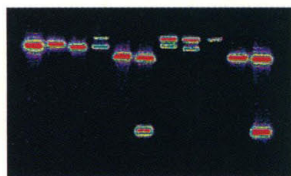
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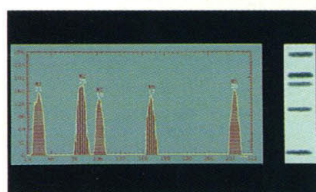
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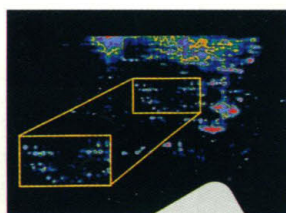
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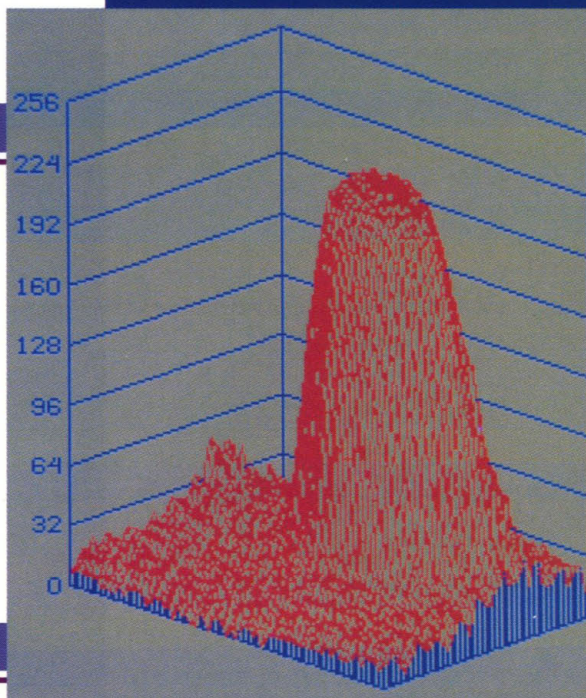
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2. Bauer, J.C., and Fox, J.S. (1991). *Strategies* 4: 6-7

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1. Nielson, K. and Mathur, E.J. (1990) Strategies 3:17-19.

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4. Mullis, K.B., and Faloona, F.A. (1987) Meth. Enzymol. 155:335-350.

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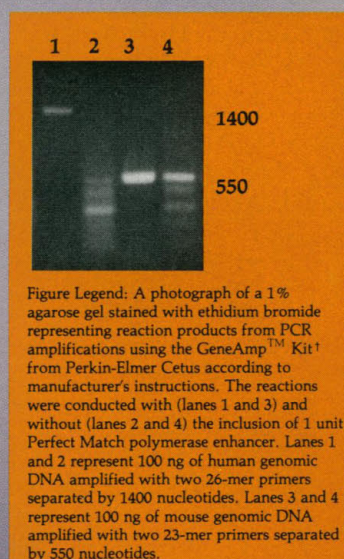
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COVER The fossil record is rich in information on past changes in biodiversity and patterns of extinction. Echinoderms such as those on the cover (maximum test diameter 8 centimeters; arms may exceed 1 meter), *Uintacrinus socialis* Grinnell from Kansas (Smoky Hill Member, Niobrara Formation), are thought to have adopted a planktonic existence, and they were abundant and globally distributed in Late Cretaceous seas. The Uintacrinida order suddenly became extinct well before the end of the Cretaceous. See p. 754. [Photo by John Weinstein, courtesy of the Field Museum of Natural History]

