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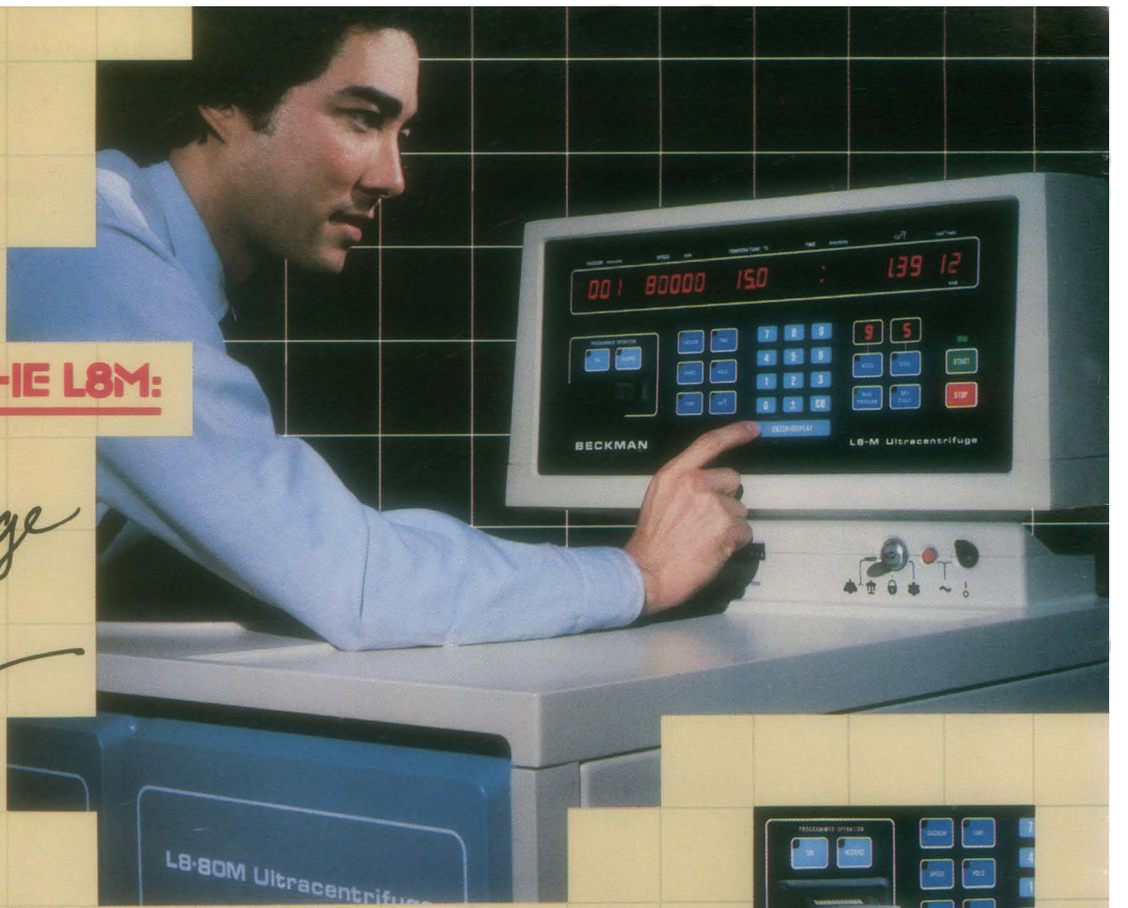

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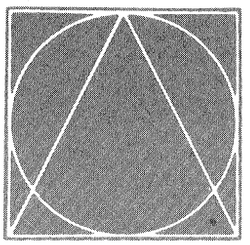
COVER

Eruption of Kilauea volcano (March 1983) on the East Rift zone near Puu Kamoamoa on the eastern border of the Hawaiian Volcano National Park. See page 1118. [J. D. Briggs, U.S. Geological Survey, Hawaiian Volcano Observatory]



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Tues: **APPLICATIONS OF MONOCLONAL ANTIBODIES IN BASIC BIOMEDICAL RESEARCH.** Virus Receptors on Somatic and Immune Cells, *Mark Greene*; Dissecting the Reovirus Hemagglutinin, *Bernard Fields*; Molecular Probes for the Nervous System, *Colin Barnstable*; The Cytoskeleton in Cancer Cells, *Lan Bo Chen*; Studies on Parasites, *Diane Pratt*; Probes for Variants in DNA Structure, *David Stollar*; Monoclonal Autoantibodies, *Robert Schwartz*

