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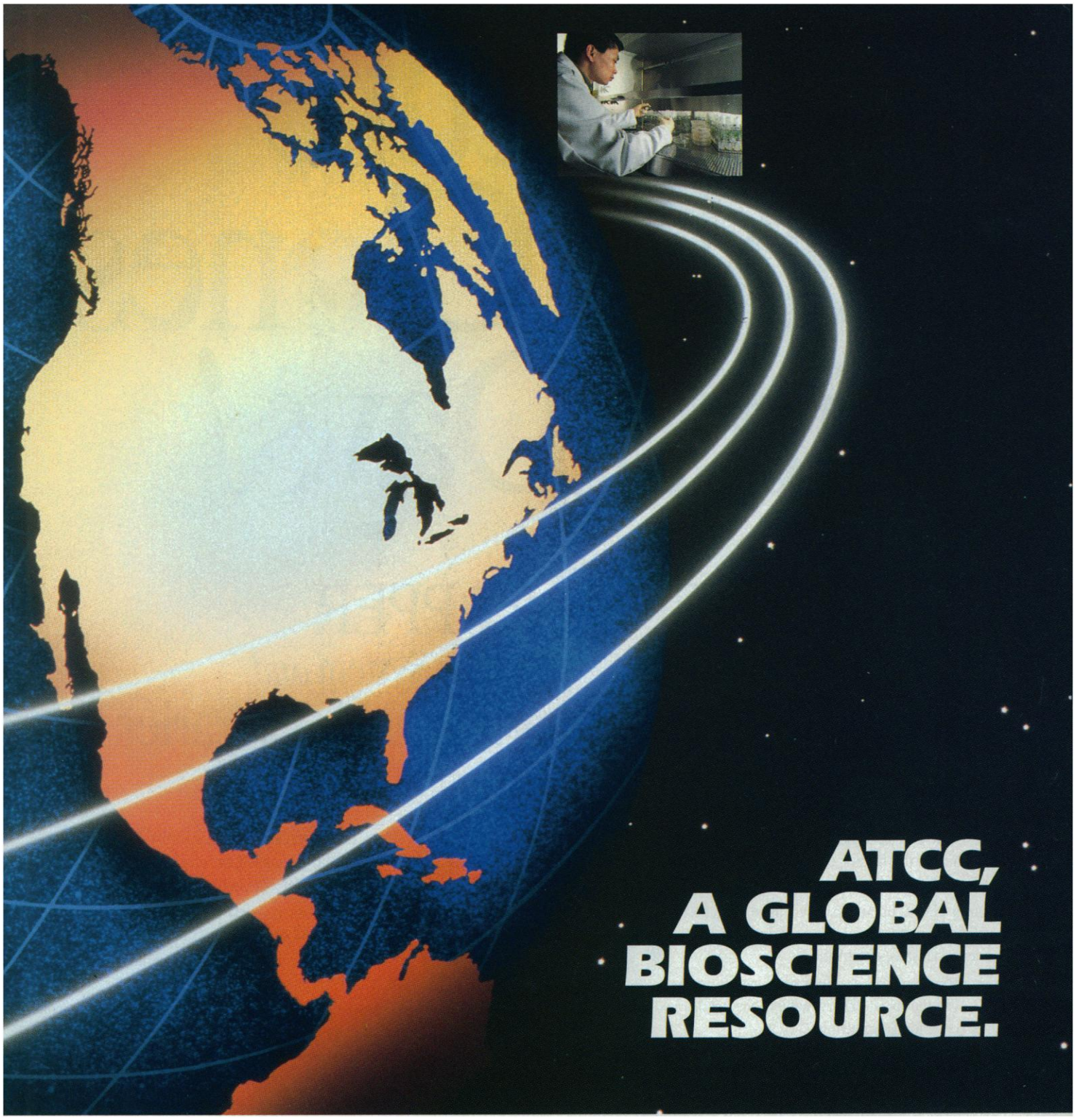

