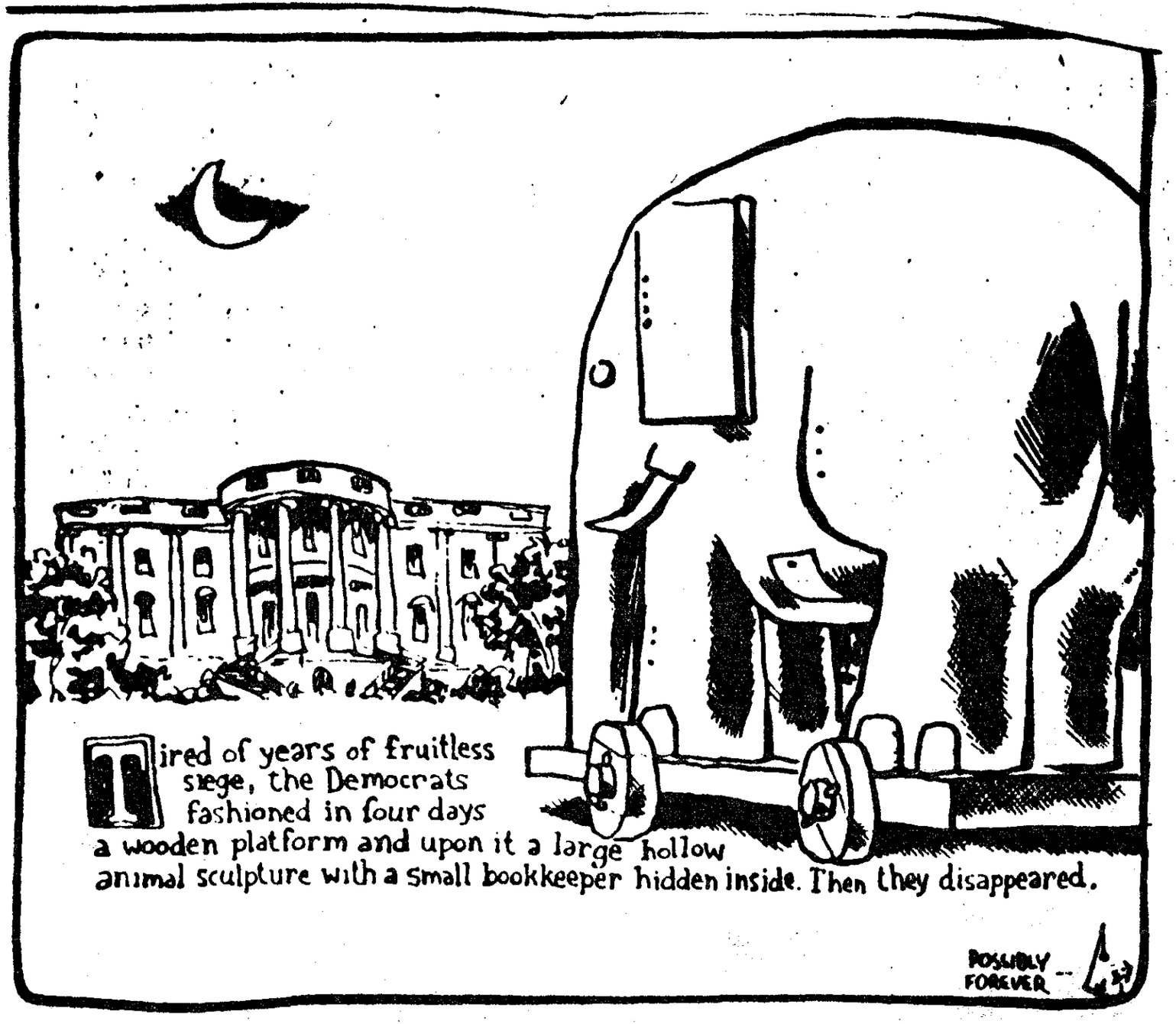

Tired of years of fruitless siege, the Democrats fashioned in four days a wooden platform and upon it a large hollow animal sculpture with a small bookkeeper hidden inside. Then they disappeared.
POSSIBLY FOREVER

MEMORANDUM

TO: Mr. Bill Miles

FROM: Mr. Norman Latker

SUBJ: Retreat Subjects

DATE: October 14, 1988

The following are items that you may wish to discuss or may be quizzed about on retreat next week. We have discussed all these matters so no detail is provided.

1) On-line database.
2) In-house database.
3) SBIR.
4) University R&D Directory.
5) Physical location of Washington office.
6) SUPA Journal.
7) Possible acquisitions:

    a) Inside R&D.
    b) Dvorkowitz.
    c) Lloyd Patterson, Inc.
    d) NERAC.

8) USET Involvement with Maxwell Foundation (including contract guiding, conduct of research activities).
9) Smithsonian and Maryland Biotech Institute.
10) New clients (foreign and domestic).

NL:srn

Political Heat Rising on Sharing of Federal R&D Funds?

From Equity, Excellence, and the Distribution of Federal Research and Development Funds *(88 pp.), an analysis prepared for Congress by William C. Boesman and Christine Matthews Rose, staff members of the Science Policy Research Division, Congressional Research Service, Library of Congress.**

•

In addition to the comprehensive universities, there are approximately 182 research institutions falling outside the "top" 100 universities [in receipt of federal R&D funds], that are qualified to conduct cutting-edge research. Major discoveries made in the field of high-temperature superconductors . . . occurred at the University of Houston and the University of Alabama, Huntsville. The University of Alabama received $3.2 million in Federal support for science and engineering while the University of Houston received $7.9 million for R&D in fiscal year 1985. In comparison, Johns Hopkins University and the Massachusetts Institute of Technology, both "top-100" institutions, received $429.2 million and $187.7 million, respectively.

Proponents arguing for "geographical equity" in dispersion of Federal science funds contend that policies and programs should be established to strengthen and maintain strong science programs at these 182 research institutions. These "non-elite universities," or "second- and third-tier universities" as described by David Eli Drew, Claremont Graduate School, ["Finest Science Not Always Found in the Fanciest American Universities," *Los Angeles Times,* October 18, 1987], are receiving a small fraction of Federal R&D funding while productively engaged in basic research. These institutions, along with the comprehensive institutions, are employing many doctoral science faculty members from the top 100 institutions from which they graduated . . . . Proponents maintain that the present institutional concentration of Federal science funds has failed to respond to shifts in the distribution of scientific talent. The best researchers and the best ideas are not necessarily limited to the leading institutions.

[Whatever] the merits of the peer/merit review system, and there are many, that system is intended to select the best proposals for scientific research from among those available mainly on the basis of present scientific merit regardless of extraneous factors, including geographical considerations. Thus, the peer/merit review system is likely to reinforce the existing geographical distribution of R&D funding to scientific institutions as long as it correlates with the distribution of research excellence.

•

[Various data suggest] that a relationship exists (whether causal or derivative is unknown) between Federal R&D funds expended in a State and the economic level of the State as measured in terms of per capita personal income . . . . [Of] the 17 States having per capita personal income at or above the US average in 1985, 10 also received Federal R&D funds above the US average per capita level. Perhaps even more significantly, of the 34 States having per capita income below the US average, 31 also received Federal R&D funds below the US average per capita level.

While much more than Federal R&D funds expended in a State determine its relative economic development, patterns [of distribution of Federal R&D funds] suggest that the concerns of State and regional policymakers about the importance of R&D to their State may not be misplaced. Such patterns also suggest that the unequal distribution of R&D funds may become more of a political and economic issue in the future than it has been over the last couple of decades.

**Reports produced by the Congressional Research Service are directly available only to members of Congress. But the legislators and their staffs routinely fulfill outside requests for copies. To get this one, specify that it's a report from the Congressional Research Service, give the full title and the identifying document code: 88-422 SPR. The main Capitol switchboard number is 202/224-3121.*

Science & Government Report
Northwest Station
Box 6226A
Washington, D.C. 20015

Second class postage paid
at Washington, D.C.

Three Gloomy Reports on US Industrial Prospects Issued by OTA

In the Washington report-writing industry, it's a boom season for dour productions on the ineptitude of American industry. Checking in with the following new trio in this genre is the Congressional Office of Technology Assessment (OTA), whose topics of study directly reflect Capitol Hill's concerns:

Advanced Materials by Design (GPO Stock No. 052-003-01095-0, 353 pp., $14), reports that US industry is mainly sitting on the sidelines, waiting to see whether research on exotic materials can be used in saleable products, while Japanese manufacturers are closely involved with early efforts at commercializing the next generation of composites and ceramics. OTA notes that a large part of the US effort is financed by and focused on the needs of the Pentagon, and that "By a margin of 2 to 1, the US ceramics companies interviewed by OTA felt that Japan is the world leader in advanced ceramics R&D."

Commercializing High-Temperature Superconductivity (GPO Stock No. 052-003-01112-3, 106 pp., $8), reports that "American companies may already have begun to fall behind." OTA adds that "Japanese firms have been much more aggressive in studying possible applications of HTS (high-temperature superconductivity), and have more people at work, many of them applications-oriented engineers and business planners charged with thinking about how to get HTS into the marketplace."

Paying the Bill: Manufacturing and America's Trade Deficit (GPO Stock No.052-003-01124-7, 88 pp., $4), notes that "US pre-eminence in many manufacturing fields has evaporated," and one big reason is that "American manufacturers have fallen behind in the practical application of technology."

OTA doesn't prescribe for its Congressional clients. But the options offered in the three reports include closer collaboration of the federal, academic, and industrial sectors, expanded efforts to extract industrial value from military R&D, and increased federal financing of research in industry.

Superintendent of Documents, USGPO, Washington, DC 20402; tel. 202/783-3238.

Job Changes & Appointments

Anne G. Keatley, Executive Director for Government and Public Affairs, National Academy of Sciences, has been appointed Director of Institutional and External Affairs at the Carnegie Institution of Washington, effective August 1.

Eric Fischer, formerly with the Senate Budget Committee as a Congressional Fellow of the American Association for the Advancement of Science, has been appointed Deputy Director of the Smithsonian Tropical Research Institute. Fischer was formerly on the faculty of the University of Washington (Seattle). He succeeds ***James R. Karr,*** who has been appointed Professor of Biology at Virginia Polytechnic Institute and State University, Blacksburg, Va.

Thomas L. Poulos, Professor of Biochemistry, University of Maryland, has been appointed Director of the Center for Advanced Research in Biotechnology (CARB), jointly sponsored by the University, the National Bureau of Standards (NBS), and Montgomery County, which borders on Washington, DC. ***Walter J. Stevens,*** a computational physicist at NBS, has been appointed Deputy Director of CARB, one of four research centers in the Maryland Biotechnology Institute, which aims to nurture high-tech industrial development.

Howard J. Silver has been appointed Executive Director of the Consortium of Social Science Associations, a Washington-based lobby that represents social and behavioral sciences scholarly and professional organizations.

Silver has held the post on an acting basis since the resignation last January of ***David Jenness.***

Medical Award Honors NCI Head for Developing Hodgkins Therapy

Vincent T. DeVita Jr., Director of the National Cancer Institute, has been named the first recipient of a $150,000 prize established by the Pezcoller Foundation of Trento, Italy, to honor outstanding medical researchers. DeVita was cited for the development of treatments for Hodgkins Disease and diffuse large-cell lymphomas. The award, to be given every three years, is financed by Alessio Pezcoller, now age 90, for many years a cancer surgeon in Trento, and a major bank in that city. The award selection was made by an international committee of medical reseachers.

SGR Wins Investigative Prize

Science & Government Report has been named the first recipient of a new prize for "exclusive or investigative reporting" by newsletters.

The award was for SGR's coverage of fraud charges against Stephen E. Breuning, a research psychologist accused of fabricating data on tranquillizer dosage for retarded children (SGR March 15, April 1, 1987). Breuning's research was branded fraudulent by the National Institute of Mental Health and he was subsequently indicted on federal criminal charges. He has denied any wrongdoing.

The newsletter prize, $1000, is sponsored by the National Press Foundation, an independent, non-profit organization that annually awards prizes in various categories of journalism.

Hopkins Spurs Economic Development

By Nancy Myers
STAFF WRITER

The Dome Corp., the real estate and new venture development subsidiary of Johns Hopkins University and the Johns Hopkins Health System, is working hard to promote economic development for the university and in the technology community.

Last month, Dome formed Triad Investors Corp., a company to transfer and commercialize technology, and Cartermill Inc., a joint venture with a British company to market a data base of U.S. university research resources. Dome is seeking a higher profile for its programs and the university in the local and international technology communities.

Founded in 1984, the Dome Corp.'s mission is to strengthen the financial position of Johns Hopkins University and Health Systems through real estate development and for-profit business ventures. The company's biggest project until now has been development of the Bayview Research Campus in Baltimore, a 130-acre mix of office, research and production space for biotechnology firms and JHU programs. But the two latest spin-offs have shown Dome's interest in branching out beyond the university into the technology community.

"I think we're becoming a lightning rod in a sense that will help attract and nurture business...in the area in other ways," says Triad President and Chief Executive Leigh Abts.

Triad will be funded by $10 million, including at least $8 million from private industry partners and $1 million each from the university and from the Johns Hopkins Health System. Triad will then invest up to $1 million to commercialize research conducted by researchers from JHU, other universities and small companies. About one-third of Triad's projects could be outside the university, Abts says.

"We're a for-profit entity that is sensitive to the academic environment," he says. Historically, university researchers and small business scientists are reluctant to work on commercialization, but Triad's resources will help ease the transition.

"In this area...there's been a need here for a more proactive role by the Johns Hopkins family," Abts says. "Triad was conceived to be a bridge between the academic and corporate communities."

Federal technology-transfer legislation over the past few years gave impetus to Triad's founders, he explains, because of the innovative ways federal laboratories are encouraged to commercialize technology.

Research projects expected to be commercialized first include development of a vision enhancement system with a video screen instead of lenses for those with seriously impaired vision; erasable optical disc switch technology, a less costly process to erase and rerecord videos and compact discs; and a jet-injector system to replace hypodermic needles.

Triad's projects will be managed by Abts, a business team, and a scientific advisory group, as well as industry leaders and Dome officials.

Another recent Dome Corp. venture is the BEST America data base, modeled after a successful British data base, to maintain information from most of the 300 to 500 research-oriented institutions among the 3,000-plus U.S. universities. The data base will be produced by Cartermill Inc., a joint venture of the Dome Corp. and Addison-Wesley Longman Group Ltd., London, which founded the BEST Great Britain data base in 1985.

"There's a need for this because there's nothing like this," says Kenneth Blaisdell, Cartermill president and CEO. "There's a need to understand what resources are available."

Blaisdell, who was most recently assistant provost for research development at Johns Hopkins, says the data base is different from the networks connecting many universities: the BEST America data base expects to be a comprehensive listing of all research-oriented universities; and the service will be available to users outside the university, including corporations and federal laboratories.

When agreeing to become part of the data base, each university receives a copy of its data base of faculty and staff expertise, special facilities and services and doctoral-student resources. Hopkins and Rensselaer Polytechnic Institute are two of the first to join. Information from the universities will be marketed throughout Europe, the United States and Asia.

The BEST data base, which offers more than 22,000 records representing every British university and polytechnic, boasts a 90 percent resubscription rate. That's largely because of the data base's unique service, says Michael Tobert, Cartermill managing director and a founder of the BEST data base.

Corporate subscriptions allow unlimited on-line access to either or both data bases. In Great Britian, a year's unlimited subscription to the British data base is about 10,000 pounds; rates would be comparable for the U.S. data base, and higher for both data bases.

Initiative Sights Maryland Manufacturing

By Nancy Myers
STAFF WRITER

Maryland's new initiative to revive the state's flagging manufacturing industry will build on the resource base of area universities, says a top state official.

The initiative, announced at a

"We've got to use the existing higher-education resources to make this work," said Randy Evans, Maryland secretary of economic and employment development. "The decline in manufacturing has got to stop today, here and now."

research centers and productivity and quality analyses for state businesses conducted by the University of Maryland.

Also, the initiative creates an executive response team of state and industry officials to address

M
A twel
program
of Scien
Technol
growing
manage
in techn
form of r
processe
Design
engineer
five to te
experienc
Offerec
Engineer
nation's f
focusing
technolog
H
ENG
Now is the time
ment through
courses in engi
The Johns Hop
the Shady Grov

neracnews

nerac, inc.
one technology drive / tolland, connecticut 06084 (203) 872-7000

FEDERAL TECHNOLOGIES: A WEALTH OF OPPORTUNITIES

Tolland, CT -- The federal government as a wellspring of licensing opportunities? The U.S. government spends billions of dollars annually on advanced research and engineering activities conducted within the federal laboratory network and other research centers. Surprisingly, a large share of these federally-developed technologies and inventions are available for purchase, commercial development, and licensing by American companies. Businesses now have greater access to these technologies as the result of recent actions taken by NERAC, Inc., a technology transfer center operating in cooperation with NASA.

To help promote the rapid commercial development of federal technologies, NERAC recently augmented its resources to include information contained in the Federal Applied Technologies (FAT) Database, a product of the Center for the Utilization of Federal Technology. With the addition of FAT references, NERAC's technical staff now helps companies locate the latest federal technologies available for license in such areas as medicine, energy, environmental testing, agriculture and defense. Last year, over 100 American businesses obtained licenses to federal inventions with the objective of commercialization.

The FAT references were recently incorporated in NERAC's Available Technologies Database (ATD), a composite data file comprised of references to technological innovations and developments available for license, transfer or sale. NERAC is compiling the ATD file in cooperation with corporations, database suppliers, professional societies and individual entrepreneurs.

Depending upon the federal technology itself and market conditions, exclusive, co-exclusive or non-exclusive licenses are available to interested firms and entrepreneurs. Over 700 patent awards and 900 patent application descriptions are added to the federal file each year, reflecting a staggering number of commercial opportunities.

Located in Tolland, Connecticut, NERAC works with subscribing companies and individual entrepreneurs nationwide to access existing and evolving global technologies that will help them compete more effectively and productively in the global economy.

To learn more about federal technological opportunities, or about NERAC, phone Nan R. Cooper at (203) 872-7000.

PR/12-88

Tech Transfer Creates Conflicts

By Nancy Myers
STAFF WRITER

The National Institutes of Health held a retreat for high-level government and industry officials Dec. 19 and 20 to consider conflicts of interest and other controversies relating to the trend toward cooperation between the federal laboratories and U.S. industry.

Technology-transfer legislation and other rules have been implemented over the past six years, allowing NIH and other federal scientists to consult for and work on joint ventures with private companies. But NIH officials are now worried the new openness has caused ethical problems.

"It's just the beginning of an ongoing discussion of the issues involved," says Dr. Philip Chen, NIH associate director for intramural affairs, who organized the retreat.

Since 1985, NIH scientists have been allowed to earn extra income by consulting for private companies. The figures have not been staggering. John Eberhart, an NIH intramural program adviser, says in fiscal 1988 124 NIH scientists received total consulting fees of $689,231; the average fee per individual was $5,588. The 1986 Federal Technology Transfer Act created other industry-lab opportunities, notably cooperative research and development agreements, known as CRDAs, now being implemented.

