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New Routes in the Preparation of Mechanically Hard Films W. D. Sproul
Light emission revealing the propagation and composition of carbon plasmas generated by ablation of a graphite target in vacuum with a pulsed argon-fluorine laser, at times from 100 nanoseconds (upper left) to 1500 nanoseconds (lower right) after the laser pulse. Three principal plasma regions were discovered and related to the quality of amorphous diamond-like carbon films. See page 898 and the special section on Thin Films beginning on page 878. [Image: D. B. Geohegan and A. A. Puretzky]

Penetrative Convection and Zonal Flow on Jupiter
K. Zhang and G. Schubert

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Exclusion of Int-6 from PML Nuclear Bodies by Binding to the HTLV-I Tax Oncoprotein
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Cure of Short- and Long-Term Experimental Chagas’ Disease Using D0870

Auditory Neurophysiologic Responses and Discrimination Deficits in Children with Learning Problems

A Receptor in Pituitary and Hypothalamus That Functions in Growth Hormone Release

On the Web
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The McKay et al. paper, related News story and additional links are available at http://www.sciencemag.org/science/content/273/5277/924.htm
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**Polymer patterns**
Polymer molecules are usually insoluble in one another, and so diblock copolymers, which alternate two different compositions, usually form phase-separated domains. Morkved et al. (p. 931) show that electric fields (generated over several micrometers by surface electrodes) can be used to align these domains in a thin film. Such aligned domains could serve as templates for the construction of more complex nanostructures.

**Nanotube networks**
Long, hollow nanotubes can be formed into conduits and intersecting networks. Evans et al. (p. 933) bonded bilayer vesicles onto a surface and then used suction from a micropipette to draw out long tubes 20 to 200 nanometers in diameter. The vesicles contained a photo-polymerizable polymer [polyethylene glycol (PEG) 1000 dinitracrylate] so that the bilayers could be used as a template for the formation of a rigid, flexible network of PEG gel by laser irradiation. Such networks could be used to transport material in biosensors and devices.

**Colliding comets**
Comets could represent the most primitive, uncontaminated components of our early solar system if they have not been mixed with other materials. Farinella and Davis (p. 938; see the Perspective by Yamamoto, p. 921) suggest that some short-period comets (<200 years), which come from the Edgeworth-Kuiper Belt, may not be as primitive as once thought. They modeled the rate and number of collisions in the belt based on the recent discovery of more objects in this region and conclude that most have undergone collisional processing.

**Evidence suggesting early life on Mars**
The dozen meteorites thought to come from Mars have been studied closely for information on the past history of the planet. McKay et al. (p. 924; see the news stories by Kerr, p. 864, and Lawler, p. 865) report several lines of evidence from studies of one such meteorite (ALH84001) that they argue can best be accounted for by the presence of ancient microorganisms on Mars, although inorganic processes cannot be ruled out for each feature separately. Fractures in this meteorite contain carbonate globules. They identified several aromatic organic molecules on the fracture surfaces. The carbonate contains tiny magnetite and iron-sulfide grains (up to 100 nanometers), and its surfaces show small organized structures similar to those associated with fossil terrestrial bacteria.

**Swept away**
The Galileo probe encountered strong zonal winds with nearly constant speed throughout its descent into Jupiter's atmosphere, which indicates that solar absorption is not the controlling energy source. Zhang and Schubert (p. 941) present a model that produces fast zonal winds by thermal convection from the deep, metallic hydrogen-helium fluid layer of Jupiter's interior. This model provides additional insight into Jupiter's dynamics.

**Tax deregulation**
When a cell becomes transformed, the usual controls that prevent unrestricted growth are overcome. Human T cell leukemia virus I produces a protein involved in transforming cell—the Tax protein. Desbois et al. (p. 951) now show that a protein already thought to be involved in preventing cell transformation, Int-6, is redistributed from its usual localization in the cell nucleus to the cytosol in the presence of Tax, which suggests that the usual function of Int-6 is disrupted by Tax during transformation.