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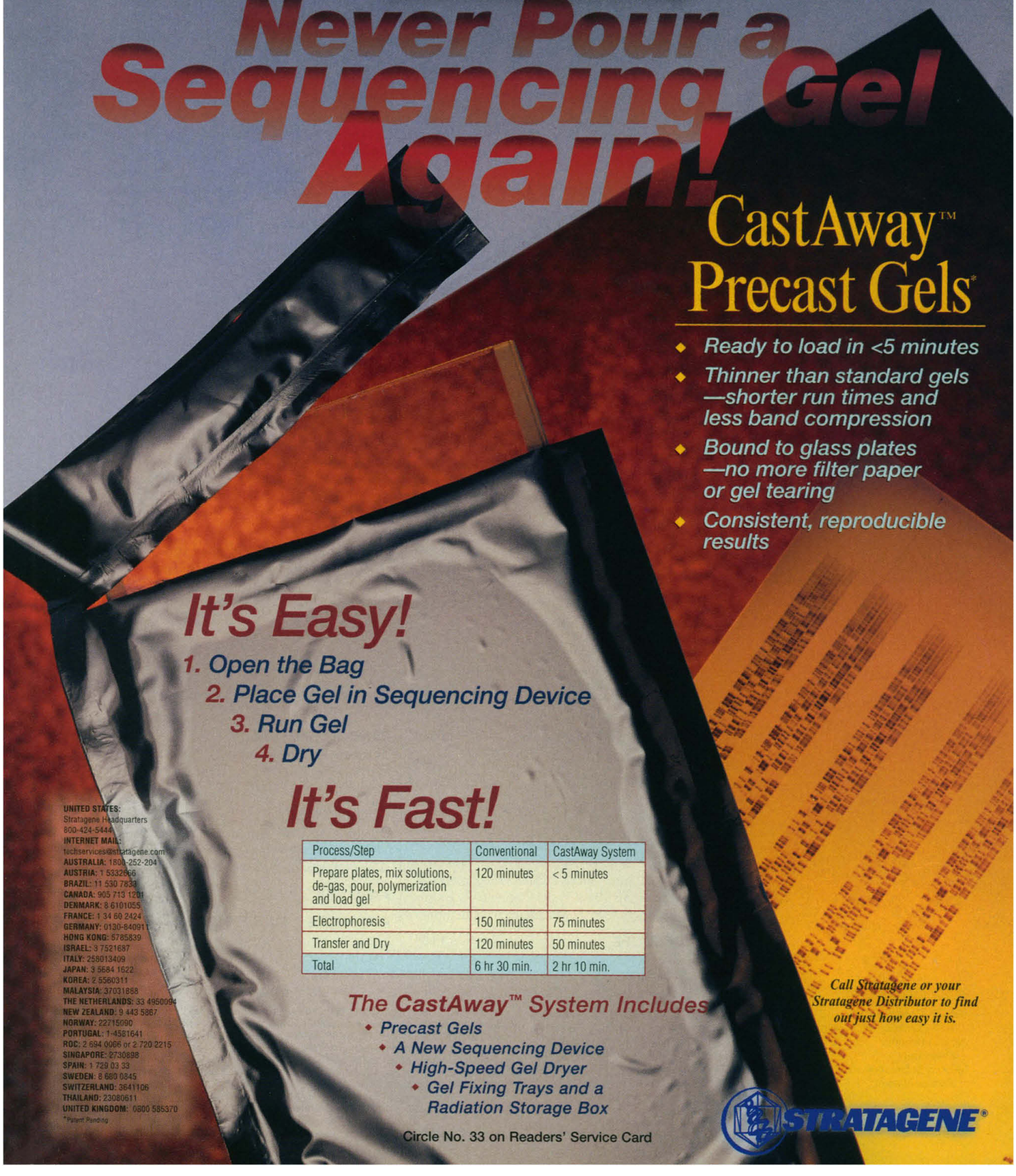

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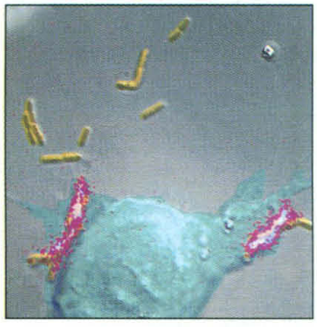
1183, 1231 & 1234

Host-pathogen cross talk



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RESEARCH NEWS

PERSPECTIVES

RESEARCH ARTICLES

DEPARTMENTS

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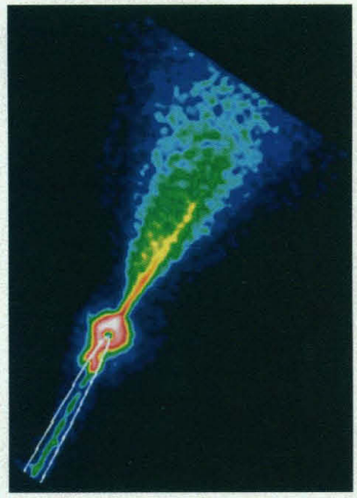
COVER

