

GARFIELD AT EIGHTY

INTRODUCTION • MOST HIGHLY CITED BY KAREN HOPKIN • GARFIELD-LEDERBERG LETTERS

• EUGENE GARFIELD EDITORIALS • EUGENE GARFIELD: A DIVERTIMENTO BY PÉTER JASCÓ

EDITED BY AILEEN CONSTANS

DESIGNED BY LISA MODICA

COVER ILLUSTRATION BY ERICA P. JOHNSON

PUBLISHED BY *THE SCIENTIST*

I'm writing this after an editorial meeting for *The Scientist* with Gene Garfield and Josh Lederberg. We discussed plans for upcoming issues of the magazine and, as ever, the co-owner and editorial advisor kept me and a colleague on our toes. Such meetings are the ongoing expression of an extraordinary partnership of Garfield and Lederberg that stretches back to the late 1950s. Then, Lederberg provided Garfield with the emotional and intellectual support to develop the Institute for Scientific Information. Later, the pair collaborated on Garfield's second labor of love, *The Scientist*.

The newspaper for scientists didn't see the light of day until 1986, but Gene had dreamed it up in the early 1960s. It was no small vision: Writing about the idea in *Current Contents*, he professed to being "optimistic that my dream of weekly, twice-weekly or even daily publication will be realized."¹ This must have seemed quite mad to some at the time, but it proved prescient. In 2002, *The Scientist Daily* became a reality online. Along the way Garfield made his magazine a trailblazer in web publishing, as he has done in so many areas of intellectual and technical development.

The Scientist has consistently maintained "its own unique and lively style" and "niche in the ecology of scientific publications" as Gene demanded in 1986.¹ That's not to say that it hasn't changed dramatically over the years, as all successful publications must. The various guises of *The Scientist* are presented within this book, along with extracts from memorable "Garfieldorials."

Today, under the enthusiastic promptings of Gene and his friend and co-owner Vitek Tracz, we are taking bold steps, such as the new print and web versions launched at the turn of the year, along with a full careers site and a custom publishing division catering to the pharma and biotech market. The one certainty in working with Gene and Vitek is that innovation will always be a driver, which makes the work environment at *The Scientist* more exciting than anywhere else I've been. But it's a lot more than that. There's real pleasure and a sense of involvement and belonging when you work at this magazine, a feeling that's fostered by the owners.

On behalf of the current and previous staff of *The Scientist*, I want to express our affection, appreciation and deepest respect for "Dr. G." For his unflinching commitment to the magazine. For his support, belief and leadership over 20 years. For being accessible and inspiring to everyone who works here. And for his occasionally pointed—but always constructive—comments on copy.

We look forward to the next editorial meeting!

A handwritten signature in black ink, appearing to read "Richard Gallagher". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

Richard Gallagher, Editor

1. E. Garfield, "Introducing *The Scientist*: At last, a newspaper for the science professional," *Essays of an Information Scientist*, Vol. 9:222, 1986.

MOST HIGHLY CITED

At 80, ISI and *The Scientist* founder Eugene Garfield isn't quite finished improving information analysis.



When he was a boy, Eugene Garfield lived across the street from a branch of the New York Public Library. There, he spent hours wandering through the stacks, scanning the titles of all the books on the shelves. “I had to get special permission, because they wouldn’t let a kid in the adult section,” recalls Garfield, who turned 80 in September. That might seem “staggeringly obsessive,” in the words of one colleague, but it might explain Garfield’s interest in how to find and organize information – a fascination that has shaped his professional career.

Over the past half century, Garfield’s name has become synonymous with the field of citation analysis. “Gene is a leader in this database world we now live in, a world of ideas and information and vast networks of data,” says Baruch Blumberg, a Nobel laureate at the Fox Chase Cancer Center in Philadelphia. “The work he did analyzing references and assembling the citation index was pioneering.” Garfield’s ground-breaking contributions include *Current Contents*, a weekly compendium of the tables of contents from select scientific journals; the Science Citation Index (SCI), the place to find out who’s been referencing whom; and *The Scientist*, originally conceived as a daily newspaper of science.

EXPLOSIONS ROCK A CAREER

Garfield, who is founder and chair emeritus of the Philadelphia-based Institute for Scientific Information (ISI), began his career as a graduate student in a chemistry lab at Columbia University. “I wasn’t very good or happy,” he says. “There were a number of explosions and I was advised to look for other work.”

He found his true calling at an American Chemical Society conference where he stumbled across a subsidiary meeting of ACS’s division on chemical literature. “I heard people talking about literature searching and I found out they were making a living doing this stuff,” says Garfield. “So I went up to the chairman of the meeting and said, ‘How do you get a job in this racket?’”

Through that relationship, Garfield secured a job working on an indexing project at Johns Hopkins sponsored by the National Library of Medicine. “The indexing of medical literature at the time was archaic,” says Garfield, “and it somehow did not completely satisfy what people needed.” While searching for a solution, Garfield learned about legal citations. “In American law, precedent is what counts,” he says. “If you go into court and cite a decision, you’d better be sure that decision has been upheld and not overruled. So you go to the legal citator to find out if the case has been cited.”



For Garfield, such a citation guide was just what he was looking for. “It gave me the structure of the index I needed,” he says. “And it’s how the idea for SCI got started.” But he wasn’t quite ready to jump into such a large resource-heavy project. Instead, his first information-purveying product was *Current Contents*, a research digest whose concept was, “in retrospect, blindingly straightforward,” says Sandy Grimwade, former publisher of *The Scientist* and president of AMG Science Publishing. “You just sort of photocopy all the tables of contents of scientific journals, bundle them up into a little publication, and send it to people.”

“It was pretty much the best way to find out what was going on in scientific literature [at the time] without going to the library and digging through every single journal,” says Grimwade. “And it was a fantastically successful enterprise.”

SCI: JUST DO IT

The profits from *Current Contents* gave Garfield room to experiment with other new ventures, including his beloved SCI. The intellectual impetus for the production of the first citation index came in 1959 in the form of a letter from Joshua Lederberg, a leading geneticist who’d just taken home the 1958 Nobel Prize. Lederberg wrote to ask what had happened to Garfield’s proposal to generate a citation index, originally published in *Science* in 1955. “I wrote him a long letter back saying it’s difficult to get support,” says Garfield. “He told me how to go about applying for grants. It was that simple.”