"It's clear that we need to form a tighter relationship between industry and national resources like NIH," says Dr. James Barrett, president of Genetic Therapy. But maintaining NIH's standards and accessibility also is important, he says.

"We're operating in a changing environment and we're evolving with it," says NIH Director Dr. James Wyngaarten. "Preserving the excellence and diversity of NIH is the greatest challenge."

Government-wide standards of conduct issued by President Lyndon Johnson in the 1960s prohibit accepting gratuities from companies doing business with an agency, establish honorarium limits, and prohibit unapproved outside consulting. Also, the standards mandate that each agency establish rules regarding conflict of interest. NIH officials plan to draft new regulations to reflect the new legislation.

Marvin Guthrie, director of the office of technology affairs at Massachusetts General Hospital, Boston, said hospital officials set up guidelines that match the institution's culture and atmosphere (including freedom for hospital researchers to set up their own collaborative agreements), and NIH officials should do the same.

"The next thing for you all to decide is who you want to be and how you want to interact with industry," Guthrie says. "One of the most sacred rights [of the scientist] is the right to collaborate."

Reid Adler, director of NIH's newly created Office of Invention Development, says NIH should creatively avoid conflict of interest.

"The public wants access to biotechnology research fruits, and cooperative agreements are the way to do that," Adler says. However, he cautioned that the agreements should be crafted carefully.

NIH scientist Martin Gellert says cooperative agreements should be true collaborations, not just company funding or commercialization efforts.

"I think it's essential that we have them," Gellert says. "But they need to be the right kind of CRDAs."

"We're going to be developing CRDA fever and I have serious doubts about the CRDA system," adds Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases. He predicts scientists will become less generous with scientific data if the possibility exists for licensing agreements or other cooperative ventures.

Many seminar attendees would like less consulting by NIH scientists, and suggest that increasing salaries, a plan recommended by an Institute of Medicine study, is one way to decrease consulting's appeal.

"If you increase salaries there will be less and less consulting," Fauci says. Fauci's institute is second only to the National Cancer Institute at NIH in consulting fees and cooperative agreements, and officials there consider the pairings carefully.

"It's an ethical high-wire act," acknowledges Wyngaarten, who signs off on every consulting agreement and has turned down a few.

Pay NIH Scientists More, Report Says

By Nancy Myers
STAFF WRITER

Radical changes such as privatization in the National Institutes of Health intramural research program are not needed to maintain NIH's research excellence and scientific achievements, says an Institute of Medicine study.

The report, "A Healthy NIH Intramural Program: Structural Changes or Administrative Remedies?" concludes that changes including higher salaries and more management autonomy would help preserve NIH's world-class reputation.

The committee strongly recommends NIH officials be given more flexibility in hiring and wages, including exceeding federal salary caps, to attract and keep top-quality researchers.

The Office of Management and Budget and the Department of Health and Human Services requested the study earlier this year to assess whether privatization or other actions are needed to allow the intramural program to fulfill its mission (*WT*, Aug. 18).

The NIH intramural research program, including the lab facilities of each institute, employs about 6,500, including 2,500 scientists and 1,800 guest researchers. About $650 million, or 11 percent, of NIH's overall budget was spent on intramural research in fiscal 1988; most of the rest was spent on grants and contracts to researchers at universities and companies.

NIH Director James Wyngaarten applauds the report. "All we really need is a different pay scale," he says.

The committee urges Congress to give NIH authority to develop a demonstration project to overcome systemic deficiencies and to charter a foundation to endow up to 10 distinguished investigators. Also, the report suggested giving NIH officials autonomy and authority.

"Efforts to micromanage NIH...are counterproductive and cause NIH to be inefficient in carrying out its mission," says the report.



Joe Gibbs, Head Coach
Washington Redskins
NFL's winningest coach of the 80's

"Put IVT's products on your team and be a winner!"

IVT

External Port

With 3.5



- 20 to 680MB of removable hard disk
- 44MB removable cartridge and most floppies
- Tapes up to 150MB
- For PC XT, AT, PS/2 & most compatibles
- SCSI, ST506 & Micro-Channel models
- Portable between work groups and locations
- Supports DOS, XENIX and Novell environments
- Full one year warranty

Mix and
Disks, T

Custom c
5.25 & 3.5
sure types
optical me

IVT Computer Corporation
Subsidiary of Iverson Technology Corporation

P.O. Box 6070
1356 Beverly Rd.
McLean, VA 221(

TECHNICAL FA
RFI / EMI & DAT
SPECIALI

COMPLETE SEF
DESIGN AND ENC
TO CONSTRU(

- ☐ Site Planning - Design & Engineering ☐
- ☐ Power Conditioning and Distribution ☐
- ☐ Specialized Air Conditioning ☐
- ☐ Computer/Network Cabling ☐
- ☐ Access Flooring

TECHNICAL CONSULTING SERVIC
YOUR BUDGETARY RE

BARLOWS

1115 West Broad St
Falls Church, Va. 2

703 - 534-4800 ☐ 1-800 227-5

Scientist Warns of U.S. Reliance on Foreigners

Ex-Foundation Chief Calls Dependence on Imported Talent 'Ominous'

By Malcolm Gladwell
Washington Post Staff Writer

The United States is suffering from an "ominous" dependence on foreign professors and researchers in its higher education and research efforts, former National Science Foundation chairman Roland W. Schmitt told a meeting of the Washington-based Council on Competitiveness yesterday.

"We have become just as dependent on the import of research and faculty grade talent as on the import of consumer electronics, DRAM memories, or automobiles," Schmitt, now president of Rensselaer Polytechnic Institute in New York, said, pointing to statistics showing that almost 40 percent of all graduate students of engineering in the United States are foreign-born.

Schmitt spoke at the introduction of a new Council on Competitiveness report that calls for the U.S. government to end years of complacency and formulate an aggressive technology policy to "create an environment more conducive to rapid commercialization by the private sector."

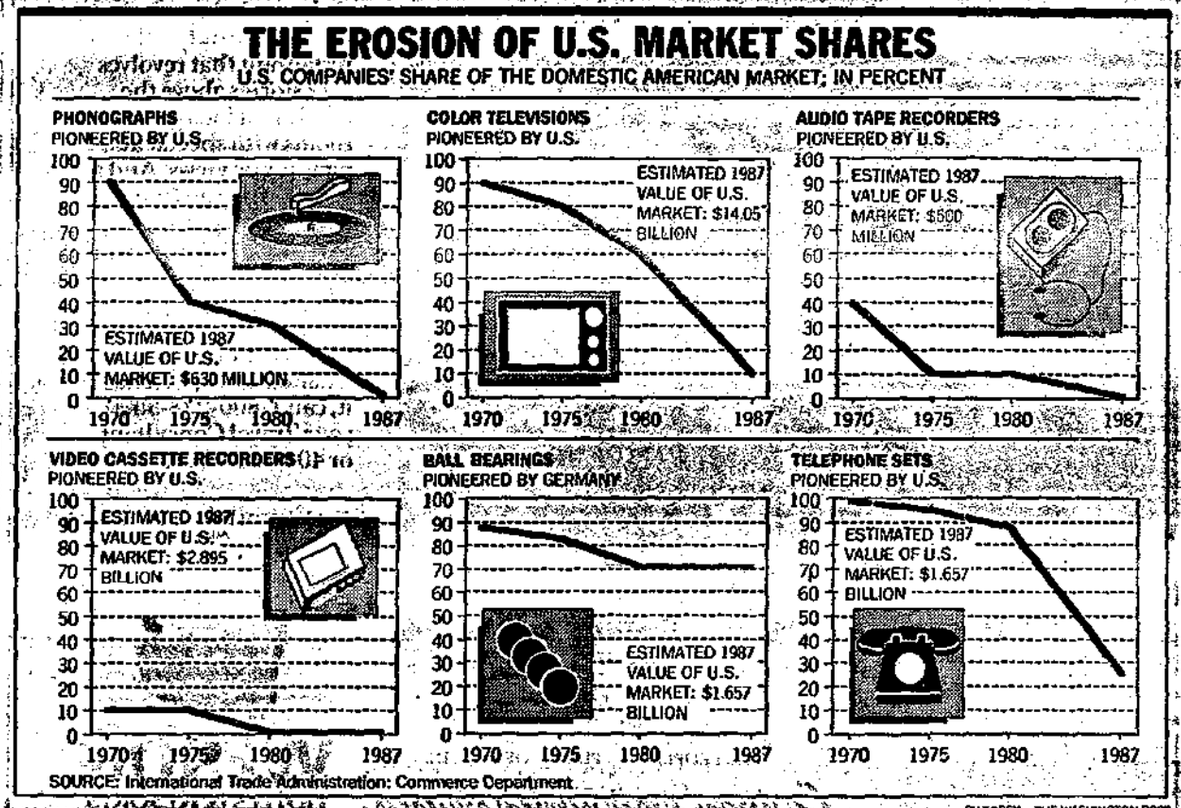
The report is the latest of many that have focused on America's declining industrial strength since the "competitiveness" issue became the catch phrase of U.S. economic policy four years ago.

America's Achilles' heel is its poor performance in turning scientific discoveries into commercial products and services, the report said. It cited five major product lines pioneered by U.S. companies—phonographs, color televisions, audio tape recorders, video cassette recorders and telephone sets—in which the U.S. market share has sharply declined. Part of the problem, the Council said, is governmental indifference.

"While other governments have used science and technology policies to promote industrial growth, the U.S. technology policy has viewed commercial applications as incidental or secondary in importance," said Hewlett-Packard Co. Chairman John Young, who chairs the council, a two-year-old research group made up of 151 chief executives from industry, education and labor.

The study's suggestions range from a request for a creation of a Cabinet-level office of science and technology to a redirection of the federally funded research and development efforts that currently account for half of the $125 billion the United States spends on research and development every year toward more commercial applications.

See STUDY, E12, Col. 1



Scientist Warns Of Dependence On Foreigners

STUDY, From E1

The report also calls for a new investment of federal money in graduate-level science and engineering programs to head off the country's "significant human resource problems."

According to Schmitt, a combination of decreasing interest in math and science among high school students, unqualified science teachers and underfunded engineering and science programs at U.S. colleges has created a situation that may result in a shortage of 500,000 scientists and engineers by the year 2010.

"My personal view is that [foreign professors and researchers] have saved us," Schmitt said. "But the dropping interest of our own citizens in these programs ought to be of concern."

Young, who headed President Reagan's commission on industrial competitiveness, said there has been some real progress in addressing competitiveness issues during the past few years.

"You've seen an absolute night and day difference in trade administration over the past two and a half years," he said. But he would not speculate on which of the two presidential candidates might be more receptive to the report's recommendations.

"Looking at the pronouncement of either candidate, I don't find a rich field for research and development in either case," Young said.



Technology Forecasting at J&J

An Interview with Jonathan Rosen, PhD
Vice President, R&D, Codman & Shurtleff, Inc., a Johnson & Johnson Company

Since congressional passage of the Technology Transfer Act of 1986, industry interest in technology transfer has increased dramatically. But the potential for cooperative research agreements with federal and university research laboratories far exceeds the current level of activity.

Codman & Shurtleff, a Johnson & Johnson Company, believes technology transfer is important to a company's long-term strength. Jonathan Rosen, vice president of R&D for the Randolph, MA–based neurosurgical device company, says the key to a successful program is technology forecasting.

MD&DI: What role does forecasting play in technology transfer?

ROSEN: Forecasting really is the key. You have to know what you want before you go through your business development or internal R&D group, or any other resource. The purpose of forecasting is to identify emerging technologies, both short and medium range. That's how you move forward. If you keep doing the same things, the field will pass you by. Forecasting keeps you in the middle of the wave longer. It gets down to picking an accurate time frame for the availability of a technology.

For example, I may forecast that an optic fiber will become available between one and five years from now. Within that four-year span, I may forecast that it will become available sooner if certain developments come to pass, later if they don't. The trick is to figure it out before it happens.

You can mobilize your forces quickly to evaluate whether a technology is what it's cracked up to be, how far along it is toward development, and what resources you need to bring it in and take advantage of it.

MD&DI: What is J&J's corporate expectation for company-wide technology forecasting?

ROSEN: The corporate expectation is that each J&J company in its own way will be responsible for technology forecasting, or mechanisms through which the organization becomes aware of technological changes in its area of interest that may affect its business. For example, if a drug can be administered more effectively by a transcutaneous patch than orally, and we're in the oral drug business, we're sensitized by that development. It's both an opportunity and a concern. We examine process and product technologies as well as developments in clinical science, and we make strategic planning decisions based on that information—decisions regarding the games that are being played and which ones we want to participate in.

MD&DI: Where do you get your information?

ROSEN: First, there are on-line data bases of all kinds. Someone here at J&J recently counted 5000 that were health-care related, ranging from pure scientific literature to financial and competitor analysis.

Basically, all the information that's published or in the public domain that is accessible legally and ethically is fair game.

patent information, demographics, epidemiology studies, biostatistics, environmental information, and updates on legislation.

The computer side is just one piece of the puzzle. We aggressively use freedom of information. Then there are focus groups, scientific advisory boards, committees, councils, and consultants. Also, we attend scientific and clinical symposia and conferences. Basically, all the information that's published or in the public domain that is accessible to us legally and ethically is fair game, and we keep careful and rigorous control to make sure it stays on that side of the line.

MD&DI: Once you find an area you're interested in, what's next?

ROSEN: The first time you access the information, it's to define the technological borders of your field of interest and compare it with your current strengths and limitations as a company. The next step is to decide whether you're going to give something the full treatment or not. A full-fledged due diligence analysis could conceivably cost hundreds of thousands of dollars, or it could amount to a 15-minute search on a computer. It all depends. In any case, you can't afford to do that for the heck of it.

MD&DI: What is involved in a full-fledged due diligence analysis?

ROSEN: It amounts to getting a complete background on the technology by answering these kinds of questions: How important is the technology? What is the state of the art? Who are the leading research groups? How close to fruition is their research? Who are your potential competitors?

Technology forecasting should be the number one objective of the whole organization.

MD&DI: How does technology forecasting interface with the strategic planning process?

ROSEN: There's an absolute explosion of available new technologies, more than any corporation can handle or absorb. And so you have to establish some criteria for selection. That's where planning from a technology perspective rather than a more traditional market-based strategic plan comes in. The use of available technologies, independent of which companies are sponsoring them or the competitive environment, is often a very practical and creative way of looking at the world and the future. Near the end of the technology forecast, the strategic planning effort—which is more an analysis of the competitive environment, the growth markets, and the part you want to play in them—follows on. When strategic planning follows technology forecasting, it can usually be made very complementary from the standpoint of identifying and pursuing technologies that are emerging over the short and medium range.

MD&DI: What would you say is the greatest barrier to technology forecasting and transfer?

ROSEN: We're all working very hard to do the best possible job of finding technology transfer opportunities and assessing them. But in a strange way, this tremendous opportunity is also our greatest limitation. So much exciting development is available in health care right now that it's extremely difficult to make good choices. Moreover, the pace of development is outstripping the decision-making process. From the time you recognize an opportunity to the time you're able to bring the resources to bear and effect a technology transfer, that technology has moved on a couple of notches. So making good decisions as quickly as possible is becoming more and more critical. The key is in the planning cycle—doing your homework ahead of time. Because if you read about an opportunity in the *Wall Street Journal*, for example, and then begin your evaluation of whether or not you're interested, it's too late.

MD&DI: Once your choice is made and you decide to bring your resources to bear on a particular technology, how do you decide whether you will develop it internally or acquire it through transfer mechanisms?

ROSEN: That's why I'm here. One of the responsibilities of the director of research is to be a primary decision maker on the issue of inside versus outside development of technology. And it's a tough question. Basically, it's a complex mixture of matching your own resources against what's available and the timetable for the technology's development. Then, of course, there's a hard-core business analysis that goes on as well. How much is it going to cost? What will your return be? You can do a cost-benefit analysis of inside versus outside R&D and get pretty far. And we do that. It's part of the full-fledged due diligence, and it can take several months to do a good job. You have to decide if that's how you want to spend your time.

But even if 90%, for example, of your technology is developed outside, it's ultimately the company's responsibility to develop a technology base. Somebody inside has to know if you're doing a good job or not. No matter which way the pendulum swings, you've got to be an expert in your business to be effective in making decisions over the long run. You can't swing so far to the side of contract research that you give up your ability to evaluate your success. And that's the responsibility of the whole board of directors—not just of the research director.

MD&DI: How important is technology forecasting to the overall operation of a medical device company?

ROSEN: In my mind, technology forecasting should be the number one objective of the whole organization. It's an absolutely vital first step in charting the course of the company. As I've said, most areas of health care are in a tremendously growth-intensive period, and we're flooded with new opportunities and technologies. If you look out at the horizon in any of the areas we're working in, health care will be provided in fundamentally different ways than it is now. It's obvious that these changes will have an enormous impact on our business over the next two decades. —D.H.

ALL THIS AND MORE...

FROM CUTTER



MORE PRODUCTS

Cutter offers a full range of the highest quality I.V. set components. With unique design features such as our Ultra-Site™ medicinal Y entry and duck bill check valve. A non-DEHP PVC tubing formula is available and all components are radiation compatible.

MORE SUPPORT

With over 45 years of experience in I.V. set design and manufacturing, Cutter can help you tackle any problem you encounter. We're ready to assist you in design, packaging, labeling, testing, sterilization and qualification. Or we can design and manufacture a special set to meet your unique requirements.

For more information, or FREE copy of the Cutter OEM catalog, call Frank Serany at (415) 420-5520. © 1987 Miles Inc.

Cutter MILES

Cutter Biological, Miles Inc. 400 Morgan Lane West Haven, CT 06516

WASHINGTON POST 9/8/88

Scientist Warns of U.S. Reliance on Foreigners

Ex-Foundation Chief Calls Dependence on Imported Talent 'Ominous'

By Malcolm Gladwell
Washington Post Staff Writer

The United States is suffering from an "ominous" dependence on foreign professors and researchers in its higher education and research efforts, former National Science Foundation chairman Roland W. Schmitt told a meeting of the Washington-based Council on Competitiveness yesterday.

"We have become just as dependent on the import of research and faculty grade talent as on the import of consumer electronics, DRAM memories, or automobiles," Schmitt, now president of Rensselaer Polytechnic Institute in New York, said, pointing to statistics showing that almost 40 percent of all graduate students of engineering in the United States are foreign-born.

Schmitt spoke at the introduction of a new Council on Competitiveness report that calls for the U.S. government to end years of complacency and formulate an aggressive technology policy to "create an environment more conducive to rapid commercialization by the private sector."