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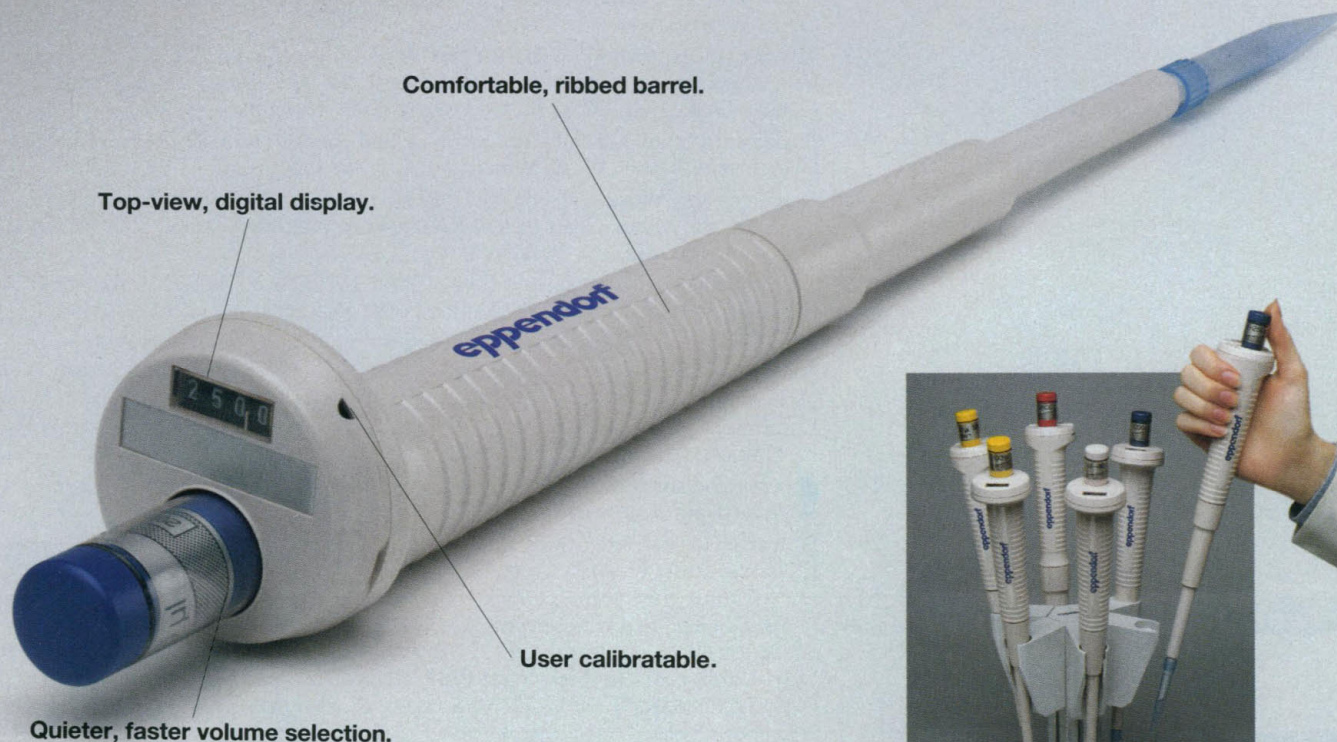
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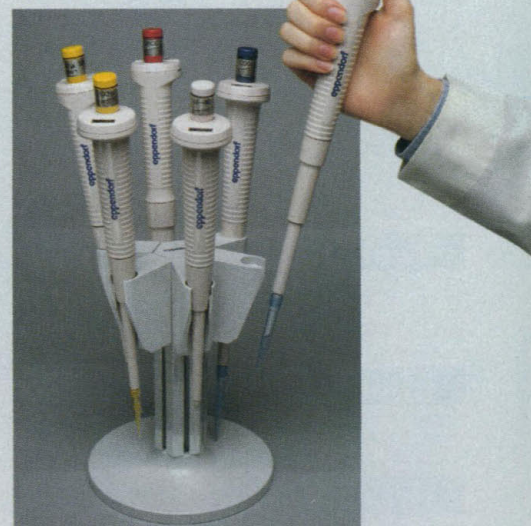
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This Week in SCIENCE

Biodiversity

Why are current efforts at wildlife conservation inadequate for maintaining biodiversity on Earth? Soulé argues that much of the problem stems from the behavior of one species, *Homo sapiens*, whose numbers are expected to reach the 10 billion mark by the year 2046 (page 744). Contemporary cultural practices—such as the quick-fix solutions typically applied to problems—and social, political, and economic goals are often incompatible with meaningful conservation efforts, which generally take decades or centuries to achieve. Overall the situation is dire, but solutions to many problems could come from more sophisticated, multifaceted approaches that consider the contributions of biology, demography, evolution, social factors, political forces, and other variables to any given conservation issues. A range of tools—as diverse as nature reserves and seed banks—exists for protecting plants and animals but these must be applied wisely and given adequate financial backing if they are to succeed. Biodiversity and conservation are addressed in perspectives by Erwin, Morowitz, and Jablonski (pages 750 to 755), an article by Ehrlich and Wilson (page 758), Koshland's editorial (page 717), and Mann's news story (page 736).