With funding from the National Institutes of Health, and help from Lederberg and the NIH’s genetics study section, Garfield produced a *Genetics Citation Index* that covered papers published from 1958 to 1962. And he came to the realization that to be truly useful, a citation index had to be multidisciplinary, referencing articles penned by Erwin Chargaff and Erwin Schrödinger all in one place. “In the early days some of the most important articles in molecular biology were published in reviews of modern physics,” says Garfield. So along with the genetics index, Garfield compiled the first general SCI covering the significant scientific literature from 1961. “We asked NSF to print the 1961 index,” Garfield recalls. “They refused. So we took the plunge.”

The move was typical of Garfield’s general business philosophy. “Gene just forges ahead and says, ‘This is what people are going to want, so I’m going to do it,’” observes ISI chief scientist Henry Small. Not that SCI was an immediate success. “The company almost went bankrupt because of the citation



THE SCIENTIST

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Graham Faces Tough Agenda In Science Post



Congress Hikes NIH Budget

Forge Back Links



indexes,” says Garfield. It took years before SCI made a profit — perhaps, says Small, because “almost every discipline had its own indexing and abstracting service. That was the establishment.”

But scientists soon caught on to the power of SCI. “If you follow citation trails, you’re really getting a good way of retrieving current literature,” says Small. “As an extra bonus, you’re finding out what people regard as important. If something is highly cited, that becomes a marker for something significant in science. So you’re getting more bang for your buck: not only finding relevant literature, but [also] important literature.” The popular indices of the day such as *Chemical Abstracts* or *Biological Abstracts* were not designed to provide researchers with a feel for which references were key.

PASSION FOR CITATIONS

Today the databases that feed the SCI not only help researchers navigate the literature, but also allow journals to gauge the impact their papers have on the scientific community. “They don’t like to admit it,” says Garfield. “But their advertising people never fail to mention it.”

The data also opened up a new field that Garfield jokes could be called Nobelology. “Nobel-class scientists publish five or six times as many papers as the average scientist and are cited 30 to 50 times more often” – an observation that ISI uses to forecast who might be headed to Stockholm each December. 2005’s picks, issued last September, included Alfred Knudson, Bert Vogelstein, and Robert Weinberg for their work on tumor suppressor genes and Francis Collins, Eric Lander, and Craig Venter for their role in mapping and sequencing the human genome. (None of these six actually got the coveted early-morning call.)

Of course, none of these things would have been possible without Garfield’s determination. “I never saw anybody so single-mindedly focused on what he wanted to do and how he wanted to do it,” says Small.

Those entrepreneurial skills might be a product of the times in which he grew up, muses Blumberg, who, like Garfield, was born in 1925. “Living through The Great Depression, feeling that you really have to provide, to do something so that you’re not destitute. I think that was a driving force for people in our generation,” he says.

As for scholarly interests, Garfield adores the written word. “He’s so obviously crazy about the scientific literature,” says Small. And most everything else in print. “He’ll pick up anything with words



written on it and read it and have an opinion about it,” says Grimwade. And usually he’ll share that information with everyone he knows. “Every day we in the community get E-mails from him, pointing to particular journal articles or studies,” says Blaise Cronin, the Rudy Professor of Information Science at Indiana University.

Although Garfield no longer runs ISI, (now owned by Thomson Scientific) he still comes in to the office every day, unless he’s off giving a talk about the agony and the ecstasy of citation indexing. “It’s a pretty rare thing for somebody his age to be that intellectually involved,” says Small. “He could be at home sitting with his feet up. Instead he chooses to be here and to be involved with the ideas and people he’s been involved with all along.”

In particular, Garfield is hard at work on HistCite, a graphical representation of citation information that will allow users to draw maps called historiographs of the history of science, based on information from the SCI and other databases. The ultimate goal for information science is something Garfield calls information nirvana: “An ideal state where you can retrieve anything on any subject you want, more or less instantly.” We’re not quite there, he declares after a 20-minute search fails to yield the reference to this nirvana that he has in mind.

Maybe not, but thanks to Garfield, we’re much closer. Even the Google search engine operates based on citation counting that Garfield made famous. He wasn’t awarded any big cash prizes by way of appreciation, but Grimwade notes that at some point the folks at Google credited Garfield with being a sort of “spiritual father of their methodology.” Many people similarly owe Garfield a debt of gratitude for guiding their careers. “I wouldn’t have my job without him,” says Cronin, who helped to edit a Festschrift in honor of Garfield’s 75th birthday. “Everyone wanted to contribute. And there were far more people who would have, at the drop of a hat, written for the book. You don’t do that unless you have a genuine affection for the individual in question,” he says. “People were very willing to step up to the podium and say ‘for he’s a jolly good fellow.’ And I don’t know for how many of us that would hold.”

Now, celebrating his 80th birthday, Garfield expresses a wish: “I hope that all this information access will do some good in this world,” he says. “In spite of everything we’ve done, I think we still have a long way to go.”

