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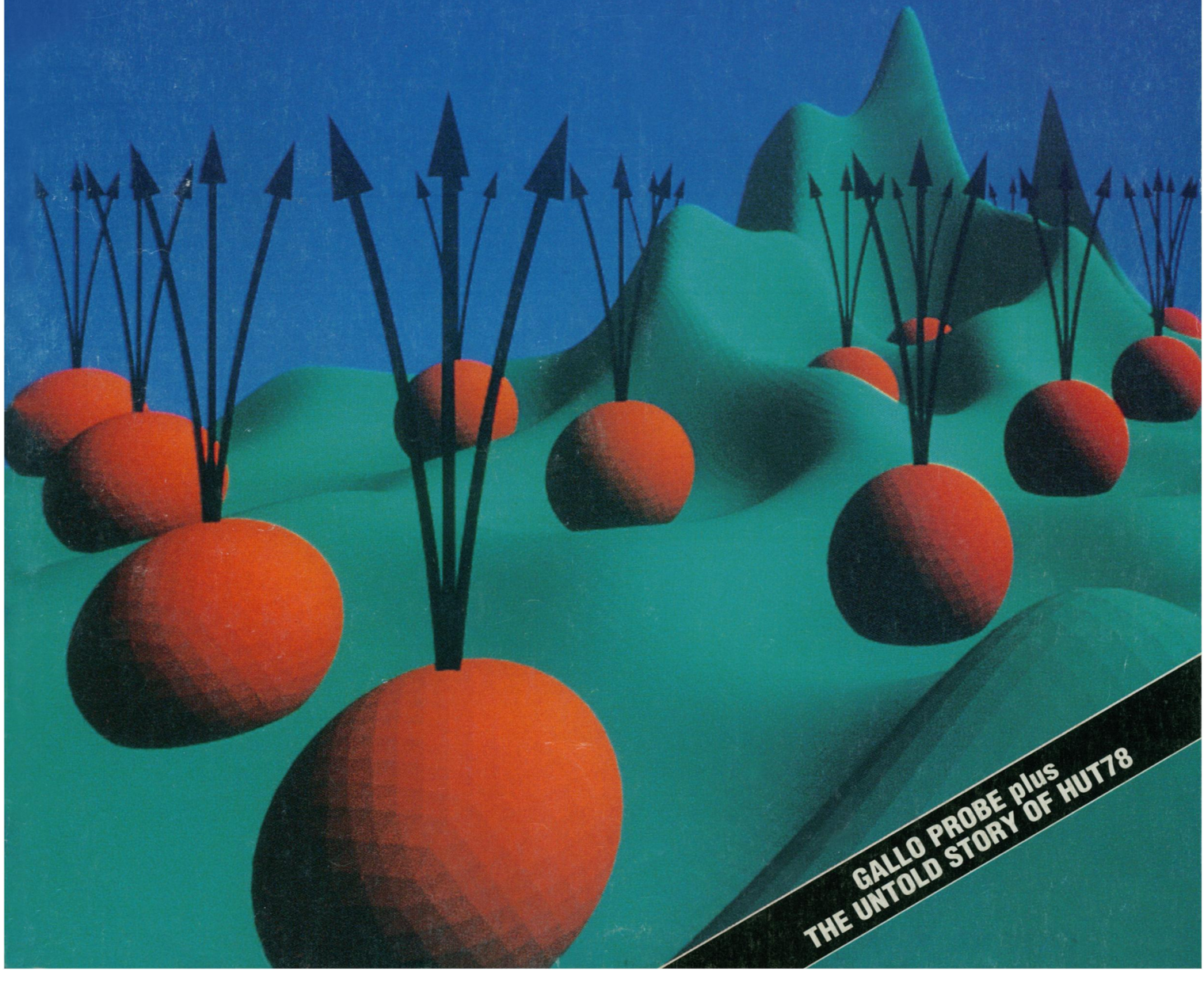