Gold fusion

Two thin films of gold have been fused together—or cold-welded—under ambient laboratory conditions (page 776). This is a remarkable accomplishment, because adsorbed species on metals usually prevent contact welding in air, and high-pressure or ultrahigh vacuum conditions or frictional work have been needed to get metal surfaces to touch and fuse. The gold films were evaporated onto compliant elastomeric supports, which appear to be crucial for effective atomic contacts and film fusion. Ferguson *et al.* speculate that, as the gold atoms on the surfaces made

contact, adsorbed organic impurities moved laterally on the surface, coalescing into islands or pockets of impurities much as bubbles of air form when sandwiched at a water-glass interface. The welded contacts showed low electric resistance, a property that can be exploited both for further characterization of the cold-welded films and possibly in the fabrication of new types of electric circuits. This system should also be informative for studies of interactions at interfaces: conditions have already been identified (insertion of a monolayer of gold alkyl thiolates) that block the welding process.

New activity for cytochrome P-450

Allene oxides are precursors of a variety of prostaglandin-like molecules. In plants, for example, one of the important metabolic products of allene oxides is jasmonic acid, which is the plant growth regulator. The biosynthesis of allene oxides proceeds from the dehydration of fatty acid hydroperoxides. A catalytic enzyme that participates in this synthesis was purified from flaxseed by Song and Brash and, through spectral analysis, was identified as the hemoprotein cytochrome P-450 (page 781). The catalytic activity of the enzyme was dramatic, with 70,000 to 80,000 turnovers occurring per minute. Because both cytochrome P-450s and allene oxides are present in animals (so far, the latter have been detected in marine invertebrates), it is possible that cytochrome P-450s will figure in the allene oxide metabolic pathway in animal cells much as it does in cells of plants.

Antibody mimetic

A small organic compound with the same binding specificity as a portion of a monoclonal antibody has been synthesized (page 792). The "mimetic" and the parent molecule after which it was patterned both bind to cell surface receptors for type 3

reoviruses and both induce similar effects upon binding, one of which is the inhibition of cell proliferation. Saragovi *et al.* homed in on the portion of the antibody molecule that was relevant to its binding, and then, with the aid of computer models, designed and synthesized the structural analog. The product, which is not a peptide, has some of the useful functional features of peptide analogs but not the disadvantages that limit peptide use in vivo. For example, peptides characteristically have short in vivo half-lives because they are readily broken down in the bloodstream by proteolytic enzymes; the mimetics are not subject to proteolysis. In addition, peptides are often highly immunogenic and can elicit inflammatory immune responses in an animal, but the mimetics are unlikely to induce immune reactions. Compounds such as this one are expected to have many uses as pharmacologic agents for therapy, diagnoses, and research.

Neuronal changes

What do damage to the nervous system and learning have in common? A study in *Aplysia*, a marine mollusk, suggests that both processes can induce the same types of neuronal changes (page 797). Walters *et al.* measured how sensory neurons in *Aplysia* fired after their axons were experimentally injured by crushing. The changes included alterations in various features of the action potentials—duration, accommodation, probability of afterdischarge, and others—and were similar to the changes known to occur in conjunction with both classical conditioning and learning that takes place through sensitization. All of the changes tend to promote the excitability of nerves and enhance their ability to transmit neurologic signals. The results support the interesting hypothesis that some types of neurologic changes that occur during learning may have been "borrowed" from changes that evolved first to compensate for and repair injury in damaged sensory neurons.