—Karen Hopkin

DEAR EUGENE,

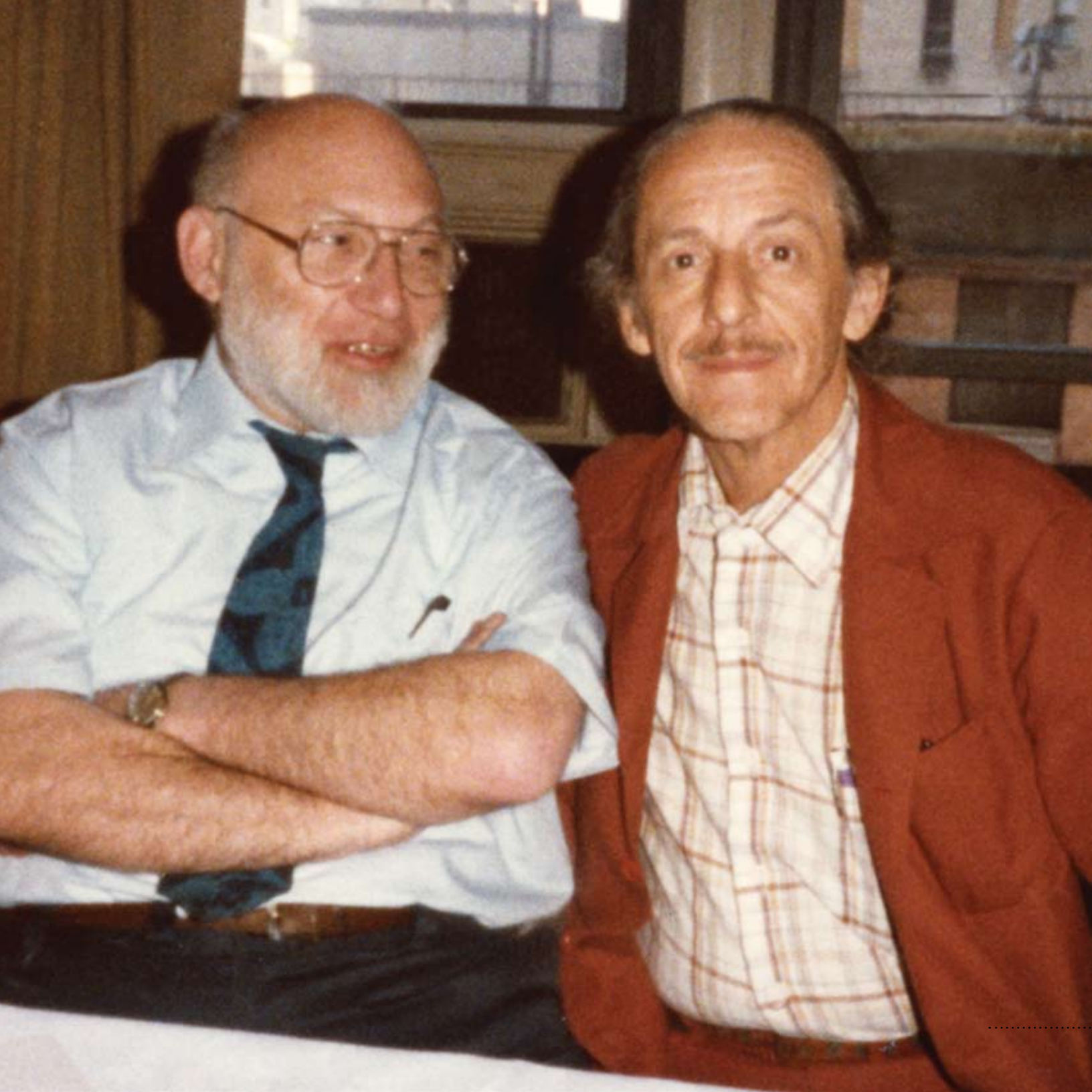
DEAR JOSHUA,

Since you first published your scheme for a "citation index" in Science about 4 years ago, I have been thinking very seriously about it, and must admit I am completely sold. • My own feeling at the present time is that the utility and feasibility of citation-indexing are in fact self-evident. • I believe that citation index research will pay off handsomely in the future in that this research will characterize all the different ways in which people "cite" the earlier literature ...

I have great faith that the citation index will one day be a spur to many new scientific discoveries in the service of mankind. • I am completely sold.

GARFIELD- LEDERBERG LETTERS

Although largely overlooked at the time of its publication, Eugene Garfield's 1955 *Science* article, "Citation Indexes for Science," so intrigued Stanford geneticist Joshua Lederberg that the young Nobel laureate wrote to its author in 1959 to find out what had become of the idea. Garfield and Lederberg's ensuing correspondence marked the beginning of a decades-long friendship and professional collaboration that led to the development of the Science Citation Index and *The Scientist*, among other ventures. In the following eight pages we reprint selections from these seminal letters.



May 9, 1959

To Eugene Garfield, from Joshua Lederberg

Since you first published your scheme for a “citation index” in *Science* about 4 years ago, I have been thinking very seriously about it, and must admit I am completely sold. In the nature of my work, I have to spend a fair amount of effort in reading the literature of collateral fields and it is infuriating how often I have been stumped in trying to update a topic, where your scheme would have been just the solution! I am sure your critics have simply not grasped the idea, and especially the point that the author must learn to cooperate by his own choice of citations and then he does the critical work

May 21, 1959

To Joshua Lederberg, from Eugene Garfield

... I hope you won't be embarrassed by a show of emotion, but your letter brought tears to my eyes. It then seemed that over six years of trying to sell the idea of citation indexes had not been completely in vain. You might be surprised how few people will take the time and trouble to scribble such a note. When asked, many endorse the idea, but don't get worked up about it enough to write spontaneously ...

You are so right when you say my critics have not grasped the idea. I try to be tolerant of those who have not had much time to study the problem. Even those who say it is a good idea frequently don't really know how they would use it – or how it differs from conventional indexing. As to opposition from the established outfits – there is no end of this. Chemical Abstracts pays lip service to Citation Indexes, but does nothing about them. Even my friends at Biological Abstracts and the *Current List* of medical literature who accept my judgment on many other conventional problems – look upon Citation Indexes as something impractical and unnecessary – particularly when there is so much more abstracting and regular indexing left undone.

... The most persistent of us need encouragement and I would feel justified now in pushing ahead for a citation index even if you were the only man to ever use it. I have great faith that the citation index will one day be a spur to many new scientific discoveries in the service of mankind.

GARFIELD AND THE CONVERTED
CHICKEN COOP IN THOROFARE, NJ
WHERE ISI BEGAN. 1955

.....



June 18, 1959

To Eugene Garfield, from Joshua Lederberg

.... I think I have to agree with you that some advance work should be done to find the bugs in a working system, and I certainly feel this should have public support. In fact, I think it would if you were to resubmit now. I imagine your tactical error was in approaching the NSF at a time when, to put it bluntly, it was too broke to do more than a fraction of what it should. It is still not so well financed, and I think you might have better luck with another agency

I haven't given adequate thought to a reasonable experiment, but have some suggestions nevertheless. I would start with some *review* journal, the papers in which are most likely to define relevant connections to later work, and to be cited in them.

Suppose, for example, you scanned all the journals you now cover for *Current Contents* for citations to *Physiological Reviews* either for a specific year ... or for a definite period ...

You could now make a critical comparison. Take a few dozen titles from *Physiological Reviews* and ask a jury to suggest the range of subject-headings they would expect to define the connections of each review. Then compare what you have retrieved by CI with the subject indexes from, say Biological Abstracts or the *Current Lists* ...

Undated

To Joshua Lederberg, from Eugene Garfield

... Your idea of starting with a review journal is most interesting. Actually it is just the reverse kind of thinking I once applied in a paper in which I suggested that we use review articles as a source of index entries. However, I never thought of using the *Reviews* as the starting point for a citation index chain – and now that you mention it I think I can see the logic – I guess I didn't fully appreciate how much review papers are cited today ... Perhaps this has to do with the definition of a review paper.

... Were you thinking of this experiment as a means of convincing people further of the value of Citation Indexes as compared with conventional indexes? In the project I proposed to NSF we could easily have obtained the data you want. Perhaps in rewriting the proposal we can incorporate this as a specific experiment to be done along with others.



INSTITUTE FOR SCIENTIFIC INFORMATION

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isi 3501
SCIENCE CENTER

June 26, 1959

To Eugene Garfield, from Joshua Lederberg

... Regarding your proposal to NSF, and the correspondence related to it, I began to have some serious questions about the necessity of more research, and to wonder if in fact the concept hadn't already been well enough sold to the NSF reviewers. I had to concur with their expressed doubts about "exactly what you proposed to do" in the actual project, as it was written. My own feeling at the present time is that the utility and feasibility of citation-indexing are, in fact, self-evident; it is rather doubtful that any limited sample would serve to convince anyone else who did not already see the point. If you could visualize exactly what questions you might hope to answer by the project, I am sure you would find it much easier to enlist support for a pilot study ...

I can easily see that \$59,000 might be thought a wasteful expenditure if its main effect were to reprove the obvious, and especially if not very much more than this would be needed to get a useful product.

July 6, 1959

To Joshua Lederberg from Eugene Garfield

I would be willing to work up more data on what it would cost to compile a Citation Index, but I truly cannot afford to lay out the expense at the present time ... You know this Citation Index business is like arranging for a Yiddish wedding. If you really have a bang up affair with a lot of people coming they will all bring big presents and give the bride and groom plenty of cash. If you run a small intimate affair – it gets unnoticed in the paper, a few close relatives and friends show up – but they don't have to give big presents to prove their love ... I am afraid that Citation Indexes will have to be a big affair even if we are going to make a few people happy. If not then it may prove to be really wasted money ... We never intended that the study would merely establish that Cit. Indexes would be good things to have – it was intended to prove that they were practical to accomplish and that they would indeed achieve desirable results.



September 9, 1959

To Joshua Lederberg from Eugene Garfield

Since my last letter much progress has been made. I have met and spoken with Gordon Allen, George LeFevre, Miss Shapard and Miss Tolkan, the last three of NSF ...

... Here is a rundown on my discussions with Gordon Allen. To really demonstrate the value of a citation index we should somehow come up with as *complete* a citation index as possible to a selected list of journals and/or articles. Compiling a citation index to a selected list of articles would increase the problem of scanning the bibliographies and references in articles *from which* citations would be taken. For example, if a paper in *Nature* is included in our sample we would have to carefully examine citations to *Nature*.

... We agreed that some mechanical method must be developed for copying the citations. This has been acted on already. About two years ago I discussed the problem with the National Library of Medicine. They have a special microfilm camera for copying references ...

... We also discussed the question of specifying the “kind” of citation involved. Here is where we get into “intellectual” problems. I believe that citation index research will pay off handsomely in the future in that this research will characterize all the different ways in which people “cite” the earlier literature ...

October 6, 1959

To Eugene Garfield from Joshua Lederberg

... If you stick to your guns on the original principles of CI, I am sure you will find it widely used as a research tool, and further perfections will evolve. What we need more than anything else is to get it going ...

... You can be sure that if you set up CI for citations to *Science*, *Nature*, etc., that many authors will then take care to include more references to these journals which will help to ensure better coverage of the literature.

Briefly then, I would strongly urge the adoption of your proposal ... on a field of five to ten source journals, like *Science*, *Nature*, *PNAS* ... I would defer extending the field to specialty journals like *Genetics* until we can judge the utility of this first result ...

... My main aim, as you know, is to encourage you to get on with the work as simply and straightforwardly as possible. If it works out as well as it must, you should have little concern for enthusiastic support for your own research using CI.

A trade newspaper for science faces quite a different task. Its function should largely be to keep watch over the things going on outside the lab that affect the conduct of science.

We have carved our niche
and grown to fill it
by focusing on
the people of science

*I would argue that scientists
who accept government funds
for their work have an
obligation to communicate
their findings to the public.*

The Scientist's subject matter will range, therefore, from political questions of science policy to financial topics affecting the economics of science, from the tough moral conundrums of scientific ethics to the frank pragmatism of “how-to” articles.

*Public expenditure on science
is tantamount
to defining science policy.*

*If the nations of the world
would collectively allocate a
small portion of their R&D funds
and their human resources to
these grand projects, the world
could more easily afford them
and all could benefit.*

EUGENE GARFIELD EDITORIALS

First launched in 1986 as a newspaper for life science professionals, *The Scientist* has morphed from a tabloid-format biweekly to a glossy monthly with a sophisticated, multimedia Web site. The next ten pages — which offer a “Garfieldorial” retrospective — show how *The Scientist* has changed through the years.

THE SCIENTIST

THE NEWSPAPER FOR THE SCIENCE PROFESSIONAL

Graham Faces Tough Agenda In Science Post

WASHINGTON—William Graham, confirmed Oct. 1 as presidential science adviser and director of the White House Office of Science and Technology Policy, faces a scientific community skeptical of his ability to affect science policy but hopeful he can represent their interests before the administration.

He assumed office in the White House the following day shortly after 3 p.m. The voice vote in the Senate ended a nine-month search for a successor to George Keyworth II, who left the administration Jan. 1 to form a consulting company. John McTague and Richard Johnson served successively as acting directors in the interim.

Graham, 48, is an electrical engineer from Southern California who was named deputy administrator of the National Aeronautics and Space Administration six weeks before the Challenger accident in January. He served as acting administrator until James Fletcher was appointed last spring.

"He took steps to restore stability to this agency in very trying times," said Sen. Pete Wilson (R-



WILLIAM GRAHAM

Calif.). "He has both the academic and real-world experience that will serve him well as science adviser to the president."

"He has an enormous task ahead and a lot of strikes against him," said Robert Park of the American Physical Society. "He certainly doesn't have the stature in the science community of his predecessors, but he appears to have the president's ear. I wish him the best of luck."

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Congress Hikes

BY BOB WESTGATE

WASHINGTON—The National Institutes of Health will receive an additional \$910 million this year in a budget that provides for more than 6,200 new and competing grants, 21 new research centers, no lid on the total number of projects to be funded and no provision to lower the reimbursement rate for administrative indirect costs paid to universities.

This good news for scientists comes as part of an agreement between House and Senate conferees on the Institutes' budget for the fiscal year that begins Oct. 1. At present, House and Senate conferees were to include this agreement in a \$600-billion funding measure that Congress must approve to keep the government running or vote on it as a separate appropriations bill that includes the budget for the Departments of Health, Human Services, Education and Labor.

For most of the decade the NIH administration has asked for a conservative budget for health institutes and their

unhappy figures. The even more disappointing comparison of funding for the Institutes' budget for the fiscal year that begins Oct. 1. At present, House and Senate conferees were to include this agreement in a \$600-billion funding measure that Congress must approve to keep the government running or vote on it as a separate appropriations bill that includes the budget for the Departments of Health, Human Services, Education and Labor.

THE SCIENTIST

VOLUME 1, NO. 1

THE NEWSPAPER FOR THE LIFE SCIENCES PROFESSIONAL

Kessler Resignation Sparks Concern About Future Of FDA

BY STEVEN BENOWITZ

When David Kessler, the commissioner of the Federal Food and Drug Administration (FDA), announced his resignation in late November, many people were surprised. The waging war against the United States tobacco

industry when he decided to step down after more than six years in the job. His supporters, including public health advocates, contend that he has made FDA a more effective health. Detractors, such as those in the tobacco and medical device industries, argue that Kessler has favored too much government

regulation, delaying drug and medical device development. Many in Congress agree with them and have launched efforts to reform FDA.

While FDA officials claim that Kessler's departure will not affect the agency's plans to go ahead with proposed restrictions on tobacco advertising, most groups agree that the new commissioner's policies will determine if the agency follows Kessler's lead or takes a less active, visible role.

Writing in *Newsweek* (Dec. 9, 1986), page 28, Kessler summed up his term: "The things we have done at FDA can and will affect the public's health—and that means we've fought the good fight." Kessler, who resigned to return to private life in his accomplishments, listed his agency's activities, from mammography standards to tobacco world-record times for drug approvals, from heightened food safety to crack-down on

fraud." He has said that he will stay until a successor is appointed. He declined to be interviewed for this article. Many consumer advocates and industry repre-

BIDDING ADIEU: David Kessler headed FDA for more than six years. He is pleased with his record.

sentatives praise Kessler's achievements. They note that he worked on inaccurate food labeling and drug action reporting systems, tightened safety guidelines, and started the approval process for the first U.S. abortion pill. V

(Continued on page 6)

Few Natural Science Classes Affected By Teaching Assistant Strike In Calif.

BY ROBERT FINN

Teaching assistants (TAs) boycotted their classes and set up picket lines at three campuses of the University of California (UC) for a week in November in an unsuccessful bid to pressure the administration to engage in collective bargaining with their union. While estimates of the strike's impact varied widely, both union and university spokesmen noted that fewer TAs in the natural sciences went on strike than did those in the humanities and social sciences. However, if legal proceedings force the university to recognize TAs, union, dealings with all UC teaching assistants would be affected.

The strike, dubbed "Rolling Thunder" by its organizers, began at UCLA on Monday, November 18. At planned, it spread to UC-San Diego on Tuesday, November 19, and to

UC-Berkeley on Wednesday, November 20. All TAs returned to work the following Monday, November 25. The strike occurred in the context of a nationwide surge in union activity among graduate student employees. Union recognition was the central issue in

A MATTER OF PERCEPTION: While TAs, percent of TAs taught classes in the natural sciences were shut down, an associate dean calls the union's figures "wildly exaggerated."

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Controversial Group Marks Quarter-Century Of Fighting For NIH Women Scientists' Rights

Amid mixed reputation, the organization, known as SHER, focuses on ending discrimination and providing support

BY BILLY GOODMAN

Twenty-five years ago, a group of women at the National Institutes of Health in Bethesda, Md., began a meeting every Wednesday at noon to work together to combat discrimination against women scientists. Today, a group of women meets every Wednesday at noon to work together to combat sex discrimination at NIH. Little more than the faces have changed, according to members of the org-



Equality for All: SHER's goal is fairness for all NIH workers, but its focus is on women, says president Billie Mackey.

leagues—to pay inequities to outright sexual harassment. SHER has maintained its broad-based support through the terms of six United States presidents and six NIH directors (and

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Biotechnology Turns To Ancient Remedies In Quest For Sources Of New Therapies

BY ALBION MACK

With consumer interest in "natural" therapies on the rise, some academic and corporate researchers have begun to look for new drugs among ancient remedies. Several such efforts focus on the rich, detailed pharmacopoeia of Chinese herbal medicine, which has been mistakenly regarded as passé and passed on for generations. In contemporary China—as in much of the world—herbal concoctions remain the predominant form of medication. In the hands of Western scientists, however, traditional herbs represent potential sources of single active compounds.

These projects, though still in their infancy, grow out of the pharmaceutical industry's longtime practice of seeking drug leads in plants. Some of the many plant-based medicines include digitalis, from foxglove, used to treat congestive heart failure; and cardiac glycosides; pseudoephedrine, from the Chinese herb ma huang (*Ephedra sinensis*), a decongestant; and anticancer drugs like vinorelbine and vincristine, from the myrtle vine *Madia sativa*. Botanical compounds also provide leads for the development of synthetic pharmaceuticals.

Only a handful of biotech and pharmaceutical companies and



BUDDING PROMISE: Sylvia Lau-Huang and colleagues have identified molecular mechanisms by which a protein derived from bitter melon, shown here, may act to suppress HIV infection.

tively examine approximately one-half of 1 percent of the higher plants on this planet for their chemical compositions and pharmacological potential," notes Michael Balick, director of the New York Botanical Garden's Institute of Economic Botany. "Yet in these species drugs on the pharmacist's shelf." In light of that ratio, Balick says, there are

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■ Frank Press of the National Academy of Sciences.
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Opinion

■ Two cheers for the project to sequence the human genome.
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Firms Forge Black Links

BY SUSAN WALTON

WASHINGTON—Looking for something new after 23 years at Bell Laboratories, Elliott Slutsky began a visiting professor in electrical engineering at Tennessee State University.

This fall, three years later, he began his second year of teaching at Howard University. The work is hard, the hours long, and the problems are many. But he is no longer bored.

"We're solving problems," he explained. "Besides teaching, I'm pleased to improve the curriculum. Industry people really can make a difference, because they know what students need."

Slutsky is one of 13 scientists and engineers from the AT&T facility on loan this year to faculty around the country. The program,

SURVEY TELLS WHO

TOTAL INCOME

20-24 \$15,000

25-29 \$15,000

30-34 \$15,000

35-39 \$15,000

40-44 \$15,000

45-49 \$15,000

50-54 \$15,000

55-59 \$15,000

Oct. 20, 1986

Oddly enough, up to now scientists have had no equivalent to the trade papers of other professions. Physicians and attorneys have access to such papers, which keep them up to date on developments that affect their professional lives. Don't scientists need the same kind of information, in the same kind of format? We think the answer to that question is 'Yes', and so we are publishing *The Scientist*.

That scientists need and want such information is obvious when you take a look at how journals of primary publication have expanded their purviews. In particular, the two premier interdisciplinary journals, *Science* and *Nature*, along with the UK's *New Scientist*, are invaluable for their news coverage of science and science-related issues like arms control. But at bottom their first task is to bring their readers the latest in scientific developments

A trade newspaper for science faces quite a different task. Its function should largely be to keep watch over the things going on outside the lab that affect the conduct of science. *The Scientist's* subject matter will range, therefore, from political questions of science policy to financial topics affecting the economics of science, from the tough moral conundrums of scientific ethics to the frank pragmatism of "how-to" articles.

March 9, 1987

The Conservative government of British Prime Minister Margaret Thatcher claims it provides "level funding" in its current support of scientific research. But, with sharply rising costs, level funding really amounts to underfunding, which can only hasten the decline of British science. Although that decline began at least a few years before Mrs. Thatcher assumed leadership in 1979, her government has done nothing of substance to reverse the trend. I say, shame on you, Mrs. Thatcher. Your budget policy is shortsighted. It can only lower the cultural and economic standard of living of your nation

Is it any wonder that years of undernourishment have stunted the growth and reduced the role of British science? A study commissioned by the Advisory Board for the Research Councils (ABRC), released last October, painstakingly evaluated U.K. performance ... The results were sobering, to say the least. From 1973 to 1982, the United Kingdom slipped in its share of papers, from 9.2 to 8.3 percent. Its share of citations declined from 10.9 percent in 1976 to 8.9 in 1982. On a citations-per-paper basis, the drop for the United Kingdom was even greater



2002

The Scientist

MAGAZINE OF THE LIFE SCIENCES

\$4.95 | VOL. 20 NO. 1 | JANUARY 2006 | WWW.THE-SCIENTIST.COM

THE BANNED
PESTICIDE THAT'S
STILL IN OUR SOIL

FIVE ESSENTIALS
OF RNAi GENE
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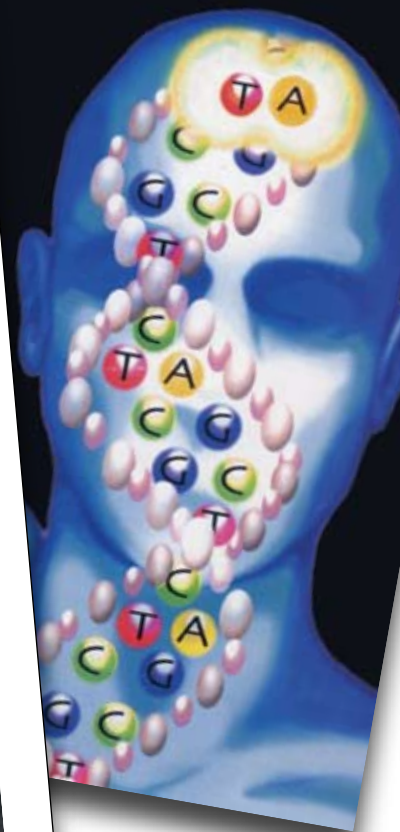
THE BUSINESS CASE
FOR PERSONALIZED
MEDICINE

IRA MELLMAN
ON WHY CANCER
IMMUNOTHERAPY
HAS A FUTURE

PLUS:
SAVE \$29,000
THIS YEAR IN
LAB EXPENSES

Is This
LIFE?

THE QUEST FOR
AN ARTIFICIAL CELL



2006

May 4, 1987

There are at least three major reasons why science lobbying is essential. In the short term, it increases the likelihood that funding for basic and applied research for the next fiscal year is available for worthy science projects, which otherwise might be eclipsed by the demands of other special interest groups who have the advantage of years of experience in gaining the attention of the decision-makers in government. It's a matter of coping with reality. Second, and in the long term, lobbying goes far beyond buttonholing representatives in the corridors of power. When done correctly, lobbying is an educational effort—one directed not only at elected officials but also at the public, whose support is vital to science.

Finally, public expenditure on science is tantamount to defining science policy. By lobbying, whether through letter-writing or through membership in an association that lobbies, scientists take an active role in helping to shape that policy rather than merely reacting to what is presented by government officials. A case in point is the science policy of the Reagan administration. By its advancement of flashy big-ticket items, such as SDI research, the Shuttle, the Superconducting Supercollider, and NSF's Centers program (some or all of which may be worthy of support), the Reagan administration has taken the lead in shaping science policy now and in the coming years. If, as the continuing federal deficit would seem to require, funding for these programs cuts into funding for individual investigators and little science projects, many scientists will wish they had been more vocal in their preferences for public funding of science.

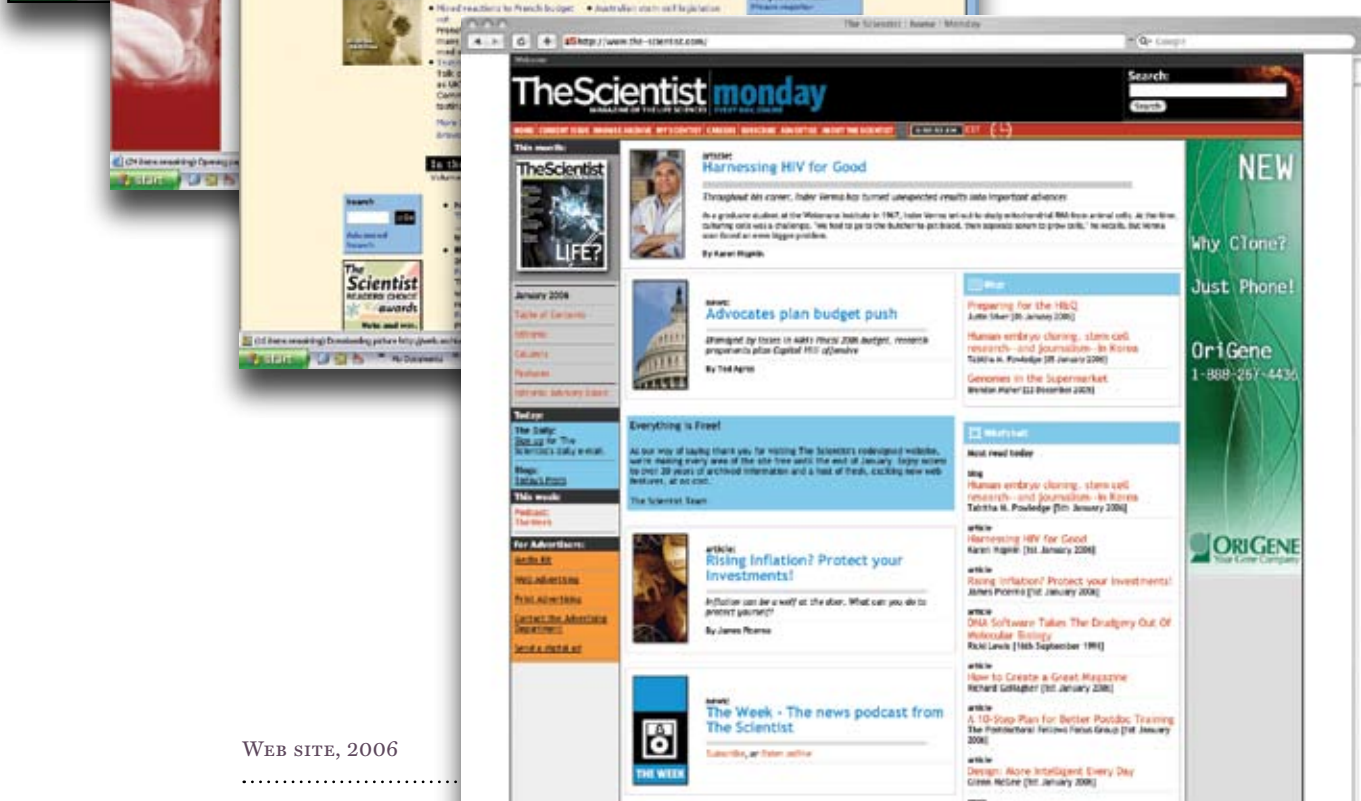
June 27, 1988

The handwriting for the future of federal science funding is on the wall, and Frank Press has read it as well as anybody.

In his April 26th speech, the National Academy of Sciences president uttered publicly what many have acknowledged privately. The United States cannot afford to pursue at full tilt its Big Science agenda—the superconducting supercollider, the human genome project, the space station—without cutting into support for the legions of individual investigators representing Little Science.

Press's statement (*The Scientist*, May 30, 1988, page 1) has recognized what had already become a fractious debate between proponents of worthwhile Big Science projects and proponents of worthwhile Little Science projects. Indeed, it may have divided the camps even further. But why should scientists squabble over a single small pie when they can collectively bake a large one that feeds and sustains many

One tactic for successfully managing Big Science today is to make megaprojects into collections of Little Science projects. If the nations of the world would collectively allocate a small portion of their R&D funds and their human resources to these grand projects, the world could more easily afford them and all could benefit.



Jun 12, 1989

About two years ago, Mikhail Gorbachev introduced the words *glasnost* (openness) and *perestroika* (restructuring) into the world's vocabulary. These words have become symbols of hope for a fundamental change in East-West relations.

For scientists, *glasnost* is interpreted to mean improved communication, freer travel, and closer collaboration between researchers in the East and West

But Gorbachev's policies of *glasnost* and *perestroika* have received a mixed response in eastern Europe. In particular, the German Democratic Republic (GDR) is the most stubborn opponent. The unfortunate result is that the Wall will likely remain a formidable barrier to freedom and communication for East German scientists

In late 1987, after 14 years of exhausting negotiations, East and West Germany signed an agreement on scientific cooperation on projects ranging from AIDS research to nuclear energy. In annexes to the agreement, both parties pledged to allow the exchange of scientists "and their families."

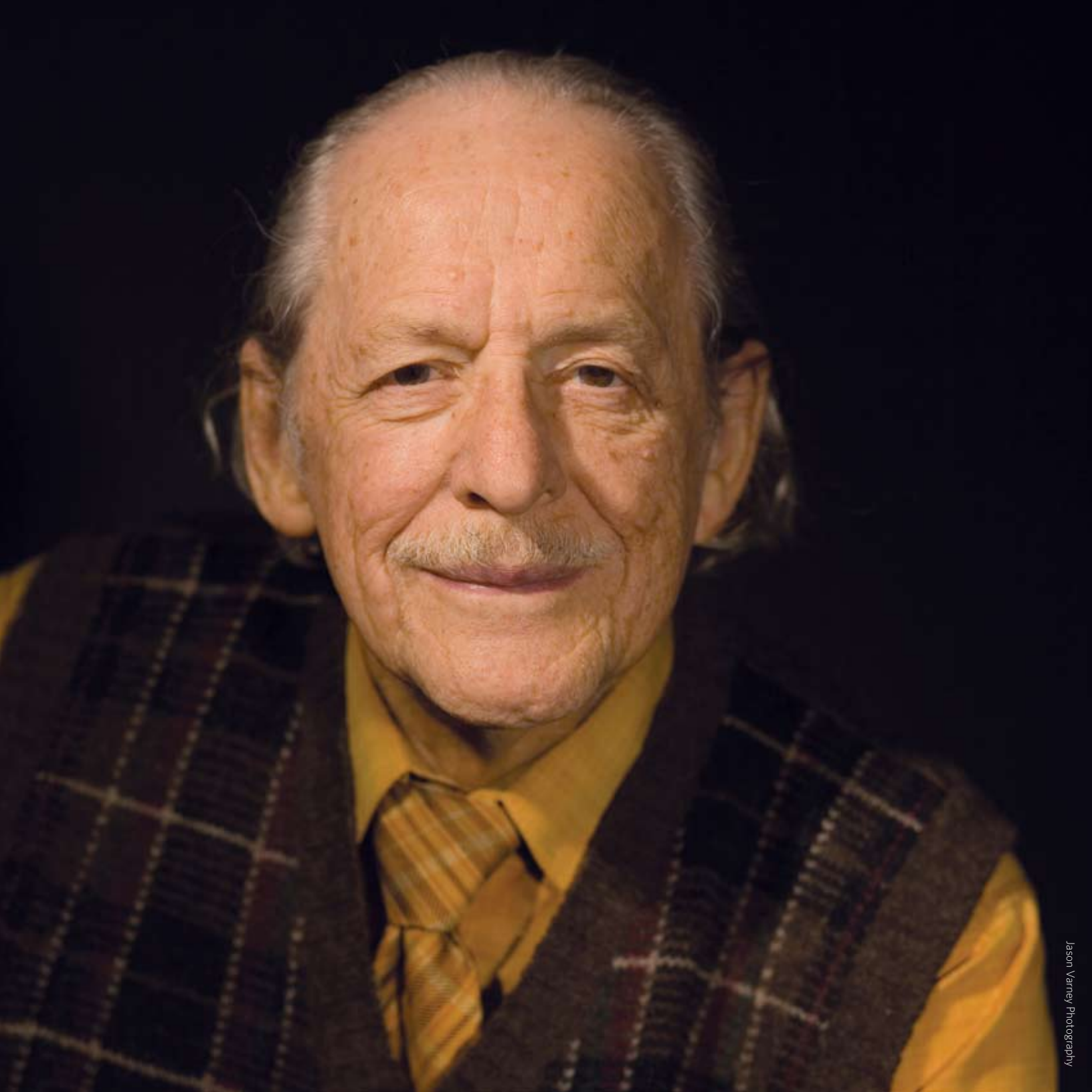
Does this agreement signal a new era of scientific freedom in East Germany? The letters I have received from East German scientists are skeptical at best, and bitterly pessimistic at worst

Jan. 7, 1991

As we ring in the New Year with best wishes to all our readers, *The Scientist's* staff has special cause for celebration: This is our 100th issue—and it marks the entry into our fifth year of publishing.

When *The Scientist* was launched in September 1986, the idea of a newspaper for scientists had been brewing in my mind for more than 25 years. In the post-Sputnik era, scientists and policymakers became aware of the need to facilitate communication across established disciplines, and it was my intention to meet that need. At the time, the cognitive aspects of research were adequately reported—as they are today—in large-circulation science magazines and primary research journals. But none of these publications, in my view, dealt in appropriate depth with the science community's bread-and-butter career concerns

In the last four years, *The Scientist* has addressed that need, emphasizing that science is, at the core, a human, social activity. We have carved our niche and grown to fill it by focusing on the people of science



Jan. 10, 1994

Although the United States research community had its share of problems during 1993—a depressed job market, congressional budget cutting, the demise of the superconducting supercollider, and so forth—it was a banner year in many respects, as well, yielding abundant cause for us to be optimistic as we enter the new year.

Our hopes should be buoyed, for instance, by the knowledge that the National Institutes of Health is now led by Harold Varmus, a distinguished biologist. Varmus appears eager to defend the clear merits of basic biomedical investigation and to voice the demand, on behalf of the nation's bench scientists, for the financial—and philosophical—support that curiosity-driven research clearly deserves

Many uncertainties face us all as we enter the new year. We can only hope, for instance, that the sluggish US economy will regain energy; we can only hope that President Clinton's health care reform and free-trade programs will materialize as beneficial for both science and society; and we can only hope that Congress will play a proper role in supporting the nation's research activities.

Aug. 19, 2002 editorial cosigned by Alexander Grimwade

We have recently achieved two significant steps in the development of *The Scientist* on the Web. In the past few weeks, we have launched a new design for our Web site at www.the-scientist.com, and the 16-year online full-text archive of *The Scientist* back issues has been completed. Our newly designed site is, effectively, the fourth generation of *The Scientist* presence on the Web.

In 1992—almost prehistory in “Internet time”—*The Scientist* launched an experiment in cooperation with the National Science Foundation. We provided a text file of each issue as it was published, through a Gopher site We believe that through this service, *The Scientist* was the first regularly published science periodical available in full text on the Internet.

... Now we have changed our design again, to make the site easier to navigate. We have developed a specialist site, at www.biomedscientistjobs.com, devoted to career development and job advertising, and we have added a daily news section, where professional science writers in New York and London report on breaking news in the world of science.

With the completion of our electronic archive, our earliest issues from the 1980s are now available on the Web site. Since we had no electronic version of issues from that era, we developed a laborious procedure of scanning the pages from those yellowing printed copies, running them through an optical character recognition program, creating HTML files, and posting the issues through our publishing system. We take considerable pride in being able to make our entire archive available to anyone, free of charge.

EUGENE GARFIELD: A DIVERTIMENTO

Diversion and its etymological variants have several meanings, and only in some romance languages is recreation its primary connotation. Still, I could not resist a play on words when paying homage to a man who has been an unabashed fan of fun and pun,¹ arts and entertainment,² and other forms of hedonism - although not the ostentatious partying preferred by many nouveau-riche CEOs.³

Beyond founding, developing, and managing the highly successful Institute for Scientific Information and dozens of traditional and digital publications, Gene Garfield has published on the side more than 1,500 scholarly and professional papers in the past 50 years. Many people have wondered how he does this while leading an immensely rich private life, and enriching the lives of others.⁴

I envy those who have worked for his company and in his company. I was lucky enough to have spent a little quality time with him at the best beaches - in the shade, of course,⁵ shared with him the best cuisine - without a drop of alcohol or a puff of smoke, of course,⁶ talked shop, and read and re-read hundreds of his essays in his digital archive. By now, I think I know a little about how he does it.

He creates the perfect synergy of the pleasures of science and the science of pleasures, and knows when to stop for diversion and to think.⁷ It helps that he does not live in an ivory tower, immersed in study. On the contrary. He earned the hard way degrees in library science, linguistics, and chemistry. And he knows the art of chemistry in more ways than one, always looking for the connections and commonalities between cultures through his restless traveling within the United States and around the world.

His most revealing essays are those that show his passion for discovering, understanding, learning, and helping,⁸ and those that vent against the nonsense practices of people who turn pleasures into displeasures.⁹ He traces down the best sources (in print and in person), and gives credit where credit is due through impeccable sourcing and acknowledgement.

The irony of all this is that none of the essays I refer to and list below has been cited by others (at least not in the source journals covered by ISI). This - the occasion of Gene Garfield's 80th birthday - is the perfect opportunity to give him credit for these uncited masterpieces.

—Péter Jacsó

Professor, Library and Information Science Program, University of Hawaii - Manoa

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THANKS, DR. G.,
FOR YOUR ENCOURAGEMENT,
FEEDBACK, AND VISION.

—THE STAFF OF
THE SCIENTIST

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THANK YOU DR. GARFIELD
FOR YOUR INNOVATION, YOUR WISDOM
AND YOUR SCHOLARSHIP.

—YOUR COLLEAGUES AT
THOMSON SCIENTIFIC