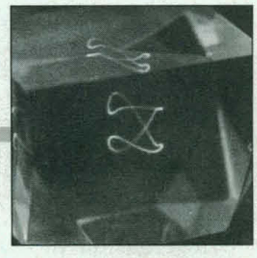
Surface displacement since the 1992 Landers, California, earthquake obtained by interferometric processing of ERS-1 satellite radar images. Maximum range displacement of ~5 cm (blue through red to green) is localized in step-overs of the 1992 surface break, from lower right to upper left. Such deformation may be caused by pore fluid flow as pore pressure gradients induced by the earthquake deformation dissipate. Image width is ~40 km. See page 1202 and the Perspective on imaging on page 1181. [Image: Courtesy of the Jet Propulsion Laboratory]

REPORTS

TECHNICAL COMMENTS



1199
Analyzing attomoles of proteins



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Movie of a three-color solid-state 3D display by Downing *et al.*
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THIS WEEK IN SCIENCE

edited by PHIL SZUROMI

3D displays

Methods for visualizing three-dimensional (3D) data in real time are often limited in spatial and temporal resolution or require restricted viewing zones or the wearing of special headgear (as for virtual reality displays). Downing *et al.* (p. 1185; see the news story by Glanz, p. 1172) present an interactive device that allows true 3D viewing of color images from any perspective. The device involves a transparent rare earth–doped heavy-metal fluoride glass, in which red, blue, and green volume elements can be separately addressed by laser diodes.

■

A trace of protein

Analysis of attomole (10^{-18} mole) samples of protein, an amount typical of a minor component in a single cell, is an important goal in bioanalytical chemistry. Valaskovic *et al.* (p. 1199) report high-resolution mass spectra from attomole samples of carbonic anhydrase from a crude blood isolate. A capillary electrophoresis system that could perform separations on subnanoliter samples and a thin-wall electrospray ionization tip that could use ultralow flow rates are key components.

■

Fluid response

Jogs in strike-slip faults produce either local compression or extension depending on their orientation. This deformation can affect fluid pressure at depth. Peltzer *et al.* (p. 1202; see cover) present synthetic aperture radar interferometry images (see Perspective, p. 1181) of jogs in the rupture of the 1992 Landers, California, earthquake. The land surface was uplifted gradually by several centimeters in extensional jogs, whereas it subsided in compressional jogs. The pattern and rate of deformation can be explained by influx of fluids in extended regions and draining of overpressured fluids in compressed regions.

■

Cold-blooded noses

Endotherms generally have high metabolic rates and often have broad nasal passages to accommodate high rates of lung ventilation. Ruben *et al.* (p. 1204) examined skulls of various dinosaur fossils and show that, like modern ectotherms, they had narrow nasal passages and lacked a respiratory turbenate, a structure that increases surface area in the nasal passages in birds and mammals.

■

Plant histories

Inferences can be made about the evolutionary history of a biological population from its fossil record or from the genome of living relatives. Richman *et al.* (p. 1212) have added a new way to draw information out of extant genomes. Analysis of the complex self-incompatibility locus of flowering plants, maintained by balancing selection, shows that traces of ancient population bottlenecks can be inferred from the sequence of existing alleles.

■

Estrogen responses

Decreases in estrogen contributes to bone loss and cardiovascular disease in postmenopausal women. Some drugs like raloxifene antagonize the action of estrogen in reproductive tissue but actually mimic the effects of estrogen in bone and other tissues. In reproductive tissues, the estrogen receptor binds to DNA sequences known as estrogen response elements (EREs) and enhances transcription of target genes. Yang *et al.* (p. 1222; see the news story by Pennisi, p. 1171) studied regulation of the transforming growth factor–β3 (TGF-β3) gene, which is regulated in an estrogen receptor–dependent manner in bone cells. They present evidence for the existence of a distinct response element (the raloxifene response element, or RRE) in the TGF-β3 gene that is activated more effectively by raloxifene than by the endogenous hormone 17β-estradiol (E2). Although E2 acts through the ERE in reproductive tissues, raloxifene and endogenous estrogen metabolites other than E2 may produce tissue-specific responses through the RRE.