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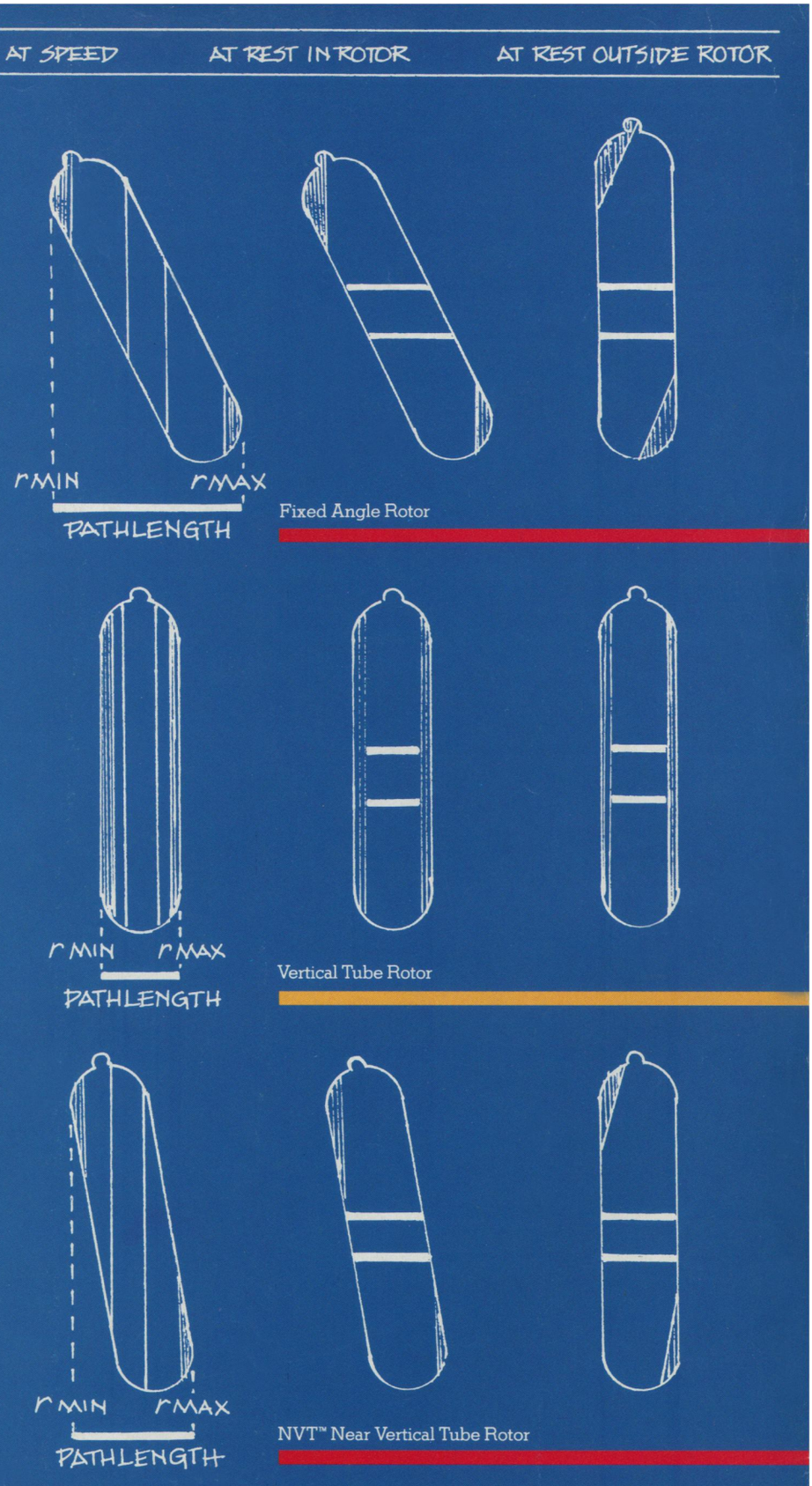