**Evidence suggesting early life on Mars**
The dozen meteorites thought to come from Mars have been studied closely for information on the past history of the planet. McKay et al. (p. 924; see the news stories by Kerr, p. 864, and Lawler, p. 865) report several lines of evidence from studies of one such meteorite (ALH84001) that they argue can best be accounted for by the presence of ancient microorganisms on Mars, although inorganic processes cannot be ruled out for each feature separately. Fractures in this meteorite contain carbonate globules. They identified several aromatic organic molecules on the fracture surfaces. The carbonate contains tiny magnetite and iron-sulfide grains (up to 100 nanometers), and its surfaces show small organized structures similar to those associated with fossil terrestrial bacteria.

**Hormone unknown**
Release of growth hormone (GH) from the pituitary gland is controlled by the antagonistic actions of growth hormone--releasing hormone (GHRH) and somatostatin, which are released from the hypothalamus of the brain. However, some synthetic agents (known as growth hormone secretagogues, or GHSs) that can cause GH release appear to use a distinct pathway. Howard et al. (p. 974; see the Perspective by Conn and Bowers, p. 923) have discovered a new receptor that mediates the action of GHSs. The receptor was localized not only in the pituitary but also in the hypothalamus, where it might act to control release of GHRH and somatostatin. This new receptor provides a strong indication that there remains an undiscovered hormone that is the natural counterpart of the GHSs and has an important role in control of GH release.

**Kept in check**
Cells with chromosomal defects are normally prevented from replicating by checkpoints; for example, the spindle assembly checkpoint in yeast prevents cells that lack spindle microtubules or that have a misaligned chromosome from segregating its chromosomes. Hardwick et al. (p. 953) show that one of the protein kinases associated with this checkpoint, Mpslp, phosphorylates Madlp, one of the other checkpoint components, when this checkpoint is activated. Normal cells that over-express Mpslp also activate the checkpoint, arresting mitosis in cells with functional spindles. As this checkpoint differs in normal and tumor cells, its control could find use in targeting chemotherapy to tumor cells.

**Parasites expunged**
An estimated 18 million people, mainly in Latin America, are infected with the parasite Trypanosoma cruzi, the causative agent of Chagas disease. Urbina et al. (p. 969) report that a bistriazole, D0870, effectively cures both acute and chronic T. cruzi infection in mice. This contrasts with two other drugs, which slowed progression but did not eliminate the parasites, raising the possibility that D0870, which is currently being developed as an antifungal agent, could provide a boost in the fight against Chagas disease.
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Politics and pussycats

Rustum Roy's comments, made in an earlier editorial, about public funding for scientific research are called, by various readers, "important, but unpopular," "a conundrum," and "an utter illusion." Elsewhere, the "existing official definition" of scientific misconduct is defended. The politics of AIDS research—and how reporters depict this research community—are discussed. A tokamak under construction in India is described. And concerned readers ponder the fate of Schrödinger's "unfortunate cat."

Funding Basic Research

Rustum Roy's editorial (19 July, p. 163) about how to enter the fray of public debate in the political arena over science funding goes a long way toward injecting realism into the discussion. Both Science and Roy are to be commended for bringing to the attention of the readers an important, but unpopular, view. I want to reinforce the message and help focus the debate. Although overall federal funding levels are generally looked to as a measure of the nation's science health, it is critical to also consider the allocation of funds within a given total together with the management of whatever allocation is made to a particular field. Significant increases in productivity can be made even within a shrinking budget, if a more thoughtful approach is taken in preparing and managing the science budget after a vigorous discussion of the options. Most appeals are for more money across the board, and the average scientist is admonished to simply support the decisions made by the entrenched bureaucracy. As Roy points out, however, if you are tempted to speak out about the allocation of funding and the management, be prepared to hear from the contented scientists who want only to talk about the unrealistic need for ever-increasing budgets.