Guides for RNA editing

In trypanosomes, most of the pre–messenger RNA (mRNA) in the mitochondria undergo RNA editing. To form a mature functional mRNA, uridylate (U) residues are both inserted and deleted at precise locations in the primary transcripts. Kable *et al.* (p. 1189; see the Perspective by Sollner-Webb, p. 1182) have elucidated the mechanism for U addition in *Trypanosoma brucei*. Editing is controlled by guide RNAs (gRNAs), short RNAs that are complementary to the edited sequences, that direct endonuclease cleavage of the mRNAs. The upstream cleavage product adds U residues from free uridine triphosphate, and the mRNA halves are then religated. The reaction does not utilize transesterification, as previously thought.

■

Do as I say...

During neurogenesis in *Drosophila*, the developing neural cell prevents its neighbors from also realizing their neural potential through a process called lateral inhibition. Rooke *et al.* (p. 1227) have characterized a new gene, *kuzbanian* (*kuz*), that is required for lateral inhibition. The *kuz* gene is required for cells to receive the inhibitory signal from the emerging neural cell, and is also required for a positive signal from the cells that neighbor the neuron for the development of the neuron.

■

Hormone sensitive

The plant hormone abscisic acid regulates various developmental and physiological responses. Cutler *et al.* (p. 1239) have identified gene mutations that confer enhanced sensitivity to abscisic acid. The gene encodes a protein farnesyl transferase, suggesting that farnesylation is a required step in regulating sensitivity to abscisic acid.

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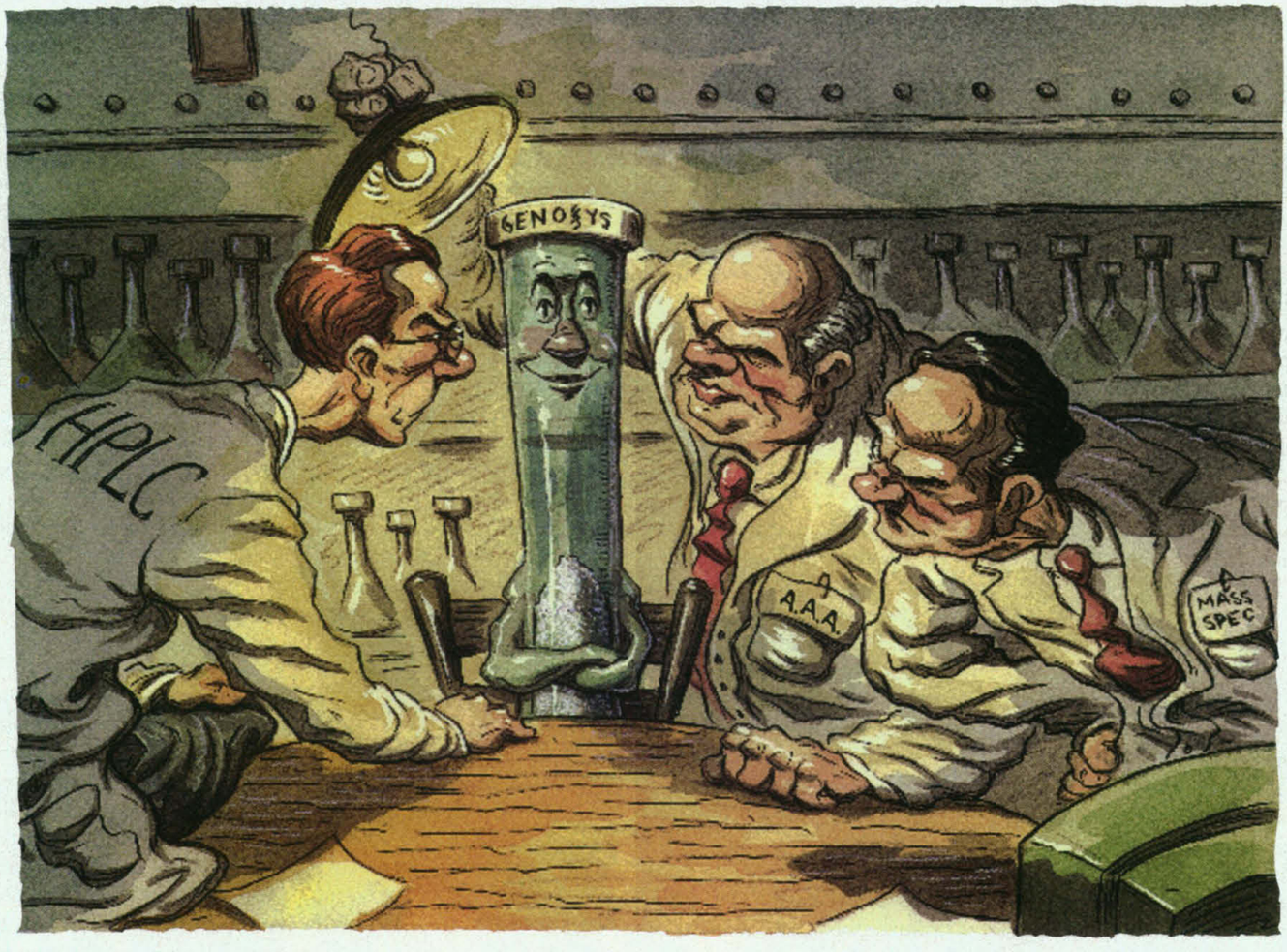