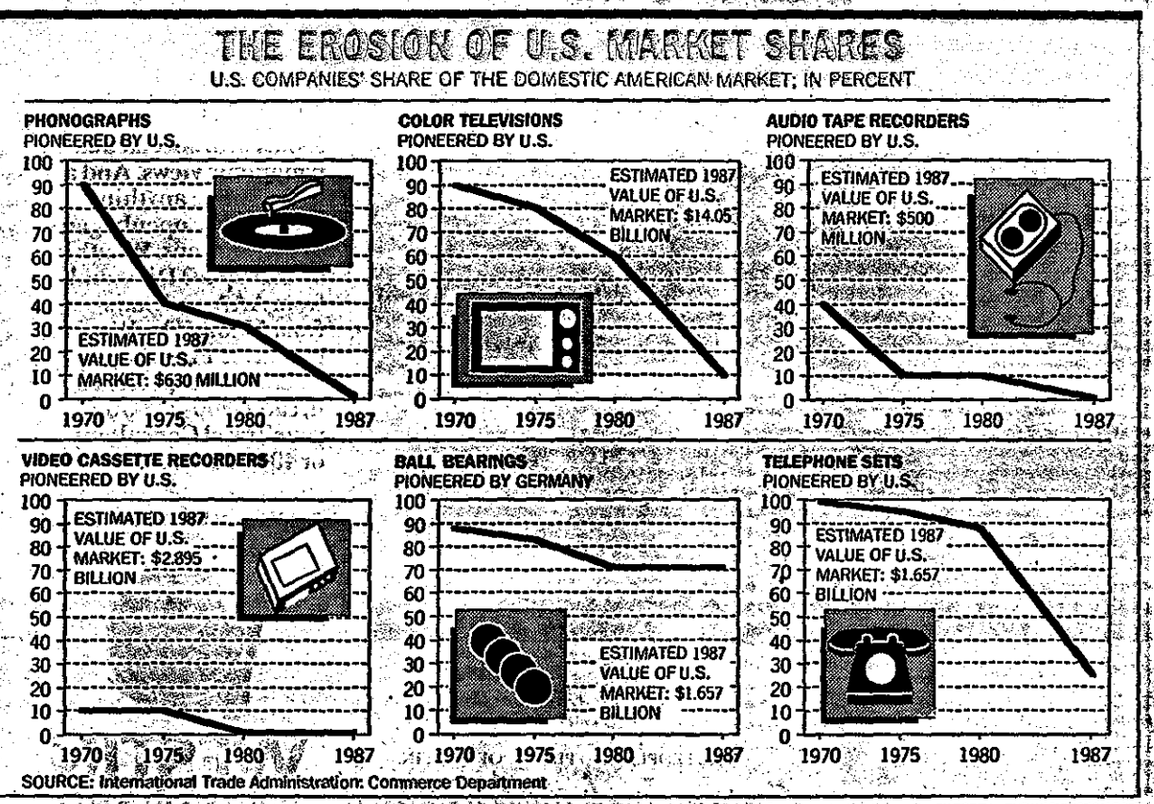
The report is the latest of many that have focused on America's declining industrial strength since the "competitiveness" issue became the catch phrase of U.S. economic policy four years ago.

America's Achilles' heel is its poor performance in turning scientific discoveries into commercial products and services, the report said. It cited five major product lines pioneered by U.S. companies—phonographs, color televisions, audio tape recorders, video cassette recorders and telephone sets—in which the U.S. market share has sharply declined. Part of the problem, the Council said, is governmental indifference.

"While other governments have used science and technology policies to promote industrial growth, the U.S. technology policy has viewed commercial applications as incidental or secondary in importance," said Hewlett-Packard Co. Chairman John Young, who chairs the council, a two-year-old research group made up of 151 chief executives from industry, education and labor.

The study's suggestions range from a request for a creation of a Cabinet-level office of science and technology to a redirection of the federally funded research and development efforts that currently account for half of the $125 billion the United States spends on research and development every year toward more commercial applications.

See STUDY, E12, Col. 1



Scientist Warns Of Dependence On Foreigners

STUDY, From E1

The report also calls for a new investment of federal money in graduate-level science and engineering programs to head off the country's "significant human resource problems."

According to Schmitt, a combination of decreasing interest in math and science among high school students, unqualified science teachers and underfunded engineering and science programs at U.S. colleges has created a situation that may result in a shortage of 500,000 scientists and engineers by the year 2010.

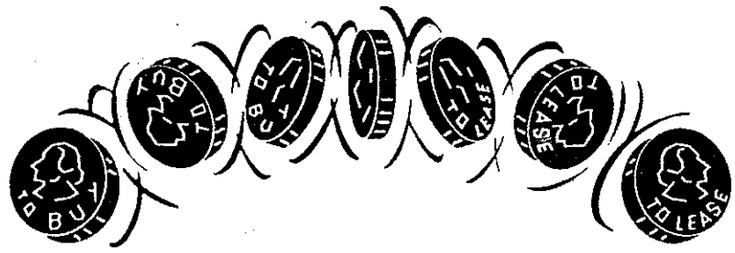
"My personal view is that [foreign professors and researchers] have saved us," Schmitt said. "But the dropping interest of our own citizens in these programs ought to be of concern."

Young, who headed President Reagan's commission on industrial competitiveness, said there has been some real progress in addressing competitiveness issues during the past few years.

"You've seen an absolute night and day difference in trade administration over the past two and a half years," he said. But he would not speculate on which of the two presidential candidates might be more receptive to the report's recommendations.

"Looking at the pronouncement of either candidate, I don't find a rich field for research and development in either case," Young said.

TO BUY, TO LEASE?



Although more expensive than buying a system outright, leasing a PC offers some unique advantages.

Ronnie Gunnerson

"I've been bloodied in this business," cries Wayne McFarland, president of WWC, Inc., a media promotion agency in Pasadena, California.

He started buying personal computers when CP/M was the only kid on the block and has suffered through three changeovers in technology—as DOS replaced CP/M and IBM PCs gave way first to XTs and then to ATs. McFarland recalls with little fondness scores of nonbillable hours spent figuring out what new equipment to buy and how to set it up.

Happily, those days ended a year ago when, during yet another search for systems, a WWC employee happened upon a lease-only store, Use 'R Computers, in Torrance, California.

For McFarland, computer leasing is a hedge not only against technological obsolescence but also against depreciation expenses and computer breakdowns. For $108 a month per machine, he leases two 640K Epson AT compatibles, each with a 30MB hard disk drive and a monochrome monitor. When his lease expires in two years, he can purchase the systems for $199 each—for a total price of $2791 per unit—or turn them in and lease new equipment. So much for obsolescence.

Instead of having to make a capital outlay (especially now that the investment tax credit has been abolished), McFarland has a comfortable cash cushion and writes off his fixed lease payments as an operating expense. So much for depreciation.

And McFarland is freed from service worries. "It's in the leasing company's interest to make sure the equipment is running," he observes. Although McFarland's two systems originally had controller board problems, Use 'R Computers fixed them both within 36 hours. It took seven weeks to find and solve a similar problem in equipment that McFarland once bought from a full-service dealer. Now an ardent convert, McFarland says he'll never buy another PC outright.

Of course, leasing also has its drawbacks. It's usually much costlier to lease than to buy, and only a careful examination of your computing needs and circumstances will determine whether it's the way to go. McFarland, for example, passes the monthly lease payments along to his clients as expenses. Such benefits make leasing the obvious choice for him.

An Alternative Way to Buy

Despite higher overall costs, leasing with an option to buy is fast becoming an attractive alternative to purchasing PCs outright. It now accounts for almost 30 percent of all PC sales, claims Fredric Weiss, chairman of the board of Studebaker-Worthington Leasing Corporation in Jericho, New York, one of several companies that provide lease financing through computer dealers and vendors.

Lease-only operations like Use 'R Computers are springing up all over. Even IBM and Apple have established third-party leasing divisions to compete with the Studebaker-Worthingtons of the world. "So many companies are concerned about technical obsolescence that vendors and resellers alike are now offering leasing to attract a larger share of the corporate marketplace," says Jocelyn Young, an analyst with the Dallas research firm Future Computing.

The introduction of 80386-based machines and IBM's PS/2 line have raised the interest in leasing even further. Many users are confused by changes in bus architecture and unsure of the long-term implications for the new 80386s and Microsoft's OS/2, says Robert Armstrong, manager of General Electric Computer Service's rental marketing program in Atlanta. More people are choosing to try before they buy. Even those who know what they want and are willing to pay for it often end up with short-term leases simply because the product isn't available from dealers yet, he adds.

Flexibility Is a Strong Point

The decision to lease rather than buy often depends on the size of the lessee. While small-business owners make their own lease/purchase decisions and can act on the spot, department managers in large companies often spend months waiting for higher-ups to OK their purchase proposals. Interim leasing often appeases management and in some cases can win approval for a previously denied purchase.

At Landis & Gyr Powers, a Northbrook, Illinois, manufacturer of automatic temperature controls and building-management systems, the approval process takes anywhere from six weeks to six months, according to Sam Wilson, manager of technical training. To ramp up for a special project in 1985, Wilson resorted to computer leasing, and he's been renting computers and peripherals ever since. He often leases equipment after a purchase request has been turned down, then he tracks his productivity gains and ultimately wins approval to buy.

Other companies use a similar strategy. They lease computers at year's end when their allocation for capital expenditures has dried up, then roll over into a purchase at the start of the new fiscal year. At firms like Talman Home Federal Savings in Chicago, leasing has become the norm rather than the exception. "Our cost-justification studies consistently favored leasing, and now we have a lease-only policy," says Senior Buyer Betty Murdock. "Writing off the lease payments to operating expenses, plus the ability to upgrade, makes it cost-effective for us."

Uncle Sam Offers Leasing Incentives

With tax reform, Congress unwittingly provided another reason to lease. Not only has the loss of the investment tax credit discouraged capital expenditures, but the new alternative minimum tax (AMT) actually encourages leasing, according to New York attorney Marisa Manley.

Intended to prevent taxpayers from whittling their taxes down to zero, the AMT slaps a 20 percent tax on a chosen few deductions called "tax-preference items." Included among these deductions is a portion of the accelerated depreciation that Congress mandated for many kinds of equipment, including computers, put into use after 1986.

If you don't own equipment, however, you don't generate depreciation deductions, so you decrease your exposure to AMT liability. So managing the AMT, Manley says, is another reason for some companies to lease. Note, however, that the AMT affects only a tiny percentage of tax returns.



Computer leasing is a hedge not only against technological obsolescence, but also against depreciation expenses and computer breakdowns.

JAMES ROWAN



Leasing is much costlier than buying, and only a careful examination of your computing needs will determine whether it's the way to go.

Two Ways to Lease

Trends aside, computer leasing isn't for everyone. How do you decide? Understanding the leasing process is the first step. There are two types of leases—*operating* and *financial*. Under an operating lease, you rent the equipment for a period extending anywhere from several weeks to several years, usually with the intention of returning it when you're done. Monthly payments are much higher than under a financial lease, which is designed as a financing vehicle for purchase.

Under an operating lease, the lessor picks up the cost of delivery, installation, maintenance, and service. There's an important caveat, too: Should you decide to roll over the rental into a purchase, you'll probably pay far more for the equipment than if you had chosen a financial lease.

American Computer Rental in Fountain Valley, California, offers a fairly standard rollover program. Half a customer's rental fees accrue toward purchase of leased equipment should he or she decide to buy it. If so, American Computer Rental expects to cash out right away. "The customer pays whatever balance is due or it is still considered rent," explains President Mike Score.

Based on a retail price of about $6000, American Computer Rental will lease an IBM AT with a 30MB hard disk drive, 640K of RAM, and a color monitor for $480 per month. "Assuming a 12-month rental, the total is $5760. Half of that, $2880, would apply toward the purchase price at the end of the rental period," explains Score.

To buy the $6000 system, the customer has to come up with another $3120. Add that to the $5760 already spent on rent, and the total purchase price is $8880. Of course, these calculations ignore possible cash-flow considerations.

Equipment rented under an operating lease typically is not new. Richard Wall, a microcomputer specialist in the research and development division of Pillsbury Company in Minneapolis, regularly rents computers under an operating lease while waiting for purchase fulfillment. He always rents with an option to buy, but he's never exercised that option. "You get an out-of-date computer that's got quite a few miles on it," says Wall. "It doesn't look like a very good deal."

Financial Leases Are for Buyers

Unlike operating leases, financial leases are usually set up to facilitate a purchase of state-of-the-art equipment. You simply string out payments over most of the computer's useful life. The purchase is fully amortized; that is, the total of the monthly payments equals the full price of the leased equipment. However, under the terms of a financial lease, you're on your own for service and maintenance just as though you'd bought the system. Manufacturers' warranties apply, of course, but to cover any additional repairs, you must buy a service contract, which costs about 10 percent of the purchase price per year.

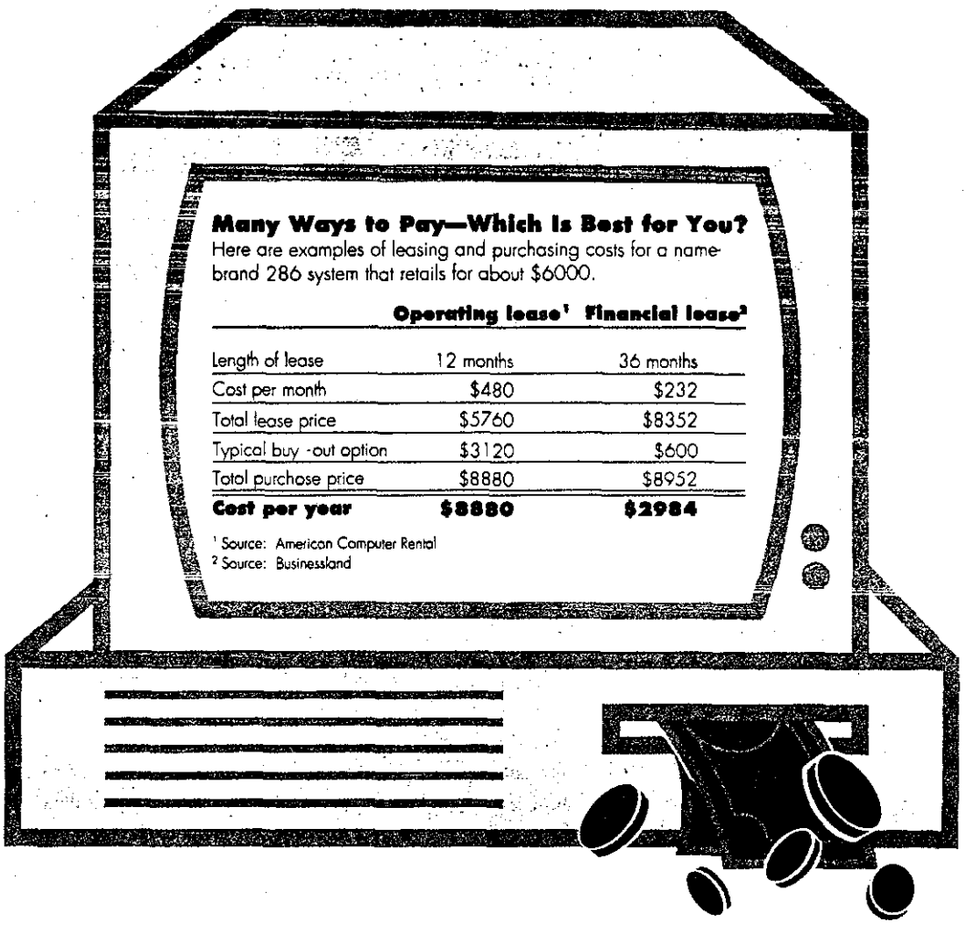
A characteristic financial lease from The Computer Factory, a New York-based computer dealer with 45 stores, spans three years, with a 10 percent residual buy out at the end.

"The 10 percent option means that there is no set price on the equipment until the end of the lease," explains Vice President of Sales Russell Madris. "At that point you negotiate the price with the leasing company to decide whether you want to keep the equipment or let it go."

A standard 10 percent residual buy out would be 10 percent of your total lease payments. For example, leasing $6000 worth of equipment for three years at an interest rate of 10 percent would yield a $7800 lease cost; you could buy the equipment for another $780, or a total of $8580. This is only about $300 less than the cost of the operating lease cited earlier, but the benefit is in the longer payment term—three years instead of one.

Another alternative is a *closed* lease where a dollar buy out is determined at the start. "Typically you pay more for a dollar buy out than you do for the 10 percent option," explains Madris. "Most of our customers are going for the option. We try not to even offer buy backs."

Depending on prevailing interest rates, using a financial lease may be a less costly way to acquire equipment than a bank loan. As Studebaker-Worthington's Weiss explains, "Once the lease is written, the monthly payment on the



Many Ways to Pay—Which Is Best for You?

Here are examples of leasing and purchasing costs for a name-brand 286 system that retails for about $6000.

	Operating lease[1]	Financial lease[2]
Length of lease	12 months	36 months
Cost per month	$480	$232
Total lease price	$5760	$8352
Typical buy-out option	$3120	$600
Total purchase price	$8880	$8952
Cost per year	**$8880**	**$2984**

[1] Source: American Computer Rental
[2] Source: Businessland

lease is fixed. Bank loans, on the other hand, are often tied to variable interest rates, so your payment can increase substantially."

Before You Sign That Lease

Three years ago, when Keven Wilder launched Chiasso, her contemporary home- and office-design store, not many retail stores in Chicago used computers as cash registers. For Wilder, leasing computers made the transition less risky.

Wilder is currently reconfiguring her system to handle multistore locations, and she intends to lease computers again "because, once more, we aren't certain it will work." She plans to use a financial lease with service fees added to the monthly payment. But she won't settle for the first lease she's offered. Wilder shops diligently for the best deal and recommends that anyone interested in leasing do the same.

"Leases can be negotiated," she says. "There's a wide range of prices and terms. A lot depends on how hungry the dealer is."

As Jim Beekhuizen of Use 'R Computers warns, "The decision to lease and the type of lease you choose depend on your company's internal rate of return and your tax position. Speak to your accountant before entering into a lease." ●

Ronnie Gunnerson is a frequent contributor to PC World.

N.Y. Times
8/20/88

University Patents Unit Is Acquired by Maxwell

University Patents Inc., one of the first for-profit companies established to market university inventions, announced this week that it had sold its licensing business to a new company controlled by the British publisher Robert Maxwell.

Based in Westport, Conn., University Patents has had contracts with seven large universities, including Princeton, the University of Illinois and the University of Colorado. Typically, the universities have given the company exclusive commercialization rights in exchange for a share of royalties.

But results have been disappointing. The company has not shown a profit since 1982. For the nine months ending last April, it lost $2.36 million on revenues of $2.4 million.

"They didn't have the resources they needed," said Donald Fruehling, president of the Maxwell Pergaman Publishing Group, a unit of the London-based Maxwell Communications Corporation. Mr. Fruehling said he wanted to use the acquisition to build a new data base on available scientific research. The terms of the deal were not disclosed.

Maxwell Communication Corp.

British Publishing Company To Buy London House Inc.

Maxwell Communication Corp. said it agreed to buy London House Inc. for $13.25 a share, or $17.4 million.

London-based Maxwell is British financier Robert Maxwell's printing, publishing and communications company. The purchase will be made through Maxwell's U.S. unit, based in Greenwich, Conn.