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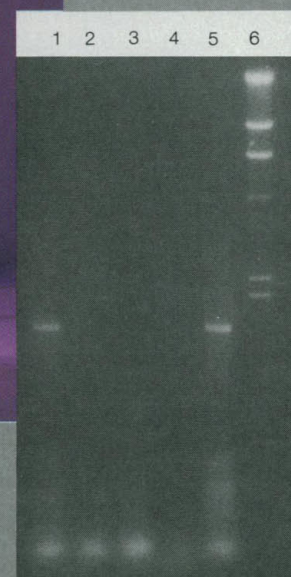
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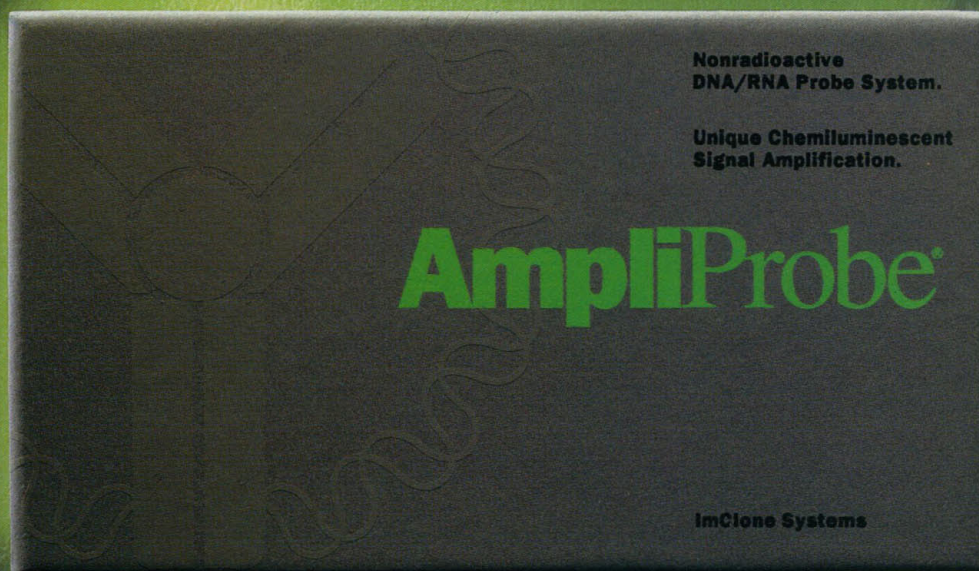
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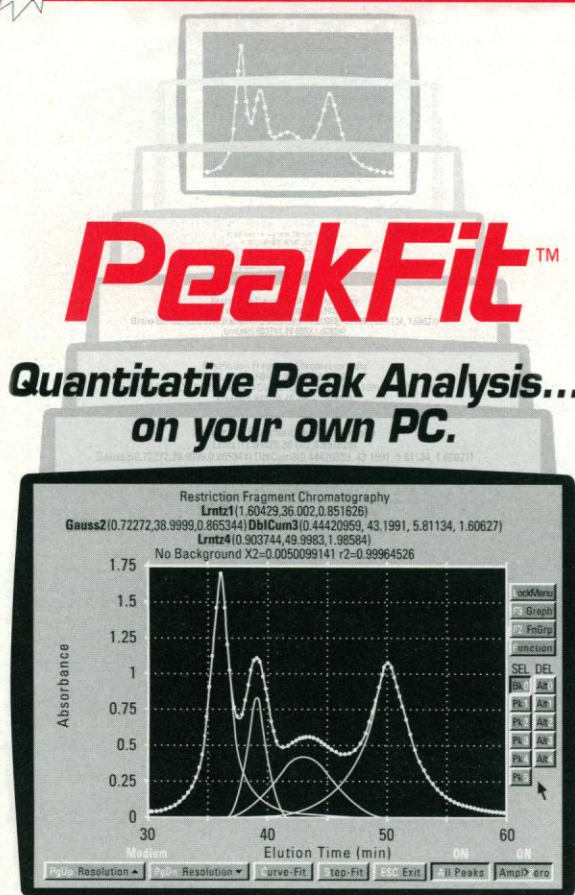
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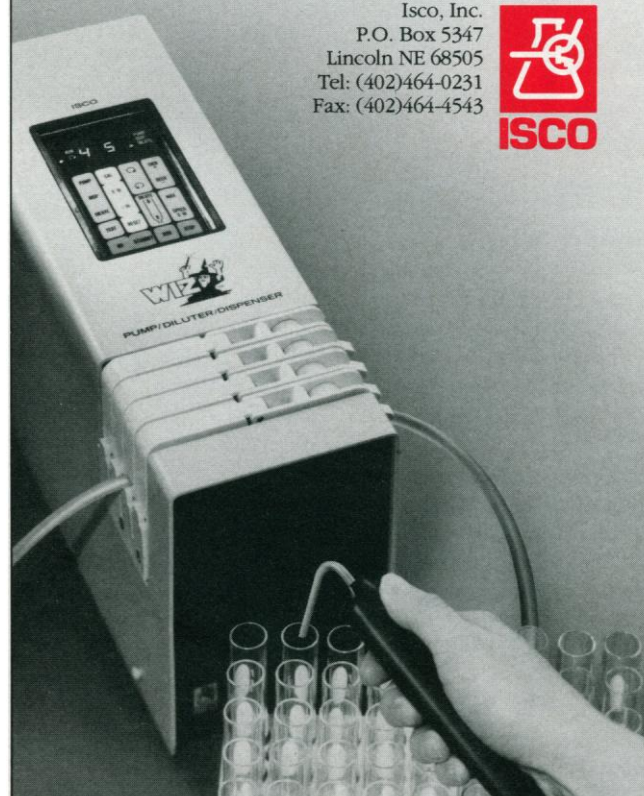