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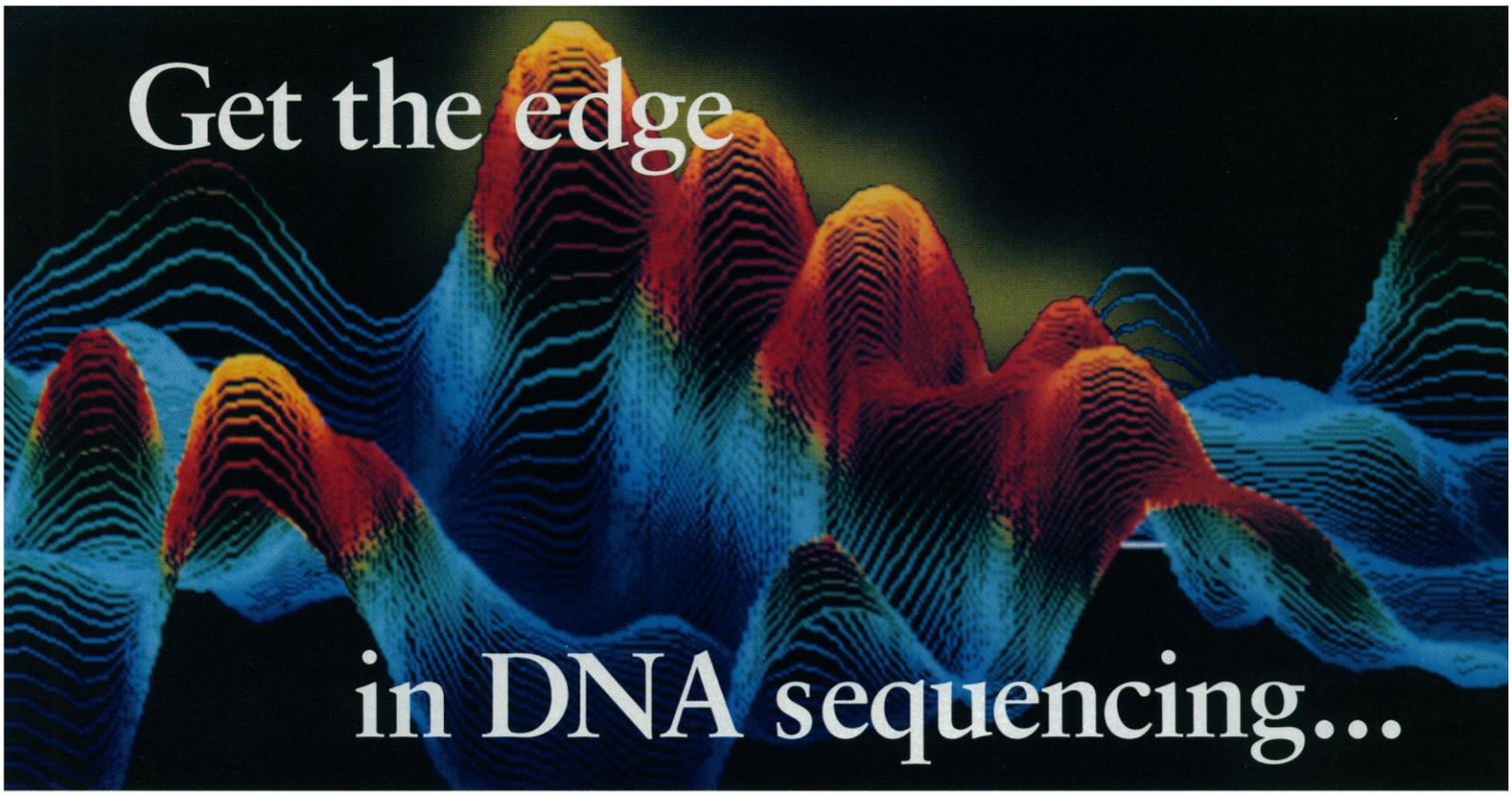