London House, Park Ridge, Ill., is a personnel-testing company. Mr. Maxwell said in a statement that the acquisition "is a natural fit" with another recent acquisition, Science Research Associates, which is involved in educational and vocational testing.

Maxwell Adds a Twist To Offer for Macmillan

By GERALDINE FABRIKANT

The financier is willing to pay $1.1 billion for part of the company.

Robert Maxwell, the British entrepreneur, stepped up his efforts to gain control of Macmillan Inc. on two fronts yesterday.

Mr. Maxwell announced a tender offer of $80 a share, or about $2.1 billion, for the New York-based publishing and information services company. And in a letter to Edward P. Evans, the chairman of Macmillan, Mr. Maxwell said he would be willing to end his tender offer and bid $1.1 billion for just the information services operations of the company.

Bankers Estimate Unit's Value

Macmillan's bankers had valued the information services unit at between $800 million and more than $1 billion. Mr. Maxwell said the offers were contingent upon his having access to the financial information that Macmillan has provided its bankers and others.

The Robert M. Bass Group of Fort Worth has offered $75 a share in cash for Macmillan. The offer has been aggressively resisted by Macmillan's management, which has proposed a restructuring plan that has been blocked by a Delaware court.

Mr. Maxwell had announced the Macmillan bid several weeks ago, but it was met with some uncertainty because it was conditioned upon his right, among others, to see the company's financial data.

"That is their mistake, not ours," Robert S. Pirie, the chief executive of Rothschild Inc., Mr. Maxwell's investment bankers, said of the initially skeptical reaction. "People who don't take Maxwell seriously generally find out they are wrong."

A Distinct Difference

Investment bankers said that a crucial difference existed between simply making a takeover proposal and starting a tender offer.

A tender offer is a direct, legally binding offer to purchase stock from shareholders. Generally, once an offer begins, significant legal consequences occur should the bidder not be prepared to proceed.

But Mr. Maxwell did restrict the tender offer, saying that it was contingent on the company's redeeming its "poison pill" anti-takeover defense, withdrawing its restructuring plan and having the offer approved by the Macmillan board.

Mr. Maxwell said that the board of the Maxwell Communications Corporation had approved the Macmillan bid and that his proposal was not conditioned upon obtaining the necessary financing. He added that his company planned to retain Macmillan's management.

In trading yesterday on the New York Stock Exchange, Macmillan's shares rose $1.50, to $83.25, indicating that Wall Street investors expect a higher bid to emerge.

Bass Group Begins Effort

The Bass Group began the battle for control of Macmillan when it offered $64 a share in cash for the publishing company. Macmillan then countered with a restructuring plan that would have given each shareholder $52.35 in cash and a subordinated note with a face value of $4.50. In addition, Macmillan would be split into the Macmillan Publishing Company and the Macmillan Information Company. Each shareholder would receive a share of stock in Macmillan Publishing and a half share in Macmillan Information.

The restructuring, as proposed by Macmillan's management, would have allowed its top-level management to convert its stake in Macmillan Inc., which totals less than 5 percent, into a 39 percent stake in Macmillan Information. That brought a negative response to the restructuring plan from Wall Street.

The Bass Group then sued to stop the restructuring in Delaware Chancery Court in Wilmington and won. Macmillan has appealed the decision to the Delaware Supreme Court.

Calling $2.34 Billion Offer 'Inadequate'

WSJ 8/29/88

By Dennis Kneale
Staff Reporter of The Wall Street Journal

NEW YORK—Macmillan Inc.'s board rejected as "inadequate" the $80-a-share tender offer of Maxwell Communication Corp., but continued to push its own restructuring proposal, which is valued at a far lower price.

The latest turn in Macmillan's three-month fight to remain independent is likely to force it to sweeten the terms of the restructuring plan, which calls for the company to be split into two businesses. A court order blocking the plan is being appealed by Macmillan.

The publishing company values its split-up plan at $64.15 a share, substantially below the $2.34 billion offer from Maxwell, a printing, publishing and telecommunications concern. A rival offer of $75 a share has been made by Robert M. Bass Group.

Some Wall Street critics argue it is now inevitable that Macmillan will end up in the hands of another company or as a vastly changed business. Bert Boksen of Raymond James & Associates, who values Macmillan shares at $90 each, said Macmillan may turn to a friendlier buyer or mount a leveraged buy-out by its chairman and chief executive officer, Edward P. Evans, and other top executives.

Either way, Mr. Boksen said: "They're goners. The only issue is who's going to wind up with them. It's clear the company isn't going to exist as it stands today."

As it announced the rejection, Macmillan said it would "explore an enhanced or alternate restructuring plan." It also said it will "continue discussions with all interested parties."

Macmillan's shares rose 62.5 cents to close at $83.875 in composite trading on the New York Stock Exchange Friday.

In London, Maxwell's board reiterated its hope for friendly discussions and prodded Macmillan to "take the necessary steps so as to afford its shareholders an opportunity to determine for themselves" whether to accept its bid. Macmillan's board rejected the offer without any vote by shareholders.

Bass, based in Fort Worth, Texas, may wait until another bid emerges to see Macmillan's response before deciding whether to increase its price. Bass officials have met several times with Macmillan representatives recently.

Bass owns a 9.2% stake in Macmillan. Its offer was to expire on Friday, but was extended once again, this time to 12:01 a.m. EDT Sept. 10.

Shortly after the Bass group made its initial bid of $64 a share for Macmillan's 29.3 million shares in May, Macmillan announced its restructuring plan. The plan would divide Macmillan into separate publishing and information-services companies, paying shareholders a one-time cash dividend of $52.35, which is included in the full $64.15-a-share valuation.

A Delaware court blocked the plan and harshly criticized it in July, saying: "Not only does (the plan) offer inferior value to the shareholders, it also forces them to accept it. No shareholder vote is afforded; no choice is given." Macmillan is appealing that ruling to Delaware's highest court, the state Supreme Court, which is scheduled to hear the appeal Sept. 9.

A Macmillan spokesman on Friday defended the company's restructuring plan on several grounds, maintaining it would ensure that current top management remains, and that the split-up would let shareholders "participate in the future growth" of both entities.

Meanwhile, Macmillan's three pending lawsuits against the Bass group and related parties, alleging takeover conspiracies and securities laws violations, remain in "investigative stages," a company spokesman said. No hearings are scheduled.

Worlco Data Sues Maxwell

By a Wall Street Journal *Staff Reporter*

NORRISTOWN, Pa.—Worlco Data Systems Inc. sued Maxwell Communication Corp. after Maxwell dropped plans to acquire the company.

Worlco filed suit against Maxwell and its U.S. unit in federal court in Philadelphia, alleging the company breached its acquisition agreement, misled Worlco and failed to negotiate in good faith.

Maxwell's Greenwich, Conn.-based U.S. unit had agreed to buy Worlco, which provides data services to media companies and other firms, for $11 million. But Maxwell said the pact was a non-binding agreement that expired in June.

A Worlco spokesman wouldn't comment on why the company hopes to force itself into the hands of an uninterested suitor. A Maxwell spokesman couldn't be reached for comment.

Macmillan Board Rejects Maxwell Bid, Calling $2.34 Billion Offer 'Inadequate'

WSJ 8/29/88

By Dennis Kneale
Staff Reporter of The Wall Street Journal

NEW YORK—Macmillan Inc.'s board rejected as "inadequate" the $80-a-share tender offer of Maxwell Communication Corp., but continued to push its own restructuring proposal, which is valued at a far lower price.

The latest turn in Macmillan's three-month fight to remain independent is likely to force it to sweeten the terms of the restructuring plan, which calls for the company to be split into two businesses. A court order blocking the plan is being appealed by Macmillan.

The publishing company values its split-up plan at $64.15 a share, substantially below the $2.34 billion offer from Maxwell, a printing, publishing and telecommunications concern. A rival offer of $75 a share has been made by Robert M. Bass Group.

Some Wall Street critics argue it is now inevitable that Macmillan will end up in the hands of another company or as a vastly changed business. Bert Boksen of Raymond James & Associates, who values Macmillan shares at $90 each, said Macmillan may turn to a friendlier buyer or mount a leveraged buy-out by its chairman and chief executive officer, Edward P. Evans, and other top executives.

Either way, Mr. Boksen said: "They're goners. The only issue is who's going to wind up with them. It's clear the company isn't going to exist as it stands today."

As it announced the rejection, Macmillan said it would "explore an enhanced or alternate restructuring plan." It also said it will "continue discussions with all interested parties."

Macmillan's shares rose 62.5 cents to close at $83.875 in composite trading on the New York Stock Exchange Friday.

In London, Maxwell's board reiterated its hope for friendly discussions and prodded Macmillan to "take the necessary steps so as to afford its shareholders an opportunity to determine for themselves" whether to accept its bid. Macmillan's board rejected the offer without any vote by shareholders.

Bass, based in Fort Worth, Texas, may wait until another bid emerges to see Macmillan's response before deciding whether to increase its price. Bass officials have met several times with Macmillan representatives recently.

Bass owns a 9.2% stake in Macmillan. Its offer was to expire on Friday, but was extended once again, this time to 12:01 a.m. EDT Sept. 10.

Shortly after the Bass group made its initial bid of $64 a share for Macmillan's 29.3 million shares in May, Macmillan announced its restructuring plan. The plan would divide Macmillan into separate publishing and information-services companies, paying shareholders a one-time cash dividend of $52.35, which is included in the full $64.15-a-share valuation.

A Delaware court blocked the plan and harshly criticized it in July, saying: "Not only does (the plan) offer inferior value to the shareholders, it also forces them to accept it. No shareholder vote is afforded; no choice is given." Macmillan is appealing that ruling to Delaware's highest court, the state Supreme Court, which is scheduled to hear the appeal Sept. 9.

A Macmillan spokesman on Friday defended the company's restructuring plan on several grounds, maintaining it would ensure that current top management remains, and that the split-up would let shareholders "participate in the future growth" of both entities.

Meanwhile, Macmillan's three pending lawsuits against the Bass group and related parties, alleging takeover conspiracies and securities laws violations, remain in "investigative stages," a company spokesman said. No hearings are scheduled.

Worlco Data Sues Maxwell

By a Wall Street Journal *Staff Reporter*

NORRISTOWN, Pa.—Worlco Data Systems Inc. sued Maxwell Communication Corp. after Maxwell dropped plans to acquire the company.

Worlco filed suit against Maxwell and its U.S. unit in federal court in Philadelphia, alleging the company breached its acquisition agreement, misled Worlco and failed to negotiate in good faith.

Maxwell's Greenwich, Conn.-based U.S. unit had agreed to buy Worlco, which provides data services to media companies and other firms, for $11 million. But Maxwell said the pact was a non-binding agreement that expired in June.

A Worlco spokesman wouldn't comment on why the company hopes to force itself into the hands of an uninterested suitor. A Maxwell spokesman couldn't be reached for comment.

Sample BRS/FATD Documents

AN LAB-0002. 8700.
TI Southeast Poultry Research Laboratory.
IT Laboratory Resources.
IN Agricultural Research Service, Department of Agriculture.
JN Announcement Date: 8601.
AV 934 College Station Road. Athens, GA 30605. Contact: Mr. C. W. Beard (404) 546-3434.
CC 98E (Animal-husbandry-and-veterinary-medicine).
MJ Resources-Expertise. Poultry. Chickens. *Bird-diseases.*
AB EXPERTISE: Research is conducted on poultry diseases (characterization, definition, detection, prevention); genetic and physiologic bases of poultry disease control; mycoplasma infections; avian influenza; infectious bronchitis; Newcastle disease; salmonellosis; influence on poultry disease development of environmental factors (temperature, humidity); biotelemetry research for monitoring chickens; solar energy for poultry brooding; and housing for disease-free poultry. No diagnostic services are provided.

AN NTN86-0797. 8703.
TI Microwave Antenna With Reduced Noise Leakage: Feed-beam taper reduces rear spillover.
IT Tech Note.
IN National Aeronautics and Space Administration, Washington, DC.
YR Jul 1986.
JN Announcement Date: 8703.
CC 49A (Antennas).
MJ Tech-note. Microwave-antennas. Antennas. Noise-reduction.
AB This citation summarizes a one-page announcement of technology available for utilization. The gain or gain-to-temperature ratio of a dual-shaped subreflector receiving antenna is increased when the illumination is tapered near the aperture edge. The taper imposed in the antenna feed reduces spillover in the transmitting mode and reduces noise pickup in the receiving mode. In a conventional dual-shaped subreflector antenna operating in the transmitting mode, the primary function of the subreflector is to direct more power toward the main-reflector aperture edge. This arrangement makes the illumination more uniform across the aperture, thereby contributing to the gain. The attempt to increase the gain is partly defeated, however, by the spillover, which is the loss of power beyond the edge of the main reflector due to diffraction by the subreflector. When the antenna is used in the receiving mode, the inward flow of power over the spillover path results in the pick-up of undesired signals or thermal noise from the side or rear. For example, if the antenna is aimed toward the zenith, the inward spillover of thermal noise from the ground causes a temperature increase of about 2.4 K in the antenna for each percent of power lost in the transmitting mode. A theoretical comparison was made among four tapers in a representative antenna design. The numerical results show that as the taper exponent increases, the illumination efficiency decreases, but there is a compensating decrease in spillover resulting in an increase in spillover efficiency.

AN PAT-APPL-6-248-371. 8700.
TI Automatic Hatchery Tray Dumper.
AU by William F. Whitehead, Jr., James S. Dickens, and Benjamin C. Haynes, Jr.
IT Patent Application.
IN Department of Agriculture, Washington, DC.
YR Filed 27 Mar 1981. 19p.
JN Announcement Date: 8124.
RN PB81-228660.
AV Copy available from NTIS: Price code A02. Order from the National Technical Information Service, Springfield, VA 22161; (703) 487-4600. For those interested in licensing this technology, contact the Center for the Utilization of Federal Technology, Room 13R, NTIS, Springfield, VA 22161; (703) 487-4732.
CC 98E (Animal-husbandry-and-veterinary-medicine). 90A (Mechanical-devices-and-equipment).
MJ Patent-applications. Materials-handling-equipment. Poultry-equipment.
MN Chickens. Wastes. Eggs. Embryos. Manpower.
AB This invention relates to automatic handling equipment for the *chicken* layer industry. The principal object of the instant invention is to automate the handling of hatchery waste in layer *chicken* *hatcheries* and to reduce the manual-labor requirements for those unpleasant and unhealthy operations associated with the handling of *chicken* waste.

NORM LATKER SEE PAGE 1+2

M-TSI, THE PUBLISHER OF CURRENT CONTENTS VOLUME 2, NO. 7 APRIL 4, 1988 $3.00/£1.50

THE SCIENTIST

THE NEWSPAPER FOR THE SCIENCE PROFESSIONAL

93117COLLI*7391M08603 1MAR90 ### 300
MARK R COLLINS
7391 MIRANO DR
GOLETA CA 93117

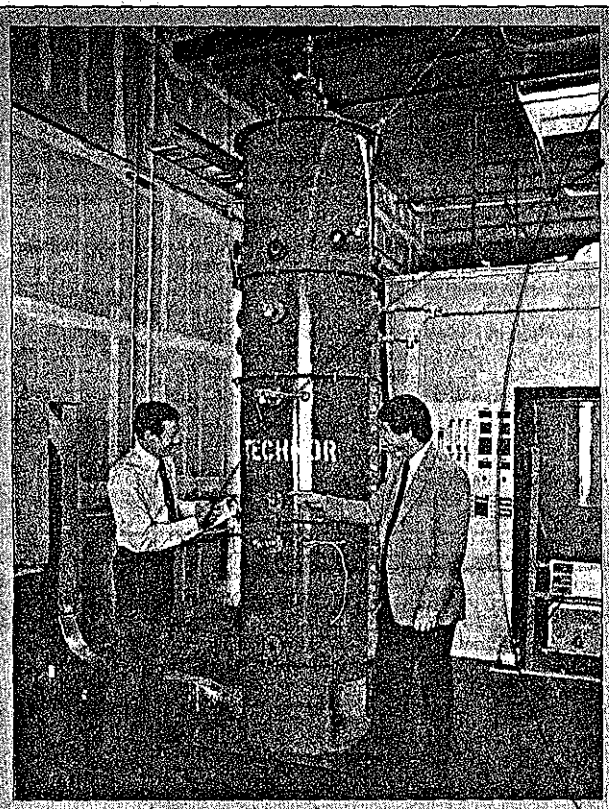
nels Take 'st Cuts at 89 Budget

INGTON—The $3.3 billion se in spending for science pace programs proposed by lministration for 1989 is ing rapidly as it begins to its way through Congress.

March 17 the House Budget ittee sliced the request in but the panel's non-binding ions in spending authority greatly by agency. The Na- Science Foundation, for ex- received $300 million of its million increase, while the million increase for general s within the Department of , which contains a $363 mil- quest for the Superconduct- upercollider, was whittled to just $100 million. The billion increase sought by including funds for the tation, was shrunk to $1.25 more.

budget committee's recom- tion was adopted March 23 full House and then quickly led to the Senate. Although res offer an indication of sional sentiment, the real ng levels are set by the

continued on page 2



Former Sandia chemist Robert Perry (right), president of Technor, and engineer James Boehmke stand next to the multi-fuel combuster used to test the company's process to clean up diesel exhaust.

Technology Transfer Is Harder Than It Looks

BY LOUIS WEISBERG

SANTA FE, N.M.—The gush of technological spin-offs that Congress hoped would follow the Technology Transfer Act of 1986 is coming out more like a dribble. Few scientists at national laboratories or with access to new technologies are rushing to take their knowledge into the marketplace.

"I think it's abominable," said Lee Rivers, the Washington representative for the Federal Laboratory Consortium, about the pace of technology transfer. "It's an atrociously long time." A former industry executive, Rivers is trying to link outside firms and scientists inside the federal labs with marketable technology.

Insiders blame the relatively small number of success stories on everything from the bureaucracy to the individual scientist.

"In the laboratory you're top dog," explained Ross Robinson, a physical chemist-turned-businessman who is executive vice president of Los Alamos (N.M.) Diagnostics. "It's difficult for a scientist to admit, 'I don't know anything about that,' and delegate responsibility to financial and marketing experts."

Rivers agreed. "Eventually, you have to put the lid on those guys," he said about scientists turned executives. "They want to be CEO, president and everything else."

The situation is complicated by an almost universal desire to pretend that technology transfer is succeeding. A recent General Accounting Office report on the role of small businesses in transferring R&D, for example, cited "about 30 to 35" spin-offs from Los Alamos alone in the last five years. In fact, very few have involved scientists who marketed their discoveries.

Most of the spin-offs at Los Alamos, as well at Sandia and Lawrence Livermore laboratories, were cases in which engineers set up a busi-

continued on page 4

ck of Support Spurs U.K. Exodus

TER MARSH

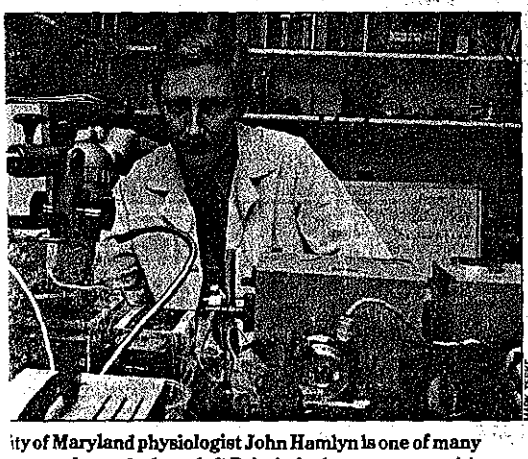
—John Hamlyn's labora- alls at the University of d are plastered with pic- the English countryside of his youth. The 34-year-old physiologist says he would like to return there some day, "but not in the foreseeable future."

Hamlyn received his Ph.D. in physiology from Glasgow University and planned to return to the United Kingdom after some training abroad. But during a 1981 visit home he "was appalled at the state of science" in his native country.

"Money was tight and there were no opportunities," he recalled. "My impression now is that Britain has a lot of talented people who are not being adequately supported."

Hamlyn decided to stay in the United States, and today is an assistant professor at the University of Maryland medical school. He runs two well-equipped labora-

continued on page 5



MARK TESKE

ity of Maryland physiologist John Hamlyn is one of many researchers who have left Britain for better opportunities.

TV Scientists Train to Put On Good Show

BY HUGH McINTOSH

BOSTON—Most scientists are not natural television personalities. But a growing number of them are becoming familiar with that powerful medium as the public looks for answers to complex technological issues.

"TV is really theater," said Ira Flatow, an independent radio and television producer, as he directed a three-hour workshop on the subject at the recent annual meeting here of the American Association for the Advancement of Science. "So if you want to be on television, you're going to have to be a good performer."

The workshop, entitled "So You Want to Be on TV? Scientists Face the Cameras," offered a crash course in dealing with the electronic media. It discussed how to present your message simply and clearly, as well as the pressures that reporters face to get the story.

A scientist's TV performance is usually an interview, panelists explained. The subject has little control over whether it will be 30 seconds of live comment or 30 hours of discussion edited down into a two-minute feature. In either case, however, the interviewer wants to make the subject look good.

Don't be put off by the approach, paneliats cautioned. "To the uninitiated, a phalanx of TV reporters, producers, sound men, camera peo-

continued on page 3

INSIDE

FACE TO FACE
NSF's Erich Bloch on the '88 U.S. science budget. Page 10.
OPINION
Leon Lederman has the best science advice yet. Howard Temin doubts that HIV's host range is expanding. Page 8.
REVIEWS
Software: six problem-solving packages compete for your attention and dollars. Page 14.

LATKER Should get!

CH TRANSFER

ued from page 1

hat sold their work back to tional lab. Such activity fails et the new federal policy's creating jobs and increasing tivity.

licants continue to be de- by the difficulty of obtaining waivers and other rights to logy, despite the act's intent ake the procedure easier. is also widespread grumbling ed tape, unnecessary delays her bureaucratic obstacles. 've got to learn never to ac- o for an answer," advised Zeigler, a polymer chemist lans soon to market poly- , a new class of materials he ed at Sandia National Lab- es. He spent $25,000 and han a year acquiring the to his discoveries from the Department.

One in Three

vnership is just one hurdle entists. Each step of the r process—from adapting hnology for commercializa- finding investors to devel- business and marketing presents a special set of ges. Gordon Longerbeam, r of Lawrence Livermore's logy transfer office, esti- hat only one in every three nies survives long enough to e jobs, products and sales. lack of an infrastructure to ientists ease into the busi- orld is another major prob- ech-transfer offices at the ories often put budding sci- entrepreneurs in contact otential investors and cus- only to abandon them once ntact is made. Officials de- at practice by arguing that uld be accused of favoritism use of public funds if they advocates for a particular s opportunity.

rt Perry, a physical chem- d that problem at Sandia- ore when he decided to form a business around a process he developed that removes nitric oxide from diesel fuel. "They had things [at the lab] that I needed to use and they weren't using them, but I couldn't use them either," said Perry, now president of Technor. He estimated that use of the equipment would have saved him a year of development.

Solutions to some infrastructure problems are coming from community-sponsored incubators, which provide support that the labs can't. Municipal governments are hoping their assistance will help build businesses that will create jobs in their areas.

Zeigler received tips on writing a business plan from the Technological Innovation Program operated by the University of New Mexico. But help in other vital areas, such as adapting technology, conducting market research and designing and packaging, is often hard to find.

"Vulture Capitalists"

Venture capitalists can provide these services, but many scientists are reluctant to seek their help and view them more as "vulture capitalists." Perry, who said that "close to 300 to 400 people" were interested in investing in, or using, his process, had trouble finding professional help to evaluate the best type of financing.

Another common complaint is the lack of seed money. Larry Icerman, director of New Mexico Research and Development Institute, said this problem is more imagined than real: last year he managed to spend only $1.7 million of the more than $3 million his state allocated to assist fledgling technological entrepreneurs. And other states, he noted, have much larger budgets. Most of the scientists who approached Icerman lacked entrepreneurial abilities, or even a plan.

"The money's there," agrees John Lonergan, president of Los Alamos Diagnostics, which makes instruments for clinical microbiology. A Harvard MBA who has helped scientists develop companies, Lonergan said that "the investor has to have a corporate structure to put the money into. I want to see a CEO, a marketing person, a business plan and audited financials."

The philosophical gap between science and business is another problem. Most scientists tend not to think of their work in commercial, or profit-oriented, terms.

Furthermore, Robinson noted, "scientists are problem-solvers. They enjoy the problems. But investors don't want to hear about problems."

There are differences among scientists, of course. The gap is generally hardest to bridge for scientists at national laboratories. University scientists are accustomed to seeking federal grants, a process that is similar in some ways to attracting investors. And researchers at commercial laboratories are forced to consider profit-margins and market needs.

By comparison, scientists at national laboratories wear what Icerman refers to as "golden handcuffs"—secure, prestigious and decent-paying careers that allow them to work on pretty much what they wish. Most would consider it folly to mortgage their houses for businesses that might fail, Icerman said.

"I'm giving up security and status," Zeigler admitted. "On the other hand, what's exciting about the business is the opportunity to do something myself, and succeed or fail on my own abilities."

Perry agreed. "It's exciting to see something grow and see an idea being utilized." But is he happy? "It depends on the day." ■

Weisberg is a freelance writer in Santa Fe.

Four Obstacles to Technology Transfer

WASHINGTON—Limited opportunities for proprietary research, an inability to copyright and license software, and institutional red tape are major obstacles to transferring technology from federal laboratories to U.S. industry, according to a new report from the General Accounting Office.

The report examined 10 laboratories operated by six government agencies, ranging from the Air Force's Lincoln Laboratory to the National Institutes of Health. Interviews with lab officials found that a majority support regulatory changes that would encourage businesses to invest in cooperative research within the labs and to make use of products produced by its scientists.

The report, carried out at the request of the Task Force on Technology Policy of the House Committee on Science, Space and Technology, suggested that computer software be treated similarly to other federal inventions and that companies be allowed to treat the results of collaborative research as trade secrets for up to five years. It also suggested that contractor-operated labs should be allowed to retain title to inventions by its scientists, and that research managers provide more information to the business community about opportunities for collaborative research.

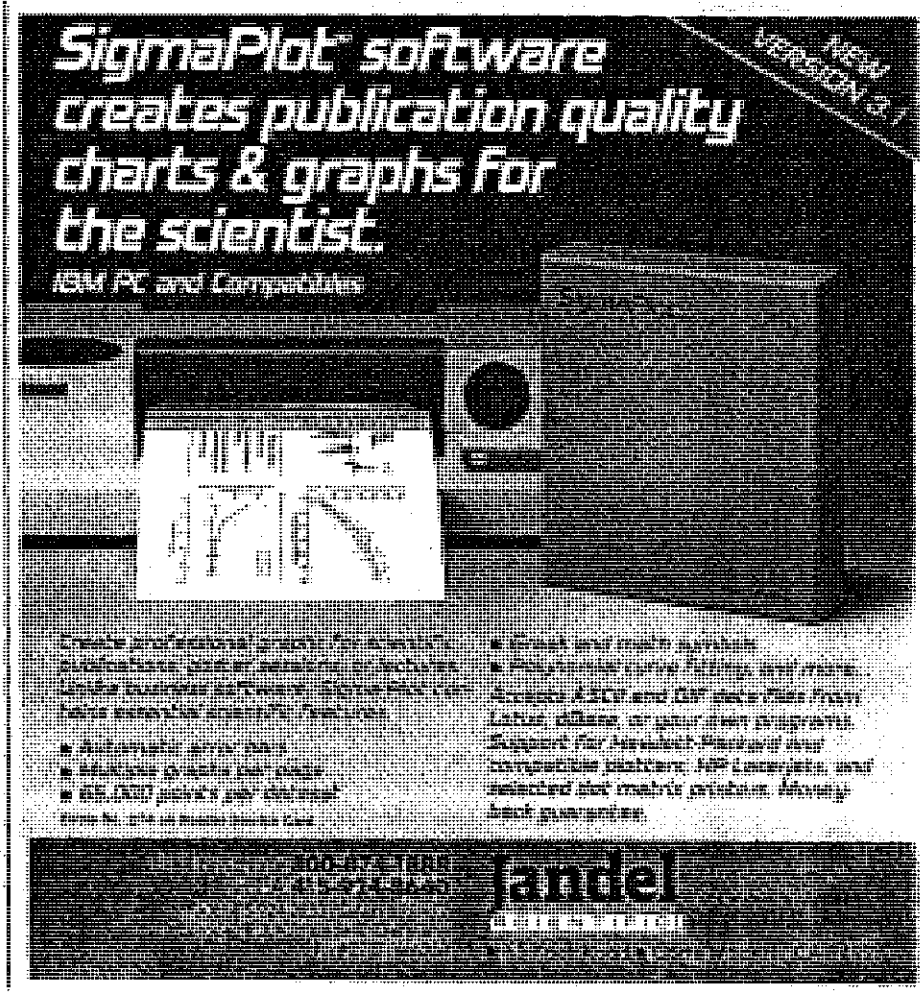
A copy of the report, "Constraints Perceived by Federal Laboratory and Agency Officials to Technology Transfer" (RCED-88-116BR), can be obtained free from the GAO at P.O. Box 6015, Gaithersburg, MD 20877.

ish Boost vestment Biotech

—The Irish government pped up its campaign to hen biotechnology by pro- more money for university h end the marketing of com- products.

$2.4 million awards will add niversities to an existing of three centers set up last addition, a company called earch Ireland has been cre- seek commercial contracts erseas companies, in particular from the United States. "What we are trying to do is to commercialize the entire national effort in biotechnology," explained program director Barry McSweeney, "given the limited resources available to us."

The program's first success involves a contract with the Diagnostics Center at Galway University to develop new assay techniques and instrumentation for a subsidiary of SmithKline Beckman. The center hopes to attract prospective customers for its products as well as further support from Beckman. McSweeney said that the new campaign expects to generate $8 million in revenues by the end of next year. ■



CAN THE KING OF PC CLONES RULE INFORMATION, TOO?

LEADING EDGE'S MICHAEL SHANE WANTS TO TURN DATA BASES INTO A COMMODITY



SHANE: "THIS IS THE BEGINNING OF THE CONSUMER INFORMATION REVOLUTION"

KEN KERBS

No one would have thought that 17-year-old Michael B. Shane would turn a sideline wig business at his widowed mother's hair salon into a multimillion-dollar operation. For that matter, no one would have thought that he'd make a fortune a decade later selling a line of faded blue jeans. And no one would have thought he'd take on International Business Machines Corp. in personal computers and grab a 7% share of the U.S. market by selling Asian-built clones.

But the chairman and co-owner of Canton (Mass.)-based Leading Edge Products Inc. did it all, and now he's convinced he can do more—lots more. Shane, now 37, wants his $400 million company to become to electronic information what Gutenberg was to print: He plans to make electronic information so cheap to get at that everyone will use it—and buy it from him. "This is the beginning of the consumer information revolution," he proclaims.

To facilitate the transition, Leading Edge has begun selling inexpensive modems that let personal computers hook up to faraway data bases. Next, Shane will sell the information itself. While electronic information services such as CompuServe Inc. and The Source Telecomputing Corp. already sell to consumers, they are too expensive and too complex to have mass appeal. Shane wants to take their information and, by using special software, make it so accessible that millions will turn to it to solve daily problems, from diagnosing the cause of stomach aches to getting advice on handling adolescents. Eventually, he says, "selling a data base is going to be like selling a commodity." To stoke up demand, Shane says that within seven months he will start a magazine that will evaluate the usefulness of data bases for owners of the 30 million personal computers in the U.S.

SWEAT EQUITY. Shane predicts he will have a multinational trading company based on information that Leading Edge generates. According to his plan, offices in 159 countries would match products with markets worldwide, for both U.S. and foreign manufacturers. It does not faze him that giant Japanese trading companies already offer such services. He is opening his first two offices in New York and South Korea in November and is planning another for Taiwan.

Shane says he has assigned project teams to work on the information service and magazine projects and is spending 99% of his own time on the trading company. But he declines to discuss what type of marketing research he's done, how much he will spend on the new projects, or where he will get the money. So far, he says, "it's mostly sweat equity."

To hear Shane's potential competitors tell it, there's a lot more sweat ahead. First there's the magazine: Jack Edmonston, senior vice-president for marketing for CW Communications Inc., which publishes numerous high-tech magazines, wonders: "Who is going to advertise? The data base companies themselves spend very little on advertising." Then there's the mass audience for electronic information. Companies such as CompuServe doubt that Leading Edge can sell information more cheaply than they do. Experts also question how much information consumers want. "We all have access to more than we can ever use," contends Jonathan Rotenberg, president of the Boston Computer Society, the largest U.S. computer-user group.

BAD FEELINGS. Beyond these doubts is a more fundamental one: Can a management style suited to the rough and tumble world of commodities work with services? There's no doubt that Shane can motivate employees. "He develops hidden talents from misfits," says John Ruffo, who served for three years as president of Leading Edge and is now a professor of business at Boston University. "They know what he has done, and they will go through hell for him."

But getting along with customers is something else. Shane is widely known and resented for delaying payments to suppliers while forcing dealers to pay cash up front. One Boston-area dealer argues that Leading Edge has been so shabby to its dealers that they may abandon its products just when Shane needs the revenues to finance his new businesses. "If anybody comes up with a better machine, there'll probably be a mass migration," the dealer says.

Shane also has a reputation for dash-

Fraud in the Laboratory?

An arcane dispute becomes a question of ethics

Starting with the Baltimore affair, [illegible] against Gallo and ending [illegible] the most famous case of science and its most famous and [illegible] have often been portrayed. Science has been [illegible] more often [illegible] more serious [illegible] recent one, [illegible] a small research firm [illegible] published university papers [illegible]. Research Institute for Molecular Pathology, the [illegible] based in Cambridge, Mass., accused the Wistar Institute's Wistar Research Foundation (WRF) of fraudulently obtaining patents on certain [illegible] and of [illegible] with [illegible] rights to [illegible] for [illegible] years. The [illegible] of [illegible] an arcane dispute quickly turned into a [illegible] of scientific ethics, in which researchers alleged that [illegible] faculty at Wisconsin researchers [illegible] had [illegible] records, patented a process that didn't work and stole the discovery of real talent. The charges prompted Walter Sievert of the National Institutes of Health [illegible] one of the most [illegible] cases of science fraud ever.

After the suit was settled out of court last June, WARF still kept the patents that had been in dispute, and [illegible] and [illegible] but reportedly "substantial" sum to RIMAT. But the result is the least important part of the story. The real issue raised by the charges of scientific misconduct were never resolved. Nor has the scientific community [illegible]. At the request of [illegible] of the accused, Dr. Leon Leon Lederman [illegible] to convene a three-member panel of experts. A congressional committee [illegible] looking up to probe the charges. And Sievert, who [illegible] for RIMAT and has a reputation as a "fraud buster," plans to [illegible] "allegations of misconduct" with NIH, which funded the UW work.

This [illegible] of the accused researchers makes the case of alleged fraud so shocking. Sadly, the [illegible] scientific [illegible] [illegible] [illegible]

Viewing Usfil table with form F: Record 48 of 1377 Main *M*

Usfil # 48

FILE NO: CU 112/113CIP
SERIAL NO: 358,877
TITLE: SUPPORTS FOR USE IN SYNTHESIS OF POLYNUCLEOTIDES
INVENTOR: CARUTHERS ET AL
DT RECD: 2/21/80
ELCT DLINE:
DT ELECTED:
PUB DT:
MGR: GMY
FILE DT: 3/16/82
COMMENTS: CIP of 247,144
ATTORNEY: YAHWAK
ATTORNEY REF:
EVALUATION: LICENSED ABIO & BECKMAN
PATENT NO: 4,500,707
ISSUE DT: 2/19/85
SM ENTITY:
ASSIGNEE:
F FILED: NO

Viewing Usfil table with form F: Record 48 of 1377 Main *M*

Usfil Page 2 # 48

STATUS: I
HONOR.:
RELEASE DT:
AVAILABLE: NO
CODE: GENE
DUE 1: 8/19/88
DUE 2: 8/19/92
DUE 3: 8/19/96
INDEX: Y
ASSIGN-
MENT RCD:
REEL:
FRAME:

To Latkovic - info only
System

Photographs by Tom Cogill

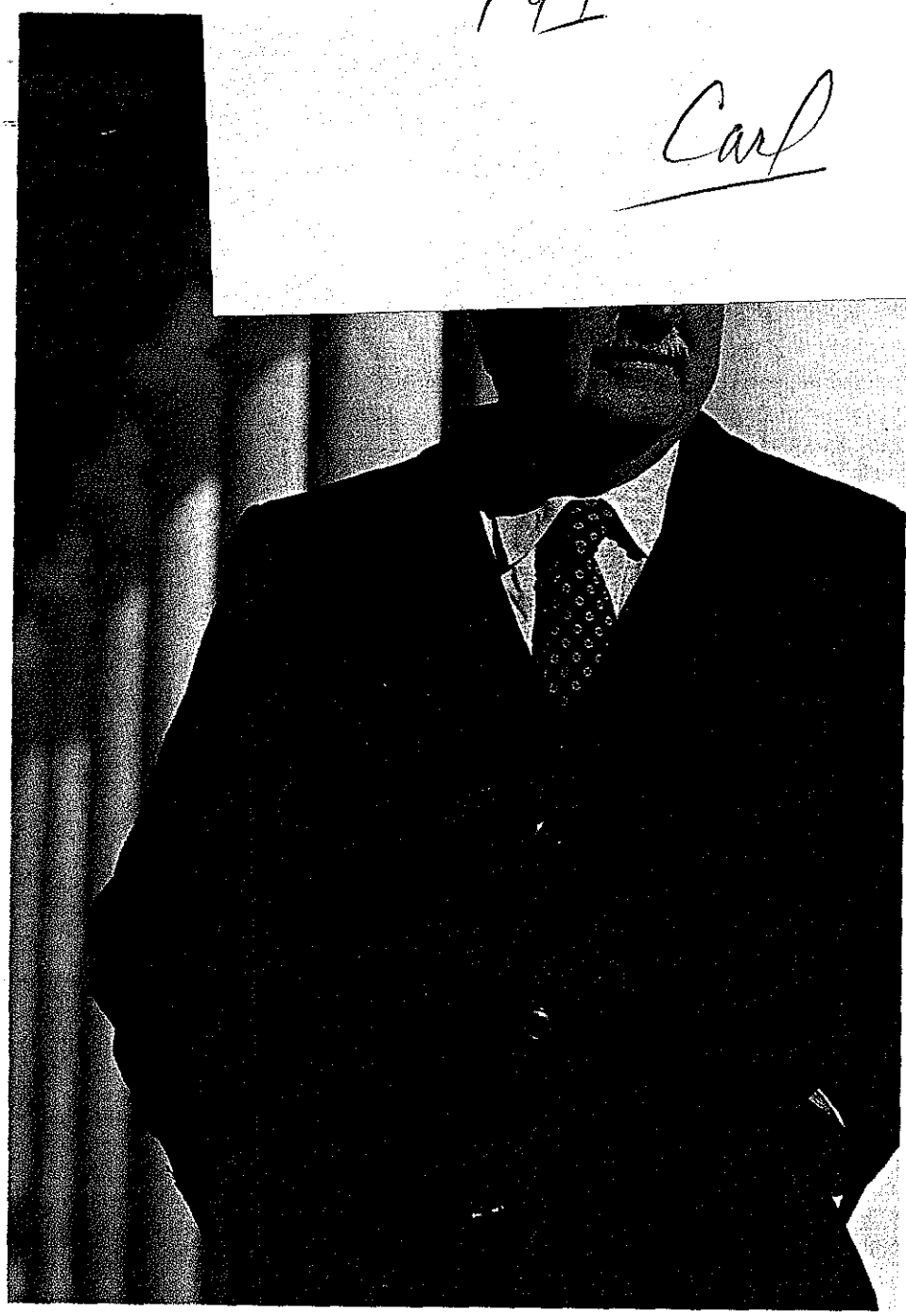
MAR 14 1988

APR 1 - 1988

BOO NEURS

Norm -
FYI
Carl

lan Snyder is
ı corps of high-
t-ups emerging
University of
research labs.



Sheridan G. Snyder was a star tennis player at U.Va. in the 1950s. Now he's back in Charlottesville, hoping to serve some more aces for his alma mater as he helps the university's scientists get their research out of the lab and into the boardroom.

by William Allcott

Sheridan Snyder builds companies out of ideas. In the 1960s, he heard that delicate instruments often broke in shipment because their odd shapes made them hard to pack. Pumping urethane foam into packing cases around the instruments solved the problem. Today, Instapak, the foam-in-place packaging company he started, is a $120 million division of Sealed Air Corp.

In the 1970s, Snyder saw that New Yorkers waiting for buses got wet in the rain because their crisis-ridden city could not afford bus shelters. His solution: Let a contractor build and maintain the shelters, give them to the city and keep a portion of the revenue from the ads posted on the shelters. Today Bus Stop Shelters Group keeps people dry in cities across the nation and generates a tidy sum for Snyder and other franchisees.

Today "Sherry" Snyder is working on the toughest challenge of his career: commercializing research conducted in university labs. If he is successful, his Charlottesville-based University Technology Corp. will enrich university scientists, the University of Virginia's endowment fund — and himself. Success also could bring an influx of high-tech business to Charlottesville, and possi-



UTC President Sam Long's next project is to convert an old Safeway store on Charlottesville's Main Street into a laboratory for UTC researchers.

bly to other parts of Virginia. It could even change the way venture capitalists approach high-tech start-ups.

Like all of Snyder's ventures, UTC started with an idea. Snyder, a U.Va. alumnus (class of '58), was visiting Charlottesville in 1984 to show his son around his alma mater. Samuel B. Long III, university vice president for development, saw an opportunity to get a donation from the successful entrepreneur and venture capitalist.

From their discussions Snyder realized that the university needed a mechanism to get research into the marketplace. The U. Va. alumni association had a patent foundation which could help scientists protect their ideas, but there was no money available to turn those ideas into companies. "There is so much good science going on here," says Snyder. "To me, as a venture capitalist, it was like a smorgasbord."

In 1986, Snyder formed UTC and hired Long as president. He capitalized the enterprise with a donation of stock from his most recent success story, Genzyme Inc., a Boston-based biotechnical manufacturer. Snyder donated 30 percent of the UTC stock to the alumni association for the benefit of the university; more stock will be transferred periodically until the alumni association owns the entire company by 1992.

"Integrating science and industry is a very delicate process."

Snyder is donating time as well as capital. "I knew from Genzyme that integrating science and industry is a very delicate process. Anybody can donate cash, but you have to get involved personally." Today UTC provides researchers with Snyder's company-building skill in addition to the funds necessary to get started.

"What Sherry is doing is a little bit unique" in the venture capital world, observes Ginger More, general partner at Oak Partners, the Westport, Conn.-based venture capital giant. "Few [venture capitalists] take such an active role, and almost none actually house the deals."

Long's and Snyder's first step was to inventory scientific research at U.Va. with commercial potential. Early on they encountered Jim Rice, an engineering professor with a project nearing the commercialization phase: Flotran, a computer program that predicts heat transfer and fluid flow, data used in the design of most machines from cars to nuclear reactors. "It was a good match," says Long. "Jim saw the big picture. From his prior experience at Babcock & Wilcox Co. he understood industry's need for his program. "We could bring the marketing experience to bear which Jim lacked." Rice agrees: The marketing of the product "was a whole new world to me."

Today, less than a year after incorporation, Compuflo Inc. is on the verge of breaking even. Rice and UTC employee Gregory A. Menke, a CPA and start-up veteran who serves as Compuflo's vice president, spend most of their time on the road, "team selling" Flotran to engineers and mechanical designers around the world. By the end of 1988, Snyder hopes for Compuflo to stand on its own.

Dr. Peter Quesenberry, who heads the department of hematology and oncology at U.Va., is a pioneer in the field of bone marrow transplants. He was bothered by the fact that the marrow he transplanted did not always produce white blood cells. His inquiries led him to the discovery of B-cell growth factors, proteins secreted by the bone lining that cause the marrow to make different types of blood cells.

Working in a crowded laboratory at the medical school, Quesenberry has isolated a line of mouse cells that make a hormone that stimulates white blood cell and platelet production. His goal is

to purify the cell line so that it can be genetically cloned, then clinically tested on animals and humans. If successful, B-cell growth factors could treat anemia, the chief cause of death among patients receiving chemotherapy.

The cost of getting an idea like this from the laboratory to the clinic can run into the millions. "Culturing the mouse tissue alone will wipe out our National Institute of Health grant," says Quesenberry. Biotechnical firms from around the country were interested in his discovery, but they wanted to control the clinical trials. "The main thing I'm interested in is seeing that patients get better," says Quesenberry. "I wanted to do the trials here, at U.Va."

UTC is giving Quesenberry that opportunity. Snyder and Long formed a company around his growth factor research. The company, called Biotein Corp., is funding research, applying for patents and devising a business plan. Long spends much of his time making contacts with other growth-factor researchers around the country and looking for new ideas and researchers to fold into Biotein's embryonic enterprise.

"We are entering a revolution in pharmaceuticals which will rival the computer revolution," says U.Va. mechanical engineer Houston W. Wood III. "Health care will take a quantum leap with the proteins that we will be able to engineer." Because only uncontaminated cells can be safely cloned, cell purification is another field of research with commercial application. Marshaling forces from U.Va.'s chemical and mechanical engineering departments, UTC is forming a company around this emerging technology.

Drawing on high speed centrifuge research conducted for the Department of Energy as well as liquid and gas chromatography techniques discovered by U.Va. chemical engineers, UTC is forming Biosep Inc. which, Long and Snyder hope, will one day lead the nation in cell purification. "The ink is still wet," says Houston Wood, "but I'm delighted. I'm here to do research, teach and work with graduate students, but it's great to think that my ideas might have some commercial application. It's wonderful to have a UTC around."

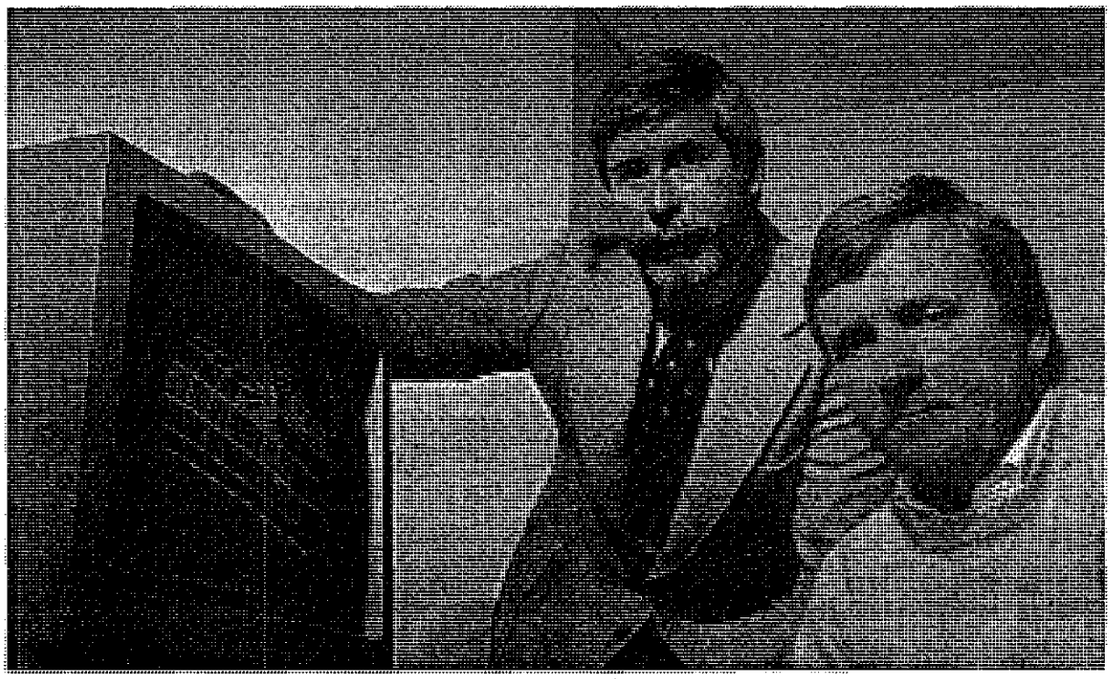
Not all of UTC's ventures are so far upstream in the research process. Endotox Corp. is a Richmond laboratory started by Dr. Robert Lovinger, formerly head of the department of endocrinology at Medical College of Virginia, to support his pediatric endocrinology practice. Soon it grew into the burgeoning fields of substance abuse and AIDS testing. UTC entered the picture in early 1987, bringing in Jim Powers, formerly an executive with Clairol, whom Snyder recruited during a casual conversation at a country store in New Hampshire. Today Endotox has doubled its sales and is moving out of its cramped space in the St. Mary's Hospital complex. Plans are under way to develop diagnostic testing kits, perhaps using some of Biotein's growth factor revelations and Biosep's cell-purification techniques.

"Sherry has an eye for that sort of synergy," says Ginger More. "He also tends to run companies on a lower investment" because of his intense involvement.

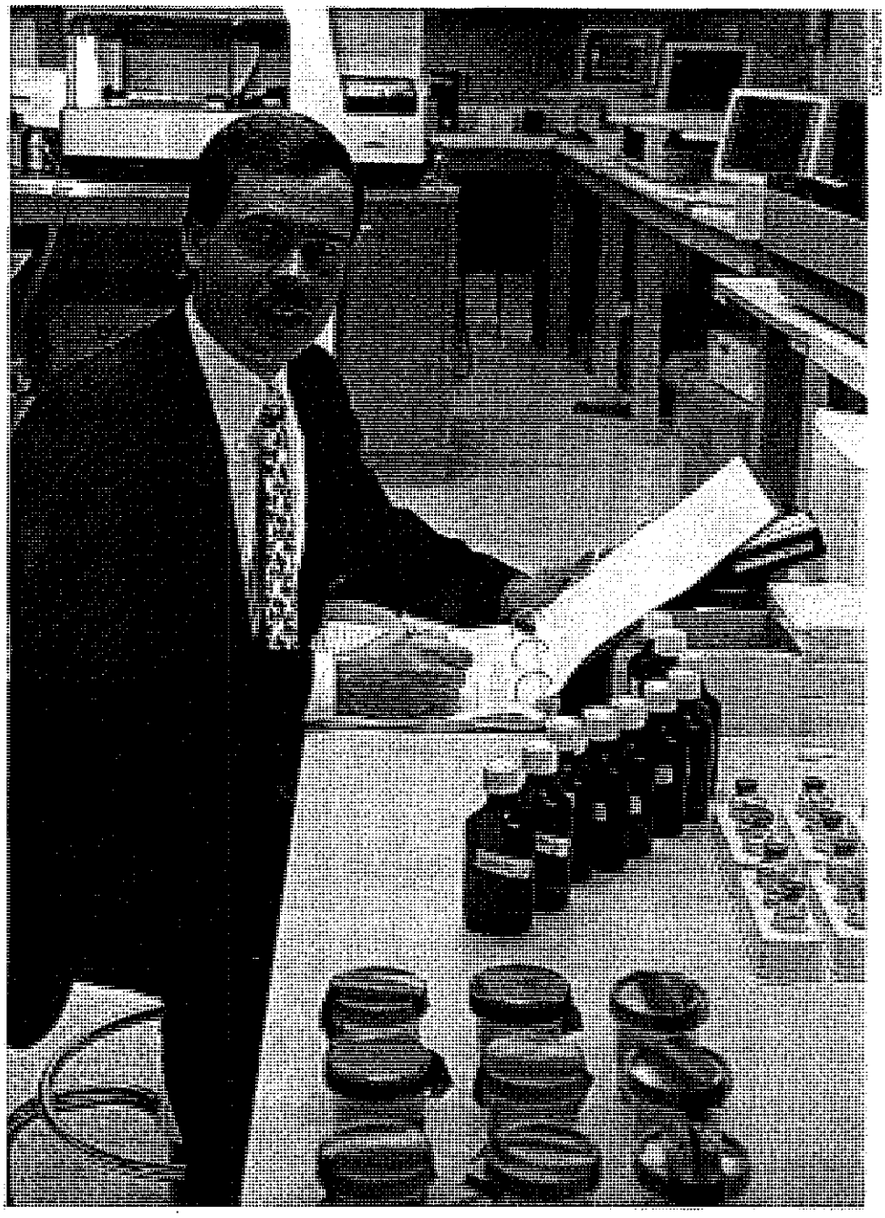
"My business is building value," says Snyder, "so I want to know at each step of the way that the value has increased." If the value of an enterprise has not increased at a particular checkpoint, UTC will pull the plug. "Investigators, naturally, believe in their projects and don't want to let them go," says Long. "To us, these are not 'babies' but businesses; we have to know when to terminate a project."

Jim Powers, Greg Menke and Kathryne Carr make up the nucleus of a group of start-up specialists that UTC hopes to create. "We want this to be a kind of boot

continued on page 33



Dr. Jim Rice's computer program, Flotran, allows design engineers to visualize fluid flow and heat transfer. Rice and Greg Menke, left, UTC's project manager, spend about a week every month on the road selling Flotran.



With the help of former Clairol executive Jim Powers, Endotox Inc. has grown from a local endocrinology lab into a major regional AIDS- and substance-abuse-testing facility.

camp for entrepreneurs," says Long. These "project managers" join the company in the early research stage and stay until it achieves a positive cash flow. Then the fledgling business hires a CEO and leaves the nest; the start-up specialist returns to UTC to pick up a new project.

"For our purposes there are three stages of corporate development: research, transition and out on its own," Snyder says. "Because of the intensity required, we can probably only handle a total of five at either of the first two stages. Our biggest stumbling block will be 'too much too soon,'" he adds. "We have to keep our hands on the reins."

The timing of UTC's genesis could not have been better. As Snyder and Long were completing negotiations for UTC's creation, the university inaugurated a new president, Robert M. O'Neil. One of his first initiatives was to look into "the rapidly changing picture of the university's relationship with industry." In 1987 he created the new position of vice provost for university/industry relations, and in September, Dr. Eve Menger, a former Allied Signal executive, assumed the post.

One of Menger's jobs is to manage the university's "technology transfer," a ubiquitous term which Menger dislikes. "Commercializing research is a tortuous and expensive process," she says. "UTC is a genuine resource for this university."

"[UTC] offers a management team, plus venture capital, plus a way for our faculty members to learn about the marketplace."

"Often researchers have no business skills nor interest in or knowledge of commerce," she adds. "[UTC] offers a management team, plus venture capital, plus a way for our faculty members to learn about the marketplace. Our only worry is that they might skim off the cream and that certainly hasn't happened yet."

Another development to flow from O'Neil's industry initiative is the University Business Innovation Center, a business incubator that provides Charlottesville entrepreneurs a place to work and some advice on getting started. Director Todd Orr sees UBIC as a complement, not a competitor to UTC. "We are looking for the guy with entrepreneurial zeal, the guy who wants to take all the risk and keep all the reward," says Orr. The innovations UTC looks at usually do not lend themselves to an incubator environment.

As centrifuge expert Houston Wood notes, "Biotechnical research is a costly process in terms of equipment, etc. . . . It's usually not done in the basement."

Menger's and Orr's enthusiasm for UTC should help allay one of Snyder's biggest fears: "Can an institution live with this unique type of animal, associated with, but not a part of itself?" Other research universities, such as Stanford, MIT, Harvard and just recent-

ly Yale, have been struggling with similar problems, observes Oak's Ginger More. "Sherry's unique relationship with the university has created a healthy environment, which the university stands to gain from."

Given the Charlottesville area's slow-growth attitude, says Snyder, "we may have to take some of the start-ups to Richmond or Roanoke."

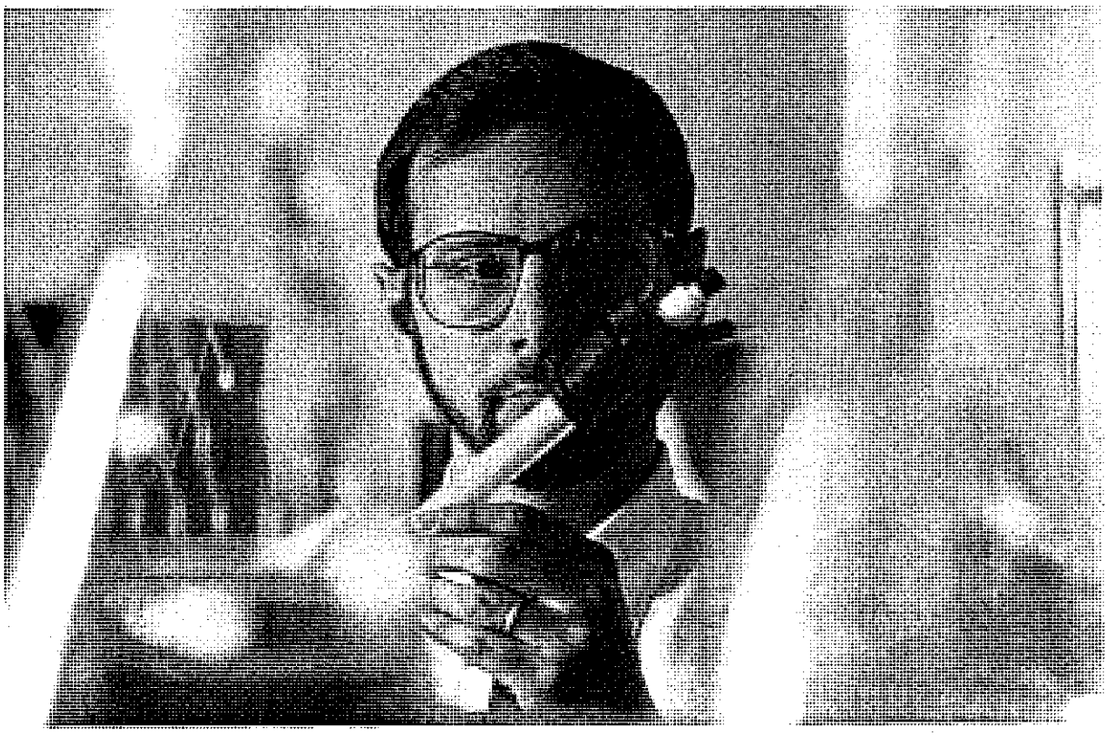
Snyder's other big concern is the slow-growth attitude in the Charlottesville area, Albemarle County in particular. "Building the companies ain't a problem," says Snyder. "But around here the right hand seems to be saying 'OK, high tech,' but the other hand is saying 'don't grow.' What I want to see in five years is a minimum of 14 to 15 good start-up businesses throwing off upwards of $40 to $50 million." Given the slow-growth attitude and Charlottesville's low unemployment, "we may have to take some of the start-ups to Richmond or Roanoke."

UTC's next challenge is gaining the confidence of the Virginia investment community. "The international venture capital community is very comfortable with Sherry," says Oak's More. "It's much easier for Sherry to get funding in Boston, London or Zurich," adds Long, "because they know him." But Snyder wants a Virginia investment banker to join in.

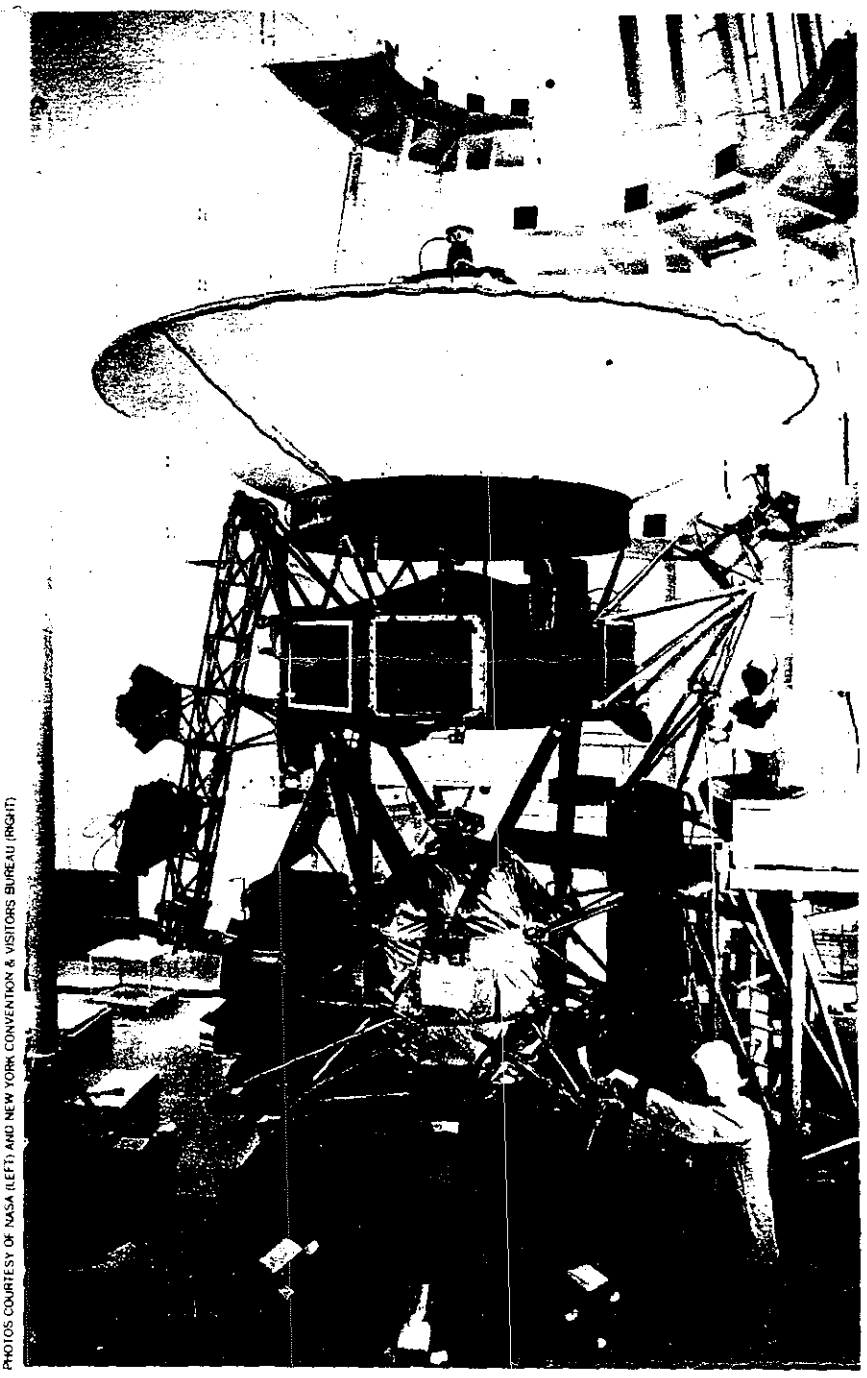
Despite Snyder's close personal ties to Virginia bankers, money has been slow to flow. Investment banker Strother Scott of Richmond's Scott & Stringfellow Financial Inc. is typically cautious: "In the right circumstances, UTC could raise a lot of money in Virginia, but Sherry's got to put together a deal with the right sizzle. Right now his sizzle is his significant contribution to U.Va. and his reputation for making money for people. It would seem that wealthy alumni would go after the opportunity to advance the scientific research at U.Va., but I don't think that's been tested."

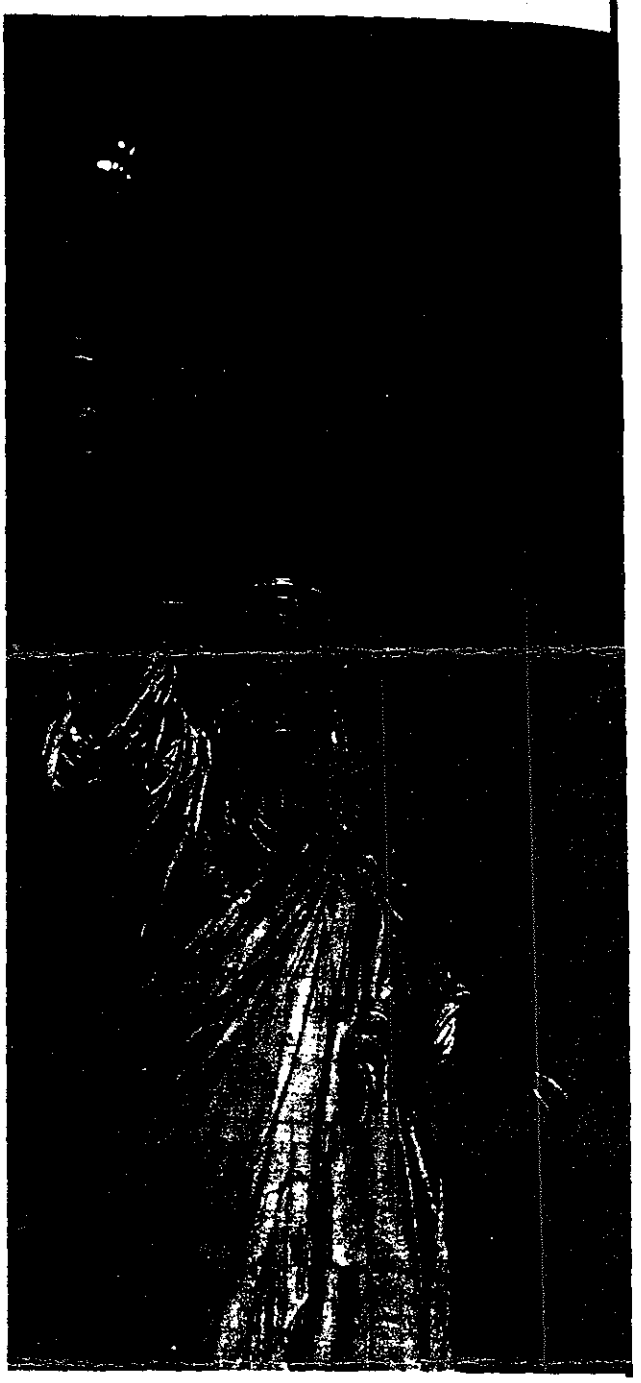
Whether or not Virginia financiers come on board, Snyder plans to raise capital through the sale of limited partnerships. Ultimately UTC will be an investment vehicle that puts money into university-related start-ups alongside Snyder and other investors. More says that Oak Partners and others in the "venture capital club" are interested. "If you back someone who knows how to win, you gain a lot of value right there," she maintains. Snyder is not worried about attracting new capital: "With $8.4 billion around in venture capital [across the country] good start-ups get good value."

Despite the obstacles, Snyder is bullish on UTC and U.Va. "There's so much enthusiasm here for what we are doing. It's not like Harvard and MIT, places that have been nursemaided by corporate America." He is energized rather than distressed that his commitment to UTC has swelled from 30 percent of his time to a full-time job: "People get lucky in life," he says, "but money will not drive you in the long run. You have to have reason, purpose and challenge. UTC gives me the opportunity to do something for my alma mater, while creating some value for the community and the university." ■



Dr. Georgio Carta's research in high-pressure liquid chromatography may form one of the building blocks in a company devoted to purification of biological compounds.





PHOTOS COURTESY OF NASA (LEFT) AND NEW YORK CONVENTION & VISITORS BUREAU (RIGHT)

What do the *Voyager* and the Statue of Liberty have in common? Both are covered with a corrosion-resistant coating developed in the 1960s by NASA scientist John Schutt. Government inventors can now receive royalties if their inventions find commercial applications.

When Air Force engineer Demosthenes Galanos stumbled upon his discovery in mid-August 1980, he didn't exactly shout "Eureka!" At that time, inventors working for the government didn't really have much to look forward to, says the now-retired captain.

But Galanos went ahead and worked on his idea anyway, spending extra hours in his lab at Eglin Air Force Base, Fla. After developing his invention—a device for viewing laser-made images—he turned it over to the Air Force patent office, which gave Galanos a $300 award and a citation. A year later, when he patented his invention, Galanos received another $100.

"It was a real joke," says Galanos of the reward system. What made matters worse for him was that his invention had commercial possiblities. "I could have brought several products to the market. Instead, I had to just walk away from it."

But this spring, thanks to the Technology Transfer Act of 1986, Galanos and about 250 other government scientists and engineers will be receiving a new type of government bonus: a share of the royalties collected from inventions that have been licensed for commercial use.

As soon as the Defense Department (DoD) directive on royalty sharing goes through, Galanos will be receiving 20 per-

Government Gives Scientists the Royal Treatment

After years of receiving only token awards when their inventions were patented, government scientists and engineers can now receive a share of the royalty payments the government collects on their inventions. BY DON LEE



BRUCE REEDY

Bob Auber works for the National Technical Information Service, a Commerce Department office that promotes and licenses inventions on behalf of several agencies, helping turn government research into profit for both the government and its employee-inventors.

cent of the $27,000 in royalties that the 3M Co., which now owns the rights to his invention, paid the Air Force last year. Galanos could receive even more in the years ahead.

Royalty sharing is a major part of the latest congressional effort to promote the transfer of technology from federal laboratories to businesses and to better compensate talented government scientists. It is intended to give researchers incentives to develop and patent inventions that could have commercial applications, such as a corrosion-resistant coating that NASA scientist John Schutt developed in the late 1960s for satellites; it has since been applied by a private company to protect, among other things, the Statue of Liberty and several bridges.

In addition to enabling federal laboratories to enter into a broad range of agreements with businesses and state and local governments, the Technology Transfer Act requires agencies to pay their researchers at least 15 percent (or, alternatively, a fixed minimum) of income from invention royalties, beginning with royalty revenues from fiscal 1987. The remaining royalties must go to inventors' labs, for distribution to coworkers or for other matters related to technology transfer. In the past, nearly all royalty income to the government—as much as $5 million in fiscal 1986—went to the U.S. Treasury.

The first payment for most of these 250 inventors will be no more than a few hundred dollars. But for others, like Galanos, it will mean as much as several thousand, up to the yearly maximum of $100,000 that Robert Gallo of the National Institutes of Health (NIH) is expected to receive for his blood test to detect the virus that causes AIDS.

Whatever the amount, many say the new government-wide policy is long overdue.

Before Technology Transfer

Before the Technology Transfer Act, inventors in Defense Department labs—where about half of the government's 200,000 scientists and engineers work—had to settle for one or two small monetary awards, typically totaling about $500; a citation some scientists derisively call an "atta-boy paper;" and idle dreams of where they and their inventions might have gone had they only conceived their discoveries in a private garage instead of a federal laboratory.

Researchers on the civilian side had it a little better. Like their counterparts at DoD, they received small cash awards from their agencies for reporting and patenting inventions; in addition, since 1980 some have been receiving 15 percent of royalty revenue from the National Technical Information Service (NTIS), an office in the Commerce Department that promotes and licenses inventions for several agencies. But according to Bob Auber, an NTIS official, the maximum amount reseachers could receive for their licensed inventions before was $10,000 over a lifetime—just one-tenth of the *yearly* maximum set by the new law. (In 1980, NTIS gave 16 inventors a total of just $3,000 in royalties; this year about 200 will receive royalty payments through NTIS.)

Either way, scientists say, these awards were much too small in light of the difficulties and disincentives government researchers encounter in developing and patenting inventions. Developing commercially useful discoveries often requires a lot of extra individual effort; most government scientists and engineers, when finished with a specific project, must quickly move on to something else rather than pursue possible spinoffs. Also, many concentrate on basic, rather than applied, research.

"The nature of my research duties made it practically impossible for me to devote any time to my invention," says Galanos. "We at the lab would normally put in 14 to 15 hours a day. I had to work on my discovery on my own time."



BILL BRANSON

Robert Gallo of NIH expects to receive a $100,000 bonus this year—royalty payments for the blood test he invented to detect the virus that causes AIDS. He's the government's top royalty earner.

Another disincentive, says Carl Merrill, chief researcher of biochemical genetics at NIH, is the administrative and legal paperwork needed to file for patents, which Merrill says reminds him of applications for research grants. "One reason I like it here is that I don't have to apply for grants," says Merrill, who in recent years has written four patent applications, including one for a silver-staining technique that hospitals now use to detect protein. "But when I take time out to do these [administrative] things," he says, "I have less time to do science."

Still another reason why some government scientists have been slow to pursue commercially useful discoveries is that inventions have traditionally had little or no bearing on promotions.

"Research people are judged and rewarded on the basis of research work, scientific papers and publications," says John Peterson, an NIH engineer with 11 patents, two of which have recently been licensed to private companies. "The reward system in government isn't designed to recognize those who invent, so inventors get left out."

"There are just too many disincentives for researchers to do anything about inventions," says Galanos. "Royalty payment compensates for them."

The Transfer Trend

The Technology Transfer Act is the latest of several laws passed recently in the wake of criticism that federally funded research has not been adequately exploited for the national good. Critics charged that federal labs have too long been isolated from both academia and industry, and that this is a major reason why only 5 percent of the 28,000 government-owned patents were being licensed to private companies for commercial development.

Meanwhile, critics pointed out, foreign countries were making good use of ideas originating from the 700 or so U.S. federal labs, with some countries later exporting these back to the United States as finished products.

In response, the government pushed through a series of measures beginning in 1980 designed to give universities and businesses greater access to federally funded research:

- The Bayh-Dole amendments to the Patent Act in 1980 gave nonprofit organizations (especially universities) and small businesses ownership rights to inventions conceived during federally funded research, enabling them to develop new technologies themselves or license inventions to businesses.
- Also that year, Congress enacted the Stevenson-Wydler Technology Innovation Act, which set aside 0.5 percent of the agencies'

Before government inventors had incentives, they would report discoveries in publications and at conferences, where foreigners could pick them up, rather than using government channels to promote speedier technology transfer at home.

research budgets to fund technology transfer, established a clearinghouse for information on federal inventions, and required agencies to appoint part-time officers to encourage technology transfer.

■ In 1984, the Federal District Court Organization Act extended the rights in the Bayh-Dole Act to federal laboratories operated by universities and nonprofit corporations, such as the Argonne National Laboratory run by the University of Chicago.

■ A year later, Department of Energy Secretary Donald Hodel signed a departmental policy enabling for-profit contractors, such as Martin Marietta Energy Systems, which operates the Oak Ridge National Laboratory, to retain ownership of inventions conceived in these facilities.

While these measures have had some effect—Oak Ridge Laboratory, for instance, has since entered into several cooperative agreements and is negotiating with many more companies—laboratories operated by the federal government still had no clear authority to enter into cooperative research projects with businesses and other parties. And without incentives for inventors, some say, government researchers continued to report discoveries and new ideas through publications and at conferences, where foreign scientists are able to pick them up easily, rather than through government channels that would result in a speedier transfer of technology at home.

The new act gives blanket authority to all federal labs to work with universities and industry and allows federal labs to exchange funds, personnel, services and facilities with collaborating partners. It also creates the Federal Laboratory Consortium for Technology Transfer, a network consisting of about 300 laboratories from 11 agencies, and for the first time, establishes the dual reward program for inventors—agency cash award programs and royalty sharing.

Talking Money

Royalty sharing by government has precedent in the experience of many universities, which, unlike private companies, have been sharing royalties with their employees—at a rate of 15 percent through much of the 1970s and at higher percentages in more recent years. Stanford University, for example, which led all other American universities and even the government with $6 million in royalty revenues last year, says it paid more than 100 of its researchers one-third of net royalties.

Other universities, such as the University of Maryland, pay their researchers as much as 50 percent of gross royalty income. As a result, says Wayne Swann, director of the technology liaison office at the University of Maryland in College Park, which was established in late 1986, "disclosures of inven-

tions have increased dramatically over the past few years."

Although the Technology Transfer Act allows federal agencies to give employees an even higher percentage than universities—theoretically, agencies could give *all* royalty revenue to the inventors—officials at the Department of Agriculture (USDA), the Department of Commerce and the Department of Energy say they will be giving the 15 percent minimum required by law. Other agencies are expected to go with a slightly higher rate, with NIH planning to give its inventors the most: 25 percent of the first $50,000 in royalties, 20 percent of the second $50,000, and 15 percent thereafter. Both the Department of Defense and NASA say their agencies will most likely give 20 percent to their inventors.

In fiscal 1987, the government received $4.5 million in royalties from about 250 licenses, according to figures obtained from NTIS, DoD, the Department of Energy and NASA. But royalties from two inventions—Gallo's AIDS test and a Hepatitis-B vaccine—are said to have accounted for about 85 percent of last year's total. (No government researcher, however, will be receiving a share of royalties from the hepatitis vaccine, as it was discovered by a nongovernment scientist while doing federally funded research.)

Of the 250 royalty checks that will soon be sent out, about half will go to NIH researchers, 40 to researchers in the Department of Agriculture, 34 to NASA scientists, 30 to the Department of Commerce, and a handful to those in other agencies.

So far, agencies have been giving the awards a low profile; some scientists contacted by *Government Executive* were unaware of details of the Technology Transfer Act and didn't know that they were scheduled to receive royalty payments. While agency officials say the Privacy Act precludes them from disclosing how much these 250 researchers will receive, they did reveal that most of the checks will be for less than $1,000. But some researchers at NASA, which last year received nearly $80,000 in royalty income, are expected to get checks for several thousand, as will some at NIH and at least two people in the Defense Department.

Based on last year's royalties of $2.8 million from the AIDS test, Gallo is certain to receive at least $100,000 this year. He could even receive more than the maximum set by law, but payment of any amount over $100,000 would first require the approval of the President.

NTIS officials say that others also may be paid much more in the years ahead. Because a new technology typically requires further development, testing of prototypes, and in some cases government approval, it is often several years before an invention is ready for commercial use. For many researchers, Auber says, the checks will represent a share of fees collected from the execution and holding of licenses rather than from actual royalties, which are percentages of sales in the commercial market. NTIS charges businesses fees ranging from $250 to $100,000 to file a license and usually the same amount annually to maintain it.

Will an entrepreneurial spirit now infuse federal laboratories? Some officials worry that government scientists will start arguing more about money than about the research they are pursuing.

"A Flurry of Activity"

Although many agency officials say it is too early to evaluate the royalty sharing policy, others say the act has already had an effect.

"There's a flurry of activity," says Anthony Lane, an official at the Army's patent division. "The Army patent people will see an increase in invention disclosures."

At the USDA, Anne Whitehead, coordinator of the department's patent program, says the department has been issuing more licenses since the 1986 act. Moreover, she says, researchers are reporting more inventions. "We are increasing our staff to handle a backload of inventions," she adds.

But with such interest spreading among government scientists, some officials say they worry that the new policy could instill too much entrepreneurial spirit in researchers, which could lead to ill will or disputes—not about science but about money. "That's a danger," says Philip Chen, chairman of the patent policy board at NIH. "We don't know what's going to happen."

Chen says royalty payment should be thought of merely as an "added feature" in the jobs of scientists, in the vein of recent policy changes that permit NIH scientists to receive compensation for lecturing and consulting. Otherwise, Chen and others note, royalty sharing could divert scientists and the labs from their mission.

Scientists, on the other hand, say royalty payments are not likely to affect their work. "It could help pay for my son's medical school expenses," says Merrill of NIH. "But it will not alter my work. The only difference is that *now* I'll take the time to write all my patent applications."

Others, however, see more promise in the new policy, saying that the Act will not only improve technology transfer, but could give the government a slight edge over the private sector as an employer. At a time when privatization of NIH is being debated, as more top government scientists are being lured by universities and private companies for as much as double or triple government salaries, plus stock options and other benefits, some say royalty benefits may even give scientists second thoughts about leaving government.

"This allows scientists to stay in government and get better compensated," says Joe Allen, acting director at the Commerce Department's Office of Federal Technology Management. Although royalty sharing is still in its infancy, Allen and others suggest that it could play a role in retaining government scientists in the years ahead, as more government scientists receive royalties and for greater amounts. They point optimistically to the continuous growth in cooperative efforts between government and private industry, stimulated largely by recent developments in biotechnology, and also predict that agencies will eventually follow universities in giving researchers a higher cut of royalties.

Despite these prospects, with only a small number of scientists due to receive royalty checks this year, and most of these for small amounts, many agree with Chen's assessment that, for now, royalty payments are "a drop in the bucket."

Robert Purcell, a scientist who has been with NIH for 25 years, says he personally doesn't think royalty payments will make any difference in retaining government scientists. He notes in particular that he and others at NIH would probably not jump merely at opportunities for additional compensation. "I've gotten a lot of lucrative job offers. But I'm here because the facilities are better and because there are more opportunites for research."

Says John Schutt of NASA, who worked three years—much of the time during evenings and weekends—developing his corrosion-resistant coating: "I'm not a greedy guy. But it's just nice to know that somebody recognizes you." □

down, an action Zucker calls "a scientific disaster." He says the shutdown "has stopped the Western world's only supply of transuranium elements with all that that implies for science, defense, and treatment of disease." Although progress is being made on restarting the reactor, he says, more support is needed.

But large, multiuser instrumentation isn't the only research area that the DOE budget proposal is hindering. At the Pacific Northwest Laboratory, director William R. Wiley is trying to build a new program called the Molecular Science Research Center. Much of the program is designed around the energy and environmental challenges described in the National Research Council's report "Opportunities in Chemistry," also called the Pimentel Report. Wiley says the research would be focused on advanced materials like superconductors, atmospheric pollution problems, hazardous and nuclear waste treatment, alternative fuels development, and health research.

Wiley told the hearing, however, that although the lab has expanded its staff and volume of research, the technical capabilities of the lab—buildings and equipment—have not kept pace. He points out that the instrumentation for the molecular science program alone will cost about $125 million, and the lab's operating budget would be cut slightly under the Administration's proposal. Wiley believes his lab has been neglected. "The last scientific laboratory resource funded [at the Pacific Northwest lab] was authorized by Congress in 1968 and became functional in 1971," he said.

Behind many of the laboratory representatives' comments are concerns about the ability of U.S. research to compete as increasingly lavish funds are spent on scientific projects by other nations. If Congress' intention is to increase U.S. competitiveness, these lab directors are saying that much of it has to begin at the level of research done at the national labs. "The laboratories represent an investment the nation has made, and, I trust, will continue to make in the future," Schriesheim says, "and the returns from this enterprise have been extraordinary."

David Hanson, Washington

Problems in technology transfer at federal labs

The General Accounting Office (GAO) has found that despite federal efforts to the contrary, constraints remain on the transfer of technology from federal laboratories to the private sector. These constraints include limits on conducting proprietary research at federal labs, difficulties in copyrighting or licensing certain types of research, and overly bureaucratic procedures.

Since 1980 Congress and the Administration have been trying to increase U.S. industries' access to technology developed in federal labs, which collectively spent more than $20 billion on R&D in fiscal 1987. Because of these efforts, government-operated labs can now enter into collaborative research ventures with private companies and grant exclusive licenses for commercialization of government inventions. Contractors who operate government-owned labs are permitted to retain title rights to inventions and technical data without having to first request that the government waive its rights to this intellectual property.

As part of his committee's ongoing study of technology policy, Rep. Robert A. Roe (D.-N.J.), chairman of the House Science, Space & Technology Committee, asked GAO to determine whether, despite various Congressional and Administration actions, any constraints remained on the transfer of technology from federal labs that might need to be addressed.

In fulfilling Roe's request, GAO conducted extensive interviews with senior research managers and technology transfer officials at 10 federal labs and program managers and/or patent counsels at six federal agencies. From these discussions, GAO identified four principal constraints on the transfer of technology.

One major constraint involves the limited opportunities for conducting proprietary research at federal labs. Officials at seven of the labs told GAO that confidentiality of company data and research results is normally among the first issues businesses raise in exploring opportunities to collaborate on R&D. At the present time, there is no confidentiality: The results of federal R&D efforts are published in the scientific literature or in patent applications, and any interested party, including competing businesses, can get information about federally funded research simply by filing Freedom of Information Act requests.

The only way a company can conduct proprietary R&D at a federal lab is to pay all of the direct and indirect costs of the research. Once companies realize this, many potential collaborations fail to come about, and the scope of the work is scaled back for some of the agreements that are negotiated, GAO says. As a way around this, personnel at all of the labs except the National Institutes of Health and the Beltsville Agricultural Research Center suggested changing federal law to allow the labs to conduct proprietary R&D under a cooperative R&D agreement. They also suggested that the labs treat R&D results as a company trade secret for up to five years, depending on the specific research project and the field of technology.

By contrast, many of the officials at NIH and Beltsville said they do not want to conduct proprietary R&D because their labs operate on the basis of free and open discussion of scientific ideas. They feel that conducting proprietary R&D might inhibit such discussions and consequently affect the labs' primary mission to improve health and agriculture.

Other constraints identified by GAO are:

- Federal labs lack authority to copyright and license computer software.
- Department of Energy contractor labs are required to get authorization from headquarters before they can license intellectual property.
- Federal labs, in their efforts to be fair in providing businesses opportunities to collaborate on research, may institute burdensome and time-consuming procedures that inhibit industry participation.

Janice Long, Washington

Deliver to Norm Later

1st PATENT CHINA

GUANGZHOU (CANTON) PRC

FIRST INTERNATIONAL EXPO ON PATENTS, HIGH TECHNOLOGY & NEW PRODUCTS NOVEMBER 18-23, 1988



1st PATENT CHINA is the first international exposition on patents, high technology and new products ever held in China. The Exhibition is to be held in Guangzhou (Canton), China, and is jointly sponsored by The Patent Office of PRC, China Patent Technology Development Company; China National Technical Import & Export Corporation; and KONG CHUNG HONG.

The aim of the Exhibition is to create favorable conditions for people who have applied and those interested in applying for patent protection in China to have their patented technology honored in China and to provide them with a chance to introduce directly to the Chinese importing parties the background of their technology, as well as to conduct license trade and related products trade with them.

Patent affairs is a new business in the PRC following the nation's reformation in this area. Implementation of their patent law is an important step in the nation's open policy. During the past two years, patent systems; i.e., information exchange and technology transfer, both under legal protection, have been brought into full play there. It has not only stirred up the active interest of numerous inventors but also provided legal protection to foreigners who want to transfer their new technologies or sell their patented products to China.



This exhibition is being held at an opportune time when China has formulated its 7th Five-Year Plan and is deepening its various reform programs. In the past ten years, the economic and technological exchanges between China and foreign countries have made great progress. Along with this, the exchange of trade and technology between China and foreign countries will witness an even greater progress and this Exhibit will have a far-reaching significance.

More than 20 PRC ministries and government organizations will sponsor ***1st PATENT CHINA***. The manufacturers, enterprises, administration developments and experts in China will participate in this unique opportunity during its open period for the purpose of conducting technology exchange and trade negotiation with foreign participants. The foreign and domestic participants will earn a 50% discount on stipulated fees on any transaction regarding patent trade or technology trade concluded within the period of this event. A further long-term service relationship will also be established.



Mr. Jean-Claude Combaldieu, the Director General of the French National Institute of Industrial Property, has predicted that ***1st PATENT CHINA*** will enhance the prestige within the major fields of the economic and social developments in China and further the promotion of international technology exchange. He has advised the Director General of the PRC Patent Office that the French will try their best to support the promotion of participation in the event. Likewise, Dr. Erich Hausser, the President of the West German Patent Office, has indicated their participation, along with the PRC Patent Office; and Sojuzpatent of the USSR Chamber of Commerce and Industry. China Universal Leasing Co. Ltd., a joint venture between the Bank of China, Sanwa Bank of Japan, Dresdner Bank AG of West Germany, China National Machinery/Instrument/Technical Import and Export Corporations have reached an agreement with Kong Chung Hong to provide their foreign currency leasing facilities to the Chinese end users who will have reserved the foreign exhibits during ***1st PATENT CHINA***.

More Information Inside on:

Exhibits
Travel Arrangements
Sponsors
Contacts
Itineraries
International Venture Capital Institute



Sponsored by:

The Patent Office of PRC, China Patent Technology Development Company

China National Technical Import & Export Corporation *KONG CHUNG HONG*

1st PATENT CHINA

COST

Option 1: Booth 3M x 3M	USD 3800.00
Option 2: Booth 3M x 4M	USD 4800.00

Basic fittings for the above booth includes: Space, walls on three sides, carpeted floor, one sign panel in Chinese and English, one information counter, two chairs, two spotlights and one waste basket.

SERVICES

The organizers offer the below basic services:

1. Description on exhibitors are introduced in the Exhibition Directories.
2. Invitations to the Opening reception.
3. Twenty-four hours security.
4. Regular stand clearing.
5. Exhibitor's manual issued to explain the related details and information about the exhibition.
6. Pre-exhibition promotional work motivated at potential Chinese buyers.
7. Arrangement of meeting and trade negotiations during the exhibition among exhibitors, end users/parties concerned.
8. Assistance from the official freight forwarder for packing and shipping of exhibits to the exhibition site.
9. Assistance with travel arrangements and accommodation.

Additional services provided at reasonable rate:

1. Special decoration, extra furniture and electrical facilities.
2. Hire of interpreters and attendants
3. Literature translation and printing.
4. Miscellaneous rental.

PARTICIPATION PROCEDURE

Fill in the application form on the reverse side and return to:

INTERNATIONAL EXPO PROMOTION CENTRE
701A, Far East Consortium Building
121, Des Voeux Road Central
Hong Kong

Application Deadline: August 31, 1988.

Reservation and Payment: A deposit for 50% of the total rental fees payable to organizer must be accompanied with the application for the reservation of the booth. The remaining balance must be settled before September 30, 1988. Deposit shall not be refunded in any circumstances, except the application is rejected by the organizer. Any payment made by an exhibitor who cancells or reduces his space reserved will be forfeited.

CONFIRMATION & CONTRACT

Your application for reservation will be confirmed within two weeks upon receipt of your application. An official Exhibitor's Contract will be mailed to you following our confirmation.

Exhibition Booths will be allocated on a "FIRST COME, FIRST SERVED" basis.

SEMINAR

It is highly recommended that seminar given by exhibitors introducing their advanced technique and equipment will put their trade possibilities into effect. Charges of seminar for a section of 3 hours is USD 400 which will include the renting of a seminar room, the provision of one interpreter and invitations to appropriate Chinese end users/parties concerned.

ADVERTISEMENT

The organizer will publish bilingual Exhibition Directories to be distributed free of charge to more than 80,000 visitors during the exhibition, and sent to departments concerned throughout China. To highlight your participation, to establish prominent images for your company, to maximize your commercial penetration into Chinese market, advertising in the directories offers you a precious opportunity.

The scale of charges is as follows:

Options	*Colour*	*B&W*
Back Cover	USD 3,500	—
Inside Front Cover	USD 2,000	—
Inside Back Cover	USD 1,500	—
Full Page (7.5" x 10")	USD 1,000	USD 600
Half Page (;7.5" x 5")	USD 600	USD 400

We also accept the application for advertisement on wall space within Exhibition Hall at a cost of USD 180 per sq. m.

Please fill in the application form on the reverse side and return with 50% deposit in USD made payable to INTERNATIONAL EXPO PROMOTION CENTRE.

Participating Organizations

Ministry of Foreign Economic Relations and Trade, PRC
Ministry of Geology and Minerals, PRC
Ministry of Aviation Industry, PRC
Ministry of Space Industry, PRC
Ministry of Nuclear Industry, PRC
Ministry of Electronics Industry, PRC
Ministry of Communications, PRC
State Commission for Machine-Building Industry, PRC
Ministry of Civil Affairs, PRC
Ministry of Agriculture, Animal Husbandry and Fishery, PRC
Ministry of Light Industry, PRC
Ministry of Public Health, PRC
Supreme People's Courts, PRC
China International Trust and Investment Corporation
China Association for Science and Technology
China Inventory Association
The State Council, Poor Area Economic Development Leading Group
State Scientific & Technological Commission, Science & Technology Attainment Department
United Nations Development Programme TIPS National Bureau in China
China Industry & Commerce Development Corporation
Chinese Academy of Sciences, New Technology Development Department
China New Building Materials Corporation
China Interchange Centre for Science & Technology
China Correspondence College for Countryside Prosperous
China Electronics Import & Export Corporation
China Association for Industrial Property Research

Contacts ...

For more information on travel arrangements, contact:

Ann Man-Chun Arunas, President
Arunas Travel Company
630 Third Avenue
New York, NY 10017
Telephone: (800) 842-1989
In NY, call: (212) 808-9330

For additional information, contact the agent authorized to represent 1st Patent China for the U.S. and Canada:

Carroll A. Greathouse, President
International Venture Capital Institute
Post Office Box 1333
Stamford, CT 06904
Telephone: (203) 323-3143
Fax: (203) 838-5714

For further information on 1st PATENT CHINA program and exhibits, contact:

S. Chan
International Expo Promotion Centre
701A Far East Consortium Building
121 Des Voeux Road, Central,
Hong Kong
Telephone: (852) 5-413328
Telex: 86088 KCHHK HX
Fax: (852) 5-8151745

International Venture Capital Institute (IVCI)

The International Venture Capital Institute (IVCI), a subsidiary of Baxter Associates, a 55-year-old multiple association management firm, has been appointed as an agent to bring a delegation from the United States and Canada to attend and participate in **1st PATENT CHINA**, by the three co-sponsors listed on the front of this brochure and Mr. S. Chan, Marketing Manager of the Conference and Exhibition. In turn, IVCI assigned the registration and travel arrangements to Arunas Travel Company.

Be sure to see the special insert in this brochure with full details on exhibiting in *1st PATENT CHINA.*

Registration Form

Enclosed is $_____ as full payment of my reservation to attend 1st PATENT CHINA Occupancy: Single ☐ or Double ☐.

(NOTE: full payment is due 45 days prior to departure.)

NAME(S) _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____ SIGNATURE _____

DEPARTURE DATE _____ GROUP I ☐ or GROUP II ☐

Upon receipt of your full payment, detailed program information will be forwarded to you along with more specific information on the travel arrangements.

If you are a member of a professional society or trade association, please indicate the name of the group:

_____

Complete this form and mail it with your check to: Arunas Travel Company, 630 Third Avenue, New York, NY 10017. **A duplicate copy of both the form and your check should be sent to the International Venture Capital Institute, Post Office Box 1333, Stamford, CT 06904, who will mail a list of all attendees to you in advance of your departure.**

Cancellation Policy ... If written cancellation is received by Arunas Travel Company 60 days or more prior to departure, your payment will be refunded, less a handling fee of $150.00 per person; if received less than 60 days but more than 14 days prior to departure, 50% of your payment will be refunded. No refunds will be made if cancellation is received 14 days or less prior to departure.