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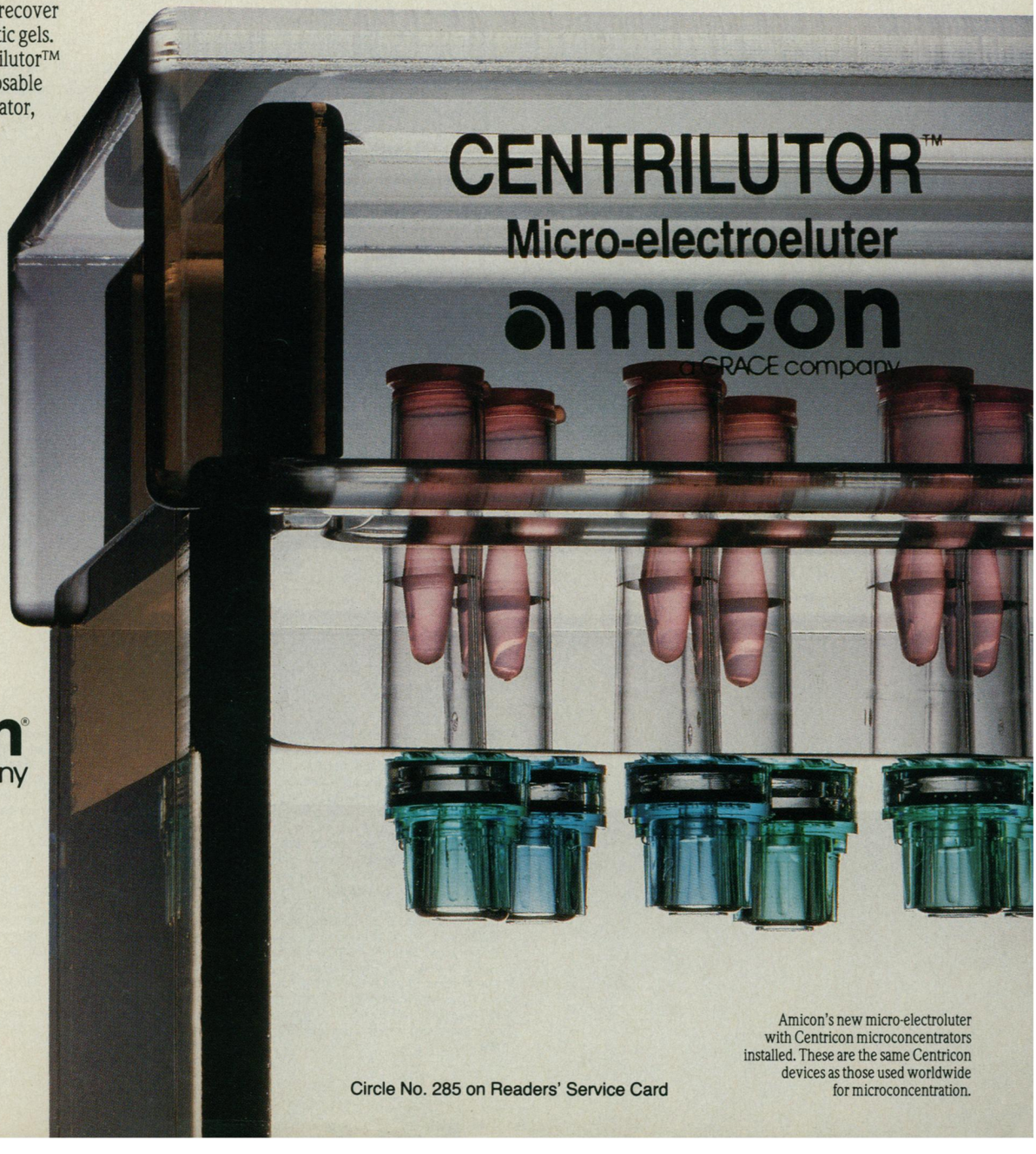

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■ The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objectives are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, to advance education in science, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

COVER Pictorial representation of the many-particle state underlying the fractional quantum Hall effect, occurring in two-dimensional electron gases at high magnetic field. The height of the green landscape gives the probability of finding any single electron in relation to its companions (red balls) and to the flux lines (arrows) of the magnetic field. See page 1510. [Illustration courtesy of T. S. Duff and T. Kovacs, AT&T Bell Laboratories]