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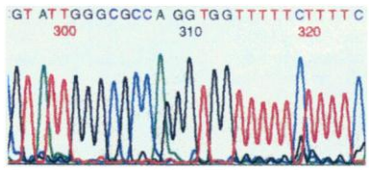

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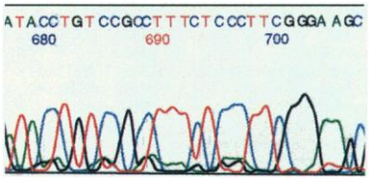

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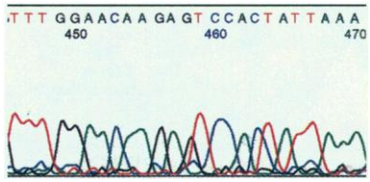

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1. *Proc. Natl. Acad. Sci., USA*, 92, pp. 6339-6343, (1995).
2. *Proc. Natl. Acad. Sci., USA*, 92, pp. 4347-4351, (1995).

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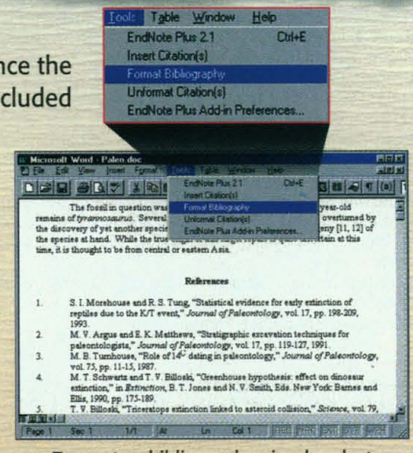

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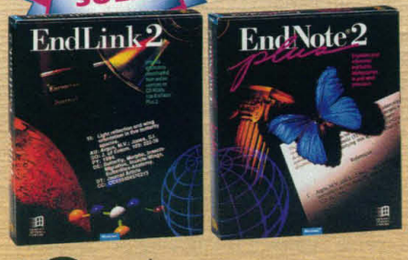

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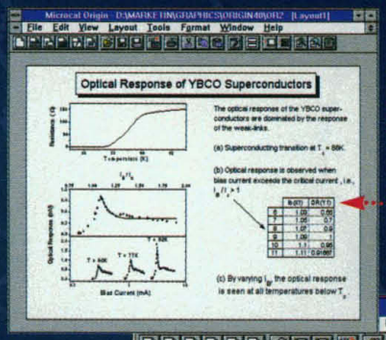

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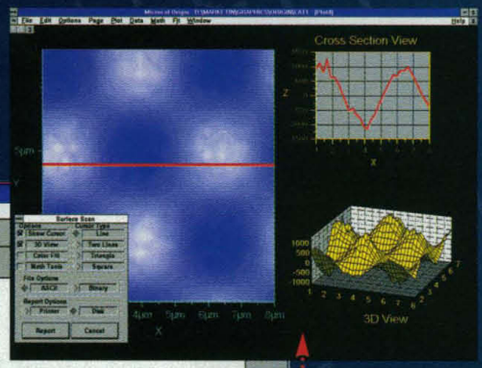
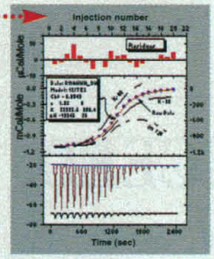
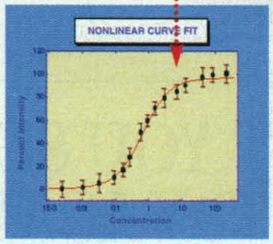


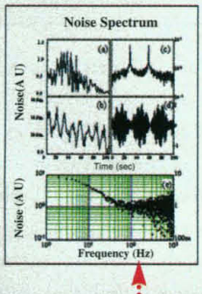
Origin Professional
Allows you to develop custom applications using floating toolbars, import custom data, and incorporate your own programs into Origin.