Wed: **USES OF ANTIBODIES IN RECOMBINANT DNA TECHNOLOGY.** Cell Surface Antigens: Antibodies and Genes, *Jonathan Seidman*; Separation of HLA Antigens and Cloning of the Genes, *Jack Strominger*; Cloning Surface Antigen Genes by Transfection and Cell Sorting, *Frank Ruddle*; Immune Detection of cDNA-*lac* Fusion Products, *Tom St. John*; Identification, Synthesis, and Cloning of Protective Epitopes in Malaria, *Victor Nussenzweig*; Site-Directed Antibodies Elicited to Synthetic Peptides, *Brian Schaffhausen*

Thurs: **MONOCLONAL ANTIBODIES IN DIAGNOSIS AND THERAPY.** Human Overview, *Stuart Schlossman*; Human T Cell Receptor, *Ellis Reinherz*; Diagnosis of Acute Leukemias, *James Griffin*; Monoclonal Antibodies in Serotherapy and Bone Marrow Transplantation, *Jerome Ritz*; Manipulation of T Cell Populations to Abrogate Allograft Rejection, *Charles Carpenter*; Monoclonal Antibodies in Imaging, Radioimmunoassay and In Vivo Detoxification, *Edgar Haber*

Fri: **T CELL CLONES, HYBRIDOMAS AND PRODUCTS.** Function of Cloned Human T Cells, *Steven Burakoff*; Cloning of Murine T Cells, *Gary Nabel*; Functional T Cell Hybridomas, *Kenneth Rock*; Lymphokines in Macrophage–T Cell Interaction, *David Beller*; Molecular and Functional Characteristics of the Interleukins, *Kendall Smith*

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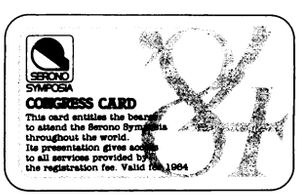

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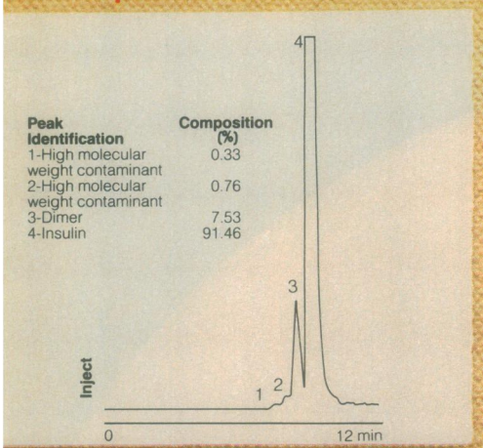

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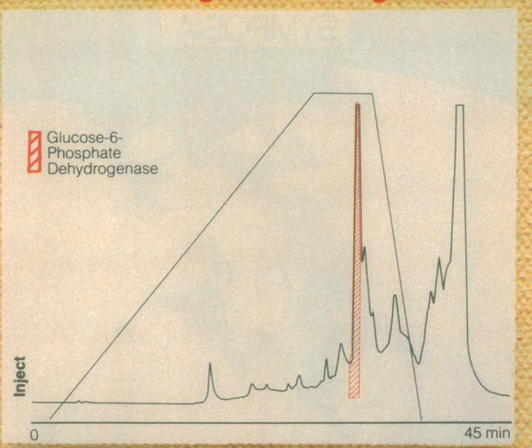
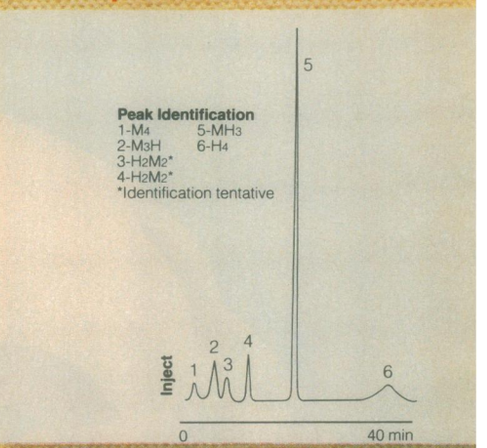


High resolution hydrophobic ion exchange separation of isoenzymes.