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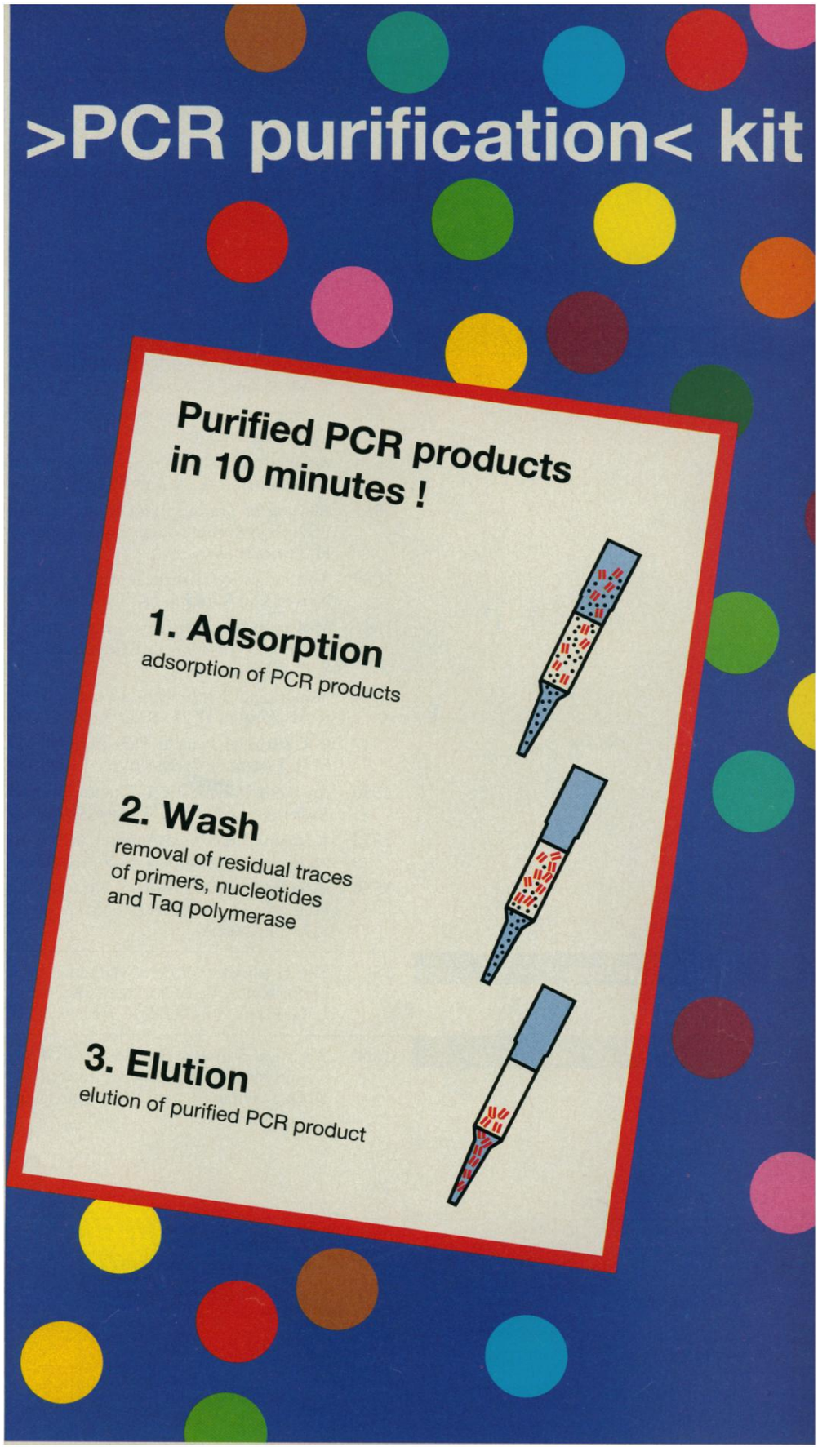

* The Polymerase Chain Reaction (PCR) is covered by U.S. Patent No. 4.683.202 issued to Cetus Corporation. Patents are pending in other countries.

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This Week in SCIENCE

Gallo probe

STRONG accusations have been made against Robert Gallo: he has been accused of taking more credit than he deserves for the discovery and cultivation of the AIDS virus. The National Institutes of Health is in the midst of a detailed "preliminary inquiry" into issues such as where the virus came from, whose cell line was used to propagate the virus, and whether the suspect procedures and data were intended to be fraudulent or were merely sloppy, unconventional, or reflections of unusual circumstances. Culliton provides inside information on the inquiry and Rubinstein tells the story of the cell line (pages 1494 to 1507).

Recombination machinery

PROTEINS in the immune system—the immunoglobulins and T cell receptors—bind to many different foreign substances. Binding is effected by diverse combining regions, and these are generated in part by recombination of a small number of gene segments called V, J, and D. The "recombinase machinery" that assembles the V(D)J genes in lymphoid cells is complex and still largely uncharacterized. One gene, recombination activating gene (RAG-1), was previously identified, and now a second gene, RAG-2, has been studied by Oettinger *et al.* (page 1517). The two genes are adjacent on the mouse chromosome, act synergistically to promote recombination, and as a pair are necessary and sufficient for recombinase activity. Both are highly conserved in animal species that carry out V(D)J recombination, and they can cooperate across species lines. This couplet may encode parts of a regulatory or catalytic molecule or two separate ones.

Contact binary

ASTEROID 1989 PB is a "contact binary" that may have formed following a gentle collision of two objects. Radar images of this asteroid, which is the first kilometer-sized object in the solar system for which images have been made, were obtained in 1989 at Arecibo when the asteroid was close to the earth (page 1523). The bifurcated structure consists of two lobes that are either in direct contact or separated by no more than 100 meters. This asteroid appears to be an S-class near-earth asteroid, similar mineralogically to stony iron or ordinary chondritic meteorites. It is the first example of a solid double astronomical object, and it will be interesting to now determine whether contact-binary asteroids are common or rare. If contact binaries are common, it becomes easier to understand how paired impact craters that exist on both the earth and moon came into being. Doublets could be the first stages in the growth of solar system bodies, examples of accretion in action. If low velocity collisions are involved in the formation of contact binaries, they might also be responsible for delivering such asteroids to the inner solar system.