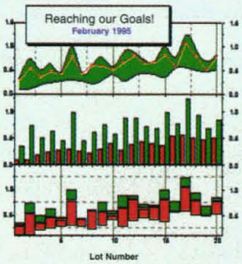
Multiple Graphs
Link axes in layered graphs. Change an axis on any graph; Origin automatically adjusts the rest.





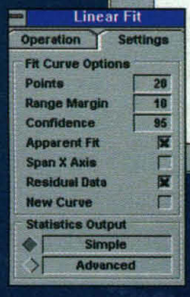
Analysis Toolbars
Simplify and provide clutter-free access to all data analysis options.





	Frequency(X)	Real(Y)	Imaginary(Y)
122579	-0.11719	-0.03269	-0.03319
122580	-0.11621	-0.06133	0.00793
122581	-0.11523	-0.03848	-0.02648
122582	-0.11426	0.03334	-0.07753
122583	-0.11328	-0.1742	0.10537
122584	-0.1123	0.03151	-0.01051
122585	-0.11133	-0.11266	-0.01934
122586	-0.11035	-0.06004	0.04655
122587	-0.10938	-0.00731	-0.06576
122588	-0.1084	-0.09003	-0.01351
122589	-0.10742	-0.09911	0.04363
122590	-0.10645	-0.02052	0.0267
122591	-0.10547	-0.0284	0.0151
122592	-0.10449	-0.14379	0.02807
122593	-0.10352	-0.0685	0.10832
122594	-0.10254	-0.11882	0.02946

Large Datasets
Unrestricted number of data points in a column.



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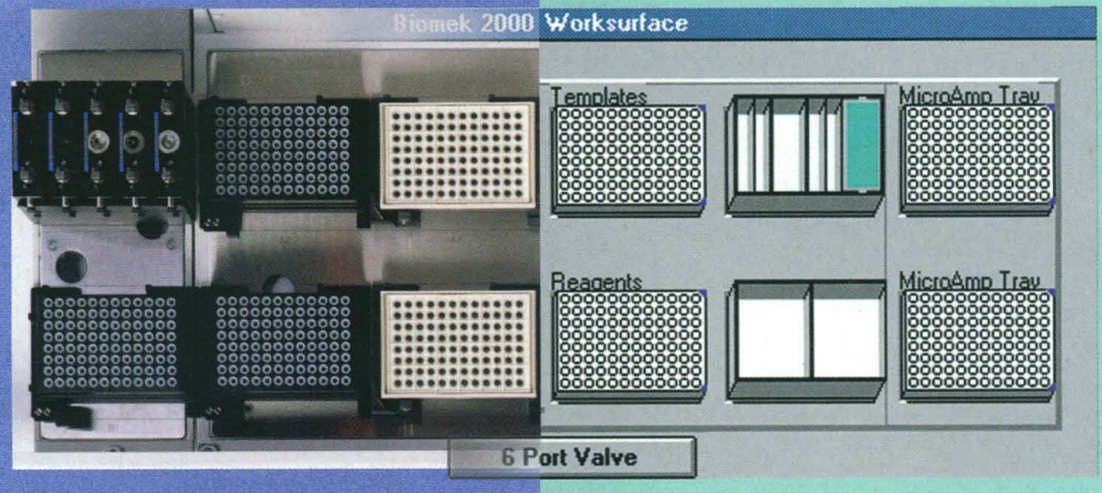

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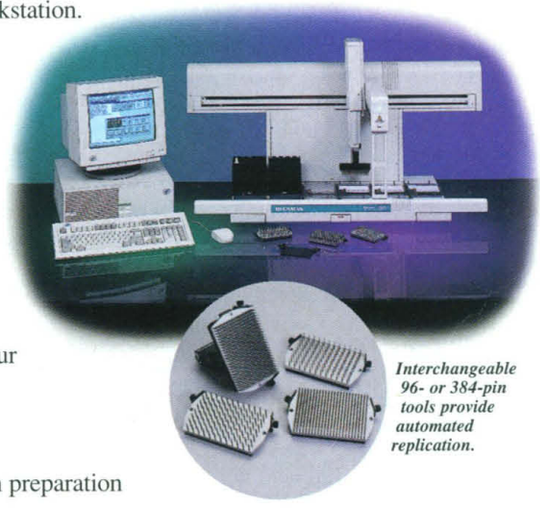

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