Louis Iannelli
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Gaithersburg, MD 20879, USA

I am dismayed by Roy's editorial, in which questions are raised about whether federal support of basic research should take an example from the abandonment of support from the corporate world and whether undirected research should be privatized and rely on the philanthropy of our billionaires. Finally, we are admonished that "when activist scientists have done their homework on questions such as these, they will be ready to enter the fray of public debate." I have done my homework and have been in the fray.

I can document that throughout the history of medical science the major advances in diagnosis, treatment, and prevention of disease were based on the curiosity of biologists, chemists, and physicists unrelated to the ultimate applications of this basic knowledge to the developed countries, the tax burden in the United States is very low and its public finance position is one of the best. If people go without food in this country, it is not because there is a shortage of food; if public schools are crowded, it is not because of lack of building materials.

Roy's notion that investment in basic research ought to meet an economic cost-benefit test presents a conundrum: how does one evaluate the future flow of benefits from the investment? Indeed, how does one evaluate the dangers yet to befall us, but of which we remain ignorant? Roy seems to accept the "end-of-science" thesis: all basic science is already known, and it remains only to apply it. Nothing could be further from the truth.

Monroe Burk
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Columbia, MD 21045, USA
ment of drugs and devices. In such a way came the discoveries of x-rays, penicillin, the polio vaccine, and genetic engineering. No industrial organization or philanthropy had or would ever have the resources or disposition to sustain such costly, long-range, apparently impractical programs. In sharp contrast to the success of investments in basic research are the disappointments in narrowly directed programs, such as the assault on cancer, in which the complexity of the problem far exceeds the essential available knowledge.

The current bipartisan support in Congress of the National Institutes of Health attests to the recognition that the federal support of basic research is a cost-effective investment in the nation's health and economy. I can make a similar case that truly pioneering inventions (for example, the airplane, xerography, the transistor) are the sources of industrial strength. It is an utter illusion to expect that philanthropy and industry will for the foreseeable future do more than catalyze the long-term support of basic science from federal sources.

Arthur Kornberg
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Stanford University,
Stanford, CA 94305-5307, USA

Defining Misconduct

In his editorial of 12 July (p. 163) Kenneth J. Ryan indicts the “scientific community” as a whole, saying it “has been reluctant to discourage misconduct and sloppy research” and that “the current research environment seems to foster cynicism about simple virtues such as honesty and fairness.” Against this background of harsh pronouncements, Ryan defends his attempt to replace the existing official definition of misconduct (fabrication, falsification, and plagiarism) by his far more sweeping and vague categories of “misappropriation, interference, and misrepresentation.”

Because Ryan refers to writings by each of us, we feel it necessary to make clear to readers of Science that neither of us endorses this redefinition. Moreover, it should be pointed out that this proposed definition has encountered widespread opposition by thoughtful people and organizations, including the Council of the National Academy of Sciences (CNAS) and the Federation of American Societies for Experimental Biology (FASEB) (1). To remain healthy, scientific research must be protected not only from misconduct but also from undue zealotry in expanding the grounds for changing misconduct.

Gerald Holton
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Frederick Grinnell
University of Texas Southern Medical Center, Dallas, TX 75235-9039, USA

Notes

1. For recent summaries of the reasons for CNAS and FASEB opposition, see The Scientist 10, 3 (22 July 1996).

The caption of the picture (p. 1873) in the item “The tale of a peacock’s tail” (Meeting Briefs, 28 June, p. 1872) states, “Computer model finds female peacocks limit time spent on choosing a mate.”

No time whatsoever can be so spent. The world lacks female peacocks. There are, however, peahens and peahicks. The picture shows three peafowl—two peacocks and a disinterested peahen who, surely, would take offense at being regarded as a mere “female peacock.”