Cosmogenic geochronometer

THE dating of glacial moraines (rocky deposits left by glaciers) has been tricky. These and other glacial landforms contain old rocks that were moved to new locations, but conventional dating techniques reveal when rocks formed or cooled but not when they were repositioned. When rocks are exposed at the earth's surface and no longer shielded from cosmic rays, various cosmogenic reactions can occur that result in the generation of ^{36}Cl. From measurements of accumulated ^{36}Cl it is possible to calculate the lapsed time since the glaciers melted and the rocks surfaced (page 1529). Phillips *et al.* tested the method in Bloody Canyon in the eastern Sierra Nevada Mountains and identified six episodes of glacial advance in the past 200,000 years. The dates for mountain glaciers match those obtained for continental ice sheets, but the data lead to different estimates of the length of time that glaciation occurred and the speed of transitions from glacial to interglacial periods.

Alkaloid synthesis: copying nature

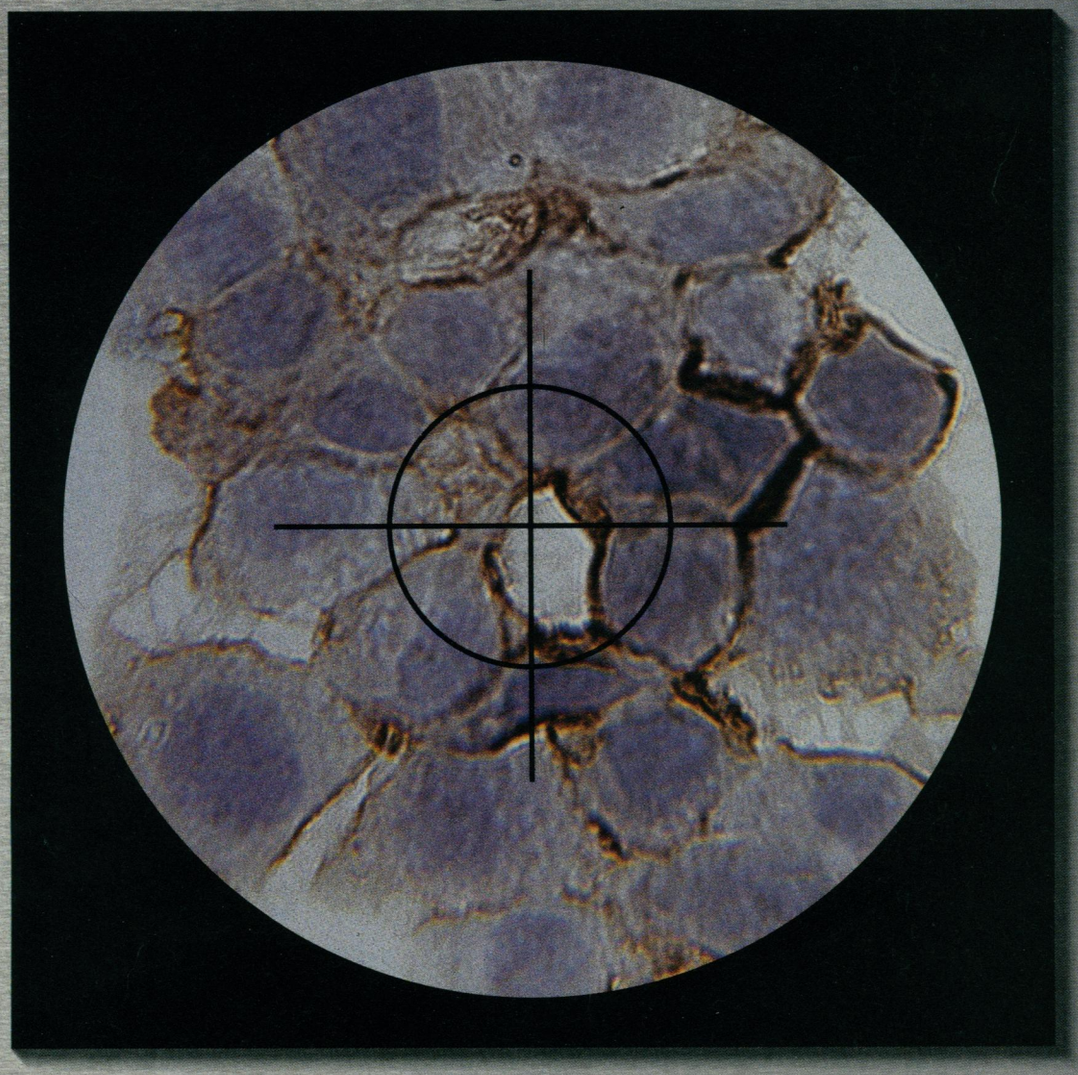
A family of alkaloids derived from squalene ($C_{30}H_{50}$) is produced by the oriental deciduous tree Yuzuriha. It is thought that a common intermediate in the production of these alkaloids is *proto*-daphniphylline, a complex compound that includes five rings. Piettre and Heathcock have devised a straightforward synthetic procedure for making *proto*-daphniphylline that probably mimics the biological synthetic pathway (page 1532). With straight-chain dialdehydes and simple reagents—potassium hydroxide, ammonia, and acetic acid—six σ bonds form to produce the five rings. This compound and related complex organic variations of the *proto*-daphniphylline theme will be useful in studies of how alkaloid biosynthesis proceeds in nature and could also facilitate the production of novel synthetic alkaloids that may have uses in both the laboratory and clinic.