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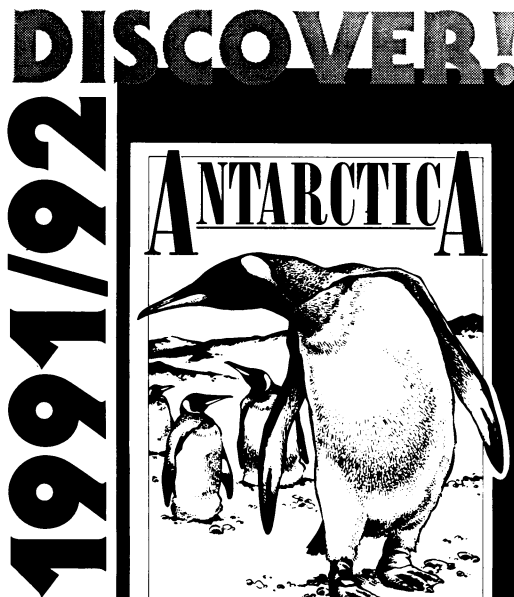
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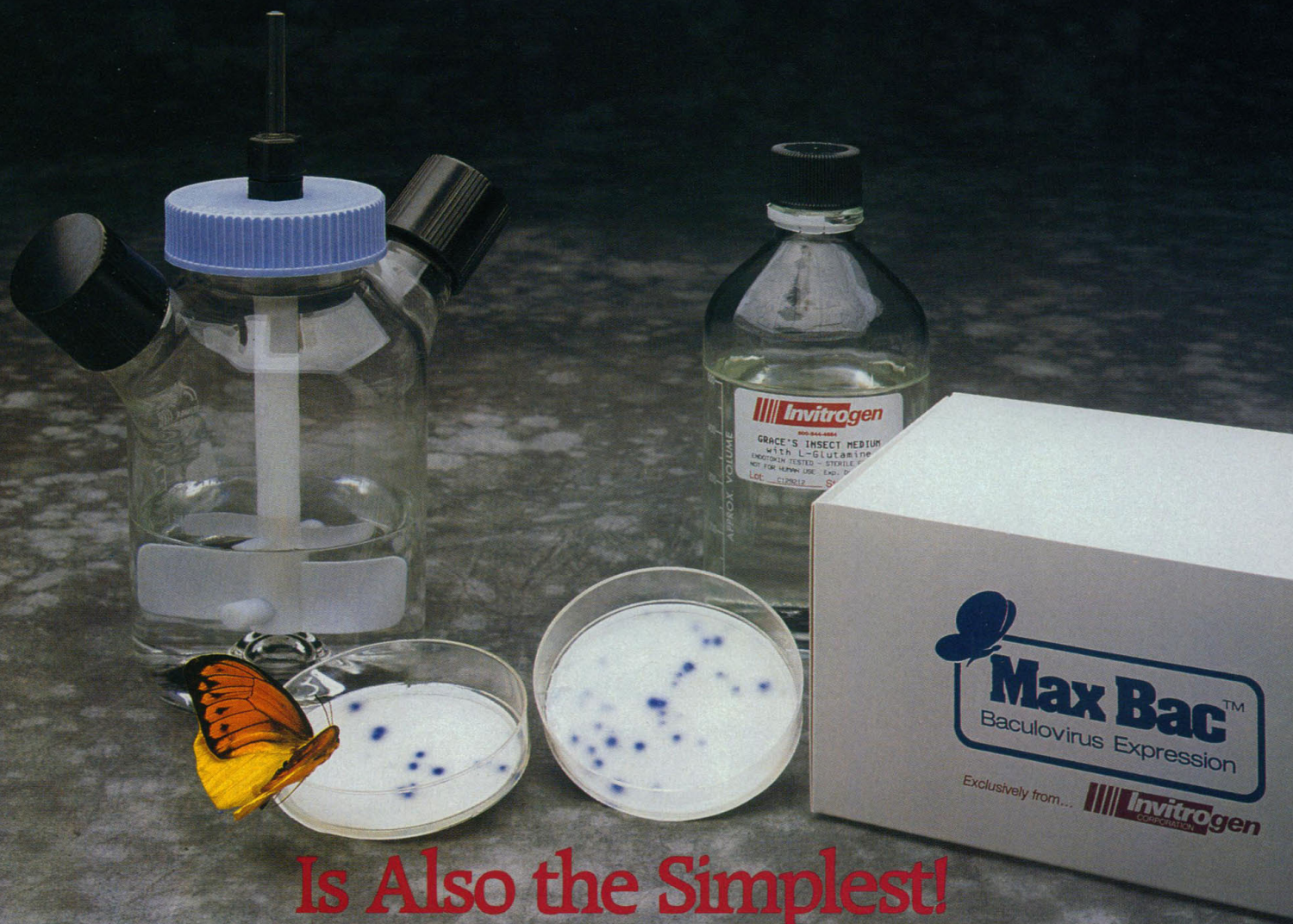
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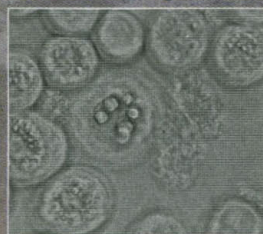