Patrik never fails to get a reaction

Patrik Samuelson is a molecular biologist at the Royal Institute of Technology in Stockholm, Sweden. Patrik uses Ready-To-Go beads to convert his RNA samples into cDNA templates for PCR.*

* PCR is a patented process of Hoffmann-La Roche, Inc.
AIDS Politics

I was amazed but not amused by Jon Cohen's perception of the current state of HIV (human immunodeficiency virus) research (Special report: AIDS, "The changing of the guard," 28 June, p. 1876). For example, the "Heavy hitters 1993-95" list purporting to show the emergence of some new wave is taken from an article entitled, "AIDS: NIH stands out" (1). The Science list is made up of several individuals who usually, but not invariably, publish as a group. A summary impact score (citation per paper) for these groups would be

<table>
<thead>
<tr>
<th>Laboratory of Immunoregulation, National Institute of Allergies and Infectious Diseases (Orenstein + Pantaleo + Fauci)</th>
<th>University of Alabama, Birmingham (Shaw + Saag + Hahn)</th>
<th>Aaron Diamond AIDS Res. Ctr. (Ho + Cao + Moore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>73.01</td>
<td>54.51</td>
<td>43.43</td>
</tr>
</tbody>
</table>

and Robert Gallo's figures were not even included in this list. In this case of statistics of scientific esteem, readers should recall a statement paraphrased from Eugene McCarthy on football coaches, that one has to be smart enough to understand the principle, but not smart enough to lose interest.

HIV disease and its ultimate symptom, AIDS, is a tragedy that transcends politics and factions. A proper sociopolitical history of HIV research would reveal that coteries and cabals in this field are neither new nor have they been a particular source of original ideas or novel approaches for dealing with the disease. More important, factionalism is not the best way to produce new scientific concepts but is a symptom of lack of direction. Assigning the categories "old guard" or "new guard" does little for creative unity in disease research, whether they are accurate or not.

Cecil H. Fox
Molecular Histology, Inc., 18536 Office Park Drive, Gaithersburg, MD 20879, USA
E-mail: jugibbs@us.net

References

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Corrections and Clarifications

In the letter “Risks from low doses of radiation: Continued” by Marvin Goldman (2 Aug., p. 562),
the reference in the last paragraph on page 563 should have been “(3)” not “(2).”

The WWW address for Pedro at the end of note 3 in the letter “Not the ‘Dark Ages’” by W. C.
Barker and R. S. Ledley (12 July, p. 165) was incorrect. The correct address is http://www.public.
iastate.edu/~pedro/rt_1.html

The WWW address for the document of the Council of Tobacco Research listed in the response by
Jon Cohen (Letters, 12 July, p. 167) was incorrect. The correct address is http://galen.library.ucsf.
edu/tobacco/docs/html/1916.01/1916.01.1.html

In the references (p. 16) of the letter by Darwin R. Labarthe about “Battling heart disease” (5 July,
p. 15), references 3, 4, and 5 should have been listed as one reference, “3,” and reference 6 should
have been listed as “4.” The numbers 1-4 as they appeared in the text were correct.

The figure (p. 47) showing the age distribution of the population of Europe (News, C. Holden, “New
populations of old add to poor nations’ burdens,” 5 July, p. 46) was incorrect. The correct figure
is shown below.

As a naïve molecular biologist, I am perplexed by one facet of the problem of
Schrödinger’s cat as it is usually presented. Why can’t the cat be considered an observ-
er and therefore remove the uncertainty about its own life or death status?

Randy Morse
State University of New York,
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Albany, NY 12201–2002, USA

My 12-year-old daughter Phoebe is a student of quantum paradoxes, but she was
concerned about an error in the illustration accompanying the Research News article
with regard to feline anatomy. Presumably, even Schrödinger’s cat would have foreleg
“elbows,” not “knees.”

Barbara A. B. Seiders
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The title of the Research News article “Schizophrenic atom doubles as Schröd-
ingen’s cat—or kitten” perpetuates a misconception about schizophrenia—which is
nothing like split personality—and trivializes a potentially disabling mental disorder.

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“Kitten,” as used by Taubes, seems need-
lessly macroscopic as a metaphor for a single
trapped atom. How about “Schrödinger’s furball”?

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Monkey Business

Presidential hopeful Pat Buchanan’s assertion (described in News & Comment, 26
July, p. 421) that he personally is not descended from monkeys explains a lot to
those of us who are from this planet.