Neurophysiology of attention

IF a person is asked to pay attention to the color of an object or to its shape or to how it moves, the flow of blood in the brain (a proxy for neuronal activity) predictably switches to different brain regions; this has been documented with positron emission tomography (PET) of the brain's extrastriate visual cortex (page 1556). Subjects fixated on a spot and then observed two similar or identical visual stimuli; the stimuli were presented 200 milliseconds apart for 400 milliseconds each. Corbetta *et al.* report that distinctive and different patterns of brain activity were induced as subjects paid attention to shape or color or motion, and the relations of structure to function in the human brain proved similar to those previously observed in brains of macaques. The exquisite sensitivity of advanced PET procedures should be useful for localizing other brain activities to distinctive brain regions.

■ RUTH LEVY GUYER

Stalking Cancer



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The Principle

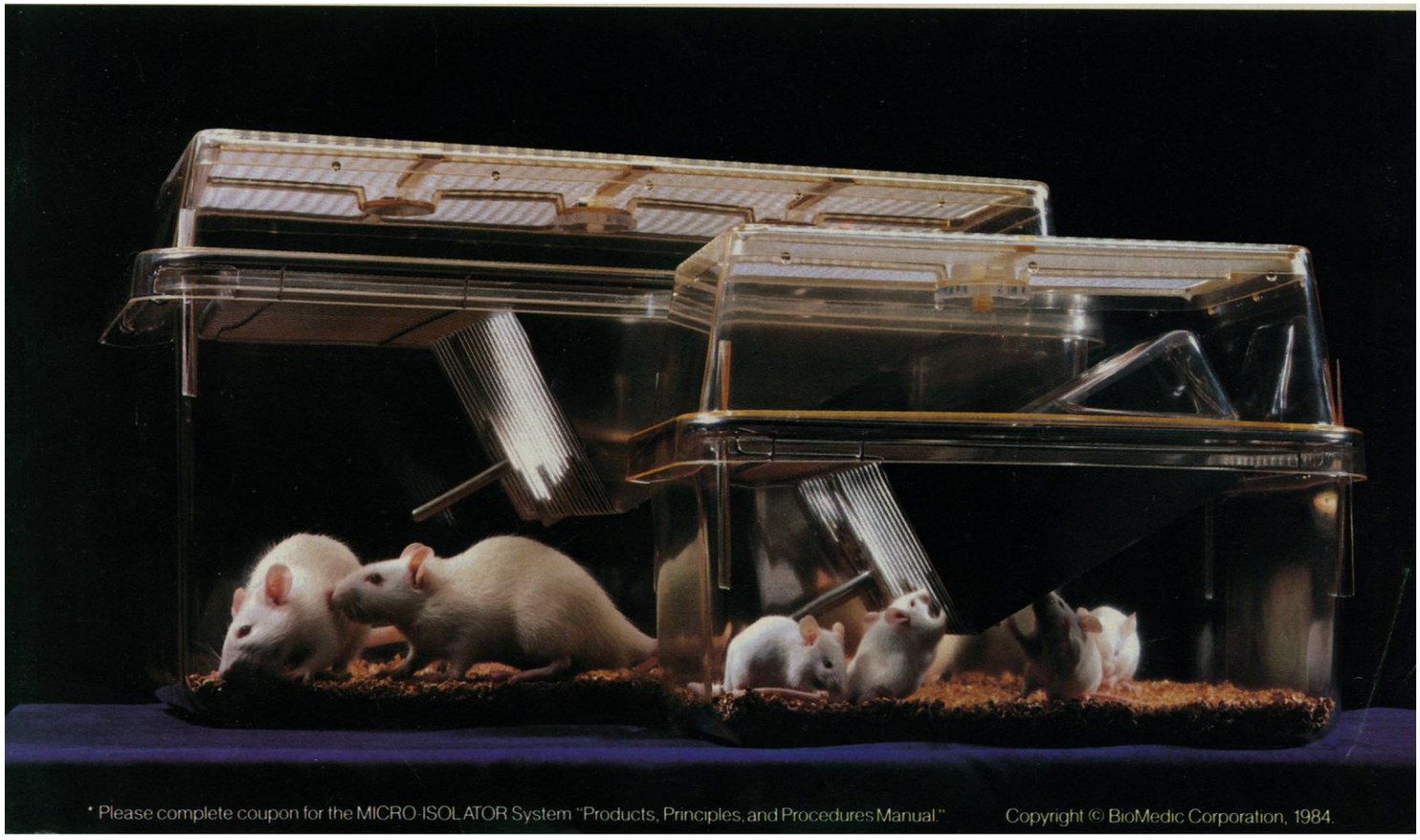
In effect, the MICRO-ISOLATOR System involves the use of durable filter-topped cages that function as "giant Petri dishes," which are only opened within a Class 100 workbench by personnel who observe aseptic technique at all times.* There are many benefits to this unique miniaturization strategy. For example, animals from multiple sources with different microbiological profiles have been housed in the same room without cross contamination. Likewise, investigators can experimentally infect animals in different MICRO-ISOLATORS within the same room without interfering with one another's research... and all of this can be accomplished without the inconvenience of requiring personnel to shower into or out of the room. Also, since all manipulations are conducted in a Class 100 workbench, individuals allergic to animals are protected from dander and therefore are able to work in comfort.

The complete MICRO-ISOLATOR System consists of the individual MICRO-ISOLATOR housing units, the STAY-CLEAN™ Laminar Flow Workbench, and the service cart.

The MICRO-ISOLATOR Units

This system consists of an autoclavable plastic cage and plastic filter frame with a static filter (now designed for rapid replacement of the filter material), plus the usual cage accessories. The plastic filter frame overlaps the bottom portion of the cage and effectively forms a giant Petri dish-like structure. Result: there is an effective protection against microbial contamination while still allowing for substantial gaseous interchange. The MICRO-ISOLATOR is, in other words, a protected microenvironment within any insect-controlled macroenvironment.

MICRO-ISOLATOR units, fabricated of autoclavable plastic material, are now available for mice, rats, hamsters, and guinea pigs.



* Please complete coupon for the MICRO-ISOLATOR System "Products, Principles, and Procedures Manual."

The Service Cart

The service cart completes the MICRO-ISOLATOR System by simplifying the movement of all necessary supplies to the laminar flow workbench for servicing the MICRO-ISOLATOR units.

For More Information

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Patents applied for on the MICRO-ISOLATOR units and other elements of the complete system.

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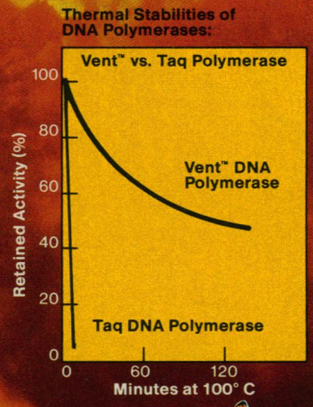

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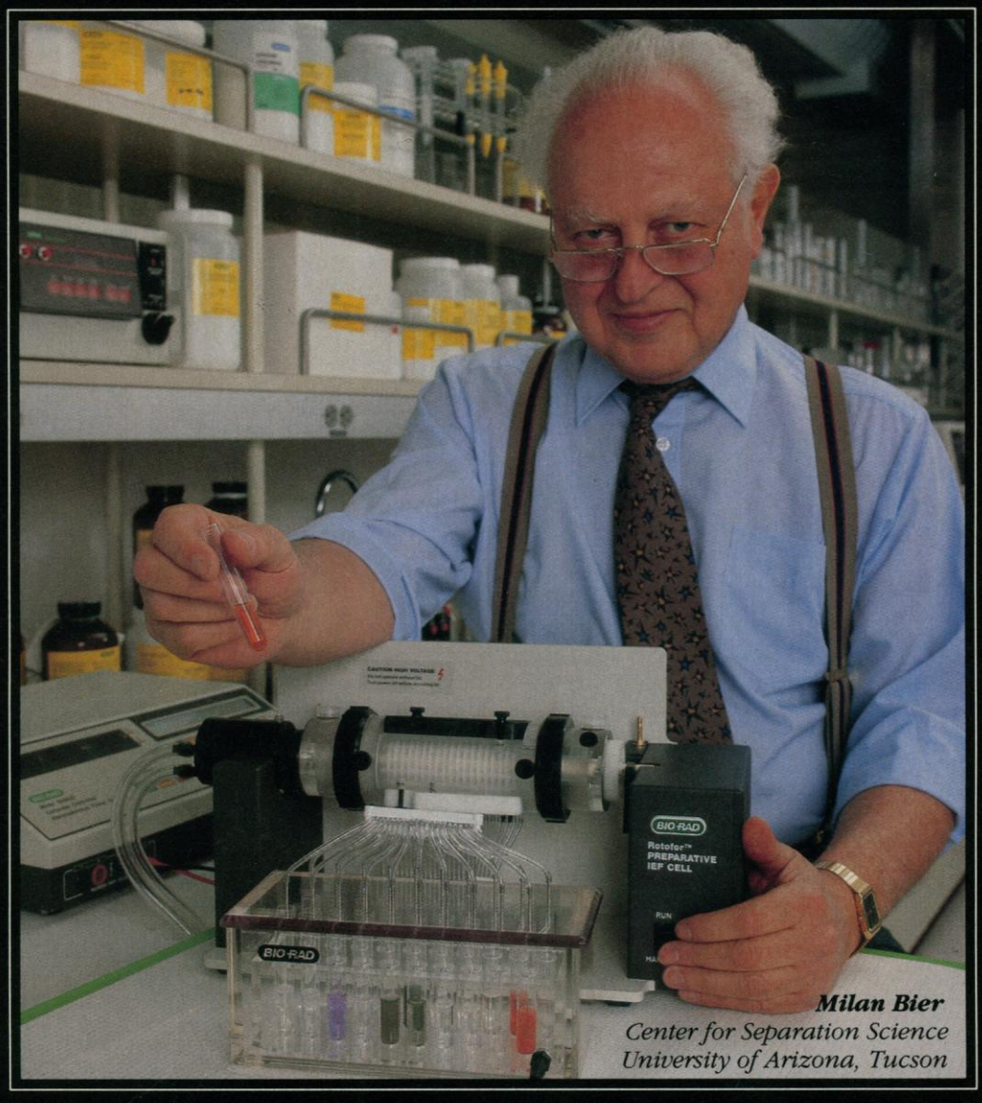

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Figure 1. Infected Sf9 insect cells showing viral occlusions.

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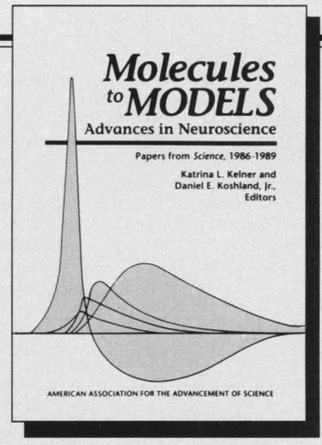
Luckow, V. and Summers, M. (1988) Biotechnology 6, 47-55

New from AAAS

Molecules to Models

Advances in Neuroscience

Edited by Katrina L. Kelner and Daniel E. Koshland, Jr.



This collection of current *Science* magazine articles in the neurosciences provides a comprehensive survey of the entire field. It is especially valuable for graduate students who want to gain a broad understanding of the neurosciences, and for neuroscientists who want to learn more about other areas of these disciplines. Contributors include William A. Catterall, Joseph B. Martin, Corey S. Goodman, Michael I. Posner, Terrence J. Sejnowski, Stephen G. Lisberger, Larry R. Squire, and many other well-known specialists in the field.

1989; 464 pp.; fully indexed and illustrated; color plates
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III. Learning and Memory: Biochemistry of information storage in the nervous system; long-term synaptic potentiation; the neural basis for learning simple motor skills; neurobiology of learning and memory; mechanisms of memory.

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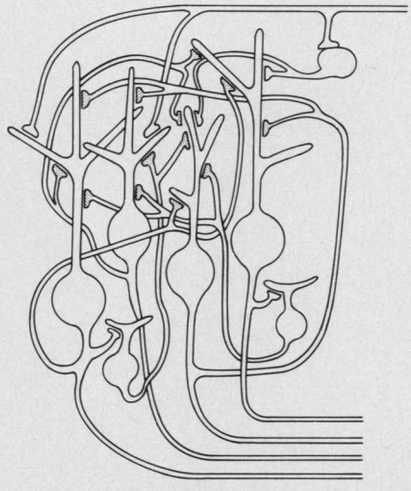

"Anatomy" of a simple model neural circuit, from the chapter "Computing with Neural Circuits: A Model," by John J. Hopfield and David W. Tank.

V. Neural Modeling: Computing with neural circuits—a model; dynamic pattern generation in behavioral and neural systems; neural model of adaptive hand-eye coordination for single postures; parallel integration of vision modules; synthesizing a color algorithm from examples; inversion of sensory processing by feedback pathways—a model of visual cognitive functions; computational neuroscience; perspectives on cognitive neuroscience.

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