Figure 1. Infected Sf9 insect cells showing viral occlusions.

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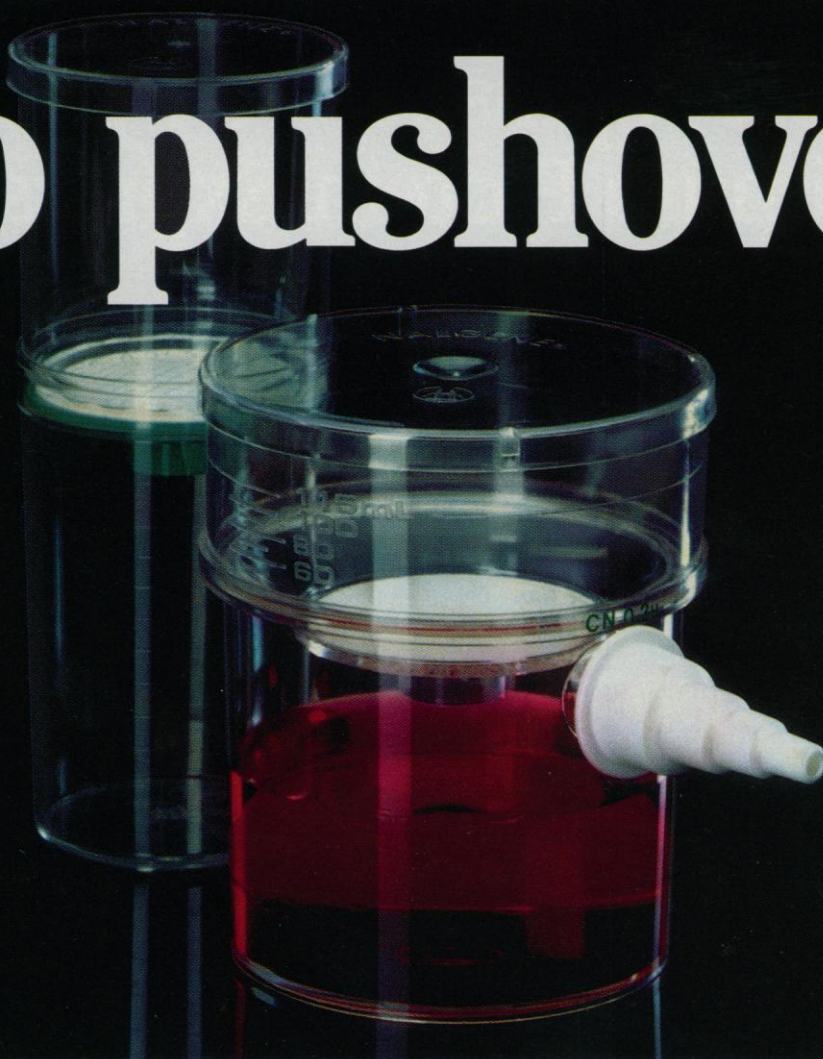
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