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Daniel S. Greenberg

Perplexing Changes in Our Science Community

Leaders of the scientific community have so often employed panic tactics to expand federal spending for research that skepticism now often greets their contentions that all is not well in the house of science.

Nevertheless, though present-day American science remains productive and rich by the standards of any other nation, it would be prudent to listen to what some of the sager, non-alarmist heads of the profession are saying. They are not proclaiming doom. Rather, they are expressing puzzlement and concern over a complex of changes now taking place in the innards of an enterprise on which we all depend for improvements in the treatment of disease, industrial and agricultural productivity, defense, energy sources and environmental purity. Thus we find Frank Press, the competent and calm White House science adviser, saying—in a mood of perplexity—that "Profound things are happening in the sociology of science that we won't understand for 10 years." What does he mean?

Press, in harmony with many of his colleagues in the federal science establishment, is not so much concerned about the availability of money for science—though that's a problem, too, given the fact that purchasing power for basic research has been on a plateau for a decade. What they are more concerned about are the long-term consequences of institutional changes that are squeezing a lot of youth, spring and vitality out of the conduct of research. For example:

• Throughout academe, a glut of tenured professors—hired in the boom days of the space era—is choking up job opportunities for newly graduated scientists. In 1968, youngsters were plentiful on physics faculties, 40 per cent having received their Ph.D.s within the previous seven years. By 1975, the figure was 19 per cent.

• Confronted with a new Ph.D. proletariat, academe has responded with the little-noted creation of a caste system that provides scientific labor at lower cost and without the long-term job commitments that have traditionally characterized university employment. Candidates not deemed suitable for faculty appointments are hired for what is referred to as the "doctoral research staff." Relatively low in status, and without job security, these researchers rarely have an opportunity to develop their professional potential; they're hired hands, usually working on someone else's project.

• Undergraduate teaching posts—which have long provided an invisible subsidy for graduate training—are on the brink of a major decline as lower birthrates begin to show up in lower undergraduate enrollments.

• The scarcity economy in academic science has spawned a spirit of caution among young researchers anxious to make their mark. Department chairmen report that doctoral candidates are increasingly shunning longshot thesis projects in favor of safe and sure problems.

• Meanwhile, industry has generally reoriented its research priorities in favor of short-term payoffs, rather than long-term inquiries of a fundamental nature. There are exceptions, but, by and large, science is a shrinking enterprise on the American industrial scene, whereas in West Germany and Japan, it's coming up fast. And the American shift is occurring at a time when, in a number of fields, including agriculture and pharmaceuticals, it is widely held that basic scientific knowledge has been pretty well exploited and that new developments must await new scientific understandings.

These and other problems have inspired an assortment of diagnoses and prescriptions for American science. Among them are urgings for academe and industry to enter into collaboration on major scientific projects and for government to help break the tenure logjam by subsidizing early retirements of academic faculty.

At the moment, however, the institutional base of science is being reshaped by forces that are only dimly understood. No one, in fact, is certain that these changes will be detrimental to the quality and productivity of science, as distinguished from its lifestyle. The scientific community, after all, remains large and well financed. But it is becoming different, and that's why many of the statesmen of science wish they had a better understanding of what this will mean for their profession and its ability to fulfill the demand for continued production of knowledge.

"By and large, science is a shrinking enterprise on the American industrial scene, whereas in West Germany and Japan, it's coming up fast."

Jack Anderson

Small Firms Stinted on Research

Following their ephochal 1903 Kitty Hawk flight, the Wright brothers got a five-year runaround from Washington before receiving any government financial help to pursue their aeronautical research. Small-time inventors and innovative businessmen today are getting the same short shrift, even though billions are being doled out by the federal government for research and development.

Butter-fat corporations lap up the cream from the research subsidies, even though they're interested more in profits and cost-cutting than new inventive breakthroughs. Small companies with fewer than 1,000 employes get skim milk from the federal churn.

Yet the little enterprising businesses rather than the corporate giants have been responsible for such developments in this country as insulin, zippers, power steering, ball point pens and self-winding watches. This was in keeping with the tradition of individual inventive geniuses symbolized by the Wright brothers, Alexander Graham Bell, Samuel Morse and Thomas Edison.

The superiority of small business research has been cited in a study which the Office of Management and Budget strangely never published. The study credited firms having than 1,000 employes with almost half of the industrial innovations between 1953 and 1973.

According to the study, 16 small technology firms created 25,553 jobs for American workers during the 20-year period because they came up with new ideas. Yet the budget office was advised that small firms were drawing inadequate funding from the government, getting less than 4 percent of the research and development layouts.

Spurred by the report, the budget office drafted a memo intended for all federal agencies, urging vigorous efforts to channel more of the research to small businesses "which are having difficulty in competing in the big leagues."

The memo added, "there is considerable evidence that the small proportion of federal research and development work that is being awarded to small technologically based firms is contributing to a serious loss of high technology capabilities in our nation. It is important that we see some real progress within the first 18 months of the administration."

This ringing call for a new deal was never sent to the agencies. Les Fettig, head of the office that was supposed to be directing the crusade, said the report and the memo were news to him until we asked what happened. He explained that the documents "fell through the cracks" during the transition period between the Ford and Carter administrations.

Fettig said his office is alert to the problem and is taking steps to make it easier for small businesses to get research and development help.

Footnote: Investigation shows that the Energy Department under James Schlesinger has been perhaps the worst offender in government in encouraging research at the Little League level. The department claimed it awarded 10.3 percent of its research contracts to small operators in the 1977 fiscal year. The General Accounting Office has challenged the statistic. GAO auditors found the amount was about 2.6 percent, because the Eenergy Department has counted subcontracts that trickle down from the big corporations.

Postal Proposal — An idea that could help reduce the postal deficit and provide the pay increase postal workers are demanding has been run up the flagpole for Postmaster General William F. Bolger. He seems ready to salute it.

Bolger is giving serious attention to the imaginative proposal of Miami public relations wizard Hank Meyer that the hundreds of thousands of mail boxes and postal delivery trucks throughout the United States be used as advertising space.

Meyer stressed in his private presentation to Bolger that he wasn't suggesting the Postal Service provide billboard-style space for promoting junk products. Under his plan, the advertising and public service messages would be subject to approval of the postal authorities.

Vacant space is available on an estimated 180,000 postal vehicles and 400,000 street deposit boxes, which could be rented for advertising.

Bolger still hasn't made a decision but if the Postal Service adopts the idea, an advertising agency would be selected by competitive bidding to run the ad operation.

On the last page of the Business Week article, there is a story about a small company who wouldn't take Government funds because of possible loss of invention rights. The company gave the Japanese 49% of the company for the necessary venture capital rather than lose these rights.

Norm.

VANISHING INNOVATION

A hostile climate for new ideas and products is threatening the technological superiority of the U. S.

A grim mood prevails today among industrial research managers. America's vaunted technological superiority of the 1950s and 1960s is vanishing, they fear, the victim of wrongheaded federal policy, neglect, uncertain business conditions, and shortsighted corporate management. They complain that their labs are no longer as committed to new ideas as they once were and that the pressures on their resources have driven them into a defensive research shell, where true innovation is sacrificed to the certainty of near-term returns. Some researchers are bitter about their own companies' lax attitudes toward innovation, but as a group they tend to blame Washington for most of their troubles. "[Government officials] keep asking us, 'Where are the golden eggs?' " explains Sam W. Tinsley, director of corporate technology at Union Carbide Corp., "while the other part of their apparatus is beating hell out of the goose that lays them."

That message—and its implications for the overall health of the U. S. economy—is starting to get through. Following months of informal but intense lobbying led by such executives as N. Bruce Hannay, vice-president for research and patents at Bell Telephone Laboratories Inc., and Arthur M. Bueche, vice-president for research and development at General Electric Co., the White House has ordered up a massive, 28-agency review of the role government plays in helping or hindering the health of industrial innovation. "Federal policy affecting industrial R&D and innovation must be carefully reconsidered," wrote Stuart E. Eizenstat, the White House's domestic policy adviser, in a recent memo outlining the review's intent.

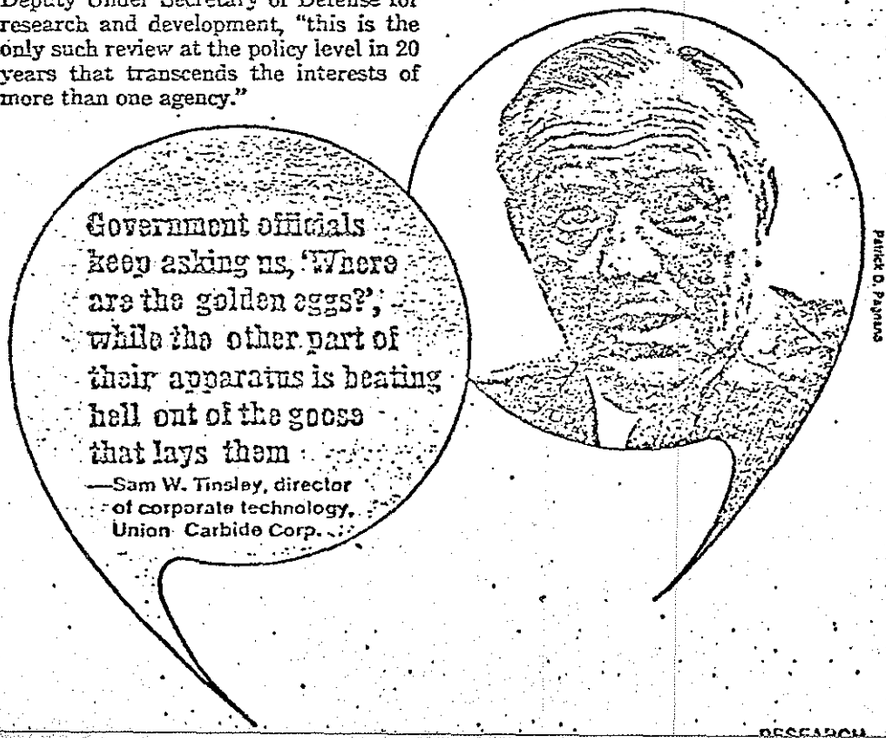
One thing that the study clearly will not accomplish is a quick fix for the deepening innovation crisis. The problem is regarded as immensely complex by the Administration, and is inextricably tied to other economic dilemmas now facing Carter's White House.

"Historically, the government's role has been to buy more science and R&D," says Martin J. Cooper, director of the strategic planning division at the National Science Foundation (NSF). "Now maybe we better go with investment incentives." Says Jordan J. Baruch, Assistant Commerce Secretary for science and technology, who will be the review's day-to-day manager: "This study developed in an environment of people concerned about economics, business, and technology."

The Administration's concern is underscored by the fact that it is organized as a domestic policy review, the highest sort of attention a problem can receive within the executive branch. Among its objectives, such a review must produce options for corrective action by the President. According to Ruth M. Davis, Deputy Under Secretary of Defense for research and development, "this is the only such review at the policy level in 20 years that transcends the interests of more than one agency."

The White House also seems determined not to conduct the study in a governmental vacuum. Baruch is soliciting input from groups such as the Industrial Research Institute (IRI), the Business Roundtable, and the Conference Board. "We want both CEOs and R&D vice-presidents," says a White House official. Labor groups have been asked to participate, too, along with public-interest groups. Congressional leaders such as Senator Adlai E. Stevenson (D-Ill.), chairman of the Senate subcommittee on science, technology, and space, have been brought into the early planning. And the 28 agencies involved extend beyond obvious candidates, such as the Environmental Protection Agency, to the Justice Dept. and even the Small Business Administration.

The study's scope is so sweeping, in



fact, that some federal officials are talking about a "thundering herd" approach to policymaking. But one government science manager demurs. "It beats having one guy write a national energy program in three months," he sniffs.

Philip M. Smith, an assistant to Presidential science adviser Frank Press and an early organizer of the study, concedes that "a lot of people have told us that we are likely to fail." But such skepticism, he believes, does not take into account the considerable clout of those involved in the effort. Commerce Secretary Juanita M. Kreps, for example, is chairing the study, and she heads a coordinating committee whose members include Charles L. Schultze, chairman of the Council of Economic Advisers, Administration inflation fighter and chief trade negotiator Robert S. Strauss, and Zbigniew Brzezinski, Carter's national security adviser. Even more important is the support of Eizenstat, who, says Smith, "is very interested in this particular review."

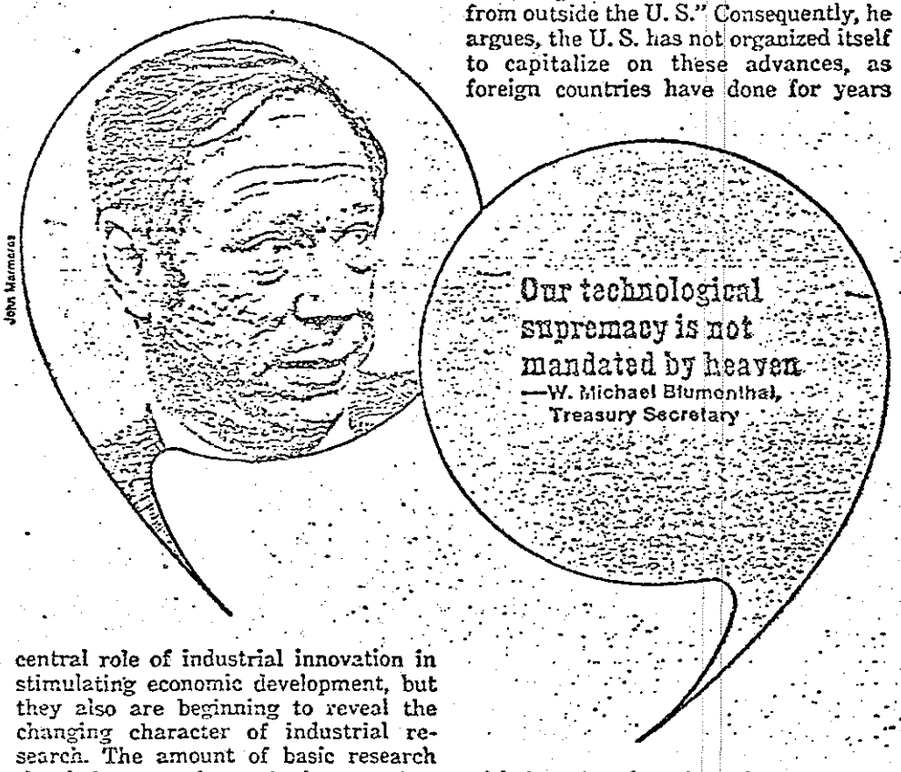
Finding 'new directions'

On the other hand, there is already grumbling within the Agriculture Dept., which was left off Kreps's committee. "We are red-faced," says a high-ranking Agriculture official. "We are out of the project because this Administration and those before it do not place any priority on agricultural research." However, Jordan Baruch insists that the department will play a role in the study. Agriculture experts point out that farm commodity exports of over $24 billion play a key role in the U. S. balance of payments. They note also that superior technology is the basis of the commanding American position among world food exporters.

Whatever its outcome, the White House policy review is being undertaken at a time when, as Frank Press puts it, "we badly need some new directions." Many experts view with alarm the declining federal dollar commitment to R&D, which has dropped from 3% of gross national product in 1963 to just 2.2% this year. For its part, industry as a whole has more or less matched the inflation rate and then some with its own spending. But such macroscale indicators do not tell all. "We've got to find out what the story is sector by sector, because each industry is going to be different," says Press. "We also have to find out what's going on abroad."

Better data on the relationship between industrial innovation and the health of the economy are becoming available. According to a 1977 Commerce Dept. report, for instance, technological innovation was responsible for 45% of the nation's economic growth from 1929 to 1969. The study went on to compare the performance of technology-intensive manufacturers with that of other industries from 1957 to 1973, and found that the high-technology companies created jobs 88% faster than other businesses, while their productivity grew 38% faster.

The numbers help to establish the central role of industrial innovation in stimulating economic development, but they also are beginning to reveal the changing character of industrial research. The amount of basic research that industry performs, for instance, has dropped to just 16% two years ago from 38% of the national total in 1956.



And a new IRI survey of member companies for the National Science Foundation demonstrates how federal policy has directly altered the nature of the research effort in another way, making it more and more defensive. The study shows that surveyed companies increased R&D spending devoted to proposed legislation by a striking 19.3%, compounded annually, from 1974 to 1977. And the rate was 16% a year for R&D devoted to Occupational Safety & Health Administration (OSHA) requirements. "When overall R&D spending is not growing nearly this fast," note the survey's authors, George E. Manners Jr. and Howard K. Nason, "other categories of effort—especially research—must be suffering."

Other observers compare the viability of industrial innovation in the U. S. with that of foreign countries. One expert is J. Herbert Hollomon, director of the Center for Policy Alternatives at Massachusetts Institute of Technology. According to Hollomon, a reason the U. S. is losing its leadership is that "we're arrogant—we have an NIH [not invented here] complex at the very time a majority of technological advances is bound to come from outside the U. S." Consequently, he argues, the U. S. has not organized itself to capitalize on these advances, as foreign countries have done for years with American knowhow. Since as much as two-thirds of all R&D is now conducted by foreign laboratories, Hollomon says, it should be no surprise that they have taken the lead in such technologies as textile machinery and steel production.

"We essentially prohibited West Germany and Japan from defense and space research," says Hollomon. "So it's no accident they concentrated on commercial fields." He adds: "I believe other nations better understand that the innovation process is important."

Says a research director for one high-technology company: "For a country like ours, the technology leader of the world, what has been happening is downright embarrassing." Indeed, even the presumed sources of strength in a consum-

er-oriented society are today under intense pressure. "Our experience with Japan in the consumer electronics industry—namely televisions, radios, audio, and transceiver equipment—shows some of our weaknesses," testified Gary C. Hufbauer, a Deputy Assistant Treasury Secretary, before a congressional subcommittee. In 1977, he said, "we had a $3.6 billion trade deficit with Japan in high-technology goods, and about two-thirds of this was accounted for by imports of consumer electronic goods."

The role of regulation

The cumulative response to these developments has been alarm. "The system has now sharpened its pencils in a way that discourages changes that are major," worries Robert A. Frosch, head of the National Aeronautics & Space Administration. "We have been so busy with other things that we may have inadvertently told the people who think up ideas to go away."

Even labor unions, which historically have left R&D decision-making up to corporate board rooms, now are complaining about lack of innovation. "Having helped to develop and pay for this technology," says Benjamin A. Sharman, international affairs director of the International Association of Machinists, "American workers have a right to demand government responsibility for using it to create new products, more jobs, better working conditions, and general prosperity." And Charles C. Kimble, research director of the Electrical, Radio & Machine Workers union, goes so far as to suggest that labor should now have a say in how industrial research money is spent.

Among research managers themselves, excessive or contradictory federal regulatory policy is the single greatest complaint. Hannay of Bell Labs points to Food & Drug Administration requirements as a case in point. According to one study, says Hannay, a 1938 application for adrenaline in oil was presented to the FDA in 27 pages. In 1958, a treatment for pinworms took 439 pages to describe. "By 1972," he says, "a skeletal muscle relaxant involved 456 volumes, each 2 in. thick—76 ft. in total thickness and weighing one ton."

Regulation, says Tinsley of Union Carbide, has put a bottleneck on new-product development in the chemical industry and has so added to the cost of getting any new chemical approved that only those targeted at a vast, assured market are attempted today. Food and drug industry researchers echo that complaint. "Today," says Al S. Clausi, director of technical research at General Foods Corp., "our industry does work that is fostered by unreal and invalid public concerns."

But regulation can have less obvious impacts, such as forcing an industry to stick with old technology rather than to experiment with new approaches to problems. "The overall effect of regulations on the auto industry has been to build an envelope around the internal-combustion device and the whole car structure," says Harvard Business School Professor William J. Abernathy, who specializes in technology management. " 'Don't do anything really new, don't change.' That's what these regulations say." Paul F. Chenea, vice-president for research at General Motors Corp., agrees. "You just don't have time to explore wild new ideas when a new rule is so closely coupled to your current business," he says.

'The science of the matter'

In Congress, where the regulatory laws are written, such thinking has so far found a small audience. "A great number of the regulations that we would call environmental . . . may actually be self-defeating," muses Harrison H. Schmitt, the former astronaut from New Mexico who is the ranking Republican on Stevenson's Senate subcommittee. "Instead of looking at pollution controls, if we were looking at building a more efficient and therefore less-polluting engine, we would not only be solving our environmental problems, but we would be producing a new thing for export."

Schmitt is one of only three federal legislators with the semblance of a science background. "We probably have

How antitrust charges can limit R&D payoffs

Companies that make it across the development minefield and bring superior technology to market still may find a threat on the other side: monopolization charges that keep them from fully exploiting the technology. As old as that problem is, such charges can come as a shock, as they did to Du Pont Co. last April.

Courts established decades ago that the Sherman act prevents a company with a hammerlock on a particular industry from making sound, otherwise perfectly legal business decisions that would, however, perpetuate its dominance. In 1945, for example, Judge Learned Hand found evidence that Aluminum Co. of America unlawfully monopolized its industry by its tendency to "double and redouble capacity" as demand increased. That, said Hand, locked would-be competitors out of the expanding market.

In a similar vein, the Federal Trade Commission said three months ago that Du Pont had used "unfair means" to keep competitors from increasing their share of the expanding market for titanium dioxide, a widely used paint pigment. "The complaint is wholly without basis," says Irving S. Shapiro, the company's chairman.

40% share. Superior technology clearly contributes to Du Pont's dominance. In the 1950s, the company devoted a decade of work—and what a spokesman will peg only at "many millions of dollars"—to develop a new way of making TiO_2. Although the highly automated, continuous process went on stream more than 20 years ago, it still tops the processes used by such competitors as NL Industries, SCM, and American Cyanamid, because it uses cheaper raw materials and produces less acid waste.

The problem with the government arises because Du Pont's 40% share of the $700 million-a-year market is still growing. That alone is enough to send government lawyers poking about for actions that can be attacked. According to Alfred F. Dougherty Jr., head of the commission's antitrust arm, even a 30% chunk of the market "could be a dominant position if all the other firms in the market had a much lower share." In fact, Justice Dept. antitrust chief John H. Shenefield asked his staff to look at Du Pont's TiO_2 policies only to find the FTC there ahead of him.



Du Pont's Shapiro: The FTC's "complaint is wholly without basis."

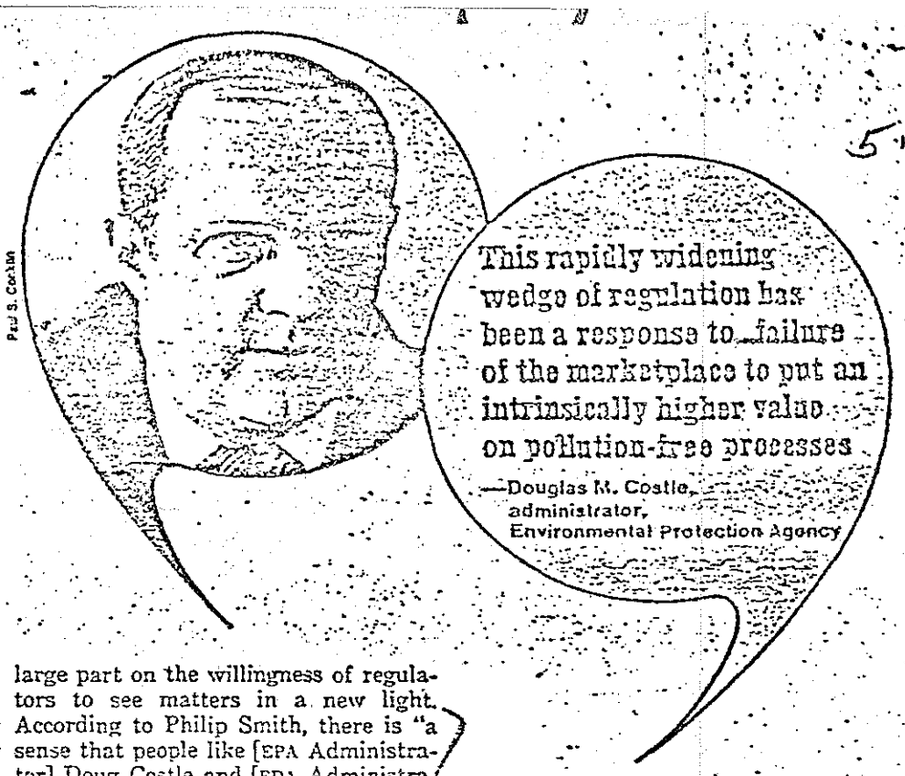
Basically, the FTC says that Du Pont keeps its market share by expanding capacity before the market is ready for more production, thereby forestalling competitors' expansion plans. Du Pont, says the FTC, should get rid of one of two current TiO_2 facilities and a new plant at De Lisle, Miss., that would begin production next year. The FTC staff also wants the company to take competitors under its wing by giving them, royalty-free, the superior technology and knowhow it has built up over the past 25 years.

exercised very poor judgment in the past," he says, "because the Congress overall—members as well as staff—have not been able to understand what is possible technologically and what is not, and therefore not been able to relate the costs [of legislation]."

Jason M. Salsbury, director of the chemical research division at American Cyanamid Co., pleads, "Before the lawyers write the legislation, let them know the science of the matter." Not only may some mandates be beyond what industry can legitimately perform, he says, but the rules force a conservative approach to science. One key indicator of this trend is the increasing number of toxicologists now employed in chemical company research labs. "Toxicologists don't innovate," notes Frank H. Henley, vice-president for research and engineering at Lever Bros. Co.

Then there is the regulatory bias against new ideas. In the EPA's grant programs for waste-water treatment at the municipal level, for instance, equipment specifications must be written so that gear can be procured from more than one source. That means a company with a unique process is discriminated against. What is more, the mandate for cost effectiveness precludes trying out innovative approaches whose value can only be measured if someone is willing to gamble on them.

If the domestic policy review is to solve such questions, it will depend in large part on the willingness of regulators to see matters in a new light. According to Philip Smith, there is "a sense that people like [EPA Administrator] Doug Costle and [FDA Administrator] Don Kennedy want to work with industry, and they don't want to fight all the time. I think we have a team of people now in government that may be able to do something."



Paul S. Conklin

The investment climate

But industry should not expect a major overhaul of regulatory practices to emerge from the study. EPA Administrator Douglas M. Costle concedes "a tremendous growth in the last decade in health and safety regulations—13 major statutes in our area alone." Though Costle agrees that the economic impact of such rules should be more closely quantified, he contends that "this rapidly widening wedge of regulation has been a response to a massive market failure—failure of the marketplace to put an intrinsically higher value on pollution-free processes."

Most regulators agree that not enough research has been done on the true nature of the environmental problems they are empowered to combat, but they also argue that regulation has led to cost-saving practices, especially in the area of resource recovery, where closed-cycle processes now help capture reusable material. OSHA officials also cite examples where the agency has laid down rules that have led to cost-cutting innovations. But Eula Bingham, the OSHA administrator, emphasizes that the "legislatively determined directive of protecting all exposed employees against material impairment of health or bodily function" requires tough regulation without quantitative weighing of costs and benefits. "Worker safety and health," she insists, "are to be heavily favored over the economic burdens of compliance."

Bingham and her boss, Labor Secretary Ray Marshall, may represent an increasingly isolated view, however. Economic issues have come to dominate thinking within the Carter Administration, and it is precisely these questions that industry has stressed in its discussions with science adviser Press and other White House officials. Just over a month ago, Treasury Secretary W. Michael Blumenthal told a meeting of financial analysts in Bal Harbour, Fla., "We are now devoting a very sizable chunk of our private investment to meeting government regulatory standards . . . and in some of these areas we may well be reaching a breaking point." Blumenthal also noted: "Our technological supremacy is not mandated by heaven. Unless we pay close attention to it and invest in it, it *will* disappear."

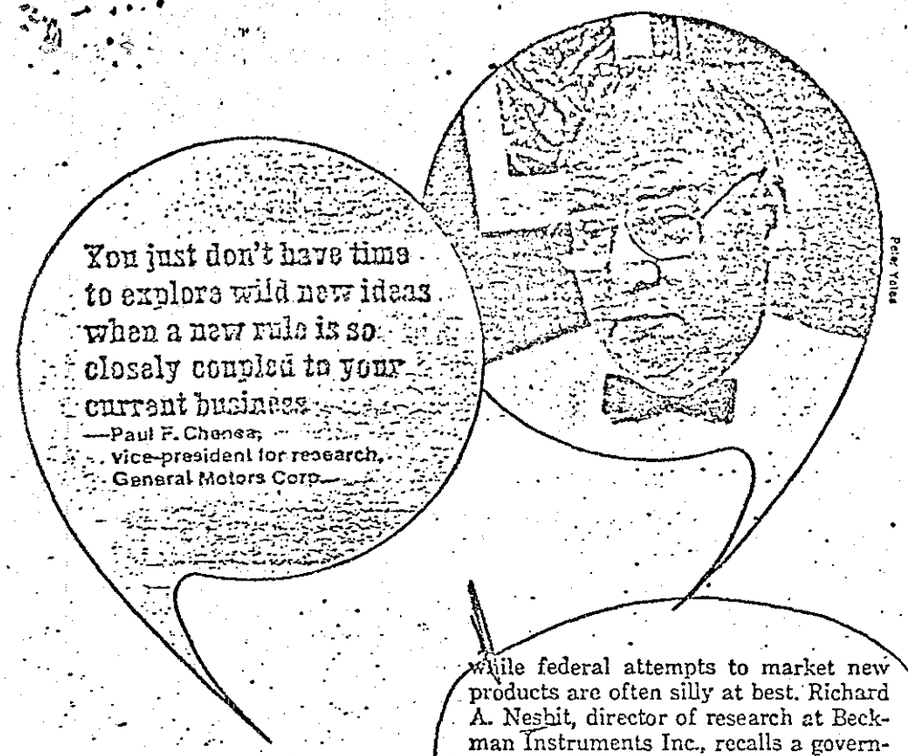
A month before the Blumenthal speech, GE's Bueche suggested to an American Chemical Society gathering that "we step back and look at R&D for what it really is: an investment. It is an investment that, like more conventional investments, has become increasingly less attractive."

Bueche, along with most other research managers, rejects the idea of direct federal subsidies to industrial R&D. Instead, he points out that "perhaps 90% of the total investment required for a successful innovation is downstream from R&D, [and thus] it becomes . . . clear why we must concentrate on the overall investment climate." Bueche attacks Administration proposals to eliminate special tax treatment of long-term capital gains, plumps for more

Whether the need for such onerous penalties can be established—before an FTC judge, the full commission, then a court of appeals and, perhaps, the Supreme Court—may take years to determine. But the approach is not unusual in monopolization cases.

The Xerox case. Just a year ago, the Justice Dept. ended such a suit against Industrial Electronic Engineers Inc. by getting the California company to promise royalty-free licenses to all comers on patents it had used to dominate the market for rear-projection readout equipment for electronic data-processing systems. And three years ago, the FTC settled a complaint by getting Xerox Corp. to open its portfolio of 1,700 copier patents to competitors. Xerox had to license three patents—chosen by the competitors—free. Fees for use of the rest were strictly limited by the FTC.

As severe as those measures may seem, and as discouraging to innovation, the antitrusters contend that it is the only way rivals can eat into a monopolist's dominance of a market. Says Alan R. Palmer, assistant director of the FTC's antitrust arm: "We have to look to what relief will really be effective."



rapid investment write-offs, and says "it is extremely important to provide stronger incentives for technological innovation by making permanent and more liberal the 10% investment tax credit."

Critics in industry

Bueche's arguments suggest the broad—yet often indirect—way in which federal policy runs counter to the best interests of innovation. Fear of antitrust moves from the Federal Trade Commission or the Justice Dept., for instance, has prevented many companies from sharing research aimed at a problem common throughout an industry—including new technology aimed at solving regulatory questions. At General Electric, the legal staff must now be notified if a competitor visits a company research facility, even if no proprietary material is involved.

For their part, Justice Dept. trustbusters claim that fears that their policies stifle innovation are not justified. They say they are flexible enough to recognize the differences in the pace of innovation from industry to industry, and that is why they allow a fair number of mergers among electronics companies. "That's an industry where you don't have to worry about someone cornering the market," says Jon M. Joyce, an economist in the Justice Dept.'s antitrust division. "There's just a lot of guys out there with good ideas."

Industry further claims that the inability to secure exclusive licenses on government-sponsored research leaves much good technology on the shelves, while federal attempts to market new products are often silly at best. Richard A. Nesbit, director of research at Beckman Instruments Inc., recalls a government circular that waxed rhapsodic over the federal commitment of billions of dollars to R&D. Included with the letter was a syringe for sampling fecal matter, and the suggestion that Beckman might want to license the technology. "I wondered if they spent billions to develop that," Nesbit recalls. "The contrast was ludicrous."

Even national accounting procedures draw criticism from industry. A major target is the 1974 ruling by the Financial Accounting Standards Board that stipulated that R&D spending could no longer be treated as a balance sheet item, but must be listed as a direct profit or loss item in the year spent. R. E. McDonald, president and chief operating officer at Sperry Rand Corp., recently told an executive management symposium, "The ramifications of that rule change are quite complex, but the net effect has been to dry up a lot of potential venture capital investments. . . . I can say quite candidly that Univac would not be here today if we had not had the advantage of the old rule for so many years."

The shortage of risk capital has had a tremendous impact on small, technology-oriented companies trying to arrange new public financing. According to a Commerce Dept. survey, 698 such companies found $1.367 billion in public financing in 1969. In 1975, only four such companies were able to raise money publicly, and their numbers rose to just 30 in 1977. Equally ominous is the experience at Union Carbide, which, according to Tinsley, has not been able to compete for venture capital and has thus canceled plans to start a number of small operations built around interesting new technology. Years ago, says Tinsley, Carbide was reasonably successful at getting such funding. "And you must remember that these ideas are perishable," he says. "They don't have much shelf life."

The Treasury Dept., in fact, has an ongoing capital-formation task force that will be integrated into the policy review under the direction of Deputy Secretary Robert Carswell. Carswell notes that "you can't draw a clear line" between R&D support and investment in general, but "if it turns out that we find some form of capital formation gives the economy a greater multiplier effect than another form, we at the Treasury would not shy away from whatever policy would help most."

Washington's changing role

Even as it has pursued policies detrimental to industrial R&D, the federal government has withdrawn as a major initiator of innovation. Research managers generally believe that companies are better equipped than government to bring new technology to society because they are more attuned to market pull. But Lawrence G. Franko of Georgetown University, an international trade expert, recently pointed out to a congressional committee that the U. S. government has in the past played an important role "as a source of demand for new products and processes, and as a constant, forbearing customer in computers, semiconductors, jet aircraft, nuclear-power generation, telecommunications, and even some pharmaceuticals and chemicals. . . ."

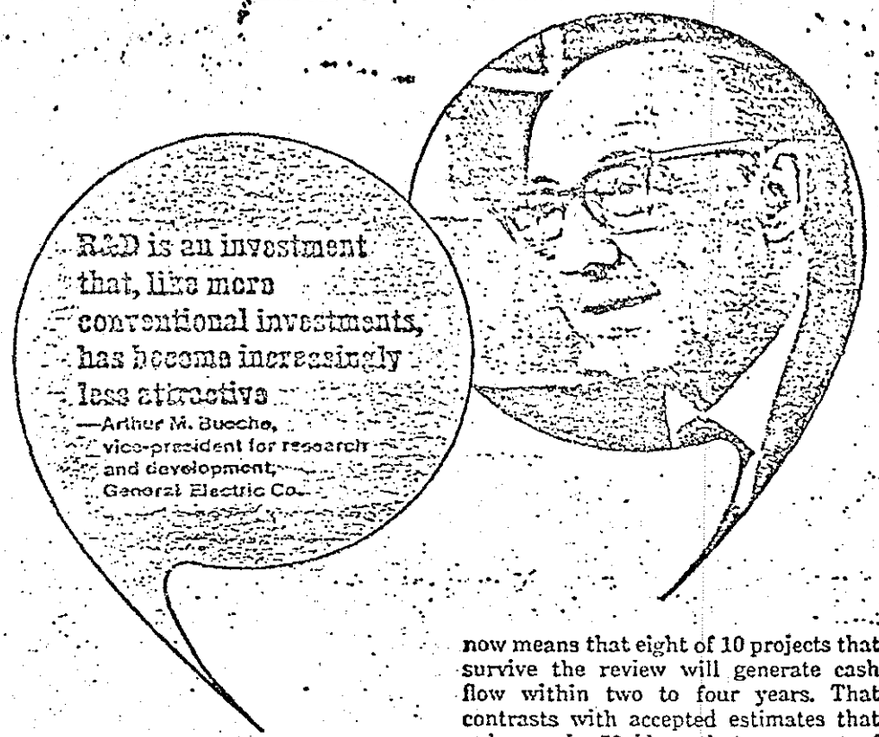
According to the Defense Dept.'s Davis, both Defense and NASA "have faded" in this role, the result of the Vietnam war and concerns over the military-industrial complex. "The consumer marketplace and other government agencies have not been able to pick up where DOD and NASA left off," she says. "The Department of Energy should be able to help with this, but it hasn't yet. And the Department of Transportation just never blossomed in this role." An unreleased IRI study for the Energy Dept. summed up industry's views. The company officers interviewed said government could spur industry's energy R&D only by creating a national energy policy, increasing its managerial competence, and offering financial incentives rather than massive contracts.