Gerald L. Epstein
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The Price of Sushi

As an American postdoc at the end of a 27-month research (24 months) and “tourist” (3 months) visit to a Japanese government laboratory, I tire of seeing the high cost of living in Japan cited in Science as a valid reason for foreign scientists shunning Japan (Random Samples, 3 May, p. 655; Science in Japan, 18 Nov. 1994, p. 1181). Living costs should have little influence on scientists’ decision-making about Japan (in contrast to those of potential exchange students) because generous salaries, free housing for most foreign researchers, employer-purchased plane tickets, and favorable tax settings more than compensate for the costs. (These circumstances explain why almost all foreign researchers I have met here are happy.)

In my case, I am returning home with a net worth of about $50,000 more than when I arrived. My 1995 taxable income, in Japan and the United States combined, was zero.

The language barrier and the lack of technicians are real considerations that prospective visitors must weigh, along with appropriate employment for a spouse and schools for children. But the price of sushi is not a concern. Worrywarts can always order the cheap omelet variety in fast-food restaurants where dishes arrive on a conveyor belt.

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Preventing AIDS

Peter Piot’s editorial “AIDS: A global response” (28 June, p. 1855) correctly assesses the magnitude of the AIDS pandemic, but the response is misguided. With, as he rightly notes, 40,000 new HIV infections in the United States in 1995, and more than 3 million around the world, the planet is indeed “becoming a dangerous place for all.” Consequently, it is curious that the search for appropriate therapeutic and preventive measures as discussed by Piot is largely confined to drugs and vaccines.

Although vaccines fall well within the rubric of primary prevention, so too does behavioral change, which would be far less costly, take less time to institute, and be at least as efficacious, if not more so. Behavioral change—avoiding sexual partners who are likely to be infected, limiting the number of anonymous partners and type of sexual activity, using condoms, and abstinence—would show benefits early on, thereby reducing the anticipated mortality, and cost less than any chemical method.

Behavioral change is the preferred approach for heart disease and lung cancer. Why not AIDS?

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Tokamak in India

In the News & Comment article “Korea plans new tokamak machine” by Jeffrey Mervis and Dennis Normile (22 Dec. 1995, p. 1918), there is no mention of the steady-state superconducting tokamak (SST) I being fabricated at the Institute for Plasma Research in Gandhinagar, India. This machine will be completely superconducting—with elongated plasmas, lower hybrid current drive, and steady-state (about 1000s) divertor operation. Its conceptual design was completed in 1995 and was reviewed by an international panel of experts headed by Jim Sinnis of the Princeton Plasma Physics Laboratory in January 1996. The preliminary conceptual design of this machine has also been presented at international forums and conferences. The engineering design of SST 1 is now under way, and the machine is likely to be commissioned by the end of 2000. SST 1 is a successor to the Indian tokamak ADITYA, which has been operating since 1989 and has made interesting contributions to the physics of edge turbulence in tokamaks.

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Letters to the Editor

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Scrubbing Ahead for Pathogen Labs

Researchers who study dangerous infectious agents will soon have to comply with what some fear will be onerous new safety restrictions. Next week, the Centers for Disease Control and Prevention (CDC) plans to issue a set of pathogen transport rules designed to reduce the risk of biological sabotage by imposing strict lab standards.

The rules are required by a new terrorism law passed in response to an incident last year in which an Ohio man obtained bubonic plague from a supplier by faking documents. All research labs that ship or obtain pathogens on a list of about 40 viruses, bacteria, fungi, and toxins will have to register with CDC and file forms for each shipment. Such labs already follow voluntary CDC biosafety rules, but now they will be inspected to ensure they meet safety criteria based on the guidelines that are now being drafted, says CDC's Stephen Morse.

Some observers say the rules will create new layers of red tape for little real gain in safety. "This is a major mess and a folly," says virologist Karl Johnson, a former director of CDC's special pathogens branch. And University of New Mexico virologist Brian Hjelle worries that small labs won't be able to afford the biosafety staff and facility upgrades required by the rules, which are enforced with criminal penalties. "What does all this have to do with terrorism?" Hjelle asks.