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Eluent B: 0.02M Tris Acetate, pH 8.0
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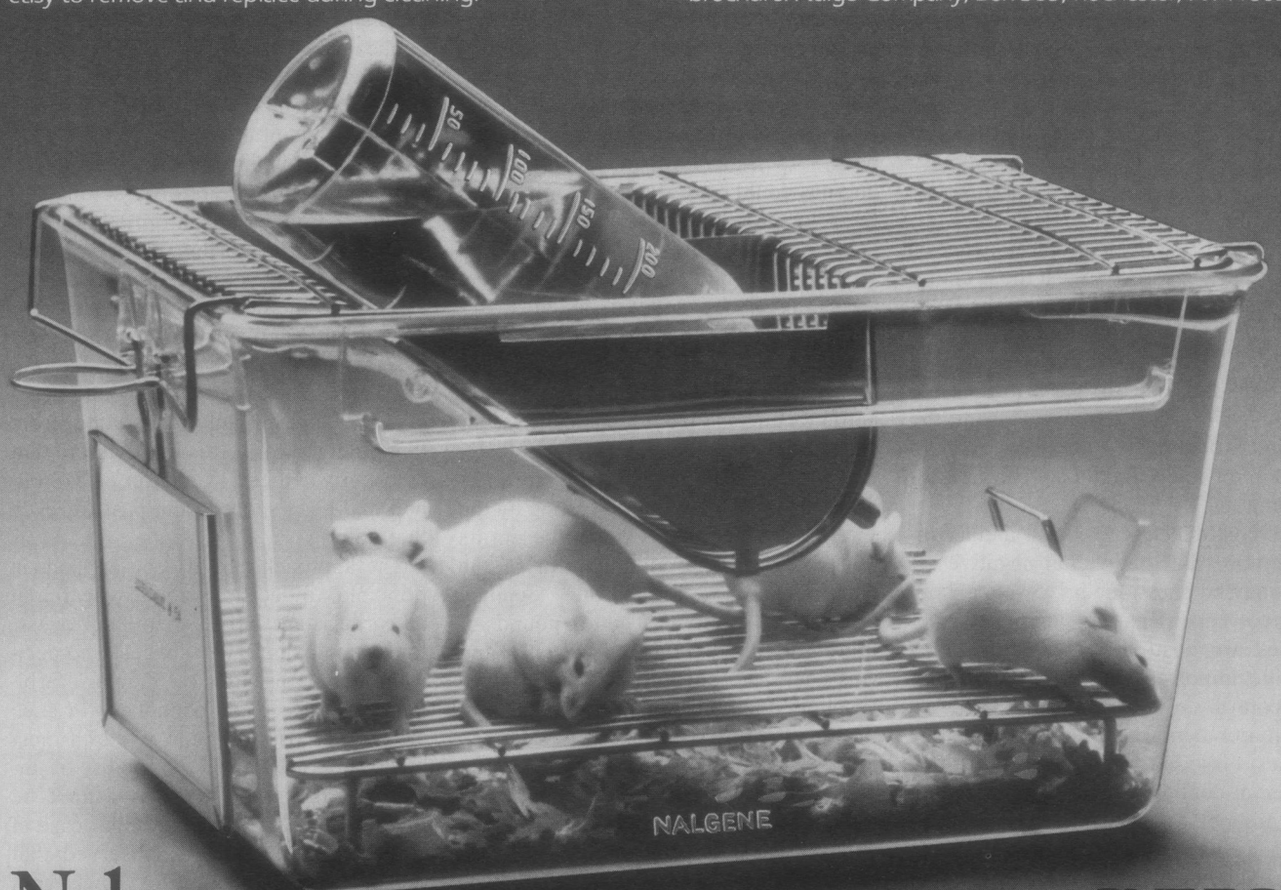

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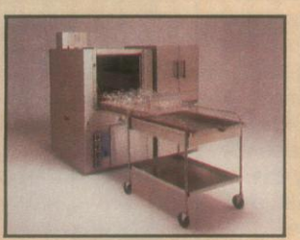

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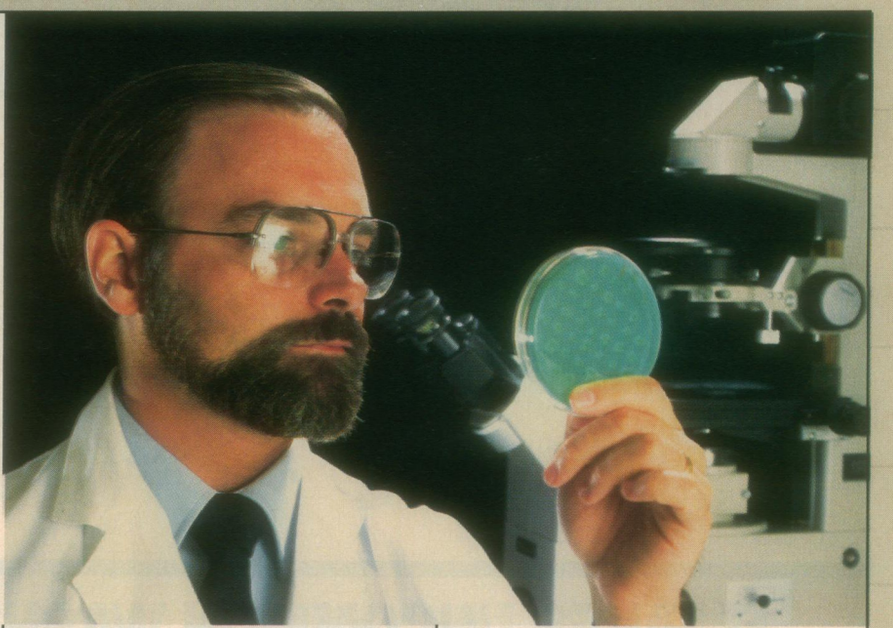

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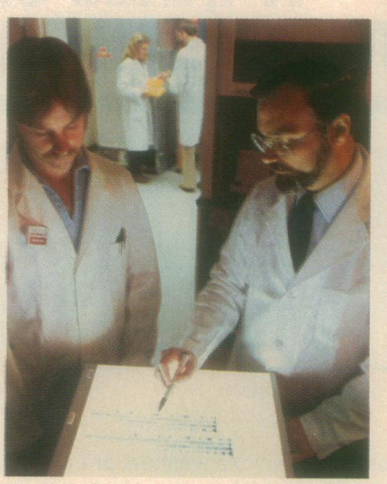

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sively increasing the prior probabilities of success along the way. In retrospect, adding an expenditure of $\$18 \times 10^6$ on β-carotene research (Bailey's estimate) to the $\$4 \times 10^6$ for the trial still leaves the enterprise looking extremely cost-effective, even if the only benefit of that research had been to identify β-carotene as a potential human anticarcinogen.

As stated in my article, I agree with Rall's observation that bioassays may have value in developing a scientific database for future priority-setting. I would take issue only with his conclusion that testing is, therefore, "necessary." Priorities do need to be set, and we must not lose sight of the primary objective of protecting the public health. In the same vein, I agree that negative studies may have value, but urge only that we be explicit that the value of such study results is "confidence" or reassurance and not cancer prevention. Indeed, one advantage of an explicit approach to priority-setting is to reveal the value judgments and beliefs that motivate a decision to perform any given study.

The fact that β-carotene is one of only a few dietary constituents that are ready for trials does not diminish the conclusion about the cost-effectiveness of that trial. Certainly I am not prepared to argue that all such trials of dietary constituents would be as cost-effective. However, recent epidemiologic and laboratory findings do suggest that rather large investments in applied research on dietary agents are likely to be cost-effective (*1*).

By the same token, the bioassay of *p*-dichlorobenzene may not be the most cost-effective among all those of industrial chemicals. However, the dichlorobenzenes, not toluene, were selected by the EPA from among the first set of nominees by the Interagency Testing Committee to be the subject of the first draft testing rules advanced by EPA. (No draft rules have yet been made final.)

As for the particular estimates of the percent reduction in cancer mortality with β-carotene, I stand by my estimates as consistent with Peto's review (17 of 20 studies he reviewed found relative risk of 1.3 or greater in the target organs examined) and subsequent studies. One advantage of my proposed approach is that it invites those who have different judgments to enter those in the model. Nonetheless, as demonstrated by the sensitivity analysis in my article, even if the estimates of cancer reduction were believed to be overstated by a factor of 2, 3, or more, the basic conclusions of the analysis would stand. Indeed, if β-carotene reduces cancer mortality by only a few percent, the major drawback to the trial would not be the size of its potential health impact (which would still be great) but its ability to detect such a small relative mortality difference.

The model is intended to be a guide to decision-making in the face of uncertainty and resource constraints, not a source of scientific truth. Thus, its conclusions in any particular instance should not be regarded as cast in stone and may change as new data become known. Moreover, scientists may disagree about the estimates entering into the model. (For example, it is my personal judgment that, absent any particular structure-activity hypothesis or ominous short-term test results, the prior probability that *p*-dichlorobenzene is a human carcinogen is not more than 10 percent. Rall's opinion is different and should be reflected in his use of the model.) What is important is that these underlying judgments be made explicit and debated openly in the priority-setting process. I am delighted that this model has already begun to stimulate such explicit, open discussion.

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The Cover's Message

I couldn't disagree more with James C. Nofziger (Letters, 4 Nov., p. 456): I had no trouble distinguishing the message in the cover of 23 September from the burden of the article by Bruce N. Ames (23 Sept., p. 1256). The cover, crudely literated, says, "there are interesting, surprising, and paradoxical relationships between eating and dying." In its present context, it also says, "to learn about some of them, look in this magazine." I think this is a fine way for a cover to function, even on a scientifically objective journal.

More generally, I think your covers are often remarkably witty and subtle (wit and subtlety are important to good science), especially the last two Halloween covers and last year's Christmas cover.

MICHAEL O'HARE
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Bypassing Peer Review for Scientific Facilities

In the past several months the number of universities making direct appeals to Congress for funds to construct scientific capital facilities has grown to nine. Such tactics allow the schools to bypass peer review from the scientific community and the prospective funding agency. In a tenth instance, universities engaged in political lobbying to have their proposal for an accelerator approved after a scientific review panel had recommended that of another group. Administrators at still another university sought and supported a recommendation to Congress to house two major research activities at their institution. The universities engaged in these efforts are both public and private. In their quest for money, some have hired professional lobbyists; all have exerted pressure through political constituencies. And members of Congress have been encouraged to consider scientific facilities as appropriate objects for pork barrel politics. Congress has responded promptly and favorably, sometimes approving funds without debate or review by committees.

Why look a gift horse in the mouth? For more than a decade university administrators have been unable to respond adequately to the appeals from their scientist to replace outmoded instrumentation and to construct the facilities needed to support new scientific developments. They have watched as their promising graduates and many on their science and engineering faculty have been captured by industry, and they are concerned that training in science and engineering will lose its creativity and innovation. The need for renewed government support for construction and renovation of research facilities is clear.

If, however, government money is awarded to universities as a result of success in a competition for political influence instead of as a reward for success in an open competition for scientific merit, the independence and preeminence of American science could be eroded. Decisions about the placement of sophisticated facilities and instrumentation require that assumptions be made about the productivity and creativity of those who will have access to them. Chances for excellence in scientific endeavors depend on the following:

- Good scientific leadership and a skilled technical support staff,
- Resources available in other departments and schools in a university,
- Opportunities for cooperation with scientists in other universities and in industry, and
- Judgment about the value of the contemplated research compared with alternative uses for funds.

Scientific reviews conducted by funding agencies and the scrutiny of the Office of Management and Budget of funding requests before they are brought to Congress have provided a sound base for the most productive use of taxpayer funds. Special pleading by universities and their professional lobbying agents will not. The Association of American Universities, the Association of State Universities and Land Grant Colleges, the council of the National Academy of Sciences, and the president of the American Physical Society have urged that facilities and instrumentation as well as research proposals continue to be subject to peer review.

Scientists should look carefully at the methods they use or condone in seeking funds. Political favors are by nature based on considerations that do not give high priority to scientific merit. The best scientists may lose favor. The successes won by courting members of Congress before recommendations have been made by the scientific community may be only temporary. And they may soon be outweighed by the dangers that result from abandoning the system of peer review that has kept American science strong and capable of adjusting to change.—ERNESTINE FRIEDL, *Dean of Arts and Sciences and of Trinity College, Duke University, Durham, North Carolina 27706 and Member, Executive Committee of the National Science Board, Washington, D.C. 20550*

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