On the other hand, there have been some recent, notable government efforts to spur the innovation process. "We've talked to the leading semiconductor companies about our hopes for their innovation," says Davis. She says that the Defense Dept. expects to program $100 million over the next five years for industrial innovation in optical lithography, fabrication techniques involving

electron-beam technology, better chip designing and testing to meet military specifications, and system architecture and software implementation.

At the Transportation Dept., chief scientist John J. Fearnsides wants to involve the private sector much earlier in the government's R&D process, thereby allowing industrial contractors to develop technology alternatives instead of having to cope with rigid specifications at the outset. Such a policy, some believe, might have resulted in major savings for the Bay Area Rapid Transit system, for instance. "It is more expensive to fund a wider range of choices, but only at first," says Fearnsides.

The NSF also has announced a new industry-university grant program for cooperative exploration of "fundamental scientific questions." The aim is to make "a long-term contribution toward product and/or process innovation."



The failures of business

While agreeing on the need for federal policies that bolster innovation, those knowledgeable about industrial research think that the companies themselves share some of the blame for stagnation and must be willing to examine their practices critically. Alfred Rappaport, a professor of accounting and information systems at Northwestern University's graduate school of management, believes that one reason the U. S. lags in R&D is that the incentive compensation systems that corporate executives live under tend to deter intelligent risk-taking. "Incentive programs are almost invariably accounting-numbers oriented and based on short-term earnings results," he says. "That puts management emphasis on short-term business considerations." Another criticism has been of the haphazard way in which companies have launched new R&D programs. In essence, industry should try to learn how to weed out bad ideas early on, say the detractors. To that end, Dexter Corp. has instituted an eight-factor "innovation index" approach to research management that weighs questions such as effectiveness of communications, competitive factors, and timing, and comes up with an "innovation potential" for new ideas. At Continental Group Inc., D. Bruce Merrifield, vice-president of technology, says that "constraint analysis" of new ideas now means that eight of 10 projects that survive the review will generate cash flow within two to four years. That contrasts with accepted estimates that only one in 50 ideas that come out of research labs ever generates cash flow, and not for seven to 10 years.

Large companies often fail to exploit their own resources effectively. In the 1950s and 1960s, some companies set up centralized research facilities, but many of these did not yield the hoped-for synergism—in many cases, apparently, because the different parts of the company were in businesses too unrelated to one another.

On the other hand, Raytheon Co. was highly successful in transferring its microwave expertise to its newly acquired Amana appliance subsidiary in 1967, resulting in the counter-top microwave oven. That was done through a new-products business group set up specifically for such purposes. And more recently, this group, headed by Vice-President Palmer Derby, brought the company's microwave talent to bear on its Caloric subsidiary's product line, resulting in a new, combination microwave-electric range.

In such ways, industry can maximize its potential for innovation in the most adverse environment. But the future health of the nation's economy, many experts believe, requires a much more benign environment for industrial R&D than has existed over the past decade. And Jordan Baruch, the enthusiastic leader of the multi-agency federal study, believes that such an environment is likely to emerge as a result of the Administration's concern.

"We may have bitten off more than we can chew," notes Frank Press, "and it may be that we can't get much done in a year. But even if it takes three or five or 10 years, I think it is historically very important." ■

Turning to Japan for venture capital

The recent drag in U. S. venture-capital commitments has opened opportunities for foreign companies to appropriate American ideas. A case in point is the experience of System Industries Inc., a Sunnyvale (Calif.) manufacturer of minicomputer peripherals.

In 1969, System Industries went to work on a new ink-jet printing process, forming a subsidiary, Silonics Inc., to develop and market it. By 1973, the research phase was over, and a cash-short System Industries went looking for venture capital to tool up for production. Unfortunately, none was there. With a depressed stock market, and recent increases in the maximum tax on capital gains that cut the expected return on such investments in half, the usual capital sources "couldn't justify taking the same risks they used to," says Edwin V. W. Zschau, the company's chairman and chief executive officer. Keeping only 51%. Next, he explains, "we were thinking about government funding. But we were discouraged from even making a proposal when we learned the government would get data rights and be able to license it to other people. We didn't see why we should give away those rights just to get a little money." What Zschau finally did give up was 49% of Silonics to Konishiroku Photo Industry Co., the Tokyo-based maker of Konica cameras.

In return, the Japanese company has spent $5.5 million on Silonics, which is enough to bring the new printer to market at the National Computer Conference in Anaheim, Calif., in mid-June. "We have one of the most promising imaging technologies for the 1980s," Zschau now complains. "But we only own 51% of it."

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9/3/78

Michael Novak

A day for Enterprise

The last thing this country needs is another holiday. Nevertheless, I would like to propose one: Enterprise Day, to be celebrated on the Monday after the first day of spring. Enterprise Day would be a counterpart to Labor Day. Its purpose would be to honor our most endangered, heavily burdened and most fragile resource: the spirit of enterprise.

The system under which Americans live is not very old. Although it may not survive much longer, in its brief passage through the gloom of history it has cast a lovely light. Most of the progress of science, and the vast part of the world's betterment in the conditions of all people, have occurred during the short tenure of this system. A relatively few of the world's citizens discovered a method for unleashing tremendous energies of initiative and imagination. Such energy has always been available. But no society before had learned how to release it.

The word "enterprise" captured the spirit of adventure that characterized pilgrims and pioneers, founding fathers and builders of industry, sponsors of invention, artists and creative thinkers of every sort. The method was simple: Permit individuals to take risks with their own lives, careers and resources. Stand out of their way and let them go directly to the public. Permit them to reap rewards for offering the public the goods and services the public decided, by its own choices, to accept or to reject.

Such an idea was at first deemed both implausible and faintly immoral. Could individuals be trusted? Did not some officer of Reason need to guide their choices? Were not citizens so corrupt that they would choose badly, squander their resources, and be attracted to lowest common denominators? "The public is a beast," some said. "Only philosopher kings can bring about Utopia," others said.

Nonetheless, enterprise took root in a few small parcels of the world's territories. The power and beauty that broke from them were so astonishing that many other nations wished to imitate their achievements. Some did not wish to trust enterprise. Some tried to reach the same goals through servitude. And Planning. Planned servitude.

Enterprise is a resource more precious to the world than oil. For oil, there are substitutes. For enterprise, there is no equivalent form either of energy or of intelligence. The most complex computer is not as sensitive as the free choices of enterprising individuals. Such individuals are an unending source of invention. They are, alas, easily suppressed. Most societies repress them.

We have reached a decisive turn in Western societies. For several decades, statist politicians could claim to provide more goods and services than enterprise alone. There was truth in this claim. But now the cost of government is high, and the productivity of enterprise is falling. Now it is clear that statism clearly means less of everything. Taxes and inflation, by statist action, climb together. Individuals must settle for lower standards of living.

For the first time in a long time, those who oppose the statists — those who nourish enterprise — are in a position to offer ordinary citizens "more." As enterprise goes up, standards of living go up. As statism rises, so do taxes and inflation, bringing standards of living down.

There is now a huge vested interest in statism. One out of every five voters works for the government. It is time to celebrate the idea of enterprise while it still lives. Labor Day has its importance. It is enterprise that invents the projects on which to labor. Enterprise imagines, labor fulfills. Labor Day needs Enterprise Day as autumn requires spring.

And what would truly make the day distinctive is that it should not be celebrated by taking off from work. There is a far better way: It should be celebrated as a day without taxes. On one day a year, sales taxes should not apply. And all earned income from that day's labors should be exempted from income taxes.

This idea, of course, is playful. But a society lives, more than pragmatists think, by celebrations. If we do not celebrate our distinctive social secrets, we may not immediately lose them, but we are certain to undervalue them.

The Washington Post BUSINESS & FINANCE

SUNDAY, SEPTEMBER 3, 1978 C1

Something's Happened to Yankee Ingenuity

By Bradley Graham
Washington Post Staff Writer

It's been 89 years since Angus Campbell put the first automatic cotton picker to work, 70 years since Henry Ford gassed up his first Model T, 39 years since Du Pont introduced a super fiber called nylon and 30 years since Edwin H. Land marketed the first instant-picture camera.

All of which helps recall a time America's inventive spirit seemed unbounded and unceasing. Ideas flowed to the marketplace as fast and furious as mountain rapids flow downhill.

But what was once thought to be an endless stream of U.S. inventions has of late been trickling out less startling and less competitive products. Meantime, adding pain to the drain, the inventive powers of foreign nations have been in ascendance. The question, once raised in a whisper, is now asked in loud and urgent tones: Has American enterprise lost its innovative touch?

Consider these facts:

• The number of U.S. patents issued per year to U.S. inventors reached a peak in 1971 and has declined steadily since. But the number granted to foreign inventors has increased steadily since 1963. In 1977, foreigners claimed 35 percent of all patents issued in the U.S. across a broad range of fields.

• The U.S. balance of trade has worsened, due not only to increased oil imports, but also to more imports of foreign manufactured goods.

• Productivity, which is partly a function of technological innovation, has slumped severely. In the past decade, the rate of growth in U.S. productivity has averaged only half of what it was the previous 20 years. In contrast, productivity growth rates in Europe and Japan have been on the rise.

• From 1953 to 1965, U.S. investment in research grew at an impressive rate of 10 percent annually in inflation-adjusted dollars. However, investment in research by all sectors in the U.S. over the past 10 years has shown essentially no growth in constant dollars. Further, a number of major U.S. corporations have announced recently they intend to spend even less on long-term basic research and more on development of short-term, quick-profit products.

In a world where power and progress are often measured in terms of technological breakthroughs and scientific prowess, such trends are indeed disturbing.

For a nation that has always prided itself on its tinkerers—on those lone souls who brought forth from their garages and basement labs such revolutionary devices as power steering, the office copier and the zipper—they are downright depressing.

From boardroom to research lab, there is a deepening sense that something has happened to the once unchallengeable Yankee Ingenuity. Just what, though, no one quite knows.

There is today a pervasive perception that the dynamic vitality of the U.S. economy is faltering. This perception appears to be founded on two concerns: first, that America is not as productive as it used to be; and second, that we are somehow not as inventive either. This is the first of two articles this month which will examine these concerns.

Some insist it is in rapid decline, choked by an unfavorable economic climate, government regulation and, perhaps, by the lethargy and shortsightedness of big business. Others say it has simply taken new forms, becoming more subtle and incremental in nature than grand and revolutionary. Either way, the country's genius for invention does not appear, at least, to be what it once was.

Alarm bells are going off all over. First, Michael Boretsky, a senior policy analyst in the Commerce Department: "All the indicators imply that the rate of U.S. innovation is measurably down. It's very disconcerting."

Next, Dr. Alden Bean, director of research for the National Science Foundation: "There's no solid evidence to suggest that the U.S. is going to hell in a handbasket in science and technology. But there is serious cause for concern about some trends we've seen."

After several years of arm-waiving and shouting about waning U.S. innovation, the nation's research establishment finally caught the ear of the White House. Several months ago, the Carter administration launched a major policy review of things to be done to foster innovation in private industry. The study is being coordinated by the Commerce Department and involves more than 15 agencies. A final report, including recommendations for the president, is expected by April.

But many experts say another study is hardly necessary. The worrisome state of innovation in America has been assessed and reported on many times since the first major policy review conducted by Commerce in 1967. In the interim, the problems only have become more obvious.

For one, the economic climate for innovation is poor. The financial incentives that in the past encouraged the rich and the bold to risk their money on slim-chance projects no longer exist, thanks to increases in the capital gains tax and tighter rules on stock options. Inflation, too, has put the squeeze on capital investment by existing corporations.

Also, with the winding down of space and defense programs, government support of industrially performed research has diminished. Throughout the 1950s, the government annually supported more than one-third of industrial research activity. This level of support reached almost 40 percent in 1962, but has been falling consistently and is 25 percent today.

Increased government regulation, too, has increased operating costs and shrunk the share of profits formerly available for research. So has the higher cost of energy.

Together, these developments have forced a shift in industrial research activities from the offensive to the defensive. "Major effort is being diverted into defensive research," said Howard Mason, president of the Industrial Research Institute in St. Louis. "Much more emphasis is being placed on short-term cost reductions than on long-term product and process improvements."

But as important as such external economic factors may be in explaining the innovation slump, there are certain features about the internal structure of corporate America today which some say have had a debilitating effect on innovation.

Writing in the July-August issue of the Harvard Business Review, Alfred Rappaport, professor of business at

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INNOVATE, From GI

Northwestern University, blames the research lag on the increasing emphasis American business places on short-term results. Rappaport asserts that management incentive programs are biased toward quick profits at the expense of perhaps smarter long-term investment.

"American business would do well to re-examine its own self-administered incentive systems," Rappaport concludes.

Industrial research today is dominated by a small number of very large corporations. The top 10 percent of those firms doing R&D in 1976 performed almost 70 percent of the total U.S. R&D effort. Ten firms accounted for more than 25 percent of all expenditures that year. This concentration may itself work against innovation.

"A large part of the blame for the lack of innovation lies with the oligopoly nature of American industry," said Mark Green, director of Ralph Nader's Congress Watch. "Big companies get habituated to their products and there is a reluctance to break through. If you already dominate an industry, where is the incentive to take a chance on a new and costly approach?"

But the history of innovation in America is ambiguous on this point. Studies done on whether big business or little business is more inventive have come to no conclusive end as a whole.

Certainly, many major innovations have come from outside an established industry. The ballpoint pen, for instance, was invented by a sculptor, the dial telephone by an undertaker. It took an electrical engineer employed by a shipbuilding firm in the 1930s to develop the automatic transmission, called by some the last major innovation of the auto industry. IBM's disk memory unit, the heart of today's computer, was not the logical outcome of a decision made by IBM management—rather, it was developed in one of its labs as a hooting project, over the stern warning from management that the project had to be dropped because of budget difficulties.

At the same time, certain large firms in the fields of electronics, pharmaceuticals, telecommunications and computers have been highly innovative.

In their seminal study in 1958 on the sources of invention, Harvard professor John Jewkes and his colleagues said they could not conclude that inventions flow primarily from any one source. When the study was revised in 1969, the authors stated only the obvious: that inventions can come from firms of varying size.

Business leaders, of course, refute the charge that they are less innovative today than in the past. "There's no lack on the part of big business to be innovative," said General Motors Corp. Chairman Thomas Murphy in a phone interview. "It's a big country, so we have to be big. We couldn't do all of the things we do if we weren't as large as we are."

To the public, a car may still look like a car. But auto officials say the changes which have taken place inside during the past five years have been as revolutionary as anything which has come before.

"There's a perception problem," said Thomas J. Feaheny, the man in charge of car engineering for Ford Motor Co., where "better ideas" were once not only a management dictum but a successful ad slogan. "We've never been as innovative as we are now. But the things we're doing aren't as glamorous and aren't noticed much by the consumer."

Critics note, however, that what the auto industry heralds as advances in development (the catalytic converter, on-board use of minicomputers to govern fuel efficiency and control pollution, greater use of aluminum and other lightweight durable materials) are, in fact, only more logical applications of off-the-shelf technologies rather than breakthroughs in the state of the art.

Of even greater concern, though, than what has or hasn't happened is the prospect for the future. Many major corporations have tailored research budgets to yield more practicable and immediate results. In 1968, industry allocated as much as 33 percent of its R&D dollar to the "R" part. By last year, this had dropped to 25 percent.

Corporations say the reasons for this shift from research into development have nothing to do with being too big or too comfortable. The reasons, basically, are greater pressures from government regulators to meet health, safety and environmental standards as soon as possible, and greater uncertainty about the likely profitability of longer-term, riskier ventures.

"It used to be much easier to bring new products to market," said Du Pont Chairman Irving Shapiro in an interview. "If you hit something, you'd have more time to develop it. Now it's more difficult.

"Also, the pot of gold at the end of the rainbow just isn't there. The economic environment has changed. Our thinking has had to change, too. It's become more short range."

Added Richard Heckert, Du Pont's senior vice president for R&D: "We're not exploring wholly new areas. We're concentrating instead on opportunities for research in established areas . . . We are less able to take risks. We have to concentrate on surer projects."

The degree of such thinking does vary from company to company and industry to industry. Certain high-technology fields (instrumentation, computers and electronics) remain rooted in innovation and continue to churn out impressive new products. In other industries, though—particularly those most apt to be subject to regulation and high energy costs (steel, chemicals, paper, packaged goods and autos)—product innovation has leveled.

Part of the difficulty in deciding what to do about the innovation lag is figuring out how to define it. To begin with, innovation defies measurement.

"There are no indicators which you can look at to measure the advancement of knowledge," said NSF's Dr. Bean. "Some people count patents, but that's unreliable in part because some firms don't like to patent things and would rather rely on trade secrets rather than disclose important discoveries. Others count citations in the research literature, but that's unreliable, too."

But even without sure data, many have not hesitated to push the panic button. "You can't use statistics to say there's a problem," said Jordan J. Baruch, the assistant Secretary of Commerce who is directing the government's innovation policy review. "But you'd have to be blind not to see it."

Urgency about the problem is all the greater because America seems uniquely stricken. Western Europe and Japan grow more inventive, or so it appears, while U.S. firms age. Examples abound of foreign firms taking the lead in both new and traditional product areas. The Japanese, for instance, totally eclipsed the American communications industry in the development of video tape recorders. The Germans and Swiss now set the pace in textiles. Inventiveness in the steel industry has centered in Belgium and Austria. Some U.S. cities are even going abroad to scout for new ways to handle old problems. (The Council for International Urban Liaison here publishes a monthly newsletter called Urban Innovations Abroad that goes to 3,000 city officials in the U.S.)

Moreover, U.S. productivity rates have been in a rut for a decade—and that has serious consequences for everyone's real income and for the nation's overall standard of living. Of course, technological change by itself does not make or break productivity. There are other contributing factors, most important among them being capital investment and improved labor skills. But technology is an important ingredient in the mix.

With industry's current bent toward the here and now, there is concern that the U.S. may be cutting its innovative bridges. Some economists, notably Charles P. Kindleburger at MIT, have drawn disturbing parallels between the way U.S. firms are responding to America's battered competitive leads and the responses of British firms in the twilight of the English empire. British firms, just as American firms now, became defensive—that is, rather than redoubling efforts to generate innovations, they curtailed investment and demanded government protection against imports.

Does the current emphasis on small, incremental kinds of advances rather than on big breakthroughs threaten the dominant position the U.S. still holds?

No one is sure. Despite all the studies of innovation and productivity, no one can say whether there is an optimum rate of invention a society should adhere to, or how much innovation is enough.

There does seem to be general agreement, though, on this: The rapid technological growth which the U.S. experienced during the first two decades after World War II was unusual and is not likely to be repeated.

"We made an enormous investment in the war, made some great technological advances during it, and came out of it with a great belief in the power of technological progress," said J. Herbert Holloman, director for the Center of Policy Alternatives at MIT. "We also were handed an accidental lead, in having survived the war better than anyone else. But one of the things that is increasingly going to be the case is that new technological innovations are going to happen outside the U.S."

Holloman said that American business has in the past displayed an NIH (not-invented-here) complex, meaning that U.S. managers have been arrogant toward anything not thought up first in America and slow to embrace it. This is one of the things that he said will have to change if American firms hope to continue to compete in world markets. American businesses must learn to be quick to adapt, to exploit foreign inventions as well as their own, he warned.

"The problem is not with basic science," Holloman said. "The problem really is how effective we can be in adjusting and adapting."

Some have argued that U.S. multinationals may themselves have hastened this competitive bind on America by transferring their best technologies to foreign markets in recent years. Those who say this also urge legislation that would restrict further transfers of technology.

But most who have studied the innovation problem say the solution lies in fostering innovation at home—through a more liberal tax policy, a relaxed regulatory policy, less aggressive antitrust practices and, in general, a more cooperative spirit between business and government such as exists in Japan and the leading Western European countries.

And above all, they argue for greater certainty in government policy. "I think that more than an increase in government support of R&D or a reduction in regulation, what private industry people are interested in is a reduction in uncertainty about government action," said Dr. Bean. "Look, there's enough economic uncertainty in the R&D process without the government."

Times Picayune (NO); 5/30/78 NEW ORLEANS

Profits of Research

Comes now Dr. Sidney Wolfe of the Health Research Group, a Ralph Nader-umbrellaed organization, to protest government policies of managing the benefits of government-financed research.

University laboratories license their inventions, made possible by government grants, to private companies for developing and marketing. Money from the licenses is plowed back into research and development. The companies can keep the licenses only long enough to earn back their costs of testing and development. The government gets nothing back.

The General Services Administration now intends to publish a model contract to coordinate the licensing activities of several agencies, especially the National Science Foundation and the Department of Health, Education and Welfare. This plan Dr. Wolfe attacks as a "giveaway of patents whose nature, utility and value are unknown at the time of disposal." The government should "recoup some of its investment."

The Office of Management and Budget has jumped in, asking GSA to hold up on the policy. Its enforcement has been suspended for 120 days.

Government laboratories, such as the Department of Agriculture research center at New Orleans, take out public patents on products they develop, then license them to companies royalty-free. It may indeed be argued that this process is a "giveaway," that the flame-retardant cotton flannels developed here, or the cotton machinery equipment pioneered by USDA here, are extremely valuable to the sleepwear industry or the ginning firms and that the government, which has developed them at taxpayers' expense, should recoup its expenditures.

But from where we sit, the licensing policy with regard to university laboratories is essentially just. It lubricates the process by which technology developed under government grants eventually reaches the public. Inventions developed in university programs, as Howard Bremer, president of the Society of University Patent Administrators, points out, tend to be "very embryonic." Private business has the capital and know-how to test and market the products.

Some reasonable and fair fraction of the resulting profits, however, should revert to the university, and another reasonable and fair slice of the pie should revert to the government. If the product is in reality a technical advance, it will reap enough in the marketplace for these royalties scarcely to be noticed by the manufacturer. But they would represent at least symbolically that the people of the United States have furnished the original endowment for their development.

6/6/78

Can DOE Keep a Secret?

Wall St. Journal 7-17-78

By Walter S. Mossberg

WASHINGTON—In recent years, many members of Congress have worried that the government lacks accurate information on the major U.S. energy companies and the energy reserves they control.

So last summer Congress ordered the Energy Department to assemble a comprehensive, detailed new body of energy information. In unusually specific language, the lawmakers demanded an annual government report showing the revenues, costs, profits, cash flow and investments of the major oil companies, broken down by line of business, type of energy and geographic area.

But the Department's plans to carry out Congress's wishes have run into steely opposition from the industry. The battle is likely to come to a head this month and will probably wind up in court. The opposition threatens either to cripple the government's ability to collect the information Congress wants, or severely curb the government's ability to use it.

The oil companies are insisting that any specific corporate data they supply the Energy Department on the new reports be withheld from other government agencies, notably such law-enforcers as the Justice Department. They say the other agencies should be limited to general summaries of the information which wouldn't identify the data by company name. Otherwise, they warn, they may not cooperate in filling out the reports.

But, after months of agonizing over the industry's threat, the Department decided last month that it would share the information it gets with other agencies. That decision is now open to public comment and will be the subject of a hearing set for today. After that, unless the Department changes its mind, it will become final government policy.

The Government Argument

Law-enforcing agencies, including the Justice Department and the Federal Trade Commission, have argued that they need company-by-company statistics from the Energy Department in order to enforce a multitude of laws, especially the antitrust laws. They say there's only one federal government, and its branches should work together. And they note that the Department can legally compel the companies to fill out the new reports, so they discount the industry's threats.

Michael Pertschuk, chairman of the FTC, told Energy Secretary James Schlesinger that withholding of specific company data from other agencies "would severely handicap the timely enforcement of the laws relating to antitrust and consumer protection." And an FTC staff report concludes "surely it is not in the interests of sound public policy ... to have separate pockets of relevant information scattered about the government."

Critics of the industry contend the argument over confidentiality is just another tactic in an oil-company effort to deny the government the data it should have to make policy. But the major companies insist they favor the collection and use of the data for policy-making purposes, and government officials say they don't sense any general resistance. Indeed, some industry officials insist that a more industry-oriented energy policy could emerge once the government knows what the companies know. They say they are merely trying to keep secret data confidential.

But oil industry lawyers insist their companies' constitutional rights are at stake in the matter. If the company-supplied data sought by the Energy Department were freely shared with agencies prosecuting or investigating the companies, they say, they would be denied their rights to due process in challenging the government's use of evidence. In effect, they would be forced to testify against themselves, they contend.

Further, the industry insists that data collected by the Department of Energy, largely for statistical and analytical purposes, isn't necessarily accurate or meaningful when used for regulatory or investigatory purposes for which it wasn't intended.

"Shell has nothing to hide," Shell Oil Co. Vice President Robert Thompson declared recently. But he complained that "confidential information submitted by Shell to the DOE for one purpose may be used by another federal agency for an entirely unrelated purpose with the result that such information is both misrepresented and misunderstood."

Last summer Congress ordered the Energy Department to assemble a comprehensive body of energy information. But the Department's plans to carry out Congress's wishes have run into steely opposition from industry.

The companies also contend that spreading their confidential information around the government would increase the chance of leaks, or other releases of the data to the public, the press, and, worst, to competitors. They insist that the law-enforcers can do their jobs with summaries of the data, and that if they want more specific information, they can subpoena it.

Company lawyers argue there are legal precedents for keeping agencies from sharing data with one another, and they are likely to sue the Department as soon as it issues the new financial reporting forms, possibly blocking action for years. Even if lawsuits fail, one industry representative warns "you can fill out a form in a way that is informative or uninformative."

The industry position has outraged some liberal members of Congress and some consumer groups as well. James Flug, director of Energy Action, a private group which frequently opposes the oil industry, says "the companies act like they're going to supply the data out of noblesse oblige, instead of a legal requirement. They're trying to set conditions on it so it can't be used. What have they got to hide?"

Both Sen. Edward Kennedy (D., Mass.) and Rep. John Dingell (D., Mich.) have pushed legislative amendments that would flatly require the sharing of all the data with other agencies, provided those agencies promise to keep the proprietary information from reaching competitors.

The hints of noncooperation from the industry are deeply troubling to Lincoln Moses, who heads the Energy Information Administration, the Energy Department's statistical division. "The obtaining of data," he says, "clearly depends on the cooperation of the respondent."

At the same time, he acknowledges a duty to supply relevant data to other agencies when justified. The 1977 law setting up the Energy Department required that data collected be shared with the Department's own regulatory arms, and a 1975 law required the Department's predecessor agencies to share data with the FTC, the Justice Department, the Interior Department and the General Accounting Office, Congress's investigatory arm.

However, congressional guidance on this point hasn't been consistent. Other laws covering the Energy Department and its predecessor agencies are silent about sharing of specific company data with other agencies. In the past, Congress has specifically barred sharing of such information by the Census Bureau. Some agencies, including the Bureau of Labor Statistics, jealously refuse to share specific data they've collected, fearing their sources will dry up.

To resolve the dilemma, the Department toyed for a while with a two-track system: Two forms would be issued to oil companies, one to collect statistics for general analysis and one to collect data for the law-enforcers. The reasoning was that the companies could balk at, or sue over, the second form without affecting the energy statisticians' ability to gather the information they need.

But that plan would have required legislation, which probably would have had a hard time passing Congress this year. Liberals attacked it as an open invitation for the companies to lie to the law-enforcers. And the companies themselves quibbled over some aspects of the plan.

Action Promised Soon

So the Energy Department is forging ahead with its plan to share the data, on request, with "sister" agencies in government. Officials hope to publish the final regulation soon and issue the reporting forms to the 30 biggest oil companies next month.

The Department defends the plan by noting that all agencies are required to protect from public disclosure truly confidential information, such as trade secrets; therefore, officials reason, sharing of the information with other agencies wouldn't compromise company secrets. The Department promises it will require other agencies to keep confidential those things the Energy Department itself would keep confidential.

To help protect the companies' constitutional rights to due process, Department officials say they'll probably adopt a notification procedure so that companies will know that another agency is about to receive certain data from the Energy Department. That would allow the companies to appeal to judges or hearing officers on a case-by-case basis in order to block the transfer or use of the data by the receiving agencies.

Officially, Mr. Moses and his staff are hopeful that the oil companies will ultimately decide to cooperate and not wreck the new reporting system with half-hearted compliance or lawsuits. But privately, Energy Department planners are bracing for lots of trouble as they proceed to try to get a detailed picture of the nation's energy industry.

Mr. Mossberg, a member of the Journal's Washington bureau, covers energy matters.

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Daniel S. Greenberg

Perplexing Changes in Our Science Community

Leaders of the scientific community have so often employed panic tactics to expand federal spending for research that skepticism now often greets their contentions that all is not well in the house of science.

Nevertheless, though present-day American science remains productive and rich by the standards of any other nation, it would be prudent to listen to what some of the sager, non-alarmist heads of the profession are saying. They are not proclaiming doom. Rather, they are expressing puzzlement and concern over a complex of changes now taking place in the innards of an enterprise on which we all depend for improvements in the treatment of disease, industrial and agricultural productivity, defense, energy sources and environmental purity. Thus we find Frank Press, the competent and calm White House science adviser, saying—in a mood of perplexity—that "Profound things are happening in the sociology of science that we won't understand for 10 years." What does he mean?

Press, in harmony with many of his colleagues in the federal science establishment, is not so much concerned about the availability of money for science—though that's a problem, too, given the fact that purchasing power for basic research has been on a plateau for a decade. What they are more concerned about are the long-term consequences of institutional changes that are squeezing a lot of youth, spring and vitality out of the conduct of research. For example:

• Throughout academe, a glut of tenured professors—hired in the boom days of the space era—is choking up

"By and large, science is a shrinking enterprise on the American industrial scene, whereas in West Germany and Japan, it's coming up fast.

cost and without the long-term job commitments that have traditionally characterized university employment. Candidates not deemed suitable for faculty appointments are hired for what is referred to as the "doctoral research staff." Relatively low in status, and without job security, these researchers rarely have an opportunity to develop their professional potential; they're hired hands, usually working on someone else's project.

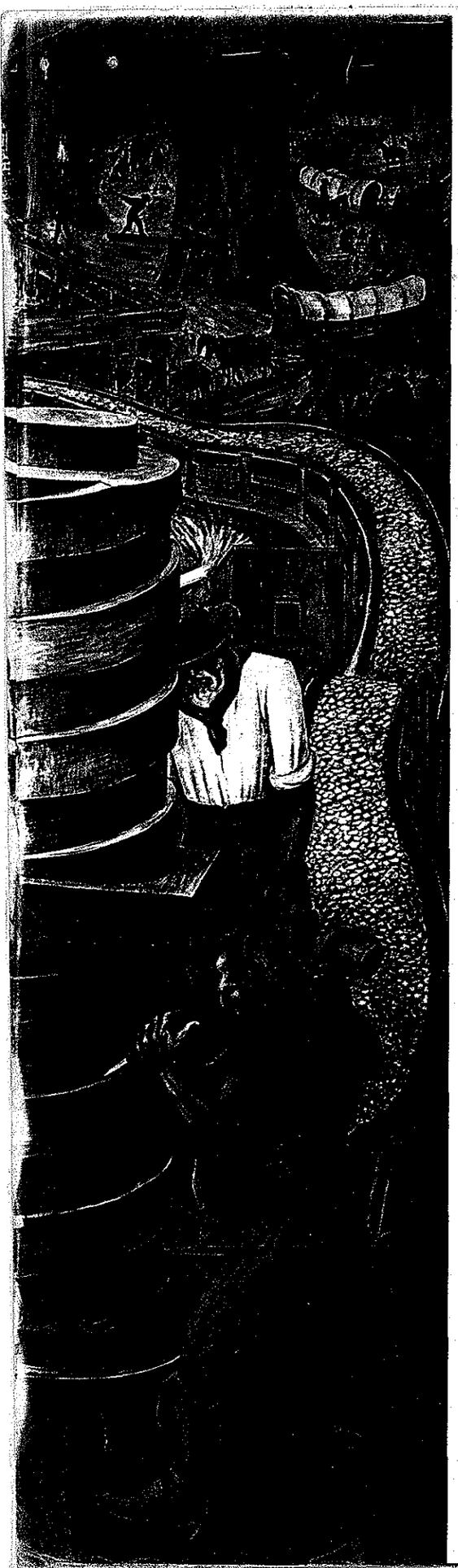
• Undergraduate teaching posts—which have long provided an invisible subsidy for graduate training—are on the brink of a major decline as lower birthrates begin to show up in lower undergraduate enrollments.

• The scarcity economy in academic science has spawned a spirit of caution among young researchers anxious to make their mark. Department chairmen report that doctoral candidates are increasingly shunning longshot thesis projects in favor of safe and sure problems.

• Meanwhile, industry has generally reoriented its research priorities in favor of short-term payoffs, rather than long-term inquiries of a fundamental nature. There are exceptions, but, by and large, science is a shrinking enterprise on the American industrial scene, whereas in West Germany and Japan, it's coming up fast. And the American shift is occurring at a time when, in a number of fields, including agriculture and pharmaceuticals, it is widely held that basic scientific knowledge has been pretty well exploited and that new developments must await new scientific understandings.

These and other problems have inspired an assortment of diagnoses and prescriptions for American science. Among them are urgings for academe and industry to enter into collaboration on major scientific projects and for government to help break the tenure logjam by subsidizing early retirements of academic faculty.

At the moment, however, the institutional base of science is being reshaped by forces that are only dimly understood. No one, in fact, is certain that



INVENTING THE HISTORY OF INVENTION

Three Big Thinkers Who Placed Technology at the Heart of History

by Arthur P. Molella

THE HISTORY OF TECHNOLOGY WAS OFFICIALly born in the United States in 1958, when the Society for the History of Technology was established. But long before the subject donned that academic cloak, three lone pioneers virtually invented it, writing histories that took on the human and moral dimensions of technology in the broadest way. The Harvard economic historian Abbott Payson Usher published *A History of Mechanical Inventions* in 1929. That same year the literary and social critic Lewis Mumford began the first draft of what would eventually become his masterpiece, *Technics and Civilization*, published in 1934, and simultaneously a Swiss art historian named Sigfried Giedion began a sweeping work that appeared in America in 1948 as *Mechanization Takes Command*. Together these men opened up a whole new, vital side of history and pursued it with a breadth of purpose that some critics complain isn't being emulated by anyone today. They were the founding fathers of their field.

Books on the history of invention had appeared as far back as the fifteenth century, but the literature had consisted mainly of narrowly focused,

Industry dominates the landscape in Diego Rivera's 1941 mural *Pan American Unity*.

CITY COLLEGE OF SAN FRANCISCO

technical chronologies, handbooks, and encyclopedias written for engineers and inventors. Rarely had they raised the larger social issues surrounding the emergence of technology. In contrast, Usher, Mumford, and Giedion set a far-reaching intellectual and moral agenda. Their classic writings, still in print, continue to inspire students of the field, posing questions that properly remain at the center of the discipline. Yet except for Mumford, who is enjoying something of a revival these days, little is commonly known about these men and what led them to the field and how they shaped it.

Although they began their books at the same time and were aware of one another's writings, Usher, Mumford, and Giedion worked independently. They had very different approaches to the history of technology, reflecting their disparate personal and professional backgrounds. Nonetheless, their books elaborated a number of common themes, most fundamentally a central concern with how man has reconciled the needs of the human spirit with the brute material conditions of existence. They all saw technology as the crux of this reconciliation.