Morse says CDC has received few complaints about the rules, proposed in June, but Hjelle and some other researchers note that the comment period lasted only 30 days and fell during summer vacation. To register, labs must submit an initial self-inspection to CDC by February.

For Hire: Ten Old Hands

Talk may be cheap, but some of the nation's most prominent science policy analysts are hoping that companies and universities will pay generously for advice on how to manage their R&D affairs.

The new venture is called the Washington Advisory Group (WAG), and its cachet lies in the political savvy of its senior fellows—10 men at or beyond normal retirement age. The list includes three former presidential science advisers—Allan Bromley, Frank Press, and Edward David—as well as former National Science Foundation Director Erich Bloch, former National Institutes of Health Director James Wyngaarden, former NASA chief Robert Frosch, and Alan Schriesheim, who just stepped down as head of Argonne National Laboratory.

The group is the brainchild of Robert White, former president of the National Academy of Engineering (NAE). "We're a virtual consulting firm," says Managing Director Bruce Guile, a former NAE staffer. "The idea is that clients will be served directly by one of the senior fellows, who can offer them a wealth of experience and knowledge." Asked about the firm's older-white–male lineup, Guile said the fellows "would like to see women and minorities added to the mix."

WAG's first customer is the French oil drilling giant Schlumberger Ltd., which wants a review of its R&D operations. Guile says the group also hopes to attract philanthropies looking to re-shuffle their grants portfolios and universities hoping to cash in on discoveries by their faculty.

"Although we expect to be profitable, the real point is to make a contribution to the nation's R&D effort," David says.

Cancer Institute to Propose 'Genome Anatomy' Project

The National Cancer Institute (NCI) is about to unveil a new battle strategy in the war against cancer. Later this month, NCI Director Richard Klausner plans to propose an ambitious new initiative to develop technologies for characterizing the genetic fingerprints of cells and assessing their tumorigenic potential. "We want to move forward in developing a resource and [the] intellectual infrastructure for reading all genes," Klausner told Science.

The Cancer Genome Anatomy Project, as it's called, will involve creating cDNA libraries of normal and cancerous breast, colon, and prostate tissues to be made available as a public resource. With these libraries, researchers will be able to determine what genes are active at various stages of cancer's development. To reach this goal, NCI will also come up with standards for acquiring, analyzing and preserving tissues used to make the cDNA libraries. It also plans to push computerized technologies for analyzing gene expression in both the clinic and the lab.

The project is one of several development and diagnostics programs for which Klausner hopes to get $79 million in 1998, of which $50 million will support laboratories developing molecular-based diagnostics, according to NCI's wish-list, known as the 1998 "bypass budget." Most of the remaining $29 million would go toward establishing tissue banks and setting up projects to match the genetic fingerprints to various stages of disease and patient profiles. An informatics infrastructure will link these resources to the cancer community, Klausner says. The Genome Anatomy project must pass review by NCI's scientific advisers, but Klausner hopes it will be up and running next year.

Scripps Sued Over Integrin Research

Scores of labs studying cellular adhesion proteins known as "integrins" will be watching a lawsuit filed on 19 July by Telios Pharmaceuticals of San Diego against David Cheresh of the Scripps Research Institute, a leader in integrin research. Telios wants researchers using a discovery on which it owns a patent to sign a licensing agreement—even those who aren't currently involved in commercial projects—and it is seeking a federal court injunction to stop Cheresh's research.

Integrins have potential commercial value, particularly for cancer treatment, because they may be used to regulate tissue growth. Telios and its parent company, Integra LifeSciences Corporation of Plainsboro, New Jersey, own a 1988 patent on a basic discovery in the field—a 3-aminoc acid sequence known as RGD. Telios is suing Cheresh, Scripps, and a German research partner, Merck KGaA, for allegedly infringing on its RGD patent.

Scripps declined comment, but Cheresh says he thinks the case could be "precedent-setting" if it interferes with research. Years ago, Cheresh says, the discoverers of RGD shared materials freely with the community, but their invention now belongs to Integra. Fred Cahn, Integra vice president, says, "We believe [Scripps and Merck KGaA] have a drug candidate in development," and hopes to negotiate a license. In general, Cahn says, "we believe that if people are doing this research [with RGD], they should obtain a license."

Washington, DC, patent attorney Kate Murashige notes that the patent at issue is "a central concept" in integrin research. While only a subset of the hundreds of integrin researchers are likely to be affected, says one, Eric Brown of Washington University, the legal threat is still worrisome: "Wouldn't it be terrible if you had to consult a lawyer before you could do an experiment?"
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Wiley Declines to Publish Jensen Book

Last spring, the New York branch of John Wiley & Sons canceled a book on intelligence research, *The G Factor*, on the eve of publication, labeling as “repellent” the views of its author, Christopher Brand of Edinburgh University, on racial differences in IQ (Science, 3 May, p. 644). Now, Wiley has evidently decided that controversial psychologist Arthur Jensen’s 800-page tome on the same topic—the bulk of which it has had under review for the past 10 months—is too hot to handle. In a letter dated 29 July, the publisher wrote to Jensen that “after careful review and discussion, we have concluded that we are not the right publisher for your book....”

Jensen, an emeritus professor at the University of California, Berkeley, is well known for his research on the g or “general intelligence” factor, including its biological underpinnings. Two of the book’s 14 chapters discuss race differences in g. But Jensen says his editors at Wiley had been very positive about both the book and prospects for a contract once all the chapters were in. Furthermore, he was told the scientific reviews were excellent. Indeed, one of the reviewers, Wesleyan University psychologist Nat Brody, wrote Wiley last November that the book “meets the highest standards of scholarship” and predicted “this book will be the standard reference on the subject for many years.”

But then came the Brand affair. After that, says Jensen, he was warned that at Wiley “they were having a lot of conferences about my book at a level these things usually don’t get discussed at.”

Wiley spokesperson Susan Spilka denies that political worries affected Wiley’s decision. “We in no way had made any commitment” to Jensen, she says. “We look at thousands of books, we reject some and accept some—that’s the business of publishing.”

Designing the Best Possible Meeting

Every veteran meeting goer knows the frustration of discovering that two choice sessions are being held at the same time at opposite ends of the convention center. Organizers try to avoid such conflicts. But the scheduling is largely done “in a hurry... and by intuition” says mathematician Carroll Johnson of the Oak Ridge National Laboratory.

Crystallographer Yvon Le Page of the National Research Council of Canada, Ottawa, thinks he has a better way—a mathematical system to take the guesswork out of scheduling. Tested at last summer’s American Crystallographic Association meeting in Montreal, the method could be a boon to organizers of future meetings, says Johnson.

Le Page began work nine months before the meeting, after session topics had been decided, with an email survey asking participants which sessions they wanted to attend. His sample of about 100 revealed a small number of “interest profiles,” such as macromolecular crystallography or materials sciences, whose adherents tended to travel together throughout the meeting.

As he relates in the June issue of the *Journal of Applied Crystallography*, *Le Page* found that calculating the optimum scheduling would have involved an “astronomical number of permutations.” He therefore resorted to an approach known as dual problem theory, which describes how to take one solution to a problem and find its “dual,” which has the opposite effect. The easiest starting point, he found, was a meeting scenario that would maximize conflicts for the attendees. “It is quite straightforward to frustrate massively the participants” because there are many possible bad scenarios, explains Le Page. He then switched the parameters to achieve the dual solution. The result was “a pretty good meeting” and a narrowed range of possibilities amenable to tinkering. From these Le Page says he came up with a “very good” meeting that featured five parallel sessions scheduled in seven half-day chunks for the 1100 participants.

At least one attendee attests that Le Page’s efforts were worthwhile: University of Chicago crystallographer Zhong Ren says he “didn’t notice any conflicts and was able to go to all the sessions” he wanted to.
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Linguistic Tools


Students of Japanese face a daunting task when tackling the written language. To be considered literate, one must master approximately 3000 kanji characters, the borrowed Chinese ideograms that make up the core of written Japanese. The full set of kanji in common use comprises over 6000 characters. Mastery is even harder for scientists and engineers, who must command additional specialized vocabulary and characters. Several recent books and disks may help ease the chore for the serious learner.

A prime textbook for such learners is Basic Technical Japanese, developed at the University of Wisconsin as part of its respected graduate course in Japanese for engineers. The book concentrates on the rudiments of Japanese grammar and the written language, focusing on the 500 most common kanji in technical use. Each chapter introduces a handful of kanji along with technical vocabulary followed by grammar lessons and translation exercises. The goal is to prepare the student for translating what he or she desires from the copious technical literature available only in Japanese.

Basic Technical Japanese offers lessons with a general set of kanji covering many fields from physics to biochemistry, but what about the more specialized student who needs a more complete set of technical kanji? The Technical Japanese Supplements series fills this need. These companion volumes provide drills in the extensive borrowed terminology written entirely in katakana as well as the kanji for many terms of art in each field. The first, "Kanji for Understanding Technical Japanese," was designed as a supplement to an earlier incarnation of Basic Technical Japanese and provides more information about the kanji therein. The other three concentrate on the language of solid state physics, polymer science, and biotechnology, all fields in which there is a substantial untranslated Japanese literature. Taken together, these volumes provide comforting aid to the beginning non-native student of technical Japanese.

One can always tell when someone is learning Japanese by the stacks of small flashcards he or she carries. To further ease the absorption of the kanji mentioned above, Basic Technical Japanese is complemented by a software package called Kanji-Flash. This MS-DOS program is tied to the chapters of the textbook and presents kanji exercises of various kinds. Kanji are presented on the screen, and the user must enter the pronunciation of the character as well as its meaning. It is a simple and compact way to reinforce learning and does not require special fonts or sophisticated enhancements to the operating system.

A large amount of surprisingly high-quality free software related to Japanese text processing has been available on the Internet for some years. The most important tools have now been bundled onto a CD-ROM by Walnut Creek, creators of an impressive line of low-cost disks. Their Japanese Text Processing CD-ROM includes software for MS-DOS, Windows, and Unix machines, along with many useful text files. The disk holds 593 megabytes in 4400 files, making it a cost-effective resource. As an example, the CD-ROM contains Stephen Chung's superlative Japanese word processor, JWP version 1.3, and James Breen's extensive electronic Japanese dictionary. Several games and learning aids are included, too. To fill out the collection, some 860 reports from David Kahaner, formerly of the Office of Naval Research, contain commentary and analysis on critical science and technology issues in Japan. And finally, when taking a break from memorizing kanji, one can always contemplate some of the 118 wonderful ukiyo-e woodblock prints to be found on the disk in JPEG format.

David Voss

Vignettes: Horology

Anyone seriously attempting to design a clock for accurate timekeeping must first ask himself what we really mean by accurate timekeeping. The horological intellectual recognizes that this actually means a clock which is more easily predictable in its behaviour. By definition, the time told by each and every working clock is a perfectly accurate response to the natural influences upon it. What we call "errors" in timekeeping are merely those influences upon a clock which we haven't compensated for in its design, or which we haven't accounted for in interpreting what the clock says.

—Jonathan Betts, in the foreword to Philip Woodward's My Own Right Time: An Exploration of Clockwork Design (Oxford University Press)

The measurement of time is something new, even for humans. Time never needed keeping until man invented time keepers.

—Paul Quinnett, in Darwin's Bass: The Evolutionary Psychology of Fishing Man (Keokee)

Books Received


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- **Oligonucleotide Probe Kits**
  The Label-It 5' End Labeling Kit yields labeled oligonucleotide probes in 5 min with high specific activity and greater than 95% efficiency. The enzyme used for this reaction, bacteriophage T4 polynucleotide kinase (PNK), catalyzes the transfer of the set γ-phosphate of adenosine triphosphate to the 5' terminus of either DNA or RNA. This PNK reaction-driven system offers the versa-

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