Themes of reconciliation were of the utmost urgency to the generation shaped by World War I. The war had provoked intense questioning about what technology was doing to society and to culture. Traditionally regarded as a force for good, technology had come to be associated with war, the shattering of the past, and a present clouded by automation and the prospect of human enslavement by machines. And there were clearly no simple answers. Those who feared that the automobile, the airplane, the radio, and automated mass production would usher in an era of ugly materialism and submission to technology also saw new technology-bred possibilities for democratic opportunity and national community.

In coming to terms with such issues, Usher, Mumford, and Giedion all remained confident that if properly controlled and directed, technology could support rather than erode human values. The most hopeful sign of all was a general trend they perceived, beginning at the turn of the twentieth century, toward an organic rather than mechanical view of things—in technology and in the sciences and humanities as well. A vision of the world that saw the similarities and interrelatedness between natural organisms, modern man, and machines might hold untold possibilities for laying the foundation for a more humane technological society.

Usher saw technology not as an outside force afflicting man but as a deeply creative human enterprise.



Abbott Payson Usher in the 1910s, when he was teaching at Cornell University.

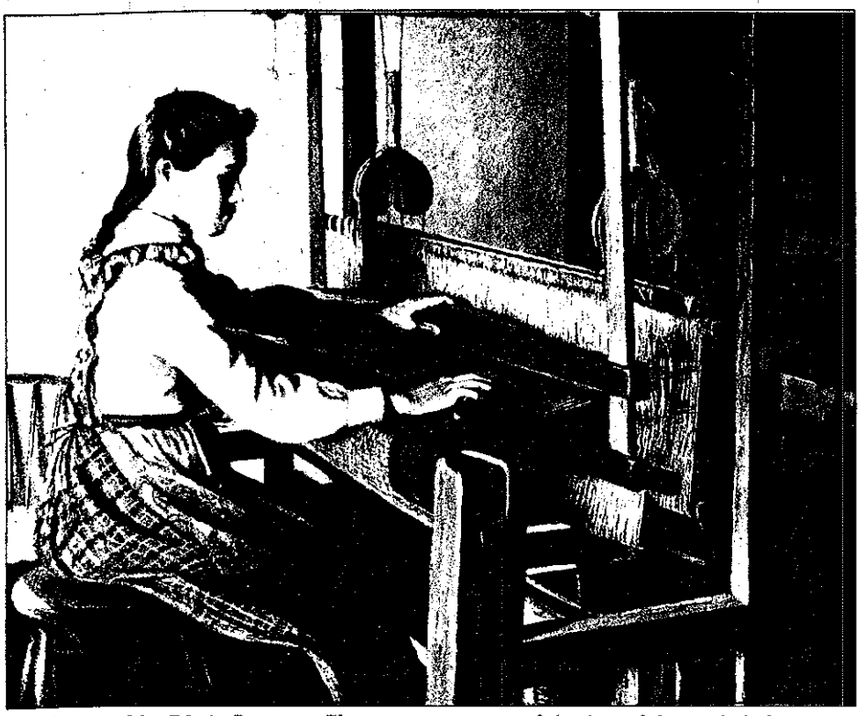
COURTESY OF MIRIAM USHER CHRISMAN

Abbott Payson Usher (1883–1965): Technology as Adaptation

A. P. Usher was the least vivid personality among this trio of historians, but some of his ideas were the most advanced, in ways still not widely appreciated. Born in Lynn, Massachusetts, he was the son of Edward Preston Usher, a prominent New England lawyer, author, and railroad entrepreneur who built one of the earliest interurban electric lines in Massachusetts. Like his father, A. P. Usher was educated at Harvard. Except for a decade "in exile" at Boston University and Cornell, he spent his adult life teaching economics there.

As a young professor at Harvard, Usher imbibed heavy doses of German and French social and economic history. The teaching of these subjects, strongly influenced by Marxist historiography, stressed the role of the physical environment—geography, natural resources, and climate—in the development of society and culture. Usher himself pioneered what became known as the "new economic history," emphasizing quantitative and scientific measures of economic change, and he stressed the importance of the Industrial Revolution in shaping Western economic development. In 1920 he wrote a textbook on the Industrial Revolution and took the innovative step of putting technology front and center in it, while most economic historians treated the rise of industrial technology as a secondary influence or even caricatured it as the mere product of heroic inventors.

After a decade of study Usher came forth with a book whose focus on technology surprised his colleagues, *A History of Mechanical Inventions*. A difficult treatise, it traced in exquisite detail the development of inventions including the water wheel, mechanical



A 1906 pastel by Edwin Romanzo Elmer conveys a nostalgic view of domestic industry.

SHELBURNE MUSEUM, SHELBURNE, VT.

clocks, spinning and weaving machines, the steam engine, and other prime movers. Usher saw similar stages in the emergence of each of these technologies and viewed them all not as the miraculous achievements of a few inspired individuals but as the accumulated sums of many small improvements by largely anonymous inventors and skilled artisans.

Most of *A History of Mechanical Inventions* was highly technical, and the book set a standard for narrowly focused history—precisely the kind for which today's historians of technology are sometimes criticized. Why, then, does Usher count as a "big thinker"? The answer lies in the book's opening chapters, in which he placed technological history in perspective. Usher wrote of a dangerous conflict growing between material and spiritual values as the world became more mechanized, but he also evinced a fierce belief in the possibility of a benign outcome, in humanity's power to improve its situation through the intelligent, responsible application of technology. To him, technology was not at all an external force oppressing society but rather a cultural product of that society, for good or for ill.

Usher agreed with the French and German social historians and geographers who had influenced him that the dynamics of civilization resulted from the interplay between humans and their material environments. But he thought that his forebears, especially the Marxists, went too far when they portrayed mankind as a passive victim of material forces, including the forces of mass production. He emerged from his studies a fervent anti-Marxist.

Usher viewed the study of the history of technology as an antidote to all kinds of determinism. He elaborated this view in a theory of innovation that portrayed technology as a deeply creative human enterprise. Adapting ideas from the newly introduced theory of gestalt psychology, he maintained that invention was not a step-by-step logical process but the complex fruit of the unconscious mind's ability to perceive and form patterns, or gestalts. Applied to technology, gestalt theory drew attention to the inventor's aesthetic, emotional, and spiritual sides.

Gestalt psychology was explicitly antimechanistic. It was heavily influenced by developments in theoretical physics, especially by quantum mechanics and relativity theory, which seemed to challenge the Newtonian mechanical view of nature with a more

THE INVENTOR'S GESTALT

The process of innovation has frequently been held to be an unusual and mysterious phenomenon of our mental life. It has been long regarded as the result of special processes of inspiration that are experienced only by persons of the special grade called men of genius. This mystical account of these phenomena is, however, gradually yielding ground before the growing body of psychological analysis. . . .

Our mental processes fall into two types; the synthetic, constructive, and creative activities concerned with innovation; the analytical, imitative, and conservative activities concerned with the formulation and imposition of tradition. A comprehensive theory of innovation would involve by necessity all the synthetic activities, but it could not be confined to them because the analytical activities are called into play. . . . It will now be desirable to give more attention to the details of the experiences involved in the process of invention. The experience is closely associated with the disposition of the mind to see things whole. We do not first perceive all the separate elements of an experience, and then subsequently combine them into an organized group. The whole mass of data is experienced as a unit, more or less satisfactory and complete. Such is the view of an important school of psychologists. . . . It is a great misfortune that there is no wholly adequate term to apply to this notion. In German the word *gestalt* is used; in English, *configuration*; but neither of these terms is sufficiently vivid or certain in its connotation.

***—A History of Mechanical Inventions*, by Abbott Payson Usher**

organic and holistic perspective.

Usher was one of the first scholars to apply gestalt principles to a subject other than psychology, and his attempt confused some of his readers. One reviewer of *A History of Mechanical Inventions* saw "no excuse at all for the psychological involutions of chapters one and two, which are enough to fend off almost any reader from an otherwise fascinating book." But for Usher, applying psychological theory to technological history reinforced a crucial link between the spiritual and the concrete.

Usher was ultimately working toward not just a history of invention but a comprehensive social theory. He quickly extrapolated, from his gestalt theory of technical innovation, a broader conception of social change, in which societies constantly interact with the physical environment in a complex, essentially biological fashion. Technology had to be seen as a form of organic adaptation. His goal in *A History of Mechanical Inventions* was to point the way toward a study of social change on an organic model. Paradoxically, although Usher described his method as "empirical" and frankly experimental, his writings revealed a penetrating theoretical mind at work. He never fully made the case for a new theory of social history in *A History of Mechanical Inventions*, but he mapped out a way that future social historians might follow.

Lewis Mumford (b. 1895): The Stages of History

Whereas Usher addressed his writings on technology and society primarily to scholarly specialists, Lewis Mumford ventured into the subject as a social critic with a broad general audience.

Born in Flushing, New York, Mumford at first aimed for a career in electrical engineering. He attended Stuyvesant High School, in Manhattan, where science, technology, and the industrial arts were emphasized, and there obtained the basic technical background he would need to write his masterpiece, *Technics and Civilization*. While at school he tinkered with model airplanes and radio sets.

Mumford believed that mechanization had reached its brutal peak; in the new era man and machine might be reconciled.



Lewis Mumford on the cover of *Time*, 1938.

He even sent in some ideas for inventions to Hugo Gernsback's popular-science magazine *Modern Electrics*. But then he decided to take a broader view and pursue a career as a writer and cultural critic.

Although his first several books were devoted to literary, art, and architectural history, they were steeped in the issues of the machine age. As a student at the New School for Social Research and an editor of the literary magazine *The Dial*, he worked closely with Thorstein Veblen, a trenchant critic of industrial capitalism, and acquired a taste for leftist ideology. But his principal intellectual influence was an eccentric Scots biologist, sociologist, and city planner named Patrick Geddes. It was Geddes, Mumford's "master," who introduced him to a view embracing science, technics (a now-obsolete word for technology), and society and who convinced Mumford that the human spirit must be constantly reinforced in the face of brutalizing, dulling technology.

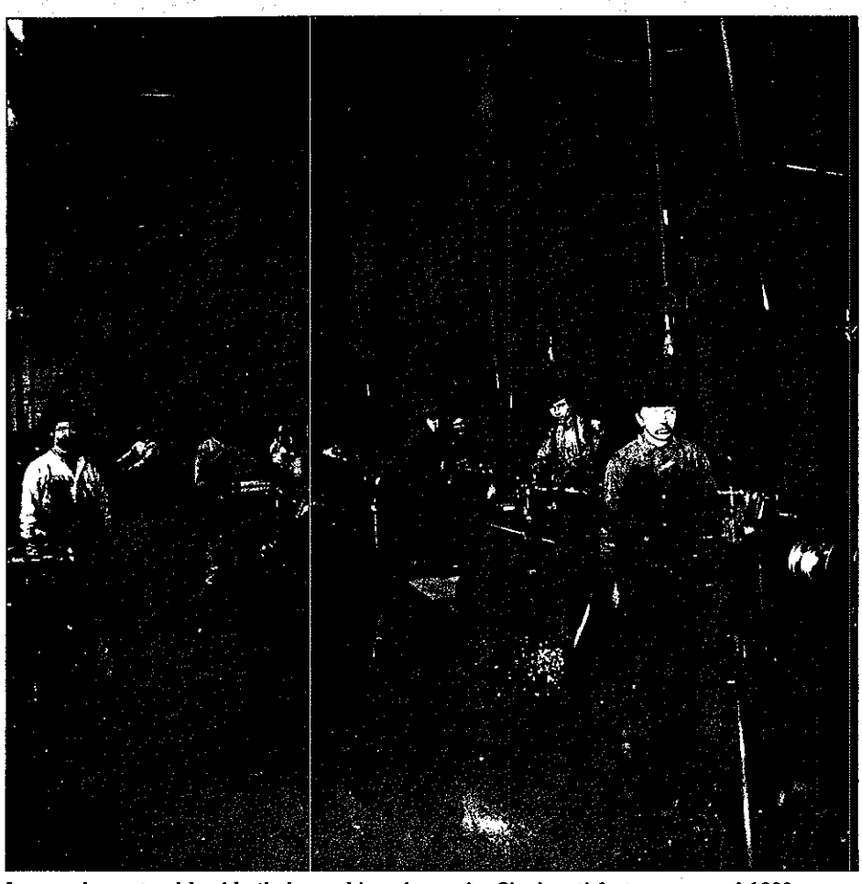
Criticisms of technology began creeping into Mumford's writings in the 1920s, as he bemoaned the spiritual damage being wrought by the regimentation and routinization of mass production. In a similar vein, he criticized modern architecture as a style suitable for robots, not human beings. His famous thesis that the clock and the discipline imposed by precise timekeeping, not the steam engine, were at the root of the Industrial Revolution first appeared in his 1926 book *The Golden Day: A Study in American Experiences and Culture*.

Mumford focused specifically on technology for the first time in a brief article entitled "The Drama of the Machines," in *Scribner's* magazine in 1930. The article helped win him the opportunity in 1931 to deliver an extension course on the machine age in America, at Columbia University. According to Mumford, it was the first such course given in America. At the same time, he threw himself into the research for and writing of *Technics and Civilization*, a work that set the pattern for the remainder of his literary career.

To prepare to write *Technics and Civilization*, he set out in 1932 for Europe and toured the national technical museums in Paris, Vienna, London, and Munich, where he could see the major artifacts of the Industrial Revolution. He was most impressed by the lively exhibits at the Deutsches Museum, in Munich, whose library introduced him to the extensive German literature on the history of invention.

Technics and Civilization appeared two years later. It presented a grand historical progression of three successive technological phases, and in so doing effectively moved the birth date of the Industrial Revolution from the eighteenth century back to the Middle Ages: "For the last thousand years

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Ironworkers stand beside their machines in a grim Cincinnati factory, around 1889.



Rows of men and women work with belt-powered machine tools in the screw room at the Elgin National Watch Company, in Elgin, Illinois, May 1899.

TOP: COURTESY OF CINCINNATI HISTORICAL SOCIETY; BOTTOM: COURTESY OF CHICAGO HISTORICAL SOCIETY

A NEW WAVE SWELLS UP

The machine has swept over our civilization in three successive waves. The first wave, which was set in motion around the tenth century, . . . was an effort to achieve order and power by purely external means, and its success was partly due to the fact that it evaded many of the real issues of life and turned away from the momentous moral and social difficulties that it had neither confronted nor solved. The second wave heaved upward in the eighteenth century after a long steady roll through the Middle Ages. . . . In the course of this effort, various moral and social problems which had been set to one side by the exclusive development of the machine, now returned with doubled urgency: the very efficiency of the machine was drastically curtailed by the failure to achieve in society a set of harmonious and integrated purposes. External regimentation and internal resistance and disintegration went hand in hand: those fortunate members of society who were in complete harmony with the machine achieved that state only by closing up various important avenues of life. Finally, we begin in our own day to observe the swelling energies of a third wave: behind this wave, both in technics and in civilization, are forces which were suppressed or perverted by the earlier development of the machine. . . . As the result of this third movement, the machine ceases to be a substitute for God or for an orderly society; and instead of its success being measured by the mechanization of life, its worth becomes more and more measurable in terms of its own approach to the organic and the living.—***Technics and Civilization*, by Lewis Mumford**

there has been a constant technological progress. This has had three phases, and more roughly three time periods: the eotechnic (wind and water and wood complex) from 1000 to 1750; the paleotechnic (coal and iron and steam) from 1700 to 1900; the neotechnic (electricity and the hard alloys and the lighter metals) 1820–?"

For Mumford, "progress" was a problematic concept. He acknowledged that technology itself progressed, but he worried about what that progress meant for social and spiritual progress. For him, technology was both cultural cause and cultural effect, with technology and culture reinforcing each other. At the root of society's mechanization lay Western capitalism, with its demand for regimentation and objectivity. Technics had responded to capitalism with the invention of the mechanical clock, which, in turn, had reinforced social mechanization, and so on. The mechanization of technics and the concomitant mechanization of humanity had reached their brutal peak in the paleotechnic era, which Mumford identified roughly with the Industrial Revolution. The attempts to reduce human beings to machines to serve the needs of mills and factories had alienated mankind from nature and ultimately from its own humanity.

While Mumford understood the destructive effects of mechanization, he also, unlike some of his despairing contemporaries, saw hope. He found inspiration in the history and philosophy of science, which he read avidly, and especially in the writings of the British philosopher Alfred North Whitehead, author of the influential *Science and the Modern World.* According to Whitehead, the revolutions of relativity and quantum mechanics had spelled the demise of the old mechanical world view, replacing it with an organic concept of nature. This revision of the underpinnings of both physics and biology put human beings back into nature and pointed toward more humane science and technology.

As Mumford saw it, the pendulum had made a full swing: "Up to the neotechnic period technological progress consisted in renouncing the organic and substituting the mechanical. This reached its height around 1870. Since then the new trend, visible in technics as well as in philosophy as in social life, is the return to the organic by means of the mechanical: a return with a difference, namely with the whole body of machines and analytical knowledge we have acquired along the way." In "organic mechanism"—a melding of mechanistic and organic conceptions—lay the hope for an ultimate reconciliation of the machine and the human spirit.

For Giedion, such diverse achievements as relativity, cubism, and skyscrapers embodied common basic truths about the culture.



Sigfried Giedion, about 1917.

Sigfried Giedion (1888–1968): Machines and the Spirit of the Age

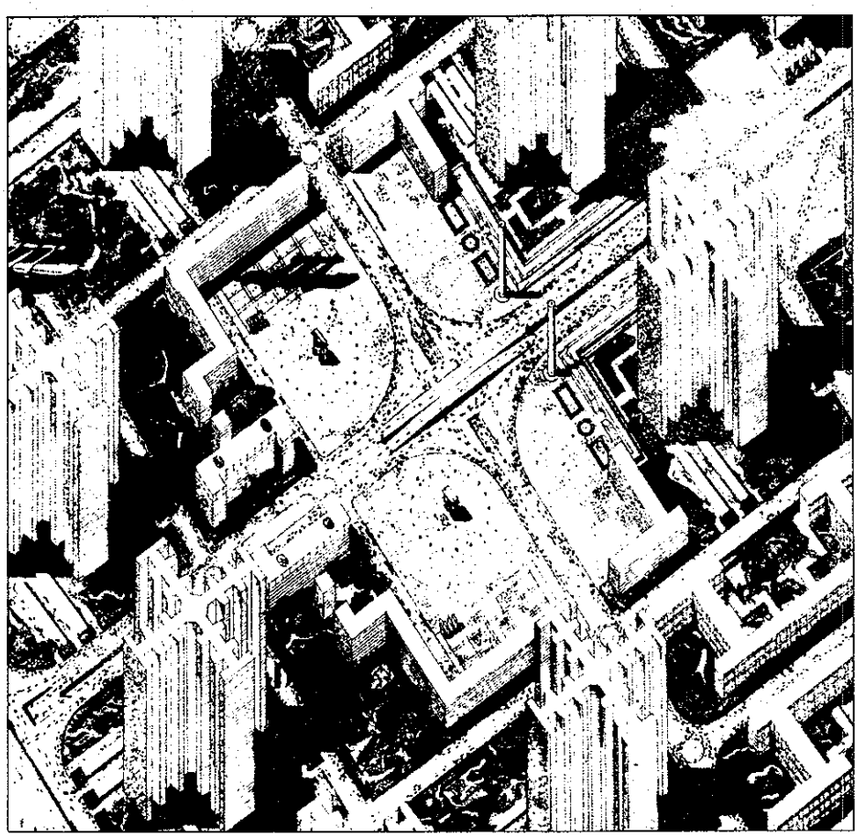
A sense of cultural crisis and hope also informed the writings of the Swiss art historian Sigfried Giedion, whose temperament combined Mumford's reformist zeal with Usher's sense of scholarly purpose.

Born in Prague to Swiss-Jewish parents, Giedion earned an engineering diploma from the University of Vienna at the behest of his father, who wanted him to take over the family textile business. Spurred on by more artistic desires, he then went to Munich and pursued a doctorate in art and architectural history with the renowned Swiss scholar Heinrich Wölfflin. All his subsequent writings revealed a determination to find an outlook that fused the artistic with the technological.

In the late 1920s and early 1930s, Giedion undertook a massive project to write a historical treatise titled *The Origins of Modern Man.* The ideological basis for this work was the modernism embodied in the teachings of the Bauhaus. Founded in Weimar, Germany, in 1919, the Bauhaus school of design promoted a gathering and unifying of art, craftsmanship, and engineering design into a new functional architecture. Giedion, a close friend of the architect and Bauhaus founder Walter Gropius, became a leading propagandist for the movement. He befriended artists such as Paul Klee, whose avant-garde paintings strongly influenced Giedion's ideas about technology and culture.

As the first part of his ambitious work, Giedion began in the 1930s a manuscript titled *Konstruktion und Chaos,* a later version of which became *Mechanization Takes Command.* Although the latter was not published until 1948, Giedion was already deeply involved with questions of mechanization and society when Usher and Mumford were formulating their views. The Nazi takeover in Germany interrupted his work and cost him his European

INSTITUT FUR GESCHICHTE UND THEORIE DER ARCHITEKTUR, EIDGENOSSISCHE TECHNISCHE HOCHSCHULE



Giedion's friend the architect Le Corbusier planned this "Ville Radieuse" for Paris.

audience: many of his close friends and colleagues, including Gropius, fled to America.

Soon after Gropius arrived in this country, he invited Giedion to deliver a series of lectures at Harvard, which were eventually published as the influential and popular modernist manifesto *Space, Time and Architecture*. Staying on in the United States, Giedion became fascinated by American industry, especially by its extraordinarily rapid mechanization in the nineteenth century. Although he had difficulty finding an American teaching post, he resolved to write in English for American audiences. And he focused his writings on the American scene.

Mechanization Takes Command, intended to complement *Space, Time and Architecture*, concentrated on the problems arising from the cultural assimilation of machines. Giedion believed that modern mechanization had engendered a broad split between "thought" and "feeling," which implied similar dichotomies between science and art, reason and emotion, and form and function. Finding ways to heal these cultural wounds became the primary goal of *Mechanization Takes Command*.

The book is built around a series of moralistic, meticulously researched case studies, including a now-famous account of the development of mass-production techniques in Cincinnati slaughterhouses. The "disassembly line," as graphically depicted in *Mechanization Takes Command*, subjected organic matter—pigs, sheep, and chickens—to unyielding inorganic forces, automated machines that butchered the spirit as well as the body.

The excesses of mechanization, Giedion argued, created a cultural imbalance epitomized by the cruelty of the automated abattoir; a healthy culture would depend on an equilibrium among cultural components, artistic and spiritual as well as scientific and technological. Like Mumford, Giedion looked to new scientific developments for solutions, and he detected possibilities for cultural healing in modern physical and biological theories. In such theories, he wrote, "we find a

THE SUN IN A COFFEE SPOON

History is a magical mirror. Who peers into it sees his own image in the shape of events and developments. It is never stilled. . . . The meaning of history arises in the uncovering of relationships. . . . The historian deals with a perishable material, men. . . . His role is to put in order in its historical setting what we experience piecemeal from day to day, so that in place of sporadic experience, the continuity of events becomes visible. . . . History, regarded as insight into the moving process of life, draws closer to biological phenomena. We shall speak little, here, of general lines and great events, and then only when necessary to connect occurrences with the bedrock in which they are rooted.

We shall inquire in the first line into the tools that have molded our present-day living. We would know how this mode of life came about, and something of the process of its growth.

We shall deal here with humble things, things not usually granted earnest consideration, or at least not valued for their historical import. But no more in history than in painting is it the impressiveness of the subject that matters. The sun is mirrored even in a coffee spoon.

In their aggregate, the humble objects of which we shall speak have shaken our mode of living to its very roots. Modest things of daily life, they accumulate into force acting upon whoever moves within the orbit of our civilization.

The slow shaping of daily life is of equal importance to the explosions of history; for, in the anonymous life, the particles accumulate into an explosive force.—***Mechanization Takes Command*, by Sigfried Giedion**

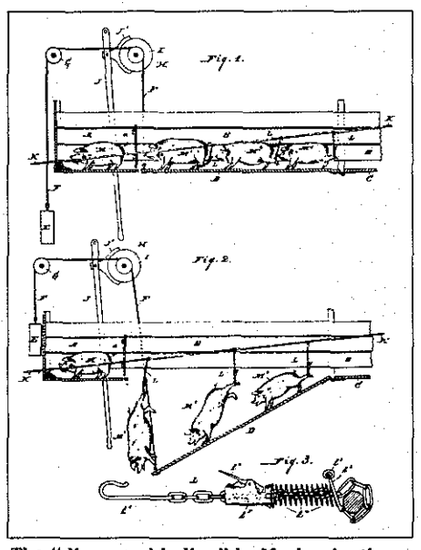
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departure from the investigation of an isolated process, from purely mechanistic conception of the world." In unpublished writings, Giedion ruminated on the philosophical implications of relativity and quantum mechanics, according to which the "cosmos is beginning to resemble more and more one great thought." He detected a reversal of the trend toward viewing organic phenomena in mechanical terms and the beginnings of a movement toward organic unification, ultimately a convergence of art, technology, and life. "The central feature or character of the cosmic movement," he speculated, "is therefore toward wholeness."

Despite such mystical-sounding speculation, *Mechanization Takes Command* deals primarily with humble things. Pursuing what he termed "anonymous history," Giedion focused on the work of unknown innovators and everyday objects, especially the odds and ends of mass production: the Yale lock, the vacuum cleaner, bathroom fixtures, the bread we eat. In addition to visiting museums and manufacturing sites, he mined company records, patent files, and patent-model collections. Like Mumford and Usher, Giedion was a self-proclaimed "empiricist," who believed in going out into the world and seeing it for himself. The rewards for massive personal research should be substantial, he felt, for commonplace artifacts have a cumulative cultural effect. They stamp an age and a culture more indelibly than the occasional discoveries of a few celebrated inventors.

Without an understanding of its broad purpose, *Mechanization Takes Command* can seem an eccentric volume indeed, almost amorphous in its diverse array of subjects. Giedion's aim was not to trace an evolutionary succession of technological devices but to induce from a myriad of objects what was "essential" and what was "transient" to an age. The essential would reflect a central unified conception, embracing the truths of science, technology, philosophy, and the arts. Even such diverse achievements as the theory of relativity, cubist art, and the skyscraper embodied interrelated truths. Every object manifested a central conception or idea—the spirit of the age. According to Giedion, "the sun is mirrored even in a coffee spoon."

Western thought had reduced organisms to mechanisms; these three men wanted to work in the opposite direction.



The "disassembly line" in *Mechanization Takes Command* begins with this device "for catching and suspending hogs."

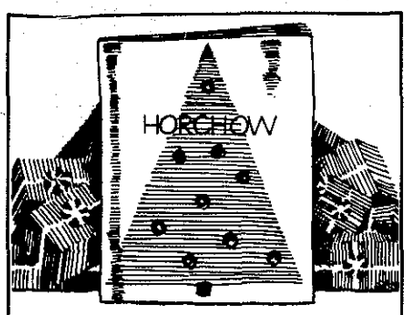
Mechanization Takes Command bore a close kinship to Giedion's writings in the history of art and architecture, which in turn reflected his debt to his teacher Heinrich Wölfflin, heir to the thought of G. W. F. Hegel, Germany's great idealist philosopher. There is indeed a distant but direct relationship between Giedion's spirit of the age and Hegel's world spirit. But the beauty of *Mechanization Takes Command* is its determination to see the universal in the particular, resulting in a unique approach to the history of technology that dealt not with such spectacular artifacts as locomotives or steam engines but with coffee spoons, cups, chairs, and bathtubs—important in their own right as physical manifestations of the human spirit.

A History of Mechanical Inventions, *Technics and Civilization*, and *Mechanization Takes Command* are works of impressive scholarship and originality, and they opened up new historic vistas when they were written. Their unique power derives from the fact that their authors were grand thinkers in pursuit of sweeping moral and cultural truths. The appearance of these classic histories was itself a historical phenomenon, a response to the concerns and anxieties of the perilous time between world wars. Usher saw technology not as an antihuman force but as a means of liberation; Mumford portrayed humanity at the mercy of machines but saw hope in a new neotechnic age; Giedion, at once threatened and captivated by mechanization, urged a reassertion of human feeling and values.

For all three, ultimate salvation appeared to lie in a new approach to a fundamental split that had arisen in Western thought. Since the seventeenth century the trend in biology had been to reduce living organisms to mechanisms; Usher, Mumford, and Giedion all wanted to work in the opposite direction and raise our conception of mechanisms as organisms or as parts of a larger organism. Perhaps the "true" relationship of mechanism and organism can never be finally plumbed. Nevertheless, the approach suggested by Usher, Mumford, and Giedion encouraged a new way of thinking about technology, as an essentially human phenomenon rather than as an independent process divorced from human vitality and concerns. And it opened up a new way of thinking about history itself—with technology at the heart of the mystery. ■

Arthur Molella is chairman of the Department of the History of Science and Technology at the National Museum of American History. He is working on a book about the origins of the history of technology as a field of study in the United States.

U.S. PATENT 252,112. JAN. 10, 1882.



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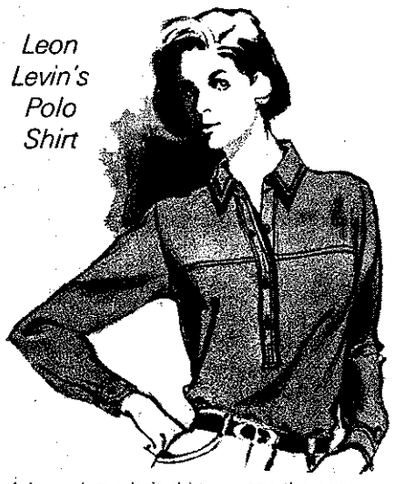
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Phenomena, comment and notes



Part of farm machine abandoned as unfixable is routine challenge for Willie.

A sociologist finds a living definition of workmanship in a man who keeps things running beyond their time

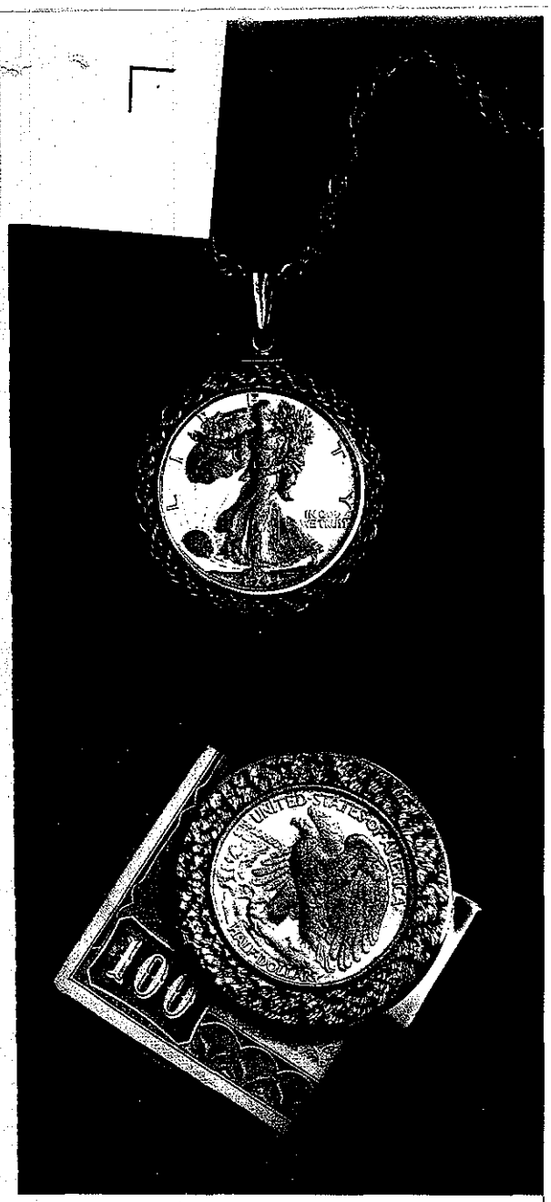
When we talk about science stories around here, we normally mean "hard" science—physics and astronomy, molecular biology, stories that involve a mechanical universe and plenty of photogenic hardware. Occasionally we will slip over the line into anthropology, even into contemporary urban anthropology, but never as far as sociology. This stance is partly a matter of ignorance, but also, in my case, prejudice. The one college course I took seemed to consist mostly of arbitrary definitions, generalizations and incredibly arcane ways of stating the obvious.

A recent issue of *Scientific American* unsettled my complacency. There was MIT physicist Philip Morrison favorably reviewing a sociologist's study of a repair shop in upstate New York. The book is *Working Knowledge: Skill and Community in a Small Shop*, published by the University of Chicago Press. The author is Douglas Harper, an associate professor of sociology at the State University of New York College at Potsdam. The hero is a man named Willie, a mechanic who embodies the very ideal of Robert Pirsig's *Zen and the Art of Motorcycle Maintenance*, a man whose skills span 2,500 years of human history. The irony is that this man can exist only in a region of grinding poverty, outside our consumer society.

In a special way, the author is a neighbor of the hero. As he points out, "It is not enough to live within ten or fifteen miles; to be neighbor to Willie you have to behave in a way that is routine in the shop but sometimes mysterious to outsiders. A person becomes a neighbor by passing informal tests, but you generally don't know what the tests are or whether you have passed until the time comes to ask for help. . . . An exorbitant offer of money or a promise to do better next time you have a chance to repay a favor will not bring Willie out on a cold night. When you ask for help the chips are cashed in. If you have paid your dues—if you are a *neighbor*—Willie will come, and he will stay until the problem is solved. For these jobs no money is exchanged. The most important work, ironically, is not sold but given."

Willie fixes Saabs, farm machinery, cedar-oil stills, well-drilling rigs, sawmill engines, plumbing, electrical systems, "machines and dwellings that are in ill repair, improvised and makeshift." The Saabs he usually works on are not the status symbols of today's young professionals but the older cars, "inexpensive and long-lasting, pragmatic and ugly; suited for rough roads and cold weather." When he needs a part he takes it from one of the wrecks outside the shop—or he makes it. He redesigns as he repairs: if the door handle on a particular model fails frequently, Willie designs and builds a different mechanism that will not.

It takes more thinking to fix something than it does to make it in a mass-production world, Harper argues. Makers are now machine tenders, turning out one small part in endless repeti-



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tion, knowing and needing to know almost nothing about the ultimate product. The repairer does need to understand the larger picture. Harper writes that even this distinction will fade, however. "In a typically rationalized repair, a mechanic removes a part of the machine thought to be defective and puts another in its place. Because automobiles are owned for fewer years, the work of replacing parts is not complicated by rusty bolts or deteriorated mounting brackets. It is a simple procedure, detailed in manuals. The defective parts are seldom repaired. In fact in many of the components (particularly the ignition systems) of modern cars, internal elements are sealed and impossible to fix."

Willie's understanding of metals goes back to 500 B.C., to the first blacksmiths who learned to work iron into weapons and implements. (Harper points out that although we customarily think of blacksmiths as farriers, horses were not shod until about A.D. 900.) Willie's father was a blacksmith who gradually moved into auto repair, and Willie's training began at the very beginning. He can still do a blacksmith's weld.

As Willie puts it: "In a manner of speaking the blacksmith was a machinist. Everything was molded and drilled. When it came to farm machinery, when you had a broken part . . . you'd get your metals to a certain temperature and then put the two pieces together and hammer them. You'd hammer them right back into one piece."

Harper compares Willie favorably with a type of person found in primitive societies whom Claude Lévi-Strauss called a *bricoleur*, a person who makes use of "odds and ends, the bits left over, the set of unrelated or oddly related objects." Above all, according to Lévi-Strauss, such a person thinks through a task: "Consider him at work and excited by his project. His first practical step is retrospective. He has to turn back to an already existent set made up of tools and materials, to consider or reconsider what it contains and, above all, to engage in a sort of dialogue with it, and before choosing between them, to index the possible answers which the whole set can offer to his problem . . . .

"The rules of his game are always to make do with 'whatever is at hand,' that is to say with a set of tools and materials which is always finite and is also heterogeneous because what it con-



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tains bears no relation to the current projects or indeed to any particular project, but it is the contingent result of all the occasions there have been to renew or enrich the stock or to maintain it with the remains of previous constructions or destructions. . . ."

Why does Willie keep on, using scraps no one else wants to fix things no one else will work on? He is most certainly not getting rich. Relations with his customers can be complicated and unpleasant. He is frequently in pain from an injury incurred while working on the St. Lawrence Seaway (he could collect disability but does not—he would rather be working). Harper thinks the essential element is neither Willie's knowledge nor the responsibility of being able to keep so many farmers and other neighbors going. Instead, Harper contends, it is what Thorstein Veblen called the instinct of workmanship—to "seek realization and expression in an unfolding activity." As Veblen put it: "The instinct [of workmanship] may be in some sense . . . concerned with the ways and means of life rather than with any one given ulterior end. It has essentially to do with proximate rather than ulterior ends. . . . Efficient use of the means at hand and adequate management of the resources available for the purpose of life is itself an end of endeavour, and accomplishment of this kind a source of gratification."

Whatever the grand theories, Willie goes on. He is installing an old gasoline-storage tank as part of a solar hot-water heating system, and a wind-powered generator with blades of his own design (cut from 55-gallon drums) that produce even pressure on the central shaft. His own Saab has begun its fourth hundred-thousand miles. But the de-skilling, the disabling that cause the worker alienation sociologists love to write about is catching up to Willie. The new cars are too complicated even for someone with his skills. And instead of keeping their old machinery running, farmers trade it in for new to receive the best depreciation allowances and investment credits.

Garages have always intimidated me because of my total mechanical inadequacy. Now a sociologist, of all people, has taken me inside and shown me what workmanship can mean. It's time for another look at sociology—and time to mourn the passing of the *bricoleur*.

John P. Wiley jr.

POSTFIX
BY JOHN O'ROURKE

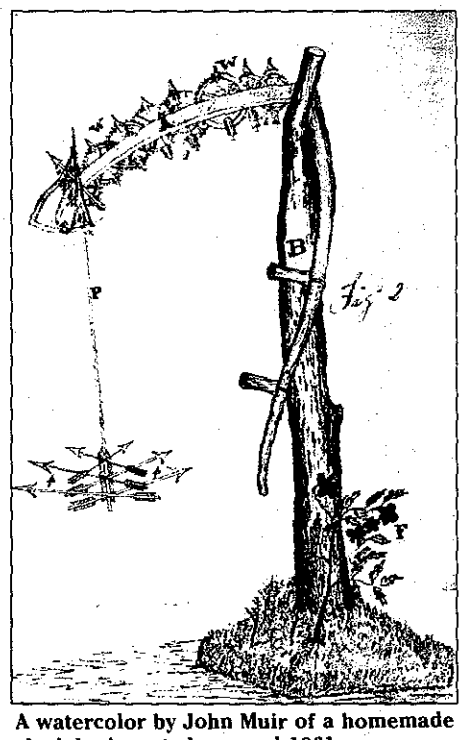
Among the Works of God and Man

John Muir spent most of his life, as he put it, in "the study of the inventions of God." He was a world-renowned naturalist and conservationist, a respected botanist and glaciologist, and a writer who with words brought the wild areas he loved to millions. But before he took up his pursuit of untouched places, he first devoted himself to what might seem an opposite world: he was a tireless inventor and mechanic, a few of whose creations might have made him rich had he bothered to patent them.

Muir was born in Scotland on April 21, 1838, one hundred and fifty years ago this spring. He spent much of his childhood in backbreaking labor on his father's pioneer Wisconsin farm, to which the family emigrated when he was eleven. While in his teens he exhibited the tinkerer's spirit that was so invaluable on a frontier farm. His first real invention was a sort of self-setting model sawmill, workable but not particularly practical. There followed waterwheels, wooden clocks, barometers, and more.

In 1860 an admiring neighbor persuaded Muir to demonstrate his ingenuity at the Wisconsin State Agricultural Fair, in Madison. The judges there pronounced him "a genius in the best sense" and gave him a special award for his exhibit, which included two hickory clocks and an "early-rising machine" that tumbled the sleeper out of bed at a preset time. At the fair he was offered a job as apprentice to a Prairie du Chien man who was perfecting a Mississippi iceboat.

The boat never sailed, and Muir soon returned to Madison and got himself admitted on probation to the fledgling University of Wisconsin. His roommate later recalled that Muir kept "a strange-looking room for a college student . . . shelves, one above the other . . . were filled with retorts, glass tubes, glass jars, botanical and geological specimens and small mechanical contrivances. On the floor . . . were a number of machines of larger size, whose purposes were not apparent."



A watercolor by John Muir of a homemade clock he invented, around 1861.

There were no laboratory facilities at the university, so Muir built his own. He constructed, among other things, "a little device for measuring the growth of plants, so delicate that . . . one could see the hand move across the dial, measuring growth from hour to hour." He invented an automatic desk, which took a stack of books, delivered each one, turned its pages, and replaced it, all according to a set schedule.

Cheerful but restless—and wanting to avoid Civil War conscription—Muir left college to work at the mill and factory of two Scottish immigrants in Ontario. There he devised his most serious inventions yet, a self-feeding lathe and a machine to bore and drive teeth for the rakes the factory made. The plant's production doubled.

"Great God!" Muir later wrote. "There were times when I was haunted with inventions that tortured me waking or sleeping until I could give them visible form, something that could be seen and touched, something that worked. My mind and heart were both given to them." But he was torn between that urge and another: a desire to devote himself to botany. He had an almost mystical yearning to get into the world's untrammeled places.

He next went to work at an Indianapolis wagon-parts plant, where he amazed his employers not only with production-multiplying innovations but also with a pioneer time-and-motion study. The owners offered him a partnership, but it was too late. In March 1867 an accident at the factory temporarily blinded Muir. As his sight returned, he resolved to "bid adieu to mechanical inventions" and take up "the study of the inventions of God." He started by hiking a thousand miles to the Gulf of Mexico and traveling on to California.

"I could have become a millionaire," he crowed, "and I chose to become a tramp." He did once attempt to patent his early-rising bed, but that was all; he believed that "no inventor has the right to profit by an invention . . . really inspired by the Almighty."

In the succeeding years he became a powerful lobbyist in behalf of national parks and forests. He uncovered the origins of American glacial masses and identified the importance of trees as watersheds and soil protectors. In 1892 he founded the Sierra Club.

For him, all his conservationist activities strained toward the same ideal as his earlier technological work. He once wrote from Yosemite Valley, "I have this big, well-defined faith for humanity as workman, that the time is coming when every 'article of manufacture' will be as purely a work of God as are these waters and pine trees and bonnie loving flowers." ■

John O'Rourke, a retired professor of marketing, lives in Carmel, California, and writes free-lance.

COURTESY OF ICONOGRAPHIC COLLECTIONS, STATE HISTORICAL SOCIETY OF WISCONSIN

Through gift, theft and license, our technology is leaking abroad almost as fast as we develop it. So scratch the long-term dream of a U.S. living off exports of high-technology goods and services.

Does anyone really believe in free trade?

By Norman Gall

NEVER MIND if the U.S. loses its manufacturing skills; we'll just import manufactured goods and pay for them by exporting high technology and knowledge-oriented products. Steel in, software out. Autos in, microchips out.

That's a comforting theory held by a lot of people. Is it workable? Increasingly it looks as if it is not workable. The whole concept is being seriously undermined as U.S. innovations in technology are adopted not only by Japan but also by such fast-developing countries as South Korea, Brazil, Taiwan, even India.

While these countries are more than happy to sell us manufactured goods, they closely control their own imports of technology goods they buy from us. Exports of computers and other high-technology products from the U.S. are still huge, but the long-term prospects are in question. In areas of medium technology, minicomputers in particular, developing countries are adapting or stealing U.S. technology or licensing it cheaply to manufacture on their own. Many of the resulting products are flooding right back into the U.S.

The Japanese developed this policy to a fine art: Protect your home market and then, as costs decline with volume, manufacture for export at small marginal cost. A good many developing countries have adopted the Japanese technique.

Against such deliberate manipulation of markets, what avails such a puny weapon as currency devaluation? Whether the dollar is cheap or dear is almost irrelevant. Free trade is something we all believe in until it clashes with what we regard as vital national economic interests.

These are the broad trends. Now meet Touma Makdassi Elias, 41, an engineer born in Aleppo, Syria. Elias has a master's degree in computer science from San Jose State, in Silicon Valley, and a doctorate from the Cranfield Institute of Technology in England. Grounded in European and U.S. technology, Elias is now a Brazilian.



His company, Microtec, is Brazil's first and biggest producer of personal computers. Elias came to São Paulo eight years ago to teach night classes in engineering. In 1982 the Brazilian government banned imports of small computers. Seizing the opportunity, Elias started making the machines in the basement of a supermarket in the industrial suburb of Diadema.

Technology? "We worked from IBM technical manuals," Elias told FORBES. "We had a product on the market by 1983. We started making 20 machines a month. Soon we'll be making 2,400. Now my brother may be joining our firm. He's a graduate of the Sloan School of Management at MIT. He's been managing an investment company in Dubai, in the Persian Gulf, but we need him here. Brazil is one of the world's fastest-growing computer markets."

There you have it in a nutshell: foreigners, some of them U.S.-educated, copying—stealing, to be blunt—U.S. technology and reproducing it with protection from their own governments. An isolated development? No, this is the rule, not the exception, in much of the world. How, under such circumstances, can the U.S. expect to reap the fruits of its own science and technology?

Time was when technology spread slowly. Communications were sluggish and nations went to great lengths to keep technological innovations secret. In northern Italy 300 years ago, stealing or disclosing the secrets of silk-spinning machinery was a crime punishable by death. The machines were reproduced in England by John Lombe only after he spent two years at risky industrial espionage in Italy. At the height of the Industrial Revolution, Britain protected its own supremacy in

textile manufacture through laws banning both exports of machines and emigration of men who knew how to build and run them.

These embargoes on the export of technology were eventually breached. France sent industrial spies to England and paid huge sums to get British mechanics to emigrate. By 1825 there were some 2,000 British technicians on the European continent, building machines and training a new generation of technicians. A young British apprentice, Samuel Slater, memorized the design of the spinning frame and migrated to the U.S. in 1789, later establishing a textile factory in Pawtucket, R.I. So, in the end, the technology became commonplace, but it took decades, and, in the meantime, England was profiting handsomely from its pioneering.

Not so today, when 30% of the students at MIT are foreigners, many destined to return to their native lands and apply what they learn of U.S. technology. What once was forbidden, today is encouraged. Come share our knowledge.

Consider the case of Lisiong Shu Lee, born in Canton, China in 1949, raised in Rio de Janeiro, now product planning manager for SID Informatica, one of Brazil's big three computer companies. Like many leading Brazilian computer technicians, Lee is an engineering graduate of the Brazilian air force's prestigious Aerospace Technical Institute near São Paulo. Born in China, raised in Brazil, educated in the U.S. "When I was only 24," Lee says, "I was sent to the U.S. to debug and officially approve the software for the Landsat satellite surveys devised by Bendix Aerospace." Lee later worked eight years with Digital Equipment's Brazilian subsidiary.

Like Microtec's Elias, Lee had learned most of what he knew from the Americans. In teaching this pair—and tens of thousands like them—U.S. industry and the U.S. academies created potential competitors who knew most of what the Americans had painfully and expensively learned. Theft? No. Technology transfer? Yes.

In Brazil over the past few years, the Syrian-born, U.S.-educated Elias played cat-and-mouse with lawyers representing IBM and Microsoft over complaints that Microtec and other Brazilian personal computer makers have been plagiarizing IBM's BIOS microcode and Microsoft's MS-DOS operational software used in the IBM PC. The case was settled out of court. Brazilian manufacturers claimed their products are different enough from the original to withstand accusations of copyright theft.

Where theft and copying are not directly involved in the process of technology transfer, developing countries find ways to get U.S. technology on terms that suit them. They get it cheaply. Before President José Sarney departed for his September visit to Washington, the Brazilian government tried to ease diplomatic tensions by announcing approval of IBM's plans to expand the product line of its assembly/test plant near São Paulo. IBM will invest $70 million to develop Brazilian capacity for producing the 5-gigabyte 3380 head disk assembly (HDA).

Ah, but there is a tradeoff involved in the seeming concession by the Brazilians. The tradeoff is that IBM's expansion will greatly improve the technical capabilities of local parts suppliers to make a wider range of more sophisticated products. About a third of the key components in IBM's HDA catalog will be imported, but Brazilian suppliers will get help in providing the rest, some involving fairly advanced technologies.

But does what happens in Brazil matter all that much? Brazil, after all, is a relatively poor country and accounts for a mere $3 billion in the U.S.' $160 billion negative trade balance. Brazil matters very much. For one thing,



Photos by Paulo Fridman/Sygma



Microtec's personal computer factory in São Paulo
Designs cribbed from IBM technical manuals, but different enough to withstand accusations of copyright theft.



Mictrotec founder Touma Makdassi Elias
From Syria to São Paulo via Silicon Valley.



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what happens there happens in similar ways in other developing countries—and some developed ones as well. Brazil, moreover, is fast adapting to the computer age. The Brazilian computer industry employs over 100,000 people. It includes everything from the gray market of São Paulo's Boca de Lixo district to the highly profitable overseas subsidiaries of IBM and Unisys. Both subsidiaries have been operating in Brazil for more than six decades and, for the time being, have been profiting from Brazil's closed-market policies. It includes many manufacturer/assemblers of micro- and minicomputers and of peripherals. Companies also are appearing that supply such parts as step motors for printers and disk drives, encoders, multilayer circuit boards, high-resolution monitors, plotters and digitizers. The Brazilian market is bristling with new computer publications: two weekly newspapers, ten magazines and special sections of daily newspapers.

Brazil is only a few years into the computer age. Its per capita consumption of microchips works out to only about $1.40 per capita among its 140 million inhabitants, vs. $100 in Japan, $43 in the U.S. and about $6 in South Korea. But given the potential size of the market and Brazil's rapid industrialization, it could one day absorb more personal computers than France or West Germany.

The point is simply this: In their natural zeal to make Brazil a modern nation rather than a drawer of water and hewer of wood, its leaders are determined to develop high-technology industry, whether they must beg, borrow or steal the means. Failing to develop high-technology industry would be to court disaster in a country where millions go hungry. But in doing what they must, the leaders of Brazil and other developing countries run strongly counter to the economic interests of the U.S.

Because of these nationalistic policies, foreign-owned firms are banned from competing in Brazil's personal computer and minicomputer market. Brazil's computer industry is not high tech, if that means being near the cutting edge of worldwide technological advance. But it does show the ability of Brazilian businessmen and technicians to shop for and absorb standard technology, without paying development costs. In computers, where knowledge is the most expensive component, it becomes cheap to manufacture if you get the knowledge free or almost free. The U.S. develops, Brazil copies and applies. There are perhaps a dozen Brazils today.

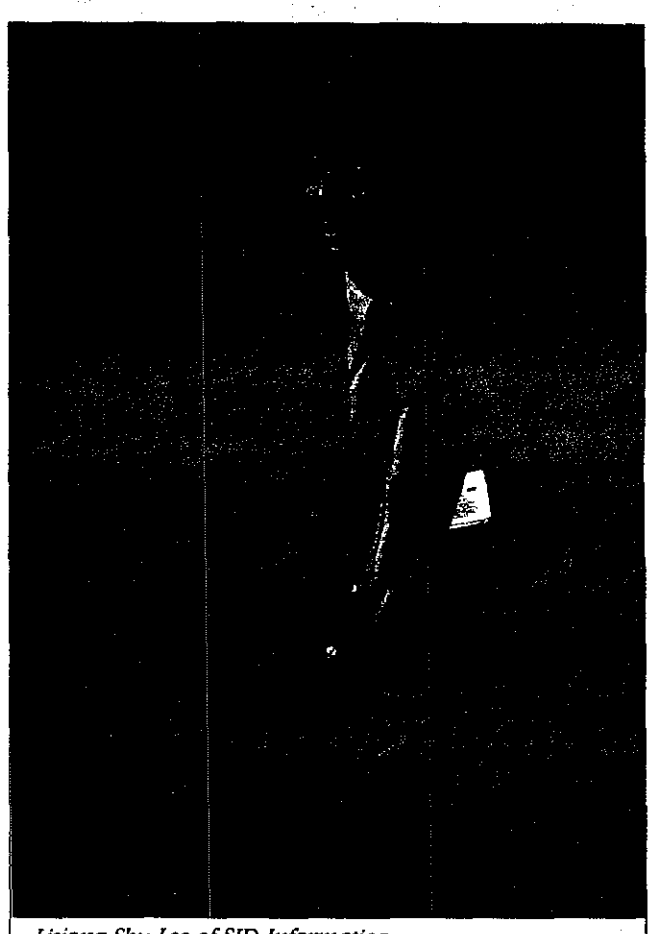
"We're a late entry and can pick the best technology," says Ronald Leal, 36, co-owner of Comicro, a CAD/CAM equipment and consulting firm. "We don't waste money on things that don't work. In 1983 we saw a market here for CAD/CAM done with microcomputers. We shopped around the States and made a deal with T&W Systems, a $10 million California company that has 18% of the U.S. micro CAD/CAM market. T&W helped us a lot. We sent people to train and they came to teach us."

Comicro learned fast. Says Leal: "We developed new software applications that we're now exporting to T&W."

Brazil exporting computer designs to the U.S.? Only five years after IBM began creating a mass market for the personal computer, the U.S. home market is being invaded by foreign products—of which Comicro's are only a tiny part. Technological secrets scarcely exist today.

Aren't the Brazilians and the others simply doing what





Lisiong Shu Lee of SID Informatica
Theft? No. Technology transfer? Yes.

the U.S. did a century and a half ago—protecting its infant industries?

If that were all, the situation might not be so serious for the U.S. But pick up any U.S. newspaper these days and count the advertisements for Asian-made personal computers claiming to be the equivalent of the IBM PC but selling at maybe two-thirds of IBM's price.

According to Dataquest, a market research firm, Asian suppliers will produce nearly 4.5 million personal computers this year. At that rate, they should capture one-third of the world market by next year. Taiwan now is exporting 60,000 personal computer motherboards and systems monthly, 90% of which are IBM-compatible. Of these, 70% go to the U.S. and most of the rest to Europe. Korea, Hong Kong and Singapore together ship another 20,000 each month.

Dataquest says it takes only three weeks after a new U.S.-made product is introduced before it is copied, manufactured and shipped back to the U.S. from Asia.

Thus the U.S. bears the development costs while foreigners try to cream off the market before the development costs can be recouped. That is the big danger. The days when a person could be executed for industrial espionage are gone.

President Reagan recently warned that the U.S. is being victimized by the international theft of American creativity. Too many countries turn a blind eye when their citizens violate patent and copyright laws. In 1985-86 U.S. diplomats successfully pressured Korea, Singapore, Malaysia, Taiwan, Hong Kong and Thailand to pass or at least to draft legislation enforcing patents and copyrights more strictly. Brazil is a major holdout.

The difficulties between Brazil and the U.S. over computers crystallized in the 1984 Informatica law, which Brazil's Congress passed overwhelmingly near the end of two decades of military rule. The law, in effect, legalizes stealing—so long as the victims are U.S. technology exporters. Complains the head of a leading multinational whose business has been curtailed under the new law: "They want our technology but want to kill our operations. This whole show is sponsored by a handful of sharp businessmen with connections in Brasília who are making piles of money from their nationalism."

The new law formally reserved the Brazilian micro- and minicomputer market for wholly owned Brazilian firms. It allowed wholly owned subsidiaries of foreign companies—IBM and Unisys—to continue importing, assembling and selling mainframes, but not out of any sense of fairness. It was simply that Brazilian companies were unable to take over that end of the business.

Under the law, joint ventures with foreign firms were allowed only if Brazilians owned 70% of the stock and had "technological control" and "decision control."

The main instruments for implementing this policy were tax incentives and licensing of imports of foreign hardware and knowhow, all to be approved by the secretariat of information science (SEI).

In 1981 Brazil's then-military government decreed that SEI would control the computer and semiconductor industries and imports of any and all equipment containing chips. The implications are especially ominous for U.S. interests: Brazil's SEI is modeled, quite openly, on Japan's

notorious Ministry of International Trade & Industry (MITI). Brazil's computer policy today follows the line of a mid-Fifties report by MITI's Research Committee on the Computer.

In the 1950s and 1960s MITI used Japan's tight foreign exchange controls to ward off what its nationalist superbureaucrat of the day, Shigeru Sahashi, called "the invasion of American capital." In long and bitter negotiations in the late Fifties, Sahashi told IBM executives: "We will take every measure to obstruct the success of your business unless you license IBM patents to Japanese firms and charge them no more than 5% royalty." In the end, IBM agreed to sell its patents and accept MITI's administrative guidance on how many computers it could market in Japan. How many Japanese products would be sold in the U.S. today if this country had imposed similar demands on the Japanese?

Some U.S. economists are describing the result of the Japanese policy as the "home market effect." They mean that protectionism in the home market tends to create an export capability at low marginal cost.

"Home market protection by one country sharply raises its firms' market share abroad," says MIT's Paul Krugman, reporting the results of computer simulations of international competition in high technology. "Perhaps even more surprising, this export success is not purchased at the expense of domestic consumers. Home market protection lowers the price at home while raising it abroad."

Brazil surely has similar intentions. IBM and other U.S. computer companies are transferring technology to Brazil as never before.

The Brazilians may have grasped a reality that the U.S. has been unable politically to address: that while there is no way to check the fast dissemination of technology today, the real prize in the world economy is a large and viable national market—a market big enough to support economies of scale and economies of specialization. In short, while a country can no longer protect its technology effectively, it can still put a price on access to its market. As owner of the world's largest and most versatile market, the U.S. has unused power.

Taiwan, Korea, Hong Kong and Singapore, lacking large internal markets, could develop only because they had easy and cheap access to the rich U.S. market.

Why doesn't the U.S. reciprocate? The Reagan Administration has threatened to restrict imports of Brazilian exports to the U.S. by Dec. 31 if Brazil doesn't 1) protect software with new copyright legislation, 2) allow more joint ventures with foreign firms, and 3) publish explicit rules curtailing SEI's arbitrary behavior.

But the Brazilians are hardly trembling in their boots. Brazilian officials hint that if Brazilian exports to the U.S. are curbed, Brazil won't be able to earn enough dollars to service its crushing external debt. Diplomats of both countries want to avoid a showdown, so they keep talking. And while they talk, the Brazilians do what they please.

U.S. Customs has responded to manufacturers' complaints by stopping pirated products at the border. But the Taiwanese now have such cost advantages that they can easily afford to license technology that they have already copied. The Koreans are more scrupulous, but pirated technology not reexported to the U.S. is very hard to control.

More than three years ago Edson de Castro, president of Data General, told a Commerce Department panel that foreign nations' computer policies "threaten the structure and future of the U.S. computer industry." De Castro explained why: "U.S. computer companies are reliant on international business and derive a substantial portion of revenues from exports. Because of the rapid pace of technological development, the industry is capital intensive. Growth and development rely heavily on an expanding revenue base. This can only come from full participation in established and developing global markets. Reliance upon domestic markets is not enough."

Yet after resisting the Brazilian government's demands for a decade, de Castro's Data General is selling technology for its Eclipse supermini to Cobra, the ailing government computer company. Other U.S. computer manufacturers are following suit.

Hewlett-Packard, in Brazil since 1967 with a wholly owned subsidiary to import and service the company's products, has just shifted its business into partnership with Iochpe, a Brazilian industrial and finance group. A new firm, Tesis, 100% Brazilian-owned, will make HP calculators and minicomputers under its own brand name.

"Only a few years ago HP refused to enter joint ventures, but now we have ones going in Mexico, China, Brazil and Korea," says a company executive. "In the past we felt, since we owned the technology, why share the profits? Then we found we couldn't get into those foreign markets any other way."

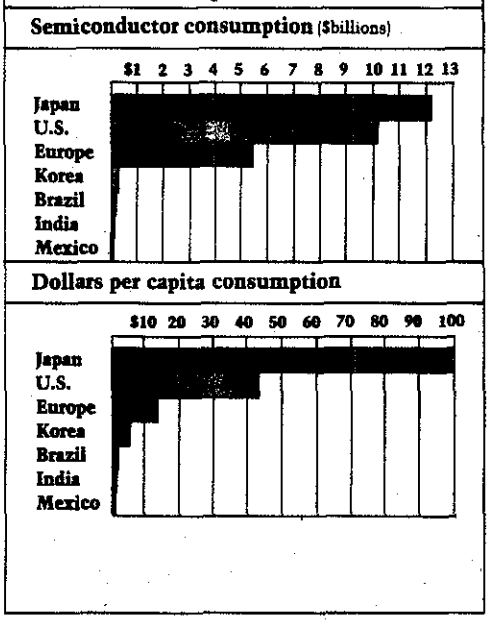
Harvard Professor Emeritus Raymond Vernon, a veteran analyst of international business, says of world technology markets: "Except for highly monopolistic situations, the buyer has a big advantage over the seller. Countries like Brazil and India can control the flow of technology across their borders and then systematically gain by buying technology cheaply."

Vernon draws an ominous parallel: "A century ago the multinationals were in plantation agriculture and electric power. Now they're all gone because their technology and management skills were absorbed by local peoples. The same thing is happening in other fields today, including computers."

This is why it makes little difference whether the dollar is cheap or dear. In this mighty clash between nationalism and free trade, nationalism seems to be winning. Where does this leave the U.S. dream of becoming high-technology supplier to the world? Rudely shattered. ■

Where the chips fall

No matter how you slice it, per capita or by dollar volume, most of the world's semiconductors go to the U.S., Japan and Europe. Don't be misled, though. The smaller markets matter, especially to the governments that work so hard to protect them.



editorial

Perspective on government-funded innovations

Imagine the following comment evoked by an historical event: Samuel B. Morse had just demonstrated his new discovery, the telegraph. Among the enthusiastic observers is an executive from the Government agency that partially supported the experiment with $30 000. "Mr Morse, thank you for showing us the utility of your marvelous invention! Uh—if you wish, we'll be glad to grant you a non-exclusive license to use your discovery."

Were Mr Morse a contemporary inventor, the comment would not be improbable. There are some two dozen policies in force regulating the rights to inventions developed with even partial federal funding, as in the Morse case.

Congressman Ray Thornton has introduced legislation that would establish a uniform federal patent policy leaving rights with the inventor, contrary to the intent of most of the current policies.

Another person with a firm opinion about who should own federally funded inventions is Senator Gaylord Nelson, chairman of the Small Business Subcommittee and champion of antitrust legislation. With a keen eye for the opportunities that reduced competition can bring, the Senator made a classic bid for media coverage by convening his committee during the recent Christmas recess to "resolve" this issue. The topic of conversation—announced with colorful headline-hunting references to Santa Claus and the Tooth Fairy—was whether it is better to allow avaricious inventors to retain any rights in their government-funded discoveries or, by damning the rascals, to polish one's public image as a trust-busting defender of the abused consumer. As befits such an orchestrated event, the witness list was tightly controlled. The National Small Business Association, and the universities, and the research community can all be heard later. What we need now is impact! Who's going to produce media coverage to our liking if one of those X!%*$ universities is in here saying the government ought to be giving away invention rights!

Inventions that can and should be used, but are not used, are worse than useless; the costs associated with their discovery are wasted assets, and the consequences of their non-use are wasted opportunities. There are several reasons for non-use. One is that businessmen are reluctant to invest risk capital in the commercial development of unproven technologies unless, having won their gamble, they are assured of a reasonable measure of exclusivity in the marketplace. To take an analogy from the trademark field, who would spend millions of dollars promoting the mark "Coca-Cola" if *anyone* could market a soft drink under that name?

Universities are not unlike the US Government in the sense that they have no control over manufacturing facilities. Like the Government, they must transfer their inventions to the commercial sector if the inventions are to be used. Here the similarity ends, for universities are 600 percent more efficient than the Government in commercializing their inventions, principally because of their ability to grant exclusive licenses.

No one is suggesting that taxpayers do not have a right to own inventions produced at their expense. What is being suggested is that informed taxpayers would gladly exchange those stagnant assets for the new products, new jobs and increased tax revenues which private patent-based enterprises have traditionally lavished on our economy.

To give the gentleman his due, Senator Nelson is probably no less interested in new jobs, new products and new tax revenues than you or I. Unfortunately, he is mesmerized by the notion that patents as monopolies lead to that greatest of evils: industrial concentration (much worse, mind you, than tens of thousands of unused inventions).

Okay, we agree that concentration can be a problem, but we should be able to meet it, not even by relying on the anti-trust laws alone, but by tying a string onto every right that the inventing institution is allowed to retain. One false move and zap! The string has many strands, each one of which is known as a "march-in right." This idea is not new; the government has had this option for years on a limited scale. Senator Nelson claims, however, that these strings have rarely been pulled, and he's probably right. The question remains, can the Senator, or anyone, point out cases where the strings should have been pulled and weren't?

Next we suggest that he explain his philosophy more clearly. Recently he voted to permit the Government to acquire ownership of inventions made by private companies, whether large or small, during the course of a government-guaranteed *loan*, even if the loan is fully repaid to the lending bank, on time and with interest. If Senator Nelson's sense of equity dictates that the Government should own what the Government has paid for, however counterproductive to public interest, surely private industry should own what private industry has paid for, and invented besides.

This bill was passed before the conclusion of Senator Nelson's hearings, and before either hearings on Congressman Thornton's bill or the appearance of a long-awaited policy statement by the Administration on this very issue.

It would be in the best interests of the country if no more precipitous action were taken until all interested parties have been heard.

BETSY ANCKER-JOHNSON
Former Assistant Secretary of Commerce for Science and Technology

JESSE LASKEN NSF

Technology transfer

Dr. Nolan B. Sommer, senior vice president of American Cyanamid, spoke late last month at Georgetown University in Washington, D.C., on some of the problems facing multinational companies today. Here, verbatim, is part of what he had to say.

A major issue of broad importance to the international community concerns the transfer of technology across national boundaries. It has become a controversial subject largely because of its effect on a variety of special interests. For example, the Third World and the industrialized countries take differing views within the context of the North-South dialogue; U.S. multinational companies—who develop and apply a tremendous amount of technology—and the host governments debate about the conditions under which innovation is to be rewarded, safeguarded, and exported; and U.S. labor and certain academic critics question the benefits to the U.S. economy of the flow of technology to other lands.

Quite a few charges and misunderstandings have been generated over the years, essentially over the question of who is helped or harmed by technology transfers.

It is well to remember that technology transfer is not a new phenomenon. We have been engaged in sending and receiving foreign investment and the scientific advances tied to it for generations. And through those years the world has benefited—including the United States. The process is inexorable and will continue as long as both the sender and receiver profit or benefit.

The developing countries recognize that the technology developed by western industries can speed their economic and social development. Consequently, they have pushed for rules that would accelerate that flow, rules designed to "liberate" technology from the multinational companies who develop and implement it, making it available worldwide. Unfortunately, such an approach can be destructive to the aspiration of the less developed countries for greater industrial and social development and dangerous to the continued growth of all nations.

First and foremost, technology transfer is a voluntary process; it cannot be compelled, although it can be retarded or halted. Second, to the extent that the less developed countries try to devise shortcuts to the acquisition of high technology, there is the danger that traditional protections afforded to research and development, namely, patents and trademarks, will be weakened. And finally, technology transfer involves much more than the mere passing of research results and sophisticated equipment from a multinational company to a host country. Rather, it encompasses the overall package of management skills, investment and innovative techniques, as well as access to developed markets that are necessary to fully exploit technology. The host country must be ready to accept it.

Based on these considerations, therefore, I would make the following observations; the first to domestic critics, the second to the developing nations.

To those in the United States who argue that the transfer of U.S. technology abroad is inimical to the domestic economy, I would point out that receipts by U.S. companies from royalties and fees are at a level of about $4 billion a year—more than nine times the amount paid out in royalties and fees by U.S. firms. A U.S. Chamber of Commerce estimate of the total value of production associated with these receipts is close to $85 billion. This translates into jobs and economic growth. In fact, all of the available evidence we have shows that the export of technology generates more employment in the U.S. than is lost as a result of production abroad that uses U.S. technology.

To those in the less developed countries who want to appropriate the technology of the multinational companies I would argue that technology transfer must be a voluntary act, one which is mutually profitable to both the transferor and the transferee. If forthcoming guides for technology transfer no longer safeguard such "intellectual property" nor make it profitable to export it, corporations will neither develop nor transfer the fruits of their research. What happens then to economic development and the quality of life in the Third World? □

C&EN editorials represent only the views of the author and aim at initiating intelligent discussion.

Jack Anderson

Small Firms Stinted on Research

Following their ephochal 1903 Kitty Hawk flight, the Wright brothers got a five-year runaround from Washington before receiving any government financial help to pursue their aeronautical research. Small-time inventors and innovative businessmen today are getting the same short shrift, even though billions are being doled out by the federal government for research and development.

Butter-fat corporations lap up the cream from the research subsidies, even though they're interested more in profits and cost-cutting than new inventive breakthroughs. Small companies with fewer than 1,000 employes get skim milk from the federal churn.

Yet the little enterprising businesses rather than the corporate giants have been responsible for such developments in this country as insulin, zippers, power steering, ball point pens and self-winding watches. This was in keeping with the tradition of individual inventive geniuses symbolized by the Wright brothers, Alexander Graham Bell, Samuel Morse and Thomas Edison.

The superiority of small business research has been cited in a study which the Office of Management and Budget strangely never published. The study credited firms having than 1,000 employes with almost half of the industrial innovations between 1953 and 1973.

According to the study, 16 small technology firms created 25,558 jobs for American workers during the 20-year period because they came up with new ideas. Yet the budget office was advised that small firms were drawing inadequate funding from the government, getting less than 4 percent of the research and development layouts.

Spurred by the report, the budget office drafted a memo intended for all federal agencies, urging vigorous efforts to channel more of the research to small businesses "which are having difficulty in competing in the big leagues."

The memo added, "there is considerable evidence that the small proportion of federal research and development work that is being awarded to small technologically based firms is contributing to a serious loss of high technology capabilities in our nation. It is important that we see some real progress within the first 18 months of the administration."

This ringing call for a new deal was never sent to the agencies. Les Fettig, head of the office that was supposed to be directing the crusade, said the report and the memo were news to him until we asked what happened. He explained that the documents "fell through the cracks" during the transition period between the Ford and Carter administrations.

Fettig said his office is alert to the problem and is taking steps to make it easier for small businesses to get research and development help.

Footnote: Investigation shows that the Energy Department under James Schlesinger has been perhaps the worst offender in government in encouraging research at the Little League level. The department claimed it awarded 10.3 percent of its research contracts to small operators in the 1977 fiscal year. The General Accounting Office has challenged the statistic. GAO auditors found the amount was about 2.6 percent, because the Eenergy Department has counted subcontracts that trickle down from the big corporations.

Postal Proposal — An idea that could help reduce the postal deficit and provide the pay increase postal workers are demanding has been run up the flagpole for Postmaster General William F. Bolger. He seems ready to salute it.

Bolger is giving serious attention to the imaginative proposal of Miami public relations wizard Hank Meyer that the hundreds of thousands of mail boxes and postal delivery trucks throughout the United States be used as advertising space.

Meyer stressed in his private presentation to Bolger that he wasn't suggesting the Postal Service provide billboard-style space for promoting junk products. Under his plan, the advertising and public service messages would be subject to approval of the postal authorities.

Vacant space is available on an estimated 180,000 postal vehicles and 400,000 street deposit boxes, which could be rented for advertising.

Bolger still hasn't made a decision but if the Postal Service adopts the idea, an advertising agency would be selected by competitive bidding to run the ad operation.

On the last page of the Business Week article, there is a story about a small company who wouldn't take Government funds because of possible loss of invention rights. The company gave the Japanese 49% of the company for the necessary venture capital rather than lose these rights.

Norm.

VANISHING INNOVATION

A hostile climate for new ideas and products is threatening the technological superiority of the U. S.

A grim mood prevails today among industrial research managers. America's vaunted technological superiority of the 1950s and 1960s is vanishing, they fear, the victim of wrongheaded federal policy, neglect, uncertain business conditions, and shortsighted corporate management. They complain that their labs are no longer as committed to new ideas as they once were and that the pressures on their resources have driven them into a defensive research shell, where true innovation is sacrificed to the certainty of near-term returns. Some researchers are bitter about their own companies' lax attitudes toward innovation, but as a group they tend to blame Washington for most of their troubles. "[Government officials] keep asking us, 'Where are the golden eggs?'" explains Sam W. Tinsley, director of corporate technology at Union Carbide Corp., "while the other part of their apparatus is beating hell out of the goose that lays them."

That message—and its implications for the overall health of the U. S. economy—is starting to get through. Following months of informal but intense lobbying led by such executives as N. Bruce Hannay, vice-president for research and patents at Bell Telephone Laboratories Inc., and Arthur M. Bueche, vice-president for research and development at General Electric Co., the White House has ordered up a massive, 28-agency review of the role government plays in helping or hindering the health of industrial innovation. "Federal policy affecting industrial R&D and innovation must be carefully reconsidered," wrote Stuart E. Eizenstat, the White House's domestic policy adviser, in a recent memo outlining the review's intent.

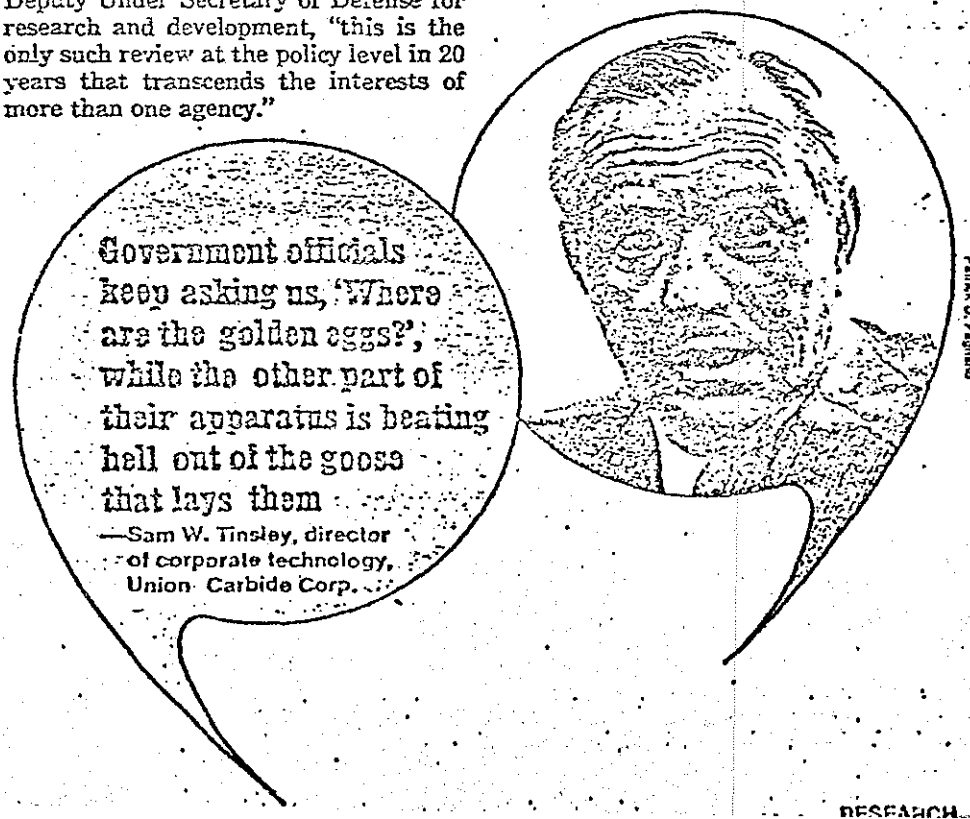
One thing that the study clearly will not accomplish is a quick fix for the deepening innovation crisis. The problem is regarded as immensely complex by the Administration, and is inextricably tied to other economic dilemmas now facing Carter's White House.

"Historically, the government's role has been to buy more science and R&D," says Martin J. Cooper, director of the strategic planning division at the National Science Foundation (NSF). "Now maybe we better go with investment incentives." Says Jordan J. Baruch, Assistant Commerce Secretary for science and technology, who will be the review's day-to-day manager: "This study developed in an environment of people concerned about economics, business, and technology."

The Administration's concern is underscored by the fact that it is organized as a domestic policy review, the highest sort of attention a problem can receive within the executive branch. Among its objectives, such a review must produce options for corrective action by the President. According to Ruth M. Davis, Deputy Under Secretary of Defense for research and development, "this is the only such review at the policy level in 20 years that transcends the interests of more than one agency."

The White House also seems determined not to conduct the study in a governmental vacuum. Baruch is soliciting input from groups such as the Industrial Research Institute (IRI), the Business Roundtable, and the Conference Board. "We want both CEOs and R&D vice-presidents," says a White House official. Labor groups have been asked to participate, too, along with public-interest groups. Congressional leaders such as Senator Adlai E. Stevenson (D-Ill.), chairman of the Senate subcommittee on science, technology, and space, have been brought into the early planning. And the 28 agencies involved extend beyond obvious candidates, such as the Environmental Protection Agency, to the Justice Dept. and even the Small Business Administration.

The study's scope is so sweeping, in



fact, that some federal officials are talking about a "thundering herd" approach to policymaking. But one government science manager demurs. "It beats having one guy write a national energy program in three months," he sniffs.

Philip M. Smith, an assistant to Presidential science adviser Frank Press and an early organizer of the study, concedes that "a lot of people have told us that we are likely to fail." But such skepticism, he believes, does not take into account the considerable clout of those involved in the effort. Commerce Secretary Juanita M. Kreps, for example, is chairing the study, and she heads a coordinating committee whose members include Charles L. Schultze, chairman of the Council of Economic Advisers, Administration inflation fighter and chief trade negotiator Robert S. Strauss, and Zbigniew Brzezinski, Carter's national security adviser. Even more important is the support of Eizenstat, who, says Smith, "is very interested in this particular review."

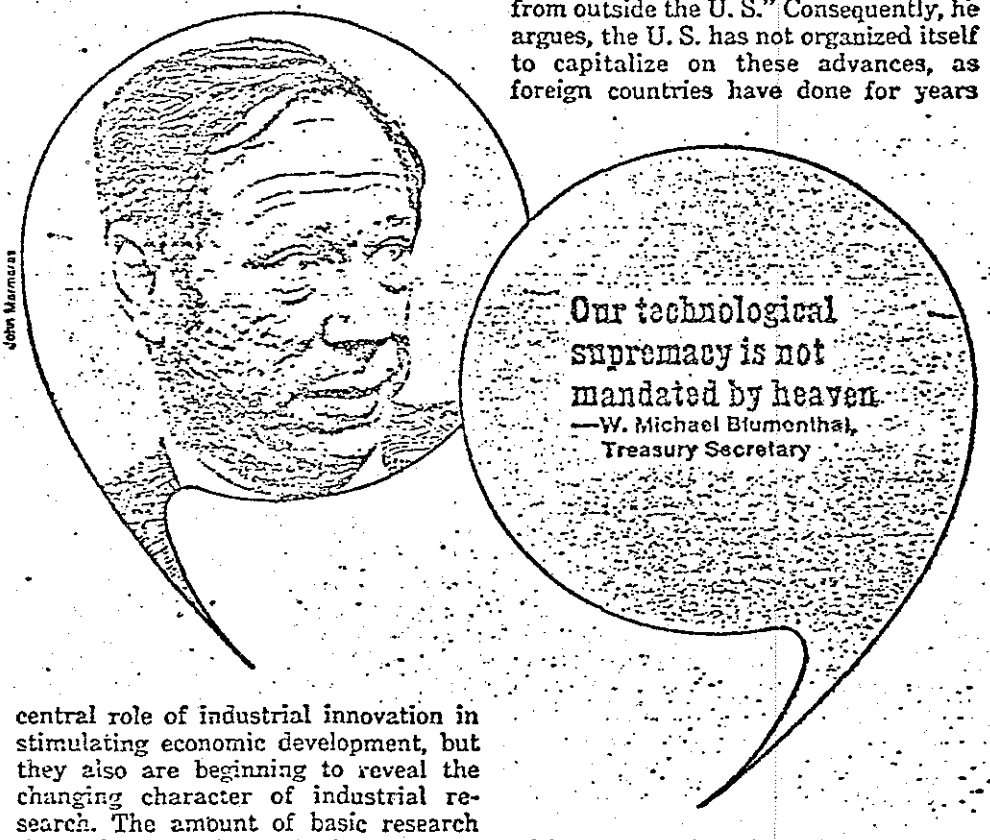
Finding 'new directions'

On the other hand, there is already grumbling within the Agriculture Dept., which was left off Kreps's committee. "We are red-faced," says a high-ranking Agriculture official. "We are out of the project because this Administration and those before it do not place any priority on agricultural research." However, Jordan Baruch insists that the department will play a role in the study. Agriculture experts point out that farm commodity exports of over $24 billion play a key role in the U. S. balance of payments. They note also that superior technology is the basis of the commanding American position among world food exporters.

Whatever its outcome, the White House policy review is being undertaken at a time when, as Frank Press puts it, "we badly need some new directions." Many experts view with alarm the declining federal dollar commitment to R&D, which has dropped from 3% of gross national product in 1963 to just 2.2% this year. For its part, industry as a whole has more or less matched the inflation rate and then some with its own spending. But such macroscale indicators do not tell all. "We've got to find out what the story is sector by sector, because each industry is going to be different," says Press. "We also have to find out what's going on abroad."

Better data on the relationship between industrial innovation and the health of the economy are becoming available. According to a 1977 Commerce Dept. report, for instance, technological innovation was responsible for 45% of the nation's economic growth from 1929 to 1969. The study went on to compare the performance of technology-intensive manufacturers with that of other industries from 1957 to 1973, and found that the high-technology companies created jobs 88% faster than other businesses, while their productivity grew 38% faster.

The numbers help to establish the central role of industrial innovation in stimulating economic development, but they also are beginning to reveal the changing character of industrial research. The amount of basic research that industry performs, for instance, has dropped to just 16% two years ago from 38% of the national total in 1956.



And a new IRI survey of member companies for the National Science Foundation demonstrates how federal policy has directly altered the nature of the research effort in another way, making it more and more defensive. The study shows that surveyed companies increased R&D spending devoted to proposed legislation by a striking 19.3%, compounded annually, from 1974 to 1977. And the rate was 16% a year for R&D devoted to Occupational Safety & Health Administration (OSHA) requirements. "When overall R&D spending is not growing nearly this fast," note the survey's authors, George E. Manners Jr. and Howard K. Nason, "other categories of effort—especially research—must be suffering."

Other observers compare the viability of industrial innovation in the U. S. with that of foreign countries. One expert is J. Herbert Hollomon, director of the Center for Policy Alternatives at Massachusetts Institute of Technology. According to Hollomon, a reason the U. S. is losing its leadership is that "we're arrogant—we have an NIH [not invented here] complex at the very time a majority of technological advances is bound to come from outside the U. S." Consequently, he argues, the U. S. has not organized itself to capitalize on these advances, as foreign countries have done for years with American knowhow. Since as much as two-thirds of all R&D is now conducted by foreign laboratories, Hollomon says, it should be no surprise that they have taken the lead in such technologies as textile machinery and steel production.

"We essentially prohibited West Germany and Japan from defense and space research," says Hollomon. "So it's no accident they concentrated on commercial fields." He adds: "I believe other nations better understand that the innovation process is important."

Says a research director for one high-technology company: "For a country like ours, the technology leader of the world, what has been happening is downright embarrassing." Indeed, even the presumed sources of strength in a consum-

er-oriented society are today under intense pressure. "Our experience with Japan in the consumer electronics industry—namely televisions, radios, audio, and transceiver equipment—shows some of our weaknesses," testified Gary C. Hufbauer, a Deputy Assistant Treasury Secretary, before a congressional subcommittee. In 1977, he said, "we had a $3.6 billion trade deficit with Japan in high-technology goods, and about two-thirds of this was accounted for by imports of consumer electronic goods."

The role of regulation

The cumulative response to these developments has been alarm. "The system has now sharpened its pencils in a way that discourages changes that are major," worries Robert A. Frosch, head of the National Aeronautics & Space Administration. "We have been so busy with other things that we may have inadvertently told the people who think up ideas to go away."

Even labor unions, which historically have left R&D decision-making up to corporate board rooms, now are complaining about lack of innovation. "Having helped to develop and pay for this technology," says Benjamin A. Sharman, international affairs director of the International Association of Machinists, "American workers have a right to demand government responsibility for using it to create new products, more jobs, better working conditions, and general prosperity." And Charles C. Kimble, research director of the Electrical, Radio & Machine Workers union, goes so far as to suggest that labor should now have a say in how industrial research money is spent.

Among research managers themselves, excessive or contradictory federal regulatory policy is the single greatest complaint. Hannay of Bell Labs points to Food & Drug Administration requirements as a case in point. According to one study, says Hannay, a 1938 application for adrenaline in oil was presented to the FDA in 27 pages. In 1958, a treatment for pinworms took 439 pages to describe. "By 1972," he says, "a skeletal muscle relaxant involved 456 volumes, each 2 in. thick—76 ft. in total thickness and weighing one ton."

Regulation, says Tinsley of Union Carbide, has put a bottleneck on new-product development in the chemical industry and has so added to the cost of getting any new chemical approved that only those targeted at a vast, assured market are attempted today. Food and drug industry researchers echo that complaint. "Today," says Al S. Clausi, director of technical research at General Foods Corp., "our industry does work that is fostered by unreal and invalid public concerns."

But regulation can have less obvious impacts, such as forcing an industry to stick with old technology rather than to experiment with new approaches to problems. "The overall effect of regulations on the auto industry has been to build an envelope around the internal-combustion device and the whole car structure," says Harvard Business School Professor William J. Abernathy, who specializes in technology management. "'Don't do anything really new, don't change.' That's what these regulations say." Paul F. Chenea, vice-president for research at General Motors Corp., agrees. "You just don't have time to explore wild new ideas when a new rule is so closely coupled to your current business," he says.

'The science of the matter'

In Congress, where the regulatory laws are written, such thinking has so far found a small audience. "A great number of the regulations that we would call environmental . . . may actually be self-defeating," muses Harrison H. Schmitt, the former astronaut from New Mexico who is the ranking Republican on Stevenson's Senate subcommittee. "Instead of looking at pollution controls, if we were looking at building a more efficient and therefore less-polluting engine, we would not only be solving our environmental problems, but we would be producing a new thing for export."

Schmitt is one of only three federal legislators with the semblance of a science background. "We probably have

How antitrust charges can limit R&D payoffs

Companies that make it across the development minefield and bring superior technology to market still may find a threat on the other side: monopolization charges that keep them from fully exploiting the technology. As old as that problem is, such charges can come as a shock, as they did to Du Pont Co. last April.

Courts established decades ago that the Sherman act prevents a company with a hammerlock on a particular industry from making sound, otherwise perfectly legal business decisions that would, however, perpetuate its dominance. In 1945, for example, Judge Learned Hand found evidence that Aluminum Co. of America unlawfully monopolized its industry by its tendency to "double and redouble capacity" as demand increased. That, said Hand, locked would-be competitors out of the expanding market.

In a similar vein, the Federal Trade Commission said three months ago that Du Pont had used "unfair means" to keep competitors from increasing their share of the expanding market for titanium dioxide, a widely used paint pigment. "The complaint is wholly without basis," says Irving S. Shapiro, the company's chairman.

40% share. Superior technology clearly contributes to Du Pont's dominance. In the 1950s, the company devoted a decade of work—and what a spokesman will peg only at "many millions of dollars"—to develop a new way of making TiO_2. Although the highly automated, continuous process went on stream more than 20 years ago, it still tops the processes used by such competitors as NL Industries, SCM, and American Cyanamid, because it uses cheaper raw materials and produces less acid waste.

The problem with the government arises because Du Pont's 40% share of the $700 million-a-year market is still growing. That alone is enough to send government lawyers poking about for actions that can be attacked. According



Du Pont's Shapiro: The FTC's "complaint is wholly without basis."

to Alfred F. Dougherty Jr., head of the commission's antitrust arm, even a 30% chunk of the market "could be a dominant position if all the other firms in the market had a much lower share." In fact, Justice Dept. antitrust chief John H. Shenefield asked his staff to look at Du Pont's TiO_2 policies only to find the FTC there ahead of him.

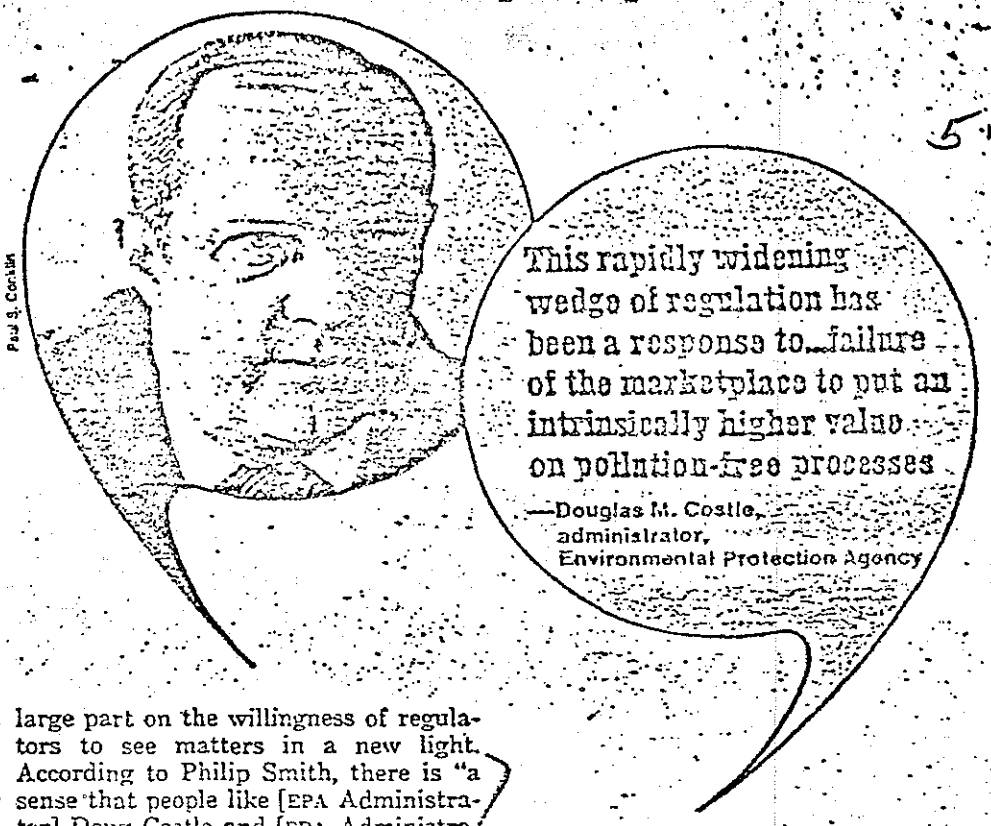
Basically, the FTC says that Du Pont keeps its market share by expanding capacity before the market is ready for more production, thereby forestalling competitors' expansion plans. Du Pont, says the FTC, should get rid of one of two current TiO_2 facilities and a new plant at De Lisle, Miss., that would begin production next year. The FTC staff also wants the company to take competitors under its wing by giving them, royalty-free, the superior technology and knowhow it has built up over the past 25 years.

exercised very poor judgment in the past," he says, "because the Congress overall—members as well as staff—have not been able to understand what is possible technologically and what is not, and therefore not been able to relate the costs [of legislation]."

Jason M. Salsbury, director of the chemical research division at American Cyanamid Co., pleads, "Before the lawyers write the legislation, let them know the science of the matter." Not only may some mandates be beyond what industry can legitimately perform, he says, but the rules force a conservative approach to science. One key indicator of this trend is the increasing number of toxicologists now employed in chemical company research labs. "Toxicologists don't innovate," notes Frank H. Healey, vice-president for research and engineering at Lever Bros. Co.

Then there is the regulatory bias against new ideas. In the EPA's grant programs for waste-water treatment at the municipal level, for instance, equipment specifications must be written so that gear can be procured from more than one source. That means a company with a unique process is discriminated against. What is more, the mandate for cost effectiveness precludes trying out innovative approaches whose value can only be measured if someone is willing to gamble on them.

If the domestic policy review is to solve such questions, it will depend in large part on the willingness of regulators to see matters in a new light. According to Philip Smith, there is "a sense that people like [EPA Administrator] Doug Costle and [FDA Administrator] Don Kennedy want to work with industry, and they don't want to fight all the time. I think we have a team of people now in government that may be able to do something."



The investment climate

But industry should not expect a major overhaul of regulatory practices to emerge from the study. EPA Administrator Douglas M. Costle concedes "a tremendous growth in the last decade in health and safety regulations—13 major statutes in our area alone." Though Costle agrees that the economic impact of such rules should be more closely quantified, he contends that "this rapidly widening wedge of regulation has been a response to a massive market failure—failure of the marketplace to put an intrinsically higher value on pollution-free processes."

Most regulators agree that not enough research has been done on the true nature of the environmental problems they are empowered to combat, but they also argue that regulation has led to cost-saving practices, especially in the area of resource recovery, where closed-cycle processes now help capture reusable material. OSHA officials also cite examples where the agency has laid down rules that have led to cost-cutting innovations. But Eula Bingham, the OSHA administrator, emphasizes that the "legislatively determined directive of protecting all exposed employees against material impairment of health or bodily function" requires tough regulation without quantitative weighing of costs and benefits. "Worker safety and health," she insists, "are to be heavily favored over the economic burdens of compliance."

Bingham and her boss, Labor Secretary Ray Marshall, may represent an increasingly isolated view, however. Economic issues have come to dominate thinking within the Carter Administration, and it is precisely these questions that industry has stressed in its discussions with science adviser Press and other White House officials. Just over a month ago, Treasury Secretary W. Michael Blumenthal told a meeting of financial analysts in Bal Harbour, Fla., "We are now devoting a very sizable chunk of our private investment to meeting government regulatory standards . . . and in some of these areas we may well be reaching a breaking point." Blumenthal also noted: "Our technological supremacy is not mandated by heaven. Unless we pay close attention to it and invest in it, it *will* disappear."

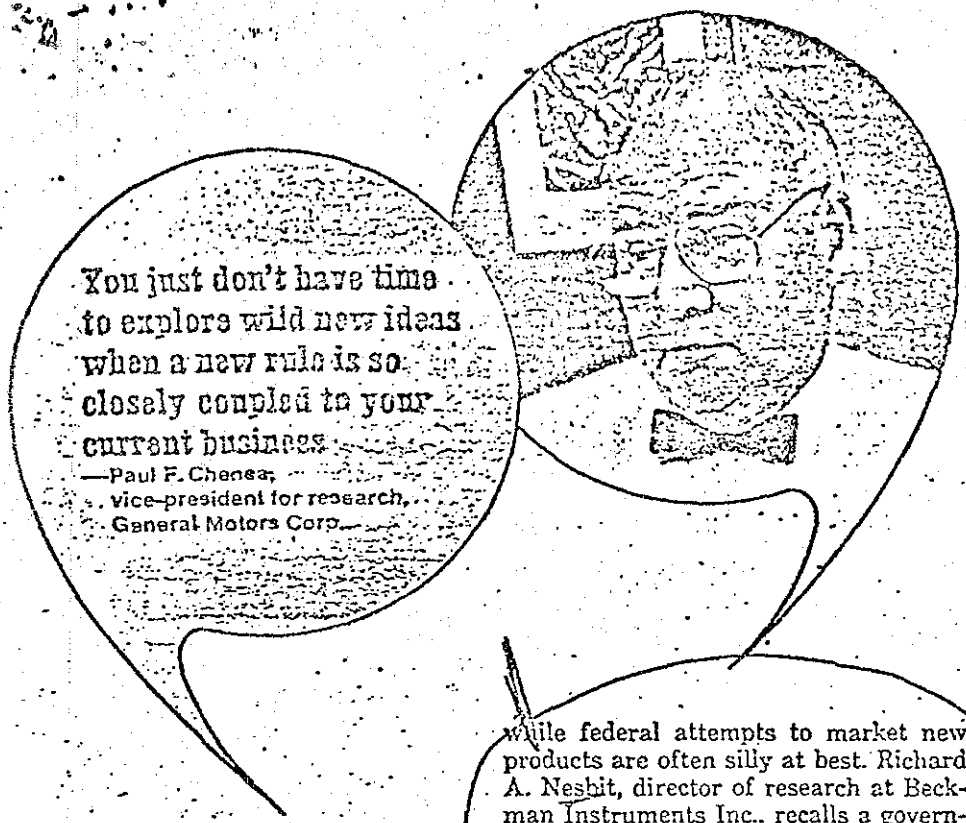
A month before the Blumenthal speech, GE's Bueche suggested to an American Chemical Society gathering that "we step back and look at R&D for what it really is: an investment. It is an investment that, like more conventional investments, has become increasingly less attractive."

Bueche, along with most other research managers, rejects the idea of direct federal subsidies to industrial R&D. Instead, he points out that "perhaps 90% of the total investment required for a successful innovation is downstream from R&D, [and thus] it becomes . . . clear why we must concentrate on the overall investment climate." Bueche attacks Administration proposals to eliminate special tax treatment of long-term capital gains, plumps for more

Whether the need for such onerous penalties can be established—before an FTC judge, the full commission, then a court of appeals and, perhaps, the Supreme Court—may take years to determine. But the approach is not unusual in monopolization cases.

The Xerox case. Just a year ago, the Justice Dept. ended such a suit against Industrial Electronic Engineers Inc. by getting the California company to promise royalty-free licenses to all comers on patents it had used to dominate the market for rear-projection readout equipment for electronic data-processing systems. And three years ago, the FTC settled a complaint by getting Xerox Corp. to open its portfolio of 1,700 copier patents to competitors. Xerox had to license three patents—chosen by the competitors—free. Fees for use of the rest were strictly limited by the FTC.

As severe as those measures may seem, and as discouraging to innovation, the antitrusters contend that it is the only way rivals can eat into a monopolist's dominance of a market. Says Alan R. Palmer, assistant director of the FTC's antitrust arm: "We have to look to what relief will really be effective."



rapid investment write-offs, and says "it is extremely important to provide stronger incentives for technological innovation by making permanent and more liberal the 10% investment tax credit."

Critics in industry

Bueche's arguments suggest the broad—yet often indirect—way in which federal policy runs counter to the best interests of innovation. Fear of antitrust moves from the Federal Trade Commission or the Justice Dept., for instance, has prevented many companies from sharing research aimed at a problem common throughout an industry—including new technology aimed at solving regulatory questions. At General Electric, the legal staff must now be notified if a competitor visits a company research facility, even if no proprietary material is involved.

For their part, Justice Dept. trustbusters claim that fears that their policies stifle innovation are not justified. They say they are flexible enough to recognize the differences in the pace of innovation from industry to industry, and that is why they allow a fair number of mergers among electronics companies. "That's an industry where you don't have to worry about someone cornering the market," says Jon M. Joyce, an economist in the Justice Dept.'s antitrust division. "There's just a lot of guys out there with good ideas."

Industry further claims that the inability to secure exclusive licenses on government-sponsored research leaves much good technology on the shelves, while federal attempts to market new products are often silly at best. Richard A. Neshit, director of research at Beckman Instruments Inc., recalls a government circular that waxed rhapsodic over the federal commitment of billions of dollars to R&D. Included with the letter was a syringe for sampling fecal matter, and the suggestion that Beckman might want to license the technology. "I wondered if they spent billions to develop that," Nesbit recalls. "The contrast was ludicrous."

Even national accounting procedures draw criticism from industry. A major target is the 1974 ruling by the Financial Accounting Standards Board that stipulated that R&D spending could no longer be treated as a balance sheet item, but must be listed as a direct profit or loss item in the year spent. R. E. McDonald, president and chief operating officer at Sperry Rand Corp., recently told an executive management symposium, "The ramifications of that rule change are quite complex, but the net effect has been to dry up a lot of potential venture capital investments. . . . I can say quite candidly that Univac would not be here today if we had not had the advantage of the old rule for so many years."

The shortage of risk capital has had a tremendous impact on small, technology-oriented companies trying to arrange new public financing. According to a Commerce Dept. survey, 698 such companies found $1.367 billion in public financing in 1969. In 1975, only four such companies were able to raise money publicly, and their numbers rose to just 30 in 1977. Equally ominous is the experience at Union Carbide, which, according to Tinsley, has not been able to compete for venture capital and has thus canceled plans to start a number of small operations built around interesting new technology. Years ago, says Tinsley, Carbide was reasonably successful at getting such funding. "And you must remember that these ideas are perishable," he says. "They don't have much shelf life."

The Treasury Dept., in fact, has an ongoing capital-formation task force that will be integrated into the policy review under the direction of Deputy Secretary Robert Carswell. Carswell notes that "you can't draw a clear line" between R&D support and investment in general, but "if it turns out that we find some form of capital formation gives the economy a greater multiplier effect than another form, we at the Treasury would not shy away from whatever policy would help most."

Washington's changing role

Even as it has pursued policies detrimental to industrial R&D, the federal government has withdrawn as a major initiator of innovation. Research managers generally believe that companies are better equipped than government to bring new technology to society because they are more attuned to market pull. But Lawrence G. Franko of Georgetown University, an international trade expert, recently pointed out to a congressional committee that the U. S. government has in the past played an important role "as a source of demand for new products and processes, and as a constant, forbearing customer in computers, semiconductors, jet aircraft, nuclear-power generation, telecommunications, and even some pharmaceuticals and chemicals. . . ."

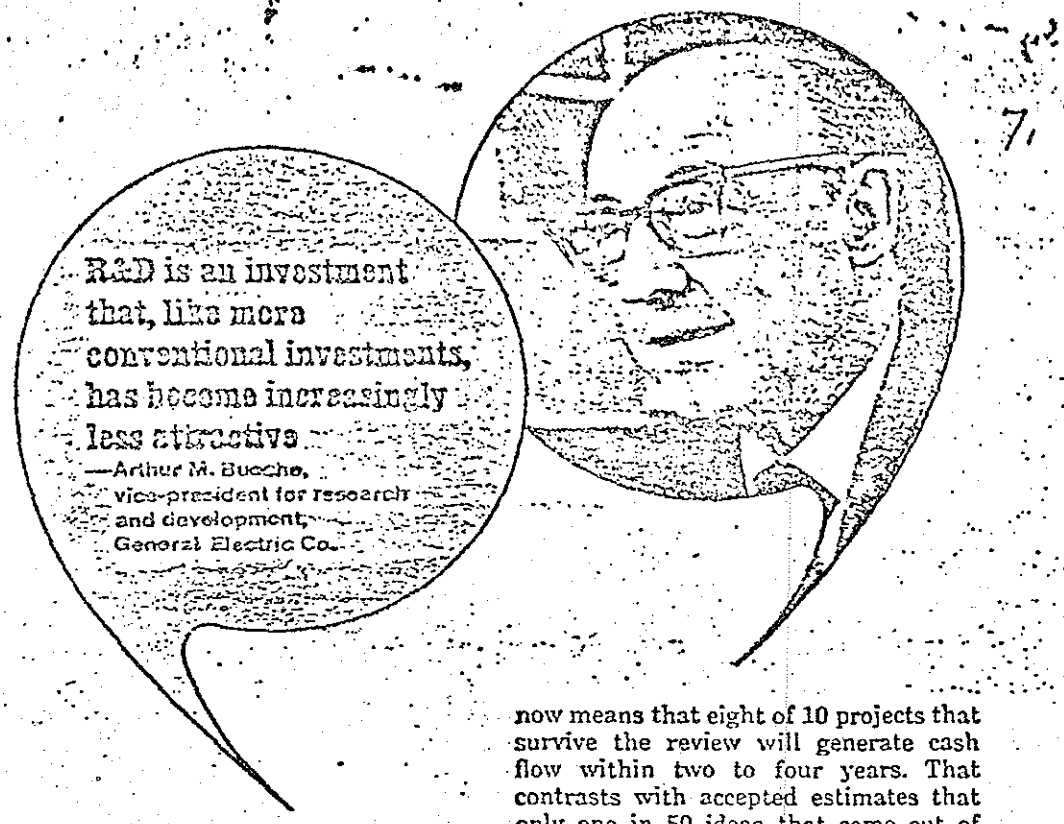
According to the Defense Dept.'s Davis, both Defense and NASA "have faded" in this role, the result of the Vietnam war and concerns over the military-industrial complex. "The consumer marketplace and other government agencies have not been able to pick up where DOD and NASA left off," she says. "The Department of Energy should be able to help with this, but it hasn't yet. And the Department of Transportation just never blossomed in this role." An unreleased IPL study for the Energy Dept. summed up industry's views. The company officers interviewed said government could spur industry's energy R&D only by creating a national energy policy, increasing its managerial competence, and offering financial incentives rather than massive contracts.

On the other hand, there have been some recent, notable government efforts to spur the innovation process. "We've talked to the leading semiconductor companies about our hopes for their innovation," says Davis. She says that the Defense Dept. expects to program $100 million over the next five years for industrial innovation in optical lithography, fabrication techniques involving

electron-beam technology, better chip designing and testing to meet military specifications, and system architecture and software implementation.

At the Transportation Dept., chief scientist John J. Fearnsides wants to involve the private sector much earlier in the government's R&D process, thereby allowing industrial contractors to develop technology alternatives instead of having to cope with rigid specifications at the outset. Such a policy, some believe, might have resulted in major savings for the Bay Area Rapid Transit system, for instance. "It is more expensive to fund a wider range of choices, but only at first," says Fearnsides.

The NSF also has announced a new industry-university grant program for cooperative exploration of "fundamental scientific questions." The aim is to make "a long-term contribution toward product and/or process innovation."



The failures of business

While agreeing on the need for federal policies that bolster innovation, those knowledgeable about industrial research think that the companies themselves share some of the blame for stagnation and must be willing to examine their practices critically. Alfred Rappaport, a professor of accounting and information systems at Northwestern University's graduate school of management, believes that one reason the U. S. lags in R&D is that the incentive compensation systems that corporate executives live under tend to deter intelligent risk-taking. "Incentive programs are almost invariably accounting-numbers oriented and based on short-term earnings results," he says. "That puts management emphasis on short-term business considerations." Another criticism has been of the haphazard way in which companies have launched new R&D programs. In essence, industry should try to learn how to weed out bad ideas early on, say the detractors. To that end, Dexter Corp. has instituted an eight-factor "innovation index" approach to research management that weighs questions such as effectiveness of communications, competitive factors, and timing, and comes up with an "innovation potential" for new ideas. At Continental Group Inc., D. Bruce Merrifield, vice-president of technology, says that "constraint analysis" of new ideas now means that eight of 10 projects that survive the review will generate cash flow within two to four years. That contrasts with accepted estimates that only one in 50 ideas that come out of research labs ever generates cash flow, and not for seven to 10 years.

Large companies often fail to exploit their own resources effectively. In the 1950s and 1960s, some companies set up centralized research facilities, but many of these did not yield the hoped-for synergism—in many cases, apparently, because the different parts of the company were in businesses too unrelated to one another.

On the other hand, Raytheon Co. was highly successful in transferring its microwave expertise to its newly acquired Amana appliance subsidiary in 1967, resulting in the counter-top microwave oven. That was done through a new-products business group set up specifically for such purposes. And more recently, this group, headed by Vice-President Palmer Darby, brought the company's microwave talent to bear on its Caloric subsidiary's product line, resulting in a new, combination microwave-electric range.

In such ways, industry can maximize its potential for innovation in the most adverse environment. But the future health of the nation's economy, many experts believe, requires a much more benign environment for industrial R&D than has existed over the past decade. And Jordan Baruch, the enthusiastic leader of the multi-agency federal study, believes that such an environment is likely to emerge as a result of the Administration's concern.

"We may have bitten off more than we can chew," notes Frank Press, "and it may be that we can't get much done in a year. But even if it takes three or five or 10 years, I think it is historically very important." ■

Turning to Japan for venture capital

The recent drag in U. S. venture-capital commitments has opened opportunities for foreign companies to appropriate American ideas. A case in point is the experience of System Industries Inc., a Sunnyvale (Calif.) manufacturer of minicomputer peripherals.

In 1969, System Industries went to work on a new ink-jet printing process, forming a subsidiary, Silonics Inc., to develop and market it. By 1973, the research phase was over, and a cash-short System Industries went looking for venture capital to tool up for production. Unfortunately, none was there. With a depressed stock market, and recent increases in the maximum tax on capital gains that cut the expected return on such investments in half, the usual capital sources "couldn't justify taking the same risks they used to," says Edwin V. W. Zschau, the company's chairman and chief executive officer.

Keeping only 51%. Next, he explains, "we were thinking about government funding. But we were discouraged from even making a proposal when we learned the government would get data rights and be able to license it to other people. We didn't see why we should give away those rights just to get a little money." What Zschau finally did give up was 49% of Silonics to Konishiroku Photo Industry Co., the Tokyo-based maker of Konica cameras.

In return, the Japanese company has spent $5.5 million on Silonics, which is enough to bring the new printer to market at the National Computer Conference in Anaheim, Calif., in mid-June. "We have one of the most promising imaging technologies for the 1980s," Zschau now complains. "But we only own 51% of it."

8.

Michael Novak

Wash. Star
9/3/78

A day for Enterprise

The last thing this country needs is another holiday. Nevertheless, I would like to propose one: Enterprise Day, to be celebrated on the Monday after the first day of spring. Enterprise Day would be a counterpart to Labor Day. Its purpose would be to honor our most endangered, heavily burdened and most fragile resource: the spirit of enterprise.

The system under which Americans live is not very old. Although it may not survive much longer, in its brief passage through the gloom of history it has cast a lovely light. Most of the progress of science, and the vast part of the world's betterment in the conditions of all people, have occurred during the short tenure of this system. A relatively few of the world's citizens discovered a method for unleashing tremendous energies of initiative and imagination. Such energy has always been available. But no society before had learned how to release it.

The word "enterprise" captured the spirit of adventure that characterized pilgrims and pioneers, founding fathers and builders of industry, sponsors of invention, artists and creative thinkers of every sort. The method was simple: Permit individuals to take risks with their own lives, careers and resources. Stand out of their way and let them go directly to the public. Permit them to reap rewards for offering the public the goods and services the public decided, by its own choices, to accept or to reject.

Such an idea was at first deemed both implausible and faintly immoral. Could individuals be trusted? Did not some officer of Reason need to guide their choices? Were not citizens so corrupt that they would choose badly, squander their resources, and be attracted to lowest common denominators? "The public is a beast," some said. "Only philosopher kings can bring about Utopia," others said.

Nonetheless, enterprise took root in a few small parcels of the world's territories. The power and beauty that broke from them were so astonishing that many other nations wished to imitate their achievements. Some did not wish to trust enterprise. Some tried to reach the same goals through servitude. And Planning. Planned servitude.

Enterprise is a resource more precious to the world than oil. For oil, there are substitutes. For enterprise, there is no equivalent form either of energy or of intelligence. The most complex computer is not as sensitive as the free choices of enterprising individuals. Such individuals are an unending source of invention. They are, alas, easily suppressed. Most societies repress them.

We have reached a decisive turn in Western societies. For several decades, statist politicians could claim to provide more goods and services than enterprise alone. There was truth in this claim. But now the cost of government is high, and the productivity of enterprise is falling. Now it is clear that statism clearly means less of everything. Taxes and inflation, by statist action, climb together. Individuals must settle for lower standards of living.

For the first time in a long time, those who oppose the statists — those who nourish enterprise — are in a position to offer ordinary citizens "more." As enterprise goes up, standards of living go up. As statism rises, so do taxes and inflation, bringing standards of living down.

There is now a huge vested interest in statism. One out of every five voters works for the government. It is time to celebrate the idea of enterprise while it still lives. Labor Day has its importance. It is enterprise that invents the projects on which to labor. Enterprise imagines, labor fulfills. Labor Day needs Enterprise Day as autumn requires spring.

And what would truly make the day distinctive is that it should not be celebrated by taking off from work. There is a far better way: It should be celebrated as a day without taxes. On one day a year, sales taxes should not apply. And all earned income from that day's labors should be exempted from income taxes.

This idea, of course, is playful. But a society lives, more than pragmatists think, by celebrations. If we do not celebrate our distinctive social secrets, we may not immediately lose them, but we are certain to undervalue them.

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Something's Happened to Yankee Ingenuity

By Bradley Graham
Washington Post Staff Writer

It's been 89 years since Angus Campbell put the first automatic cotton picker to work, 70 years since Henry Ford gassed up his first Model T, 39 years since Du Pont introduced a super fiber called nylon and 30 years since Edwin H. Land marketed the first instant-picture camera.

All of which helps recall a time America's inventive spirit seemed unbounded and unceasing. Ideas flowed to the marketplace as fast and furious as mountain rapids flow downhill.

But what was once thought to be an endless stream of U.S. inventions has of late been trickling out less startling and less competitive products. Meantime, adding pain to the drain, the inventive powers of foreign nations have been in ascendance. The question, once raised in a whisper, is now asked in loud and urgent tones: Has American enterprise lost its innovative touch?

Consider these facts:

• The number of U.S. patents issued per year to U.S. inventors reached a peak in 1971 and has declined steadily since. But the number granted to foreign inventors has increased steadily since 1963. In 1977, foreigners claimed 35 percent of all patents issued in the U.S. across a broad range of fields.

• The U.S. balance of trade has worsened, due not only to increased oil imports, but also to more imports of foreign manufactured goods.

• Productivity, which is partly a function of technological innovation, has slumped severely. In the past decade, the rate of growth in U.S. productivity has averaged only half of what it was the previous 20 years. In contrast, productivity growth rates in Europe and Japan have been on the rise.

• From 1953 to 1966, U.S. investment in research grew at an impressive rate of 10 percent annually in inflation-adjusted dollars. However, investment in research by all sectors in the U.S. over the past 10 years has shown essentially no growth in constant dollars. Further, a number of major U.S. corporations have announced recently they intend to spend even less on long-term basic research and more on development of short-term, quick-profit products.

In a world where power and progress are often measured in terms of technological breakthroughs and scientific prowess, such trends are indeed disturbing.

For a nation that has always prided itself on its tinkerers—on those lone souls who brought forth from their garages and basement labs such revolutionary devices as power steering, the office copier and the zipper—they are downright depressing.

From boardroom to research lab, there is a deepening sense that something has happened to the once unchallengeable Yankee ingenuity. Just what, though, no one quite knows.

There is today a pervasive perception that the dynamic vitality of the U.S. economy is faltering. This perception appears to be founded on two concerns: first, that America is not as productive as it used to be; and second, that we are somehow not as inventive either. This is the first of two articles this month which will examine these concerns.

Some insist it is in rapid decline, choked by an unfavorable economic climate, government regulation and, perhaps, by the lethargy and shortsightedness of big business. Others say it has simply taken new forms, becoming more subtle and incremental in nature than grand and revolutionary. Either way, the country's genius for invention does not appear, at least, to be what it once was.

Alarm bells are going off all over. First, Michael Boretsky, a senior policy analyst in the Commerce Department: "All the indicators imply that the rate of U.S. innovation is measurably down. It's very disconcerting."

Next, Dr. Alden Bean, director of research for the National Science Foundation: "There's no solid evidence to suggest that the U.S. is going to hell in a handbasket in science and technology. But there is serious cause for concern about some trends we've seen."

After several years of arm-waiving and shouting about waning U.S. innovation, the nation's research establishment finally caught the ear of the White House. Several months ago, the Carter administration launched a major policy review of things to be done to foster innovation in private industry. The study is being coordinated by the Commerce Department and involves more than 15 agencies. A final report, including recommendations for the president, is expected by April.

But many experts say another study is hardly necessary. The worrisome state of innovation in America has been assessed and reported on many times since the first major policy review conducted by Commerce in 1967. In the interim, the problems only have become more obvious.

For one, the economic climate for innovation is poor. The financial incentives that in the past encouraged the rich and the bold to risk their money on slim-chance projects no longer exist, thanks to increases in the capital gains tax and tighter rules on stock options. Inflation, too, has put the squeeze on capital investment by existing corporations.

Also, with the winding down of space and defense programs, government support of industrially performed research has diminished. Throughout the 1950s, the government annually supported more than one-third of industrial research activity. This level of support reached almost 40 percent in 1962, but has been falling consistently and is 25 percent today.

Increased government regulation, too, has increased operating costs and shrunk the share of profits formerly available for research. So has the higher cost of energy.

Together, these developments have forced a shift in industrial research activities from the offensive to the defensive. "Major effort is being diverted into defensive research," said Howard Nason, president of the Industrial Research Institute in St. Louis. "Much more emphasis is being placed on short-term cost reductions than on long-term product and process improvements."

But as important as such external economic factors may be in explaining the innovation slump, there are certain features about the internal structure of corporate America today which some say have had a debilitating effect on innovation.

Writing in the July-August issue of the Harvard Business Review, Alfred Rappaport, professor of business at

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INNOVATE, From G1

Northwestern University, blames the research lag on the increasing emphasis American business places on short-term results. Rappoport asserts that management incentive programs are biased toward quick profits at the expense of perhaps smarter long-term investment.

"American business would do well to re-examine its own self-administered incentive systems," Rappoport concludes.

Industrial research today is dominated by a small number of very large corporations. The top 10 percent of those firms doing R&D in 1976 performed almost 75 percent of the total U.S. R&D effort. Ten firms accounted for more than 25 percent of all expenditures that year. This concentration may itself work against innovation.

"A large part of the blame for the lack of innovation lies with the oligopoly nature of American industry," said Mark Green, director of Ralph Nader's Congress Watch. "Big companies get habituated to their products and there is a reluctance to break through. If you already dominate an industry, where is the incentive to take a chance on a new and costly approach?"

But the history of innovation in America is ambiguous on this point. Studies done on whether big business or little business is more inventive have gone to no conclusive end as a whole.

Certainly, many major innovations have come from outside an established industry. The ballpoint pen, for instance, was invented by a sculptor, the dial telephone by an undertaker. It took an electrical engineer employed by a shipbuilding firm in the 1930s to develop the automatic transmission, called by some the last major innovation of the auto industry. IBM's disk memory unit, the heart of today's computer, was not the logical outcome of a decision made by IBM management—rather, it was developed in one of its labs as a hobby project, over the stern warning from management that the project had to be dropped because of budget difficulties.

At the same time, certain large firms in the fields of electronics, pharmaceuticals, telecommunications and computers have been highly innovative.

In their seminal study in 1958 on the sources of invention, Harvard professor John Jewkes and his colleagues said they could not conclude that inventions flow primarily from any one source. When the study was revised in 1969, the authors stated only the obvious: that inventions can come from firms of varying size.

Business leaders, of course, refute the charge that they are less innovative today than in the past. "There's no lack on the part of big business to be innovative," said General Motors Corp. Chairman Thomas Murphy in a phone interview. "It's a big country, so we have to be big. We couldn't do all of the things we do if we weren't as large as we are."

To the public, a car may still look like a car. But auto officials say the changes which have taken place inside during the past five years have been as revolutionary as anything which has come before.

"There's a perception problem," said Thomas J. Feaheny, the man in charge of car engineering for Ford Motor Co., where "better bleak" were once not only a management dictum but a successful ad slogan. "We've never been as innovative as we are now. But the things we're doing aren't as glamorous and aren't noticed much by the consumer."

Critics note, however, that what the auto industry heralds as advances in development (the catalytic converter, on-board use of minicomputers to govern fuel efficiency and control pollution, greater use of aluminum and other lightweight durable materials) are, in fact, only more logical applications of off-the-shelf technologies rather than breakthroughs in the state of the art.

Of even greater concern, though, than what has or hasn't happened is the prospect for the future. Many major corporations have tailored research budgets to yield more practicable and immediate results. In 1968, industry allocated as much as 38 percent of its R&D dollar to the "R" part. By last year, this had dropped to 25 percent.

Corporations say the reasons for this shift from research into development have nothing to do with being too big or too comfortable. The reasons, basically, are greater pressures from government regulators to meet health, safety and environmental standards as soon as possible, and greater uncertainty about the likely profitability of longer-term, riskier ventures.

"It used to be much easier to bring new products to market," said Du Pont Chairman Irving Shapiro in an interview. "If you hit something, you'd have more time to develop it. Now it's more difficult.

"Also, the pot of gold at the end of the rainbow just isn't there. The economic environment has changed. Our thinking has had to change, too. It's become more short range."

Added Richard Heckert, Du Pont's senior vice president for R&D: "We're not exploring wholly new areas. We're concentrating instead on opportunities for research in established areas . . . . We are less able to take risks. We have to concentrate on surer projects."

The degree of such thinking does vary from company to company and industry to industry. Certain high-technology fields (instrumentation, computers and electronics) remain rooted in innovation and continue to churn out impressive new products. In other industries, though—particularly those most apt to be subject to regulation and high energy costs (steel, chemicals, paper, packaged goods and autos)—product innovation has leveled.

Part of the difficulty in deciding what to do about the innovation lag is figuring out how to define it. To begin with, innovation defies measurement.

"There are no indicators which you can look at to measure the advancement of knowledge," said NSF's Dr. Bean. "Some people count patents, but that's unreliable in part because some firms don't like to patent things and would rather rely on trade secrets rather than disclose important discoveries. Others count citations in the research literature, but that's unreliable, too."

But even without sure data, many have not hesitated to push the panic button. "You can't use statistics to say there's a problem," said Jordan J. Baruch, the assistant Secretary of Commerce who is directing the government's innovation policy review. "But you'd have to be blind not to see it."

Urgency about the problem is all the greater because America seems uniquely stricken. Western Europe and Japan grow more inventive, or so it appears, while U.S. firms age. Examples abound of foreign firms taking the lead in both new and traditional product areas. The Japanese, for instance, totally eclipsed the American communications industry in the development of video tape recorders. The Germans and Swiss now set the pace in textiles. Inventiveness in the steel industry has centered in Belgium and Austria. Some U.S. cities are even going abroad to scout for new ways to handle old problems. (The Council for International Urban Liaison here publishes a monthly newsletter called Urban Innovations Abroad that goes to 5,000 city officials in the U.S.)

Moreover, U.S. productivity rates have been in a rut for a decade—and that has serious consequences for everyone's real income and for the nation's overall standard of living. Of course, technological change by itself does not make or break productivity. There are other contributing factors, most important among them being capital investment and improved labor skills. But technology is an important ingredient in the mix.

With industry's current bent toward the here and now, there is concern that the U.S. may be cutting its innovative bridges. Some economists, notably Charles P. Kindleberger at MIT, have drawn disturbing parallels between the way U.S. firms are responding to America's battered competitive leads and the responses of British firms in the twilight of the English empire. British firms, just as American firms now, became defensive—that is, rather than redoubling efforts to generate innovations, they curtailed investment and demanded government protection against imports.

Does the current emphasis on small, incremental kinds of advances rather than on big breakthroughs threaten the dominant position the U.S. still holds?

No one is sure. Despite all the studies of innovation and productivity, no one can say whether there is an optimum rate of invention a society should adhere to, or how much innovation is enough.

There does seem to be general agreement, though, on this: The rapid technological growth which the U.S. experienced during the first two decades after World War II was unusual and is not likely to be repeated.

"We made an enormous investment in the war, made some great technological advances during it, and came out of it with a great belief in the power of technological progress," said J. Herbert Hollomon, director for the Center of Policy Alternatives at MIT. "We also were handed an accidental lead, in having survived the war better than anyone else. But one of the things that is increasingly going to be the case is that new technological innovations are going to happen outside the U.S."

Hollomon said that American business has in the past displayed an NIH (not-invented-here) complex, meaning that U.S. managers have been arrogant toward anything not thought up first in America and slow to embrace it. This is one of the things that he said will have to change if American firms hope to continue to compete in world markets. American businesses must learn to be quick to adapt, to exploit foreign inventions as well as their own, he warned.

"The problem is not with basic science," Hollomon said. "The problem really is how effective we can be in adjusting and adapting."

Some have argued that U.S. multinationals may themselves have hastened this competitive bind on America by transferring their best technologies to foreign markets in recent years. Those who say this also urge legislation that would restrict further transfers of technology.

But most who have studied the innovation problem say the solution lies in fostering innovation at home—through a more liberal tax policy, a relaxed regulatory policy, less aggressive antitrust practices and, in general, a more cooperative spirit between business and government such as exists in Japan and the leading Western European countries.

And above all, they argue for greater certainty in government policy. "I think that more than an increase in government support of R&D or a reduction in regulation, what private industry people are interested in is a reduction in uncertainty about government action," said Dr. Bean. "Look, there's enough economic uncertainty in the R&D process without the government."

Backing Off Basics

Many Concerns Stress Product Development And Reduce Research

Vexed by Sharp Competition And Federal Regulation, Firms Seek Fast Payoffs

Will U.S. Exports Be Hurt?

By Mitchell C. Lynch
Staff Reporter of The Wall Street Journal

BOSTON — The "R" is slipping from R&D, and many scientists, economists and foreign-trade specialists figure that spells trouble.

They discern an ominous change in the nation's scientific posture: Industry is curbing slow-payoff, basic research aimed at finding new products and instead is favoring hard-nosed, quick-payoff development of existing technology.

If this trend continues, some experts fret, the U.S. eventually could lose its standing as both the world's most innovative country and the biggest exporter of high-technology goods. Others worry that scientists aren't getting the elbowroom to, say, come up with synthetic fuels to replace petroleum. The problem has spread even to universities, long considered the birthplace of basic research.

"I don't hear many of my industrial contemporaries talking about exciting new major discoveries that they think will shake the world," sighs N. B. Hannay, head of research at Bell Laboratories, an arm of American Telephone & Telegraph Co. Thomas A. Vanderslice, who oversees research at General Electric Co., also is concerned. "There are trends that, unless corrected, could lead to a rapidly maturing crisis," he says.

Real Outlays Stagnant

The switch in R&D emphasis has taken place at a time when the total of such spending in the U.S. has turned essentially stagnant. American companies are spending more money on R&D, of course; one private study found that industry expenditures on R&D last year rose more than 11% from 1975 to $16.2 billion. However, the higher outlays have barely kept pace with inflation. "Strip away the higher costs, and you don't have much of an increase in the real amount of R&D being done today," says Michael Boretsky, senior policy analyst at the Commerce Department. And Otto Eckstein, who heads an economic research firm near Boston, says spending is lagging behind the pace that would be expected during a rebound from the 1974-75 recession.

Perhaps even more ominously, R&D spending in the U.S. is beginning to slacken in comparison with the rest of the world. [illegible] study estimates that the Raytheon Co. is blunt about it. "Very definitely we have gotten away from long-term general research," a spokesman for the big, diversified company says. "All the research we now are doing is applied research with well-defined goals, better focus on business objectives, and a promise of payback within a reasonable period of time."

Reasons for Switch

Executives and economists alike attribute the new, quick-payoff approach to R&D to the still-high rate of inflation, the shortage of capital funds during the current slump in the stock market, sharp competition here and abroad for existing high-technology markets, and uncertainty about government regulations and policies.

"During periods of uncertainty, companies aren't in any mood for high risks," says Alan Greenspan, a former chairman of the President's Council of Economic Advisers. "Uncertainty is plaguing the investment community, and it is far more pervasive than it was a decade ago." Under these circumstances, for example, "it is no wonder this country hasn't done much research into synthetic fuels," Mr. Greenspan says. "The payoff is too far down the road."

Richard E. Heckert, senior vice president who oversees R&D at Du Pont Co., specifically cites the impact that federal policies are having on coal-gasification proposals. "Who the hell is going to develop expensive coal processing when natural gas is selling at half its real market price?" he asks. With gas prices held down by federal regulations, Mr. Heckert says, industry is concerned about "whether it could even get a buyer for any higher-priced synthetic fuels." And George Gols, chief economist at Arthur D. Little Inc., a research and consulting firm, suggests that there is a deeper problem, "that industry, in the long run, doesn't really believe that fuel is going to be much more expensive or scarce."

Du Pont itself, whose $353 million R&D budget last year puts it among the biggest in industry, has realigned its program drastically. In recent years, the big chemical company has dropped about 22 of what it considers "new adventures" in R&D and is working on only two or three. Indeed, only 22% of Du Pont's R&D budget went to basic and new-venture research last year, compared with 38% in 1972. In the same four years, spending for what Du Pont calls "improvements for existing businesses" climbed to 78% from 62%.

This new policy means "much lower risks and much higher rewards," Mr. Heckert says. In a way, he adds, the company has given up "looking for another nylon or Dacron," two synthetic fibers that were developed by Du Pont researchers and marked major breakthroughs. Du Pont isn't searching for more extensions of plastics and synthetics because "there aren't any simple combinations left," Mr. Heckert says. "There are only so many ways you can mix around the basic molecules."

In the long run, companies like Du Pont might prefer to license technology developed by other companies, Mr. Heckert indicates.

Indeed, many companies clearly are irked because foreign manufacturers have proven adept at picking up U.S. technology through licensing agreements, improving it and then exporting high-technology products

Prof. Davidson adds that he wouldn't be surprised to see foreign manufacturers make big inroads in the U.S. markets for office copiers, electric typewriters, outboard motors and electric organs. (Using a Hammond Organ Co. license, Yamaha of Japan already has begun exporting a competitive electric organ, the professor says.)

Zenith's Layoffs

U.S. companies often lose their technological lead because, Prof. Davidson says, they are so preoccupied with keeping their share of the current-technology product market. Other observers say much research work merely involves a hunt for ways to make current products more cheaply or an attempt to accumulate so many patents in a given field as to hamper potential competitors.

A few days after Prof. Davidson was interviewed, Zenith Radio Corp.—almost as though on cue—announced that it is laying off 25% of its work force, including a large number of researchers. The reason: competition from Japanese TV-set makers. The Research Department is being brought into the Product Development Department, a Zenith spokesman said. Research projects that "aren't directly related to the immediate product line (color-television sets) are being eliminated," the spokesman added. "We're dropping some research projects where the payoff was 20 years from now. They weren't making a contribution to our needs now."

Many corporate executives, economists and academics also complain that government regulation and red tape are strangling basic research in the U.S. Foreign governments, in contrast, nurture industrial research, U.S. businessmen say.

These governments have less-stringent antitrust laws and, in fact, often urge domestic companies to share technology and production operations. For example, under pressure from Paris, the Peugeot S.A. auto maker last year acquired control of Citroen S.A., another French auto maker, which was in deep financial trouble. Peugeot's job was to bring Citroen under its wing and create one streamlined auto-making operation. The U.S. Justice Department's Antitrust Division, on the other hand, prohibits American auto makers from even exchanging information or knowhow, much less combining production operations.

Drug Regulations

Foreign governments also impose fewer regulations that slow the introduction of new products. This difference is most apparent in the pharmaceuticals field.

Du Pont's Mr. Heckert says that in this country the average corporate cost of bringing a new drug from the laboratory to the pharmacy is $10 million. "Think about introducing 50 of them," he says sardonically. To get Food and Drug Administration clearance for a muscle relaxant called Dantrium in 1972, the Norwick-Eaton Pharmaceuticals division of Morton-Norwich Products Inc. submitted to the agency 456 volumes of technical material, with each volume two inches thick—literally a ton of documents.

An FDA spokesman says the average new-drug application today takes up about 70 volumes of technical material. And the processing of such applications can take years. One reason is a bureaucratic problem: An FDA employe risks little by delaying an application, but he can get into trouble by clearing a drug that later is im-

Walter E. Goldblith, provost of the Massachusetts Institute of Technology, puts part of the blame on what he calls "a nightmare" federal funding system. Compared with the looser block grants of bygone years, money now is doled out only for tightly controlled projects, Mr. Goldblith says. By insisting on multifarious reports and other forms of accountability on basic-research projects, Washington has "fragmented the study of nature until it has become meaningless," he complains. "Scientists? Our people have had to become more like accountants," Mr. Goldblith snorts.

It is difficult to determine the extent to which this basic-research lag is hurting the nation's trade figures. However, technology clearly is important to U.S exports. The Commerce Department says that while the U.S. was incurring a $5.88 billion deficit in merchandise trade last year, its exports of technology-intensive manufactured goods were outrunning such imports by $26 billion.

"What alarms me is the trend we're seeing now and what effect it may have on our trade picture later," says Edward M. Graham, a professor at MIT's Sloan School of Business. "Right now it's a problem not quite a crisis."

"Unfair" Comparisons

But not everyone is alarmed. Some economists, including Mr. Gols of Arthur D. Little, say research comparisons with, say, the late 1960s are "unfair" because the government and corporations then were spending huge amounts of money on research related to defense and the space program.

Frank Press, President Carter's science adviser, agrees. "A certain amount of deterioration is inevitable," Mr. Press says. "The first thing we have to realize is that the boom years of the 1960s have passed." Furthermore, he warns that the statistics are "still too imprecise; we need to break down the figures sector by sector to find out where the problems really are."

To Mr. Press, the answer isn't a flood of federal funds into basic research. "We have to be careful," he says. "We don't want to overload the system."

Review of industrial innovation urged

Unusual joint Senate-House hearings held at AAAS meeting explore how lagging R&D investment by industry is affecting U.S. economy

Within the next two weeks the Office of Science & Technology Policy will recommend to President Carter that the Administration undertake a comprehensive domestic policy review of industrial innovation. OSTP chief Frank Press explains that such a review is necessary because "it is evident today that the health of our economy is being adversely affected by a lag in our productivity and a decline in our industrial innovation."

Press made his announcement at hearings held earlier this month by the Senate Subcommittee on Science, Technology & Space, chaired by Sen. Adlai E. Stevenson (D.-Ill.). Just a few days later the subject of industrial innovation was further explored at a most unusual set of Congressional hearings.

The Senate Subcommittee on Science, Technology & Space and the House Subcommittee on Science Research & Technology broke long-standing Congressional precedent by holding a day of joint hearings. The site of the hearings was even more unusual. They were held at the American Association for the Advancement of Science annual meeting in Washington, D.C. And for what may be the first time in Congressional history, people in the audience were allowed to comment on testimony and ask questions.

At the first set of hearings, Stevenson agreed with Press that "there is persuasive evidence that the U.S. trade lag and the growing competition the U.S. is facing from other countries is due to a lack of industrial R&D investment." He was disturbed by the possibility that policy review might be rejected by Carter.

But Press says that no matter what the decision is on the domestic policy review mechanism for the study, the study will go forward. He explains that he already has had numerous discussions with industrial research leaders on the issue and a number of conditions that need correction already have been identified. These include, according to Press, that:

• "There is insufficient incentive on the part of industry to innovate boldly. Industry leaders tell us that it is safer to market incremental improvements in tried and true products than to undertake greatly innovative R&D.



Press: decline in innovation

• "Industry investment is too low on exploratory research, particularly that from which results would be more advantageous to society as a whole rather than one firm or industry in particular.

• "Industrial managers . . . are having to put a larger share of their income into so-called 'defensive' measures to meet new environmental and consumer safety standards. As desirable as these standards may be (and I think most of them are), we must recognize that they require resources that might otherwise be used for innovative work more.

• "Equipment and facilities are aging and not being replaced as rapidly as necessary to keep U.S. industries productive and competitive."

It is obvious, Press says, that in some areas the U.S. has been living off past research results and a "reversal of this situation is essential not only for the domestic effect but also to improve our competitive position in world markets." Thus, the idea of a domestic policy review to identify problem areas and possible solutions, to be conducted jointly by OSTP and the Department of Commerce.

At the AAAS section of the hearings, Dr. N. Bruce Hannay, vice president of research and patents for Bell Laboratories, suggested that one place such a study might start looking for problems and remedies would be in the government's own backyard. He believes that "it is a matter of national necessity to strengthen U.S. innovative capacity, [but] unfortunately national actions and policies remain a major part of the problem." And he suggests some areas where changing federal policies would have a beneficial effect on innovation.

For example, Hannay believes that antitrust threats inhibit certain activities that might promote innovation. Cooperative research between companies is effectively barred by such threats. But, he says, antitrust relief could encourage firms too small to sustain separate fundamental research efforts to undertake cooperative basic studies or it could foster cooperation between companies with complementary talents.

In another area, he points out that federal contracts for R&D generally require that any patents that flow from the work be available to all. The idea is that since publicly funded R&D led to the patent everyone should be able to use it. "The trouble," he says, "is that what belongs to everybody is usually of interest to nobody, because the much larger investments necessary to manufacture and develop the market for a new product are unlikely to be rewarded by a satisfactory return on the investment, in the absence of an exclusive license."

One positive action the government could take, Hannay suggests, would be to use government procurement, a potentially powerful lever, to stimulate private investment. Experimental tests of this concept, he says, look very promising, explaining that "mechanisms like procurement are attractive because they focus on what the government can do with reasonable efficiency, that is, specify the results wanted. They do not depend on what the government cannot do as well, which is to determine the method for getting the result." He also believes that selective federal support for R&D for civilian technologies can be justified in certain instances.

Another participant at the AAAS hearing, Dr. Bela Gold, professor of industrial economics at Case Western Reserve University, also had a number of suggestions on how the government might go about stimulating industrial innovation, most of them economic. They include substantially more favorable tax treatment of the capital gains or delayed profits derived from desired long-term projects, special allowances for losses attributable to such efforts; cost-sharing grants for especially urgent or risky projects; accelerated depreciation for capital projects providing needed modern additions to capacity, but involving long construction periods; and establishment of an array of major government-financed research centers to conduct basic research

on the scientific foundations of various industries.

Which, if any, of these recommendations might be made following the OSTP-Commerce study won't be known for at least a year. But Press says one of the study's objectives will be development of Presidential-level options that address ways the government can assist industry in strengthening its research efforts. □

EPA schedules 29 free TSCA seminars

The following is a complete list of free day-long training seminars the Environmental Protection Agency will be holding during the next three weeks (C&EN, Feb. 20, page 8). The seminars are designed to help chemical manufacturers and importers comply with inventory reporting requirements of the Toxic Substances Control Act. Reports describing chemicals that are manufactured or imported in the U.S. and, in some cases, what quantities and where, are due on May 1.

Persons wishing to preregister for a seminar can do so by calling the number listed for the area in which that meeting will be held. The seminars begin at 9:30 AM.

In addition, the American Chemical Society's Chemistry & Public Affairs Department has arranged for EPA to present a training seminar at the upcoming ACS national meeting in Anaheim, Calif. The seminar will be held on Tuesday, March 14, in Room Magnolia C of the Disneyland Hotel following the 3:30 PM business meeting of the Division of Chemical Information.

Northeastern area: 212-557-9898

- Feb. 28, Boston—Boston-Waltham Holiday Inn, 455 Totten Pond Rd., off Rte. 128, exit 48E
- March 1, New York—New York-Coliseum Holiday Inn, 440 West 57th St., mid-Manhattan between Ninth and 10th Ave.
- March 2, Albany—Albany-Airport-Latham Holiday Inn, U.S. 9, exit 24 from New York State Throughway
- March 3, Rochester—Rochester-Airport Holiday Inn, 911 Brooks Ave., off I-490, exit 47.
- March 7–8, Newark—Newark-International Airport Holiday Inn, 160 Holiday Plaza, exit 14 from New Jersey Tpke.
- March 9, Philadelphia—Philadelphia-City Line Holiday Inn, Rte. 1 and I-76 City Ave. exit or north from Amtrak 30th St. station.
- March 10, Harrisburg—Holiday Inn Town, Second and Chestnut St., Second St. exit from I-83.

North Central area: 312-986-4830

- March 14, Pittsburgh—Pittsburgh-Allegheny Valley Holiday Inn, 180 Gamma Dr. at R.I.D.C. Park, Allegheny Expwy. off I-80 and I-76.
- March 15, Cleveland—Cleveland-Independence Holiday Inn, 6001 West Rockside Rd., exit off I-77.
- March 16, Cincinnati—Cincinnati-Riverfront Holiday Inn, 600 West Third St., Covington, on I-75 at Fifth St. exit.
- March 17, Indianapolis—Ind.-Speedway-N.W. Holiday Inn, 6330 Debonair La., Jct. I-294, I-74, and U.S. 136.
- Feb. 28–March 1, Chicago—Chicago-O'Hare Airport Holiday Inn, 3801 North Mannheim Rd., Jct. I-294, U.S. 45, and Rte. 19.
- March 2, Detroit—Detroit-Farmington Hills Holiday Inn, 38123 West 10 Mile Rd. at I-96 and Grand River Ave., off I-275.
- March 3, Minneapolis—St. Paul-State Capitol Holiday Inn, 161 St. Anthony St. opposite State Capitol, Marion St. exit from I-94.

South Central area: 214-387-0404

- March 2, Dallas—Dallas-Fort Worth Airport-North Highrise Holiday Inn, Rte. 114 at Esters Rd., north entrance to D/FW Airport off I-635.
- March 7, Kansas City—Kansas City-City Center Holiday Inn, 1301 Wyandotte St., Jct. I-70, U.S. 71, and Alt. 69.
- March 8, St. Louis—St. Louis-North Holiday Inn, 4545 North Lindbergh Blvd., on U.S. 140 at I-70, 3 miles east of I-270.
- March 9–10, Houston—Houston-NASA Holiday Inn, 1300 NASA Blvd., on Rte. 528 off I-45 (NASA exit) or Rte. 146.
- March 11, Baton Rouge—Baton Rouge-South Holiday Inn, 9940 Airline St., Jct. U.S. 61 and I-12.

Southeastern area: 404-393-0140

- March 3, Orlando—Orlando-Altamonte Springs Holiday Inn, I-4 and Rte. 436.
- March 14, Atlanta—Atlanta-Airport Holiday Inn, 1380 Virginia Ave., off I-85 S.
- March 15, Nashville—Nashville-Vanderbilt Holiday Inn, 3613 West End Ave., on U.S. 70S, off I-40 at Broadway (No. 49) exit.
- March 16, Winston-Salem—Winston-Salem Coliseum (North) Holiday Inn, North Cherry-Marshal Expressway.

Western area: 408-275-8110

- Feb. 28–March 1, Los Angeles—Buena Park (Disneyland) Holiday Inn, 7000 Beach Blvd., Beach Blvd. exit from Santa Ana or Riverside Frwy.
- March 7, Los Angeles—Laguna Hills Holiday Inn, 25205 La Paz Rd., Jct. I-5 and I-405 south of Orange County airport.
- March 8, San Jose—San Jose-Park Center Plaza Holiday Inn, 282 Almaden Blvd. at West San Carlos Ave.
- March 9, Oakland—Marriott Motor Inn-Berkeley, on Rte. 17 and I-80 at University Ave. exit.
- March 10, Portland—Cosmopolitan Airtel., 6221 N.E. 82nd Ave., off Columbia Blvd. and 80th Ave. □

Federal Alert—*new regulations*

This listing covers noteworthy regulations appearing in the Federal Register *from Jan. 9 to Feb. 15. Page numbers refer to those issues.*

PROPOSED

Environmental Protection Agency—Proposes rules change for handling Freedom of Information Act requests for business information acquired under Toxic Substances Control Act and Resource Conservation & Recovery Act; comments by March 20 (Jan. 18, page 2637).

Proposes testing requirements for four chemicals and six chemical categories recommended by Interagency Testing Committee on Oct. 5, 1977; comments by April 3 (Jan. 31, page 4073).

Proposes strict controls on halocarbon organics in drinking water; comments by May 31 (Feb. 9, page 5755).

Food & Drug Administration—Proposes further restrictions on use of chlortetracycline and oxytetracycline in livestock feeds; comments by April 20 (Jan. 20, page 3032).

Occupational Safety & Health Administration—Establishes emergency temporary workplace standard (effective Jan. 17, 1978) for acrylonitrile at 2 ppm as an eight-hour, time-weighted average; proposes permanent standard at same level; hearing in Washington, D.C., on March 21 (Jan. 17, pages 2586 and 2608).

FINAL

Environmental Protection Agency—Issues effluent limits, new source standards and pretreatment standards for carbon black manufacturing; effective Jan. 9 (Jan. 9, page 1343).

Establishes rules for restricted use pesticides and sets deadline for data and label submissions; effective Feb. 9 (Feb. 9, page 5782).

Occupational Safety & Health Administration—Issues permanent standard for occupational exposure to benzene; effective March 13 (Feb. 10, page 5918).

NOTICES

Consumer Product Safety Commission—Joins with EPA, FDA, and OSHA to form Interagency Regulatory Liaison Group to draft uniform testing standards for chemicals (Jan. 10, page 1523).

Environmental Protection Agency—Sets up data security task force to study security measures needed to protect confidential business information gathered under Toxic Substances Control Act (Jan. 12, page 1836).

Announces availability of second addendum to TSCA candidate list of 2800 additional chemicals (Feb. 7, page 5051).

Food & Drug Administration—Announces availability of draft forms for registration of drug makers and listing of drugs in commercial distribution; comments by April 10 (Feb. 7, page 5059).

Drug research—it needs a boost

Frank Markoe Jr. is vice chairman of Warner Lambert. At the National Journal's *Third Annual Health Conference in Washington, D.C., last month he expounded on his perception of some of the problems faced by the U.S. drug industry. Here, verbatim, is part of his prepared text.*

Under present law pharmaceutical research has become less robust than it should be to protect the future health of the nation. While new drugs cleared the Food & Drug Administration in an average of six months in 1962, they average about 27 months now, and the process consumes perhaps $55 million per single drug entity. New chemical entities were almost always tested first in this country; today, most U.S.-developed drugs benefit foreign patients first. While U.S. firms dominated world pharmaceutical innovation in the 1960's, European and Japanese firms are making impressive gains, with overt assistance from supportive government policies.

There are ways of reversing this trend. I would like to suggest a few.

First, we need to rethink the way we look at drug safety and efficacy. I believe that a more flexible definition of drug efficacy is needed, one that would not lessen the need for proof of effectiveness, but would allow FDA, on the advice of qualified experts, to exercise discretion.

Additionally, the proposed new drug law provides the Secretary of Health, Education & Welfare many new authorities to restrict drug marketing and require additional postmarketing studies or surveillance for any of a variety of reasons. These are overly expensive, not clearly delineated, and should be amended.

Second, we must begin to make better use of the scientific talent available in our country in reviewing new drug entities. Institutional review committees could be given increased authority to oversee drug investigations under FDA scrutiny. The British, among others, have found that a pooling of top scientific talent works most effectively to cut paperwork and speed up drug availability. I think it makes a great deal of sense, and we should begin to pursue that rationale in our own system.

And third, we must work to increase further FDA acceptance of foreign clinical studies so as to reduce wasteful duplication of research efforts.

Although it's not part of the drug reform proposal, there is one other government regulation that also threatens U.S. drug research leadership—Internal Revenue Regulation 861. This regulation requires multinational firms to limit U.S. research expenditure deductions to that portion of the firm's income which comes from the United States. We can no longer deduct our research expenditures on a dollar-for-dollar basis. Such tax policy is unrealistic and counterproductive and serves to discourage research investment in the United States.

And lastly, there is the issue of product liability. Most recently, we all became familiar with this overwhelming problem during the swine flu immunization program. It seems appropriate that when the government requires or promotes inoculations, the government must accept liability growing out of such programs. Other countries have dealt with this problem by providing workmen's compensation-type benefits in mass inoculation programs. Certainly, we should examine such a course in this country.

In the end it comes down to a very old axiom: There are no free lunches, with or without three martinis. I sense a growing assurance in Congress that it wants the future benefits of a healthy U.S. pharmaceutical research program. To obtain these future benefits, one must show a willingness to pay for it today. The future of U.S. drug regulation must therefore be tied to that reality. The first step in that direction already has been taken with an openness to divergent views. When this bill is finally enacted, it therefore, hopefully, must balance appropriate controls over industry against necessary incentives to encourage it.

The hearings and informal discussion to date give me every reason to believe that this most delicate balance is very likely to be struck. I earnestly hope so, for not only is [the drug] industry's future health dependent upon that, in a material way, so is yours. □

C&EN editorials represent only the views of the author and aim at initiating intelligent discussion

U.S. FIRMS SHED EUROPEAN PETROCHEMICALS

British Petroleum is on a buying spree that may be a portent of things to come for U.S. chemical companies with operations in Europe. Besides taking over Union Carbide's ethylene derivatives business for $400 million, the British company last week made an offer of $37 million for Monsanto's European polystyrene business. The question that arises is whether there will be a wholesale move by U.S. companies to sell their losing petrochemical businesses in Europe.

The offer by BP for Monsanto's operation includes a buy-out of Monsanto's one-third share of Forth Chemicals (BP already owns the other two thirds). Forth has a 220,000 metric-ton-per-year styrene plant in Baglan Bay, Wales, and another styrene plant in Grangemouth, Scotland, which has been shut down. Also incuded is the entire manufacturing complex at Wingles, France, which has a capacity of 105,000 metric tons per year of standard polystyrene and 25,000 metric tons per year of expandable polystyrene; and a plant at Newport, England, with capacities of 22,000 metric tons per year of standard and 18,000 metric tons per year of expandable polystyrene. The offer also includes 110,000 metric-ton-per-year acrylonitrile-butadiene-styrene and styrene-acrylonitrile capacity at Antwerp, Belgium, Newport, and Wingles. This will be expanded when a new 25,000 metric-ton-per-year unit starts up at Antwerp later this year.

Union Carbide's divestiture involves selling its Bakelite Xylonite Ltd. subsidiary in the U.K. and Union Carbide Belgium N.V. in Antwerp to British Petroleum. BP will pay Carbide $200 million in cash and assume another $200 million in debt. Also included in the sale is the chemical division of Union Carbide U.K. and laboratory facilities in Geneva.

The Bakelite Xylonite division produces polyethylene and related products, such as polyethylene film and plastic bottles and tubes. Union Carbide Belgium makes polyethylene, ethylene oxide and ethylene glycol and their derivatives, ethylidenenorbornene, hydroxyethyl cellulose, and urethane intermediates.

By selling these subsidiaries, Carbide is shedding more than one third of its European business. Last year the divested companies had combined sales of more than $300 million. Carbide says it has total European sales of $1.2 billion.

The operations sale is not the first for Carbide in Europe. Last year the company sold the phenolics division of Bakelite Xylonite to BP for more than $190 million.

One of the reasons for the European sale, according to Carbide board chairman William S. Sneath, is that the company has no ethylene facilities in Europe, and it does not want to integrate backward into the ethylene business. He says that Carbide's lack of ethylene production capability puts it at a competitive disadvantage with companies that do have ethylene facilities. However, a larger reason may be that Carbide's ethylene derivatives business may be a profit drain. Operating (pretax) profits in Europe have declined substantially for Carbide in the past few years, from $136 million in 1974 to $15 million in 1977. The generally weak petrochemicals business in Europe is surely one cause of this decline.

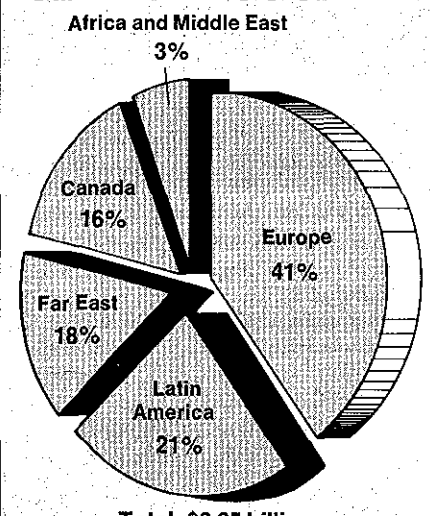
Still another reason for Carbide's shedding its polyethylene business in Europe is that the company is having to compete with government-controlled companies. Speaking last week to the International Conference on Trade & Investment in New York, Sneath said that various governments control 42% of the low-density polyethylene business in Europe.

The ethylene derivatives businesses sold by Carbide include a 100,000 metric-ton-per-year, low-density polyethylene (LDPE) plant in Grangemouth, Scotland (where BP has its huge petrochemical complex), and a 40,000 metric-ton-per-year LDPE plant in Antwerp, Belgium. In addition, Carbide has been rebuilding another LDPE plant in Antwerp that was destroyed by fire in 1975. This plant will produce 110,000 metric tons per year when it is finished at year's end.

Carbide's sale to BP also includes a 16,000 metric-ton-per-year ethylene oxide plant at Hyth, England, and a 116,000 metric-ton-per-year ethylene oxide plant and a 150,000 metric-ton-per-year ethylene glycol plant at Antwerp.

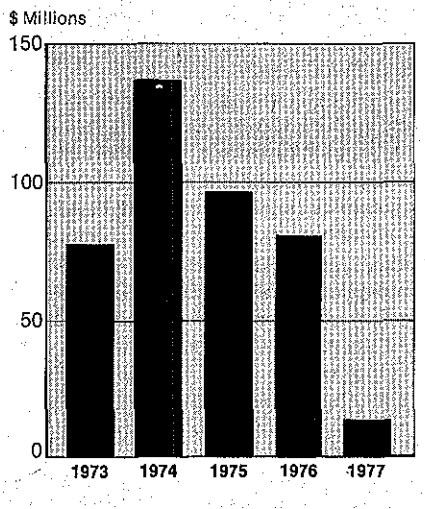
Carbide and Monsanto's sales of these operations raise the question of whether there will be more pullouts from European businesses by U.S. companies. Some industry marketing experts say there probably will be, and they point specifically to fibers operations. U.S. fibers producers operating in Europe will be selling against a cartel of resident companies. This, coupled with the poor fibers market that already exists there, may well force U.S. companies to cut operations in Europe. □

Europe makes up bulk of Carbide's non-U.S. sales...



Total: $2.25 billion

...but European profits have fallen dramatically



OIL, CARTELS, WAR AND PATENTABLE INVENTIONS—REMARKS BEFORE THE AMERICAN PATENT LAW ASSOCIATION, JANUARY 22, 1975*

*By Irving Kayton***

THE SUBJECT OF MY TALK is Oil, Cartels, War and Patentable Inventions. After having formulated the topic, it seemed to me that for those in the audience who are patent attorneys and who are knowledgeable in patent law nothing more really need be said on the subject because the title itself is self-evident, self-explanatory and conveys completely obviously everything I'm about to say.

I was, therefore, surprised when Dean Kirkpatrick of our law school, who is an antitrust lawyer, a former official of the Antitrust Division of the Department of Justice, approached me and indicated that the combination was an unobvious one. What upset me perhaps more than Dean Kirkpatrick's amazement at the topic was the response of patent lawyers whom I know who opined that the combination to them also was unobvious.

I therefore decided that perhaps in putting together this combination I, like most inventors who come up with something that may be novel, didn't fully appreciate the fact that there are interrelationships among those subjects that are not immediately apparent.

In a way that saddens me because I think it is symptomatic of the unnecessarily and unfortunately narrow conception which the patent bar has of its own role in society. The subject with which the patent bar deals, technological innovation, has for centuries been the heart and essence of man's existence on the face of the earth. It, more than anything else, more than any political arrangement, more than any political organization, is at the heart of every economic structure; it has moved mankind forward despite mankind's inertial insistence on remaining at top dead center.

The subject of Oil, Cartels, War and Patentable Inventions puts together everything today that is of vital importance to all of mankind's existence and future on the face of the earth. But to introduce the subject in a meaningful way, and in a comparative law way, so that its full scope can be appreciated, I would like to give you a hypothetical situation.

Let us suppose that the oil companies in the United States, not the oil-producing and exporting countries of the world, but the oil companies in the United States, Standard Oil of New Jersey, Standard Oil of California. Phillips Petroleum, Gulf Oil, all of them, mutually agreed and conspired to increase the price of its oil and petroleum products in the United States four-fold. Let us assume that.

What would the consequences of that action be? For one, the price would go up four-fold. An immediately apparent consequence of that would be inflation, the elimination of certain basic materials in agriculture neces-

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*This speech was given on the second day of the mid-winter meeting of the A.P.L.A.

**Professor of Law, George Washington University, Washington, D.C.

sary for producing adequate amounts of food so that hungry people would go hungrier and the price of food would go up.

Fewer automobiles would be sold because of the need to economize on fuel and companies like Chrysler, General Motors and Ford would have to shut down many of its plants. All together, the consequence of that action on the part of the domestic oil companies would contribute seriously to an economic recession, if not depression, in the United States and an incredible increase in inflation, such as perhaps as much as 12-point-some-fraction per cent.

The reason why that would happen is because those companies control the market for one of the most significant energy resources we have, and because that act is one which they could implement de facto; because of that they would in fact be able, at their whim, to control the price of that market, thereby increasing the price that would be set in a competitive situation.

Now for the patent lawyers in this group who do not know it, that is a monopoly. *That* is a monopoly. When control of a product or a resource is such that you can set price at your will four times beyond the going competitive market price, that is the exclusive control which means monopoly in an antitrust sense, which means monopoly in an odious, onerous and burdensome sense, which the Supreme Court and other courts have indicated, and it is in that sense that I always use the term monopoly.

We would not sit idly by in this country under those horrendous, outrageous, antisocial circumstances. What would we do? For one thing, the United States Government, through the Justice Department, would vigorously and properly prosecute under the antitrust laws, and would establish that whether or not the monopoly was illegal monopolization it certainly was a conspiracy in restraint of trade which is per se actionable because of the fixing of prices.

The consequences to the oil companies would be very clear. To begin with, the physical force and might of the Executive Branch of the government, after appropriate litigation, would put many of the oil company executives in prison for up to 3 years as a felony. There would be fines of one million dollars against each corporation and a hundred thousand dollars against each individual involved.

But, far more important than that, there would be private litigation under the Clayton Act against the monopolists which would result in treble damages that would, in fact, bankrupt all the oil companies, if the price increase had in fact been four-fold. That private litigation is private only in the sense that individuals bring the action but the armed might of the United States enforces the judgment for treble damages.

Now that hypothetical is hypothetical indeed, because the oil companies have not done that and could not even dream of doing it in the United States. Those acts are illegal and are considered so, even in a free market society, although, of course, we do not have a completely free market society but at least a partially free market society.

Those acts are so antisocial that the free market has to be protected to the extent that those monopoly practices could not be tolerated. And so now

we go to the real world and we find that outside the United States several oil-producing and exporting countries, many of which are in the Middle East and are Arab countries, but including Venezuela, in the American hemispheres, have done precisely that which the hypothetical I gave you provides.

What under those circumstances, could be done to protect not only the United States, but the rest of the world for whom the price of outside oil is even more significant than in the United States, although, admittedly, not under the aegis of a legal system, because, in fact, there is no international law. And I use the term law in a precise way. Law is a man-made set of rules which are enforced and enforceable by the armed strength of the rulemakers. In that sense, there is no such thing as international law. Nevertheless, the de facto remedies which man has outside the legal system are virtually the same as those within a legal system, except they are not under the umbrella of a civilized legal relationship.

What could we do? We know very well what we could do. President Ford and Henry Kissinger in the United Nations a couple of months ago, and President Ford, Henry Kissinger and the Secretary of Defense within the last couple of weeks have said in effect to the OPEC countries, "Watch your step. There is a grave danger that we may declare war," which is precisely what the United States Government does when it arrests a domestic monopolist for violating the law. That option which was so easily stated by the President in a most inappropriate gambler-like bluff is not a real one. Years ago there is not the slightest question in my mind that Saudi Arabia would have been invaded, if not by the United States then by some other country like Japan or England, and, in fact, England, France and Israel jointly invaded Egypt at the time of the Suez intervention for seemingly similar reasons. Why then can we not do this thing to protect our unique self interests?

Saudi Arabia's strength, Iran's strength, Kuwait's strength, after all, is a joke. They have no strength. But for the arms which we have given them, they would be fighting Israel and Israel would be figthing them with bows and arrows and slings and, even with the billions of dollars of military equipment which the Soviet Union and the United States have poured into the Middle East, they are not really the slightest match for the armed might of the United States. And yet we do nothing by way of physical force. Albeit in the past, that's what we would have done, namely, invaded.

Why do we do nothing? We do nothing precisely because the Soviet Union and the United States, in a mutual stalemate situation, have placed an atomic umbrella of protection over those countries and, therefore, just like in a game of checkers where the red and the black pieces are lined up in faced opposition, the oil producing and exporting countries of the world are walking the valley confidently and happily between the armed might of the two major powers of the world. That is why they were able to increase the price of oil and maintain a cartel, which means nothing more than an international monopoly, despite the obvious disaster to the rest of the world.

Well, what else could we have done? There are other things that we

could have done other than armed intervention. Economic sanctions could have been used. But economic sanctions, unfortunately, cannot work under those circumstances since OPEC can buy anything from anyone, anywhere because of the massive, unbelievably massive transfer of wealth during the past 12 months from the industrialized countries of the world to the Middle East oil producers. Indeed, corporations throughout the world are scurrying around to curry favor from those countries to get business for their own companies.

The only thing the OPEC countries seem not to be able to buy in the Middle East with their massive infusion of wealth is a place for the Palestine refugees to live securly and in comfort, although they were willing to provide many millions of dollars in arms for that group. Clearly, we have a situation where, because of the blanket protection of two contending giants, you have a third force which genuinely, actually believes that it can and will control the world by virtue of its monopoly position. The Shah of Iran is, at least according to various reports from Jack Anderson and others, determined to be a major determining force in world affairs.

On an international level, therefore, we can really do nothing, nor do I want you to think from what I am saying that I believe we ever should use armed force for the resolution of such disputes. Such a use of force I consider to be totally unacceptable for civilized man and productive of consequences far more disastrous than the direct consequences of the monopoly cartel position that has been imposed upon us.

There are ways to cope with monopolies that go beyond the typical legal responses and you must understand that the use of force that I have described to you and the economic sanctions that I have mentioned, I am referring to them as legal mechanisms in the sense of analogy. That is to say, if these acts took place in the United States, our government would use legally sanctioned force to prevent it and, therefore, the international analogy of force to prevent this outrageously antisocial, economically destructive situation, although it cannot be used, would be precisely what would be used if the monopolists were domestic.

What do you do other than those things? There are two ways to proceed. One, you try to do without the product over which there is monopoly control. In the United States that would mean extraordinary curtailment of oil and its byproducts. In Japan and in much of Europe it would mean total disaster, since almost all of their oil comes from the Middle East. But in the United States we could do it, and the Administration has suggested ways to do it.

President Ford, very belatedly, said he would impose a tax on crude oil, cut the use of oil by this heavy tax, part of which could be used to help those who are thrown out of work and those industries which cannot function without the oil, to help cope, not well, but at least marginally. But this, as even Eric Sevareid pointed out some weeks ago on CBS News, is war absolute, cutthroat, total war. Economic, it is true, but possibly in the future not economic.

Hobart Rowen, the economic columnist in the Washington Post who typically comes out in the most unobtrusive, gentle ways on economic policy, took issue with the Ford Administration prior to the last congressional elections for refusing to levy a heavy tax on gasoline consumption in the United States, because Rowen knows that this is the critical issue, not only for inflation but for recession and depression. It all focuses on this monopoly posture.

It was not politically expedient to impose a gasoline tax before the last election. Mostly everyone was against it, the poor people as well as the large corporations, whose activities depend on extensive use of oil and sale of oil. And, therefore, once again, a clear mechanism, an indicated mechanism for coping with the monopoly situation had to be junked, because it was not politically expedient.

But even now, with President Ford's recommendations, the political solutions that we have available to us are so subject to the whim of varieties of special interest groups that in a democratic society it is not likely, on such a significant issue, to have implemented an effective economic solution that's politically determined based on a mechanism that will gore as many oxen as will this kind of a solution. What the Democrats and Republicans will finally work out is anyone's guess but past experience suggests it will be largely ineffectual to break the monopoly. Even if it is in part effectual, this solution admittedly is one that will enhance inflation and contribute to recession, if not depression.

The only other way to cope with the problem is, if you don't cut consumption of the monopolized source, to develop alternative sources and alternative products. We discovered that there's a huge amount of oil in Mexico and off the Mexican coast. But the moment that that oil was discovered the President of Mexico announced that as soon as the oil flows his country is joining the Organization of Petroleum Exporting Countries.

Why not? Why should he not? Mexico has been a have-not for long enough. The Shah of Iran who came into existence and has been protected and built up by billions of dollars of United States money now says that he has a place in the sun. Now he has control. You cannot expect gratitude in a business relationship, especially since our aid to those countries was not essentially altruistic but was for self-interested, political reasons. Oil outside the United States which we do not ourselves develop will just become, therefore, part of the monopoly. Moreover, lots of the oil is a long, long time away.

Alternative sources of energy, nuclear energy for peaceful purposes that are now established and in hand pose lots of problems. They are quite expensive, not so much anymore by comparison with Arab and Venezuelan oil, but still expensive, a long time in coming and subject to real and significant technological hazards and environmental dangers.

So where are we? What can we do? We can hope. But we could also hope in the way that has invariably solved mankind's problems. We can hope that someone will invent an alternative fuel source. We can hope that

someone will invent a mechanism for decreasing the amount of fuel used for the same functions. We can hope that. And, according to the Antitrust Division of the Department of Justice, that's literally all we should do. In fact, not only is that all we should do, it's too damned much. What we should do is to make sure that there are so many impediments in the incentives to invent that one thing that will eliminate monopoly on an international level in oil, the one thing that will introduce competition into this monopoly situation, will not come about.

You have heard about the early interchange between Mr. Kauper of the Justice Department and Betsy Ancker-Johnson of the Commerce Department with respect to energy. The Justice Department wanted title to everything to go to the government and compulsory licensing so that windfall profits will not be obtained by anybody. Betsy Ancker-Johnson said the only way we can do it is to get people to invent. People don't invent out of the love they bear for the Department of Justice.

This confrontation of issues between Justice and Commerce represents in macrocosm the dilemma we're confronted with and I would like to amplify a little bit on that to show you perhaps in a simpleminded way, but cogently, I believe, the real issues before us.

You've heard about the controversy that has been raging over the last few months about the use of various kinds of books in public schools, in West Virginia and other places. Well, I have undertaken, from my own peculiar point of view, the examination of fairy tales, and I came up with a fascinating story that I had forgotten about. If you will bear with me, I believe you will find this discussion about fairy tales most helpful in understanding where we are today.

It turns out that once upon a time in a far away land a small gnome-like man, like the electrical genius Steinmetz used to be, was on the verge of actually reducing to practice a process for converting straw into spun gold. Now it turned out in that far-off land that a beautiful young maiden, who had an exceedingly stupid father, was obliged by the king of the land to convert a roomful of straw into spun gold under penalty of death if she failed and under the reward of marriage to the bilious old king if she succeeded.

This was well known throughout the land and the inventor went to the young woman and said, "I can do it, I think." And she said, "I'll give you anything if you will do it." He said, "Well, I am a lonely old man, I have no children, and the one thing in life that I would like is a child to live with me. So if you promise to give me your firstborn child, I will rush back to my laboratory and see if I can reduce to practice the invention and come back to you." And she said, "Anything, I'll give you anything including my firstborn child."

Well, sure enough, he ran back and he did make it work. He came back that night, the deal was consummated and the next day the room was full of spun gold. The young girl married the king and forthwith issue therefrom came.

The inventor approached the queen for his contracted-for consideration and she was heartbroken, even though her life had been saved and she

was the first lady of the land. And he said, "Well, I have nothing if you don't give me your child, but, if within 24 hours you can guess my name, you may keep the child. I'll give you a chance to take back that which is legally, morally and ethically mine."

The moment he left she called in the Central Intelligence Agency, the Federal Bureau of Investigation and with the various computer techniques that they have and the millions of dossiers, they found out that the inventor's name was, strangely enough, Rumpelstiltskin. When confronted with the fact that she knew his name, the inventor sadly turned away, honoring his addendum to the contract and walked off into the sunset.

Now, outrageous as is that contractual breach, outrageous as is the immoral behavior of the queen, at least she showed some intelligence. At least she offered the reward that would produce the invention when she needed it. We today don't even do that, and we have eminent domain in this country. We really can take anything we want in this country, if we feel that the deal was originally too good for the inventor. And, therefore, we don't even give lip service to incentive when it comes to the most important thing the world faces, namely, a technological alternative to the monopoly control of oil outside the United States.

Wouldn't it make sense for example to offer anybody, anybody, one dollar a barrel for oil savings or an alternative to oil which the invention can produce? We are paying over $10 minimum real price for oil and we were paying slightly over $2 real price a little more than a year ago. Doesn't it make sense to offer one buck extra when now we're paying $7 to $8 extra?

It's true that whoever invents it will be getting $7 million a day, if we eliminate the need for outside oil. But all of it taxable by the United States, unlike the foreign oil which is not taxable in any way by the United States.

This inventor, this would-be monopolist, would probably be able, at that rate, to have a harem in Saudi Arabia and Kuwait and even in Washington, D.C., where it would be illegal, but slavery, as you know, in Saudi Arabia is still legal. Now that would offend sensibilities. Seven million dollars a day for a crummy inventor is an outrage. And so this incentive which would destroy monopoly control, not create it by a patent but destroy monopoly control by a patent, is not for one moment suggested. Instead of increasing the incentive for the only solution that will not bring war, the only situation that will not result in economic chaos, is not added to the incentive which we now have.

To the contrary, the reverse is suggested by the title policy and compulsory licensing earlier urged by the Department of Justice. For Heaven's sake, why don't we offer it and take it away later by eminent domain exactly the way the queen did? Not even that is possible. Why? Because the emotional biases against human beings who invent on the part of those not capable of inventing are virtually insurmountable.

When I lecture and point out the statistically demonstrated fact that a significant fraction, fully half, of the major inventions in the United States during this century have come from outside large corporate laboratories, my colleagues in the Department of Justice laugh.

But several weeks ago we learned that two old men from Vermont, working for the past 20 years, have come up with a modification to automobile engines which produces a 50 per cent increase in mileage and a 30 per cent savings in fuel. The cost to modify the engine would be $200 or the equivalent to the amount of saving you would make on gasoline in about one year due to the monopoly-imposed prices from outside the United States.

Now, if you looked at these two men, no lawyer in the Department of Justice would look at them twice. In fact, they would probably think that the two men on approaching those nattily attired lawyers were asking for a handout. But that's where it comes from! Unlike political, institutional solutions that require dozens of well dressed, well educated, wealthy men sitting around for interminable hours making compromises, this kind of solution, which has saved mankind decade, after decade, after century, after century, comes from the mind of one, lone, isolated man who's probably too uninformed to know that what he did can not be done.

It's true that some of these stupid people will invent even when they get the word that our property system in patents stinks compared to what it can and should be. But not all inventors are that compulsive about inventing, are not that stupid about the material needs of their spouses and their children and their friends. And many of these people, and we never know who they are, will not direct their efforts to invention because they know it will be taken away.

As you have recently seen in the outrage, the rape, the property rape of the century in the United States, in *Foster* v. *American Machine and Foundry,* a man who revolutionized the commercial production of a particular type of pipe was given a pittance through compulsory licensing by the United States Court of Appeals for the Second Circuit. His name is Foster, Julius Foster, a lone inventor and a patent lawyer at that. Why should Foster go through the trouble again? The cost of the litigation far exceeded what he possibly could have gotten from his invention.

Why should anyone else knowing about Foster take the effort to save us by invention, with heartbreak as his potential reward, even when he succeeds?

Now I don't know whether the gasoline saving invention of the LaForce brothers will meet air pollution standards. I don't know whether independent testing will demonstrate that it is as good as it seemed on television, but, if a few weeks before I gave this talk, which was announced long ago, such a close possibility can come into existence for the solution of the world's biggest problem by two unheard of, unknown, old men, men typically rejected by society because they're old, I know that on a probability basis there are others who can do it, and the greater the incentive we provide, the more of them will be coming out of the walls and out of the corners.

I'll tell you something else. There are sophisticated inventors also. I'm one of them and I will tell you that I have invented an effective mechanism technologically for solving the problem but I'm not going to patent it or tell it to you or tell it to anyone else on the face of the earth until Congress

passes a statute which says that I will get $1 for every barrel of oil I save, and a harem in Saudi Arabia, in Kuwait, and Washington, D.C.

I would like to finish with what to me is the essence of what I'm saying. There is a crush of people in the United States and in the world who simply cannot comprehend that their real existences, their *real* existences, depend not on lawyers, not on judges and really, in the long haul, not even on magnificent, soft spoken, secretaries of state who would save us and who have done so in many situations, but overall depend on those who are innovative and creative. Ayn Rand, speaking through her protagonist in *The Fountainhead* said:

"Men have been taught that the highest virtue is not to achieve but to give. Yet one cannot give that which has not been created. Creation comes before distribution, or else there will be nothing to distribute. The need of the creator comes before the need of any possible beneficiary, yet we are taught to admire the second-hander who dispenses gifts he has not produced above the man who made the gifts possible. We praise an act of charity, we shrug at an act of achievement."

Unfortunately, very few of us are creators and achievers. And, as a consequence, the bulk of society cannot emphathize with those who are genuinely the salt of our earth. We can identify with, and therefore form mass movements about figures like Jesus, Moses, Mohammed and Buddah, who can tell us what we uncreative people can do towards making this world better. But we cannot identify with that elite group upon which all of life depends, the inventors and creators.

There is no way out for us now other than depression, famine, inflation and war, unless we come up with the technological solution to the genuine monopoly situation on an international level with which we are faced. I, therefore, urge you not only to reject the outrageous posture which the Justice Department has taken, and is now taking, but to demand more from our patent system by way of incentive than has ever before been asked for the purpose, very simply, of saving mankind.

Thank you.

Token Use

Regarding the new issue raised by the board, namely, whether registrant's use was only token use which cannot serve to protect rights in its registration, Judge Lane declares that the "balance of equities" plays an important role in determining whether registrant's use is sufficient. He then concludes that the scant record before the court makes it impossible to agree with the board's assertion that "a competitor [petitioner] stands in the wings ready to utilize the mark commercially." In fact, "for all the record shows, petitioner is not prepared to export in any greater quantity than has registrant."

Concurring and Dissenting Opinions

Judge Miller, concurring in part and dissenting in part, agrees with the result reached by the majority on the two-year nonuse issue, but argues that Fed. R. Civ. P. 15(b), relating to amendments of pleadings to conform to the evidence, should apply. (The majority found the rule inapplicable under the specific facts here.) According to Judge Miller, if registrant really considered that it did not have fair notice that petitioner was attempting to establish a two-year period of nonuse beginning July 12, 1973, it should have moved for reconsideration. Having said this, however, Judge Miller concludes that petitioner failed to sustain its burden of filling the gap between June 23, 1975 and July 12, 1975 by evidence rather than by implication.

On the question of token use, Judge Miller finds the record "[in]adequate for making new law on 'balance of the equities,' as the majority proposes to do." He would, therefore, remand for development of an adequate record.

Dissenting, Judge Baldwin states that the board's decision "correctly assesses the legal issues and satisfies the equities in the case." In his opinion, the record establishes "a prima facie case of abandonment by nonuse to which there was no rebuttal." While the majority concluded that registrant was not required, under Fed. R. Civ. P. 26 (e) (2), to supplement its response to petitioner's interrogatory, Judge Baldwin thinks there was a "duty * * * to update the answer."

Judge Baldwin also feels that Fed. R. Civ. P. 15 (b) should control the outcome of this case because "the abandonment issue, unrestricted by the filing date [of the cancellation petition], was tried by implied consent."

> [Text] The complaint clearly set forth the theory of the case that the mark in question was in nonuse for a period of two consecutive years. Evidence on this issue was admitted without objection from appellant. Regardless of the defects which appellant now alleges, the abandonment issue was properly tried. By operation of Rule 15 (b), the abandonment issue, unrestricted by the filing date, was tried by implied consent of the parties. Appellant had notice of the issue as tried. Notwithstanding Rule 15 (b), however, appellant's tactics are of no avail. His mark was in jeopardy from the date of last use, July 12, 1973, and the pending litigation did not stop the two years from running against it.
>
> An analogous situation is found in In re Beatrice Foods Co., 57 CCPA 1302, 429 F. 2d 466, 166 USPQ 431 (1970). In that case, the issue of registrability in a concurrent use proceeding was decided on facts as they existed at the close of the testimony period. Our rule permitting a party to show facts which existed subsequent to the filing of the complaint is based upon the dynamic nature of trademark rights. This rule should be applied in the case presently under consideration. That the two years had run against the mark subsequent to the date the complaint was filed is irrelevant.

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To conclude, appellant neither preserved his objections below in accordance with the FRCP nor attempted to rebut appellee's prima facie case of abandonment. He now asks us to put on blinders as we review the evidence on record. The equities of the case do not favor a party who has not only circumvented the FRCP, but also failed to present rebuttal evidence to carry his burden in the case. His appeal must fail. For the reasons stated above, I would affirm the board's decision that appellant's mark is abandoned. [End Text]

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TWO TRADE ASSOCIATIONS VOICE SUPPORT FOR LICENSE APPROACH IN GOVERNMENT PATENT POLICY

Now that advocates of a title approach in Government patent policy have had their say before Congress (see 358 PTCJ A-11, 360 PTCJ A-4, D-1), two major trade associations have asked that their contrary views he added to the record of hearings held before the Senate Subcommittee on Monopoly and Anticompetitive Activities. In statements submitted to subcommittee chairman Gaylord Nelson (D-Wis.), both the Aerospace Industries Association of America (AIA) and the National Security Industrial Association of America (NSIA) criticize the notion that the Government should take title to all inventions resulting from Government contracts. Instead, they argue, contractors should retain their inventions and grant a license to the Government.

In a statement submitted January 26th, AIA argues that "a title policy is not in the best interest of the public." To support its position, AIA directs the subcommittee's attention to a Colloquium held in January 1976 by the Energy Research and Development Administration (ERDA). See 316 PTCJ A-2. Most of the participants in the Colloquium spoke in opposition to the title policy imposed on ERDA by Congress.

NSIA, in a statement submitted January 31st, declares that a policy permitting the Government to take title "would defeat the inherent incentives of the U.S. patent system and the ultimate result would be detrimental to the public."

Both AIA and NSIA express strong support for the bill introduced by Representative Ray Thornton (D-Ark.), H.R. 6294 (see 324 PTCJ A-6, 325 PTCJ A-4, D-1), under which patent rights would presumptively belong to the contractor doing the federal research, subject to the Government's retention of "march-in" rights to order the licensing of a patent if it isn't being commercialized. Thornton's bill, says NSIA, "embodies an equitable sharing of patent rights between Government and industry." According to AIA, Thornton's bill adequately "protects the public should the contractor fail to satisfy public needs."

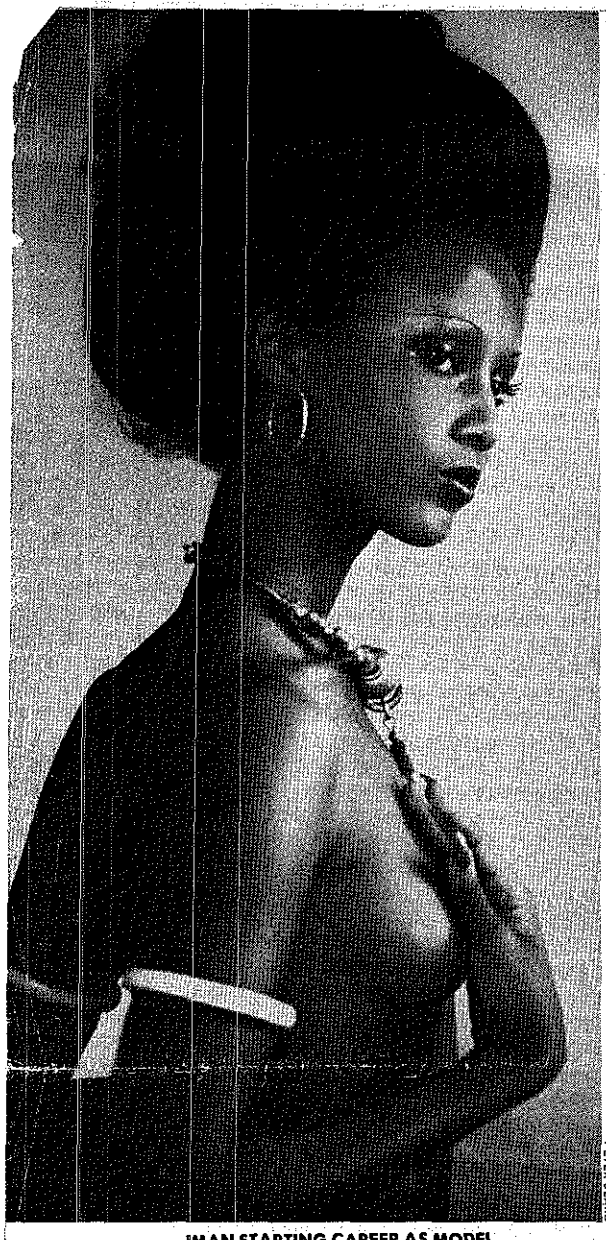
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PATENT INFRINGEMENT CLAIM WITHSTANDS SUMMARY DISMISSAL MOTION; UNFAIR COMPETITION CLAIM AXED

Because the record is barren as to the level of ordinary skill in the pertinent art, the U.S. District Court for Eastern Pennsylvania refuses to summarily dismiss a patent suit on obviousness grounds. However, the court does dismiss an additional charge of unfair competition because the patentees merely license their invention and do not sell or manufacture any product in direct competition with the defendant. (Sims v. Mack Trucks, Inc., 2/8/78)

Plaintiffs brought suit alleging infringement of a patent for a Forward Discharging Transit Concrete Mixer. A claim for unfair competition was also asserted. Defendant, Mack Trucks, moved pursuant to Fed. R. Civ. P. 56(b) for summary judgment as to each count. According to Mack, plaintiffs' patent is invalid for obviousness. Defendant also contended that plaintiffs' unfair competition count must fall for lack of standing to sue.

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PETER BEARD

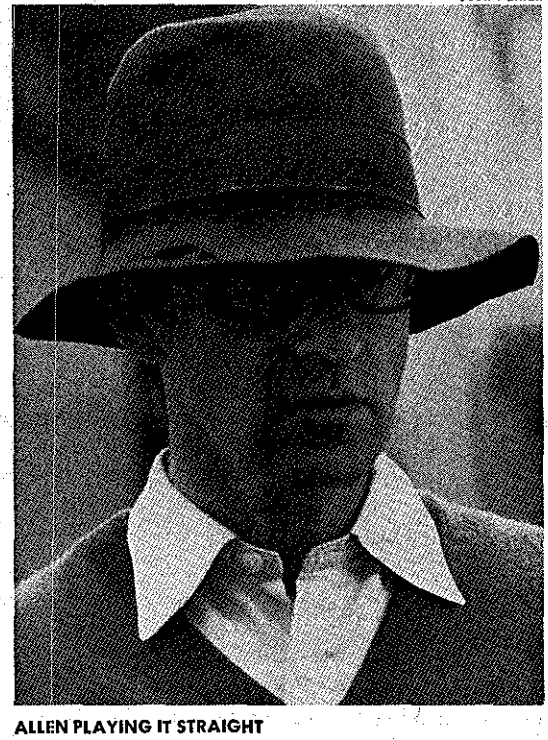
IMAN STARTING CAREER AS MODEL

Snapping crocodiles in a game preserve in northern Kenya, Photographer **Peter Beard,** 37, eyed a 5-ft. 10-in. Somali tribeswoman with the face and bearing of Egypt's classic Queen Nefertiti. "She was the most beautiful African I had ever seen," says Beard. "And in Africa, you learn to snag things when you see them." So Beard quickly snagged the tribeswoman—known as Iman—away from her chores tending the family's 500 cattle and sheep. He took lots of photographs and persuaded the Wilhelmina Model Agency in New York to sign her up. Iman, 20, who speaks fluent English, learned in the missionary schools she attended until age 15, arrived in Manhattan last week looking well-coiffed, made-up and clothed in jungle chic. "She's *very* distinguished, with a beautiful head and lovely long throat," observed **Diana Vreeland,** former editor of *Vogue.* Wilhelmina projected Iman's first-year salary at $80,000, prompting Beard to boast: "I feel like it's *My Fair Lady.*" Iman's own goal: "To see the world."

■

Woody Allen and **Zero Mostel** playing it straight? Director Martin Ritt *(Sounder, Hud)* has unsmilingly cast the two in Columbia Pictures' *The Front,* a drama about Hollywood blacklisting in the '50s. For Mostel it's all bitter experience, for he was interrogated by the House Un-American Activities Committee in 1955 and scorned by movie producers for a decade. For Allen, playing a bookie who lets a blacklisted writer use his name, drama is all new, and he claims to be, as usual, nervous. "I can't guarantee the outcome," he says on the set. "I'm going to prove that comedians don't make great actors." The lovable shlemiel of *Sleeper* and other banana-peel epics is playing love scenes without his usual costar and onetime roommate **Diane Keaton.** "We're just very very good friends," insists Allen. "We haven't been, uh, that way for years." Allen is even managing without his familiar props. "There is nothing big in the film," he says with a touch of regret. "No big bananas or big breasts."

JOSH WEINER



ALLEN PLAYING IT STRAIGHT

■

In Paris, it's New Jimmy's and Le Régine. In Monte Carlo, the snob spots for drinking and dancing are the Maona (Tahitian), Paradize (Brazilian) and New Jimmyz (art deco). The woman who manages all this, sometime Singer **Régine** (nee Zylberberg), 45, now plans new discothèques in Rio and Manhattan. "Life begins with the first cocktail," says the lady who introduced *le twist* to Paris. "She only sleeps three hours a night," adds her husband and former secretary, Roger Choukroun. The cabaret queen is also branching out into fashion design. Her first collection, introduced at a Paris ready-to-wear show last week, features—what else?—evening wear specially designed for dancing. With it all, redheaded Régine finds time to rehearse for a new film, *The Seven Per Cent Solution,* with **Laurence Olivier** and **Vanessa Redgrave.** Her part: the madam in an exclusive bordello.

THEVENIN—SIPA



REGINE IN MONACO NIGHTCLUB

■

"An odd man . . . unpleasant . . . very artificial." Many people have said worse things about **ex-President Nixon,** but the speaker this time was his own Secretary of State, **Henry Kissinger.** The occasion was a black-tie dinner in Ottawa given in Kissinger's honor by Canadian External Affairs Minister Allan MacEachen. After the toasts were delivered, Kissinger evidently assumed that the tabletop microphones had been turned off, but a technician made the

have a timetable right now. [As for the Chinese] well, they've stated publicly that they're patient.

Q. ***There have been reports that you will make a visit to Israel and Syria in December. Is that correct?***

A. Absolutely not. Short of some crisis that I now don't see, I don't believe that I will visit Israel and Syria at that time.

Q. ***Do you feel that there will be a major reassessment of American commitment to Israel—and American policy in the Middle East in general—when the aid appropriations are presented to Congress?***

A. The aid discussions take on a very curious form. The impression has been created that the aid requests for Israel and Egypt are caused by the Sinai agreement. Indeed, I saw it in your magazine [TIME, Sept. 15] that "Kissinger promised them certain things." The fact is that before the agreement the Israelis asked for $2.6 billion and were confident enough of getting it that they put it into their budget as a public figure. Seventy-six Senators urged us to meet that request.

Last year Israel received $3 billion of emergency and regular aid, and a substantial sum for Israel has been in every budget for the last 15 years. Similarly, we had allocated a certain amount for Egypt prior to the agreement. Aid levels were never discussed with Egypt during the agreement. We set the levels unilaterally after the agreement was completed. Aid to Israel and Egypt reflects our own interests; it is not a payment for the agreement.

Q. ***What about a reassessment in terms of our own domestic priorities—for example, the problems in New York?***

A. This is not a fair choice because if you sacrifice an ally abroad, even if it has no immediate consequences, the long-term consequences in terms of your international position are very severe. We must overcome the idea that when we deal with foreign governments it is a favor that we do them, that we can withdraw without penalty to ourselves. If we have a close relationship with a foreign government, it must be because we believe that we have permanent interests. If we don't, then that relationship is in trouble. But if we do have permanent interests, then we cannot choose between New York and, say, Israel.

Q. ***There's been considerable questioning and criticism . . .***

A. If it's criticism, it was unfair. [Laughter.]

Q. ***. . . . about the failure of the U.S. to speak out for trial by jury and the rights of the accused in the case of the summary execution of Basques and leftist terrorists in Spain. Why was that?***

A. I don't have the impression that trial by jury is part of the Spanish legal tradition. Trial by jury isn't the case in France and Germany. It's not the case in any country that has the Napoleonic Code or the Roman law. Trial by jury is an Anglo-Saxon concept that exists only in countries within the Anglo-Saxon jurisprudence.

We did not take an official position on the legal proceedings that were carried out in Spain, and I don't think that was the objection of many of the Europeans. Rather it was a rallying point for a historical resentment of Franco Spain, which is rooted in the experience of the Spanish Civil War. The relationship between Spain and the West—bringing Spain back to the West—is one of the critical problems of our foreign policy over the next five to ten years.

Q. ***What are your top priority items in foreign policy?***

A. In foreign policy there are always periods of innovation and then there are periods of consolidation. We went through a period of innovation with respect to the Communist countries between '71 and '73. We are now in the process of consolidating this. We then went through a period of innovation in our relations with Western Europe and Japan in the period of '73 and '75. This is still going on. Although it has not been, in my view, adequately noted, I think our relationship with the industrial democracies is better and more creative than it has been at any time since the late 1940s. The things that were considered very advanced in '73, when I put forward the Year of Europe, are now accepted as a matter of course. At that time when we proposed that economic policies should be coordinated, this was rejected. Today it is made as a demand. This is a period I would put in the middle of its creative phase.

Then we have the relationship with the new countries in which we have just begun the process of construction with the Seventh Special Session.

Those are the three areas which are in various states of evolution. Of course, you have critical problems like the Middle East, which must, in my view, in the next three to five years make a substantial advance toward peace—or maybe achieve peace.

One of the things we've often discussed is the vitality of Western institutions in the period of change. This is perhaps our deepest problem, to which a foreign policymaker can contribute by performance but not directly.

Q. ***Last week you met with the Portuguese Foreign Minister [Melo Antunes] and the Administration has put forward to Congress the proposal for $85 million in aid. How do you now feel about the survival of pluralist democracy in Portugal?***

A. My position has been that without a systematic effort to encourage the pluralistic forces in Portugal, they would be defeated. For a while there was a disagreement between us and the West Europeans, who thought that the forces of the government that was in office earlier this year would over a period of time produce pluralism. I was skeptical about this. During the summer the West Europeans came to the same conclusions we had earlier reached; namely, that pluralism had to be actively encouraged. And that has always been my position. I think it is still a very precarious situation in Portugal, the outcome of which is not clear. Recent trends are more encouraging.

> "Without a systematic effort to encourage the pluralistic forces in Portugal, they would be defeated."



Q. ***In your U.N. speech you suggested a conference between the concerned powers about the future of North and South Korea. That was rejected by the Chinese and the North Koreans.***

A. Yes, but I'm not sure that is absolutely their last word on the subject. Even if there is no formal conference, we can have exchanges of views. We are not opposed to North Korea as such. What we don't want to do is have bilateral talks with North Korea to the exclusion of South Korea. We don't want to have South Korea maneuvered into the position of an international pariah while we settle the future of North Korea in negotiations with other countries. We would be prepared to participate in any negotiations or in any conference whose composition was reasonably balanced that included South Korea. Similarly, if the Soviet Union or the People's Republic were prepared to recognize South Korea, we would be prepared to recognize North Korea.

Q. ***In 1961 in* A World Restored, *you wrote that "statesmen often share the fate of prophets"—that they're without honor in their own country. Do you feel that you're suffering this fate?***

A. Well, the lead time for prophecy has shortened. I think in the country there's a general feeling that our foreign policy is reasonably effective. Some of the criticism is the natural result of an election year. Some of it is the inevitable consequence of having been in office for seven years, in which you accumulate a lot of mortgages on yourself.

Inevitably, after one is out of office, one's policies will be seen in clearer perspective, because then the alternatives will have to be tried or rejected by somebody else. But, on the whole, the criticism does not go to the central core of the policy and, therefore, I believe the central core of the policy will be carried on after I leave office—even if another Administration succeeds us.

Q. ***It sounds like you'll stay, if the President's elected.***

A. Don't scare me like that. I'd lose at least my dog, and probably my wife. [Laughter.]



"It is necessary for the Western democracies to recapture the sense that they can control their own destiny."

forces that sweep across, that produce unemployment, that produce inflation. This is the reasoning behind the planned summit meeting in November.

Q. ***How do you think détente is perceived by the American public?***

A. The détente debate suffers from a number of misconceptions and oversimplifications. One is that détente is a favor we grant to the Soviet Union, or that we can withhold it as a punishment. The fact is that we are attempting to carry out a foreign policy geared to the realities of the period. One, that the Soviet Union is a nuclear superpower, whose military potential cannot be effectively wiped out in a surprise attack, any more than ours can. This being the case, any war between us will involve colossal, indeed catastrophic, damage.

Second, the U.S. is no longer predominant, though it is still probably the strongest nation.

Third, the prevention of Soviet expansion, which remains a primary objective of American policy, has to be carried out in a more complicated way than in the 1940s and 1950s.

Fourth, the world is no longer monolithic. It is not one in which we can give orders, or in which we can dominate a Western group and the Soviets dominate an Eastern group.

And fifth, we have to consider what this country has gone through with Viet Nam, Watergate and the attendant congressional restrictions. For us to run the risks of a confrontation that will be considered by our people as unnecessary is to invite massive foreign policy defeats.

I believe that the policy we are carrying out with the Soviet Union has put us in the best position to resist Soviet pressures and in the best position to exploit possibilities of positive developments in Soviet policies. Now, however, the debate gets carried on as if we are giving away things to the Soviet Union. Where has the Soviet Union made a unilateral gain?

Q. ***It has been charged that because of détente we gave the Russians too generous terms in the 1972 wheat deal, and that at Helsinki we allowed the Soviet Union to ratify its dominant position in Eastern Europe.***

A. The wheat deal is generally recognized today as a bureaucratic mistake. It had nothing to do with détente. In 1972 the decision was made to sell them wheat because it was considered a good thing for our farmers. And for that reason, it wasn't watched sufficiently at the political level. That was a mistake, but it was not a mistake of détente.

The so-called Helsinki issue has to be seen in the context of the evolution of East-West relationships. We used it as an incentive to get a Berlin Agreement and the start of mutual balanced force reductions in Europe by refusing to agree to a European Security Conference until after a Berlin Agreement. And that in turn quieted down an explosive situation, we hope for the foreseeable future.

With respect to the frontiers, Helsinki ratified nothing that had not been ratified before, at Yalta, Potsdam and in the peace treaties. The Soviet political position in Eastern Europe depends on military predominance, and on history since 1950, which has made it clear that the Soviet Union would not tolerate a breakaway from its form of government and that the West would not intervene if the Soviet Union asserted itself militarily.

Q. ***If we don't have a SALT agreement this year or early next year, would that basically change the relationship between the U.S. and the U.S.S.R.?***

A. I don't want to give a specific deadline for the SALT agreement. But if the SALT negotiation should fail, both sides will be forced to build their strategic forces in anticipation of what the other side might do.

In our case it would mean that rather than the Soviet Union reducing their strategic forces from the approximately 2,600 units they have now to 2,400, we would have to calculate that they will stay at 2,600—or maybe go on beyond that. To match this would involve a significant increase in our strategic defense budget. That, in turn, can only be justified on the basis of an increased danger. So the rhetoric of both sides will become more confrontational, and I would think that it would lead to a substantial chilling in the relationship—if not to a return of the cold war.

Q. ***Isn't there a basic difference between the Pentagon and the State Department on our SALT negotiating position?***

A. If there is a basic difference, I know about it only from the newspapers. The last position that was given to Foreign Minister [Andrei] Gromyko was jointly worked out by the Secretary of Defense and myself. It was then approved by the President. If there should be a disagreement—and the disagreement is always much more in the press than in reality—then it will be settled by the President.

Q. ***Do you expect that there will be an agreement this year?***

A. It's now getting rather late in the year. It would take about six to eight weeks, even after an agreement in principle, to work out all the technical details. So it may slip beyond the end of this year.

Q. ***Would it be possible for [Soviet Party Chief Leonid] Brezhnev to come to the U.S. before a SALT agreement is worked out?***

A. I would think it's unlikely. I think his visit would be tied to a SALT agreement.

Q. ***Do you agree—as the Chinese have charged—that the danger of war between the U.S. and the U.S.S.R. is increasing?***

A. I do not see the danger of war increasing with the Soviet Union. I think that in the next decade, as Soviet power grows—and it will grow not as a result of détente, but as a result of technology and economic development—the temptation to achieve political positions commensurate with that power may also grow. And in that sense there could be a danger of increased conflicts if we do not, prior to that event, regulate our relationships in some manner, and if we fail to keep up our defenses.

Q. ***Would it be in our strategic interest if there was war between the Soviet Union and China?***

A. No. We are not stimulating the rivalry; we are doing nothing to encourage that conflict. It exists; it is a fact of political life. It is not anything in which we can ourselves get involved. But a war between those two countries would be unfortunate. We're trying to improve relations with both [countries]. Of course, each might prefer it if we did not have a relationship with the other. For our purposes, it is better to have a relationship with both.

Q. ***Why should the President go to China this year?***

A. The President is going because the essence of our relationship with China depends on a mutual understanding of each other's perceptions of the world. That requires a periodic exchange [of views] at the highest level. There hasn't been a meeting between the top Chinese leaders and an American President for nearly four years. In a relationship in which so much depends on intangibles, an occasional meeting is quite important. [The trip] will certainly not be just ceremonial.

Q. ***Do you expect the question of normalization of relations—short of our breaking of relations with Taiwan—to be resolved?***

A. The issue will certainly come up, and we'll discuss it in the spirit of the Shanghai Communiqué, which provides that the purpose of our contacts is to achieve full normalization. We don't

"Our relationship with China depends on a mutual understanding of each other's perceptions of the world."



Kissinger Speaks Out on Foreign Policy

Henry Kissinger is on the move again. Last week, after making his first visit to Canada, he flew to Tokyo and then on to Peking. Before going to Ottawa, the Secretary of State sat down for two hours with TIME *Diplomatic Editor Jerrold Schecter and State Department Correspondent Strobe Talbott for a wide-ranging discussion of his foreign policy. Excerpts from the conversation:*

Q. ***Will the continuing tension between you and Congress affect American foreign policy?***

A. I don't think that there is tension between me and the Congress on a personal basis. I have, I think, extremely good personal relationships with most members of the Congress. But personal relations are not the issue. We are going through a period right now where, in the aftermath of Viet Nam and Watergate, the Congress is attempting to shift the balance between Executive and congressional power. There is [also] a profound feeling of distrust in the Congress of Executive discretion, which causes them to insist on a kind of documentary evidence which no congressional committee ever asked for before. At the same time, the structure of the committees has disintegrated to such an extent that the documentary evidence becomes public, creating new foreign policy problems.

To some extent, I favor [the tension]. I think the balance swung too far toward Executive authority in the '60s. But there is a danger that it may swing too far toward congressional authority in the '70s. And this will tend to paralyze foreign policy.

Can this problem be solved by taking Congressmen into negotiations? I don't want to exclude this totally. But it is not enough, for example, to have somebody in on a negotiation unless he knows all of the strategy that went into it. And it raises the issue of what happens if there is not complete agreement as to tactics.

In foreign policy, unless you have an overall design, your behavior grows random. It is as if, when you are playing chess, a group of kibitzers keeps making moves for you. They may be better chess players than you are, but they cannot possibly get a coherent game developed. Especially if, at the same time, you have to explain each of your moves publicly so that your opponent can hear it.

I don't know exactly what the solution is. I know I am spending over half of my time now before congressional committees. And that, too, is getting to be a problem in policymaking. I spent 42 hours in testimony and in private conversations with Congressmen in a three-week period on the Sinai accord. That is a lot of time, and it is in addition to the normal congressional contacts.

Q. ***You talk about kibitzers. Isn't that part of an open democracy?***

A. There is no parliament in the world that has the access to policymaking that the Congress of the U.S. has—not in Britain, not in France, not in any of the democracies. The key decisions have to be subjected to congressional approval. The democratic process involves an approval [by Congress] of the general direction in which a country is going, as well as of specific individual steps. But to attempt to subject every single decision to individual approval will lead to the fragmentation of all effort and will finally lead to chaos and no national policy.

Q. ***In an article in the* Public Interest, *U.N. Ambassador Daniel Moynihan wrote that "liberal democracy on the American model tends to the condition of monarchy in the 19th century: a holdover form of government, one which persists in isolated or peculiar places here and there, but which has simply no relevance to the future. It is where the world was, not where it is going."***

A. I don't agree at all. Where the world is going depends importantly on the U.S.

In the 1950s every new country wanted to be democratic because we were impressive or looked impressive, powerful and purposeful. In the 1970s, after all we have gone through, that condition no longer exists. This is not an inevitable result. It may well be that democracy is not going to make it. But if democracy isn't going to make it, this is going to mean such a monumental change in the American perception of the world and of itself that it will have the profoundest consequences within America over a period of time.

Democracy in the 19th century was an essentially aristocratic phenomenon. You had limited ruling groups in most countries. This was not true of the U.S., although we did have restricted franchises. And you had, above all, a doctrine of limited government and relatively simple issues. Now the Government is involved in every aspect of life. The issues become unbelievably complex.

Another problem is that in almost every democratic country so much energy is absorbed in getting into office that leaders are not always as well prepared as they could be and have to learn their job by doing it.

All of this has created a crisis of leadership in many democratic countries. But it is a crisis that we must solve.

Q. ***Do you think we are better off than European countries?***

A. Far better. The American body politic is basically healthy. Our people are confident. They want to believe in their Government. There is not the fundamental division you have in many foreign countries. Too often, the Communist vote reflects the fact that a significant segment of the population has opted out of the democratic process and has lost confidence in their government.

> "The American body politic is basically healthy. Our people want to believe in their government."



Q. ***Do the totalitarian countries have an advantage over us?***

A. They are at an advantage over us with respect to any one decision they may want to make. However, they face a problem of initiative and creativity. Moreover, the quality of leadership in most totalitarian countries is worse, because they have a problem of how to replace leaders at the very top, and how to rotate leaders at middle levels.

The Communist appeal in the Third World is not due to their own merit. Nondemocratic forms are gaining. Much of the world has its origin in some form of revolution. On the whole, revolutionaries don't make revolution in order to give up power after they have seized it. Therefore, in many parts of the world, there is a tendency toward totalitarianism simply because the generation that seized power did not go through all that suffering in order to yield it. Our revolution was very peculiar, [since] it was made by people who knew who they were to begin with, and who thought they were carrying out an existing tradition.

Q. ***Could we tolerate Communists in the government of Italy or in France?***

A. If you deal with a modern complicated democratic state, like Italy and France, it is not directly in our power to prevent it. It must be the responsibility of the governments concerned to prevent it. The alienation from government cannot be remedied primarily by the U.S.

At the same time, insofar as we can, it is necessary for the Western democracies to recapture the sense that they can control their own destiny—that they are not subject to blind economic

viewpoint

Getting ready for our quadricentennial

As 1975 passes inexorably into history, we Americans might well be pardoned in our pride of two centuries of generally enlightened progress. Our achievements—governmental, social, scientific, technological, industrial—have been many; our deeds, for the most part, great. Our compassion, as a nation, has been noteworthy, even singular, in the sweep of history.

Still, our bicentennial fervor should not becloud one key point: we had more than a little help along the way. It has become fashionable to speak of our current interdependent world, as if that development were a recent phenomenon. But the truth is that civilized man has been interdependent from the start. That fact is simply more pronounced and obvious now. The American success story has had many chapters. But most of them are studded with footnotes that soon lead you elsewhere, one way or another.

Take our chemical industry and the science on which it is based. Today, American Nobel laureates in chemistry make up an impressive list. Each added to our storehouse of chemical knowledge. But they were building on a base of already broad dimensions sketched in by others. Our first Nobelist in chemistry, Theodore Richards, for example, was honored in 1914 for his atomic weight determinations. Yet, the roots of his work trace straight back to Joseph Priestley, an English theologian who discovered oxygen in 1774 and who later in this country helped establish chemistry as a modern science. To Antoine Lavoisier, a Frenchman who quantified the concept. To John Dalton, another Englishman, who began to put it all together in the form of modern atomic theory. To Dmitri Mendeleev, a Russian who perceived the periodic order of the elements.

In a similar way, many of our modern chemical products and processes either were originally developed elsewhere or stem from work done elsewhere. Study the lineage of many dyes, plastics, industrial chemicals, synthetic fibers, and chances are you'll find significant spade work was done in England, France, Italy, Germany. Nor does recognizing such international connections demean the American effort. But it does underline the critical role of cross-fertilization in our development.

The process continues apace. It is true that in our two centuries we have built up an economy that now accounts for almost 30% of gross world product turned out by only about 6% of the world's people on 7% of the world's land area. But it is likewise obvious that 94% of the world's people and more than 70% of its gross product are outside the U.S. Consultant James W.L. Monkman has pointed to the potential, much of it chemical, that has built up beyond our borders, in terms of added markets, talented people, established capabilities, material resources, special advantages and new technology.

New technology and its sources are especially worth noting. For example, the share of U.S. patents issued to British, French, German and Japanese inventors rose from 11.7% to 19.3% between 1963 and 1971. In 1969, patent applications filed in the U.S. totaled 101,000. But in Japan the number was 106,000, and in France, Germany, Italy and the U.K. combined, 209,000. Research personnel in the U.S. numbered 550,000. But in the U.S.S.R., the figure was 628,000, in France, Germany and the U.K. combined, 173,000, and in Japan, 172,000. These admittedly rough numbers seem to indicate that the center of technological gravity is shifting away from the U.S.

Nor does that trend seem likely to alter any time soon. Thus, real growth in total industrial R&D spending in the U.S., according to a recent National Science Foundation survey (*see story, p. 23*), continues to lag behind performance of the 1950s and early 1960s.

Perhaps there is a dual bicentennial message here. The rest of the world is a growing source of knowledge that we should continue to tap. On the other hand, we must continue paying our dues by adding new knowledge ourselves. Therein lie the keys to our quadricentennial.

Patrick P. McCurdy

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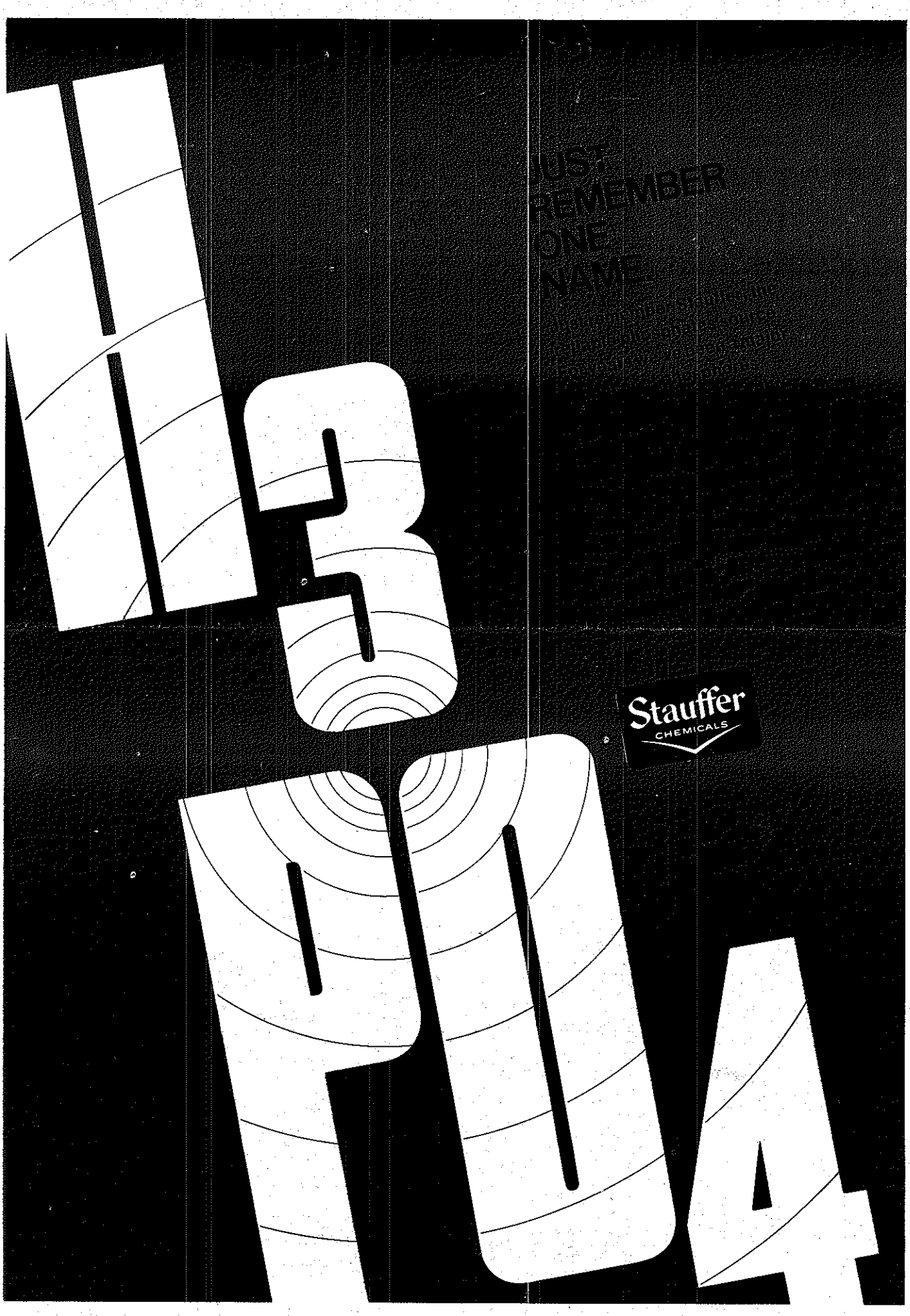
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MATHEWS ON PAPERWORK

Following are excerpts from the prepared text of a speech given by F. David Mathews, secretary of Health, Education and Welfare, before the Association of Governing Boards of Universities and Colleges on October 18.

An enormous investment of your time and talent — and the resources of your colleges and universities — is now diverted to completing forms and responding to inquiries from a multitude of agencies of the federal government and other levels of government. To put it simply, we are making bureaucrats out of educators.

Federal over-control threatens to fill educational institutions with people who are better at filling out forms than they are at thinking through ideas. In the process, we are badly short-changing both our educational institutions and the society which looks to them for leadership.

The problem goes beyond higher education, imperiling not only your institutions, not only the nation's students, but inevitably, society as a whole. I would like to report on the steps we are taking to reduce the burden of federal reporting requirements upon higher education.

First of all, we must look to the expertise that exists in the educational community. There resides within us collectively a strength not present in us individually, as a government and as an educational community. Together, we are finding ways to exercise and take advantage of that collective strength. Within the higher education community, the National Association of College and University Business Officers recently completed a survey to quantify the most burdensome federal paperwork requirements. . . .



F. David Mathews

We have just finished working with a group representing both small and large university administrators — people who have to collect the data and fill out the forms. After an intensive two weeks of discussion and analysis, the group has distilled what they have experienced first-hand and what they learned from the surveys taking place in higher education into a series of recommendations for federal action to consolidate and simplify reporting requirements.

I am forwarding their recommendations to a newly-constituted federal Interagency Task Force, which will continue to seek further advice from the higher education community and to arrive at some agreement on actions to be taken within the next sixty days. I would hope that the accomplishments of the interagency body would be reported by November 30 and then reviewed and reported to the President by a higher education panel chaired by President Robben Fleming of Michigan. . . .

With the establishment of an Interagency Task Force, we will have a forum for focussing on common concerns and arriving at a set of recommendations reflective of the understanding, the knowledge, and the advice of both higher education and the federal government. The Task Force would continue to seek the expertise of the higher education community, inviting informal participation from public colleges and universities, large and small institutions, and making use of existing efforts underway. I would hope that the Task Force would also work to establish relationships and coordination with state representatives and state agencies. . . .

It is a great temptation for university executives to argue for or against things in the name of the self-interest of their institutions. But as citizens we have an obligation to examine the question more fundamentally and to ask whether society itself stands to gain or lose. The public outcry against governmental intrusion, seen as increasing requirements, restrictions, and regulations, goes beyond higher education. The issue, more basically, has its origins in the role we assign to government and every institution touched by government is affected. . . .

My argument, then, is that we live in a two-axiom world: we can neither fail to control nor can we fail to control wisely. The hard truth is that there is no such thing as going straight from intent to result, because the process will inevitably be encumbered with forms and formulas and controls. It is no longer enough to say that the mechanisms have good purpose; it is necessary now to say that the mechanisms are as good as we can make them. It is necessary to be conscious of the possibility of untoward effects from what we do.

Whatever mechanisms we ultimately choose, we must not overlook the very clear and present danger not simply to our time and patience but to the intellectual vitality and social usefulness of higher education.

tion with other affected agencies, users and data providers.

The single agency must have the resources — personnel, hardware, software — necessary to carry out effectively the responsibilities of a single-source agency.

The single agency shall disseminate in timely fashion such summaries, aggregations, or other arrangements of the data as may be required by Congress and by the Executive Branch in the consideration of policy issues.

The single agency shall also disseminate in timely fashion to the providers of data, reports at the levels of detail necessary for effective use at the institutional level. Non-federal organizations shall have access to the statistical/informational data.

Institutions should be presented with the appropriate portions of the standard survey instruments no more frequently than once a year, at a date reasonable to give sufficient advance notice to allow preparation of information. Returns of the surveys should be at different times during the academic year, related to when the data normally become available.

Review Currently-Collected Data

The Task Force should require all federal agencies currently collecting data from institutions of higher education to examine all required reporting in terms of appropriateness, necessity, reasonableness, and duplication. These agencies should identify for the Task Force the statutory basis or the administrative regulations requiring the data, reports or institutional record keeping. These agencies should provide illustrations of actual uses of the data.

If no current valid use can be demonstrated, the Task Force should, for administratively imposed requirements, request the appropriate secretary of a department or head of an independent executive agency to have the reporting or record keeping requirement dropped and to have the regulations amended accordingly. If the requirement is statutory, the Task Force should request the appropriate secretary or head of an agency to notify Congress that the data or record keeping are not serving valid functions and to request Congress to amend the statute.

Eliminate Duplicative Paperwork

The Task Force should identify immediately, as an interim measure, the duplication in the reporting required of institutions of higher education, and develop procedures which will eliminate duplicative paperwork for respondents.

Review Processes for Administering Regulations

The Task Force should review the processes by which administrative regulations and reporting requirements are imposed on institutions of higher education. Processes must be established which include appropriate consultation on legislative intent, agency Budget) more clearly identify the real burden on institutions of higher education by requiring sponsors of forms presented for clearance:

1) to identify the items duplicated in other federal survey or reporting forms completed by the affected institutions of higher education;

2) to spell out more realistically the man hours required to obtain the necessary data and to complete the forms;

3) to identify in detail the types of internal institutional record keeping necessitated by the reporting form; and

4) to reasonably estimate the additional man hours required for this internal record keeping and to include this figure in the total burden.

Use Cognizant Agency Concept

The Task Force should recommend extension of the cognizant agency concept in order to reduce overlapping and conflicting regulations among agencies.

Under this concept, a single agency is assigned responsibility for issuing and administering regulations on a particular topic. As in the case of contract compliance with EEO procedures, different agencies may be assigned to different sectors, but in any case all of higher education would be under a single agency's cognizance for any given topic.

The Inter-Agency Task Force should examine various areas to determine whether they lend themselves to this technique or whether there are *necessary* agency differences in approach to any of the areas. The following are examples of topics that could be examined:

- the protection of human subjects
- care of laboratory animals
- management and control of property acquired under grants and contracts
- clean air
- water pollution
- nondiscrimination (in addition to contract compliance)
- patents, particularly institutional patent agreements.

Ease Burden on Small Institutions

The Task Force should, throughout its deliberations, search for ways in which the federally imposed burden on small institutions can be alleviated. We suggest that the test of materiality might be applied to frequency of reporting and to the detail required in record keeping and reporting. We suggest that the Task Force also consider simplification or consolidation of application forms for grants and any other means by which presently applied complex procedures may be made manageable for small institutions.

Below on the preceding page is a generalized chart of the direction the article takes. It simply indicates that to use the innovation process for achieving a more secure society, rather than one headed toward anarchy it is important to develop a clear focus on threats to security. Obviously, although there may be signs of anarchy, there are also signs of hope, as Herbert Hollomon of Massachusetts Institute of Technology, points out in the article. Dr. Baruch seems to have a unique opportunity to contribute original thought to the innovation process, rather than simply to retread ground covered in the past by, for example, his colleague in the Commerce Department, Michael Boretsky, and his predecessors in the job.

Harvard economist Joseph A. Schumpeter, who made more than his share of contributions to the role of innovation in an economy, held to the view in his later years that capitalism—the cornerstone of the U.S. political system—was not long for this world. He said capitalism would destroy itself not through weakness but through its successes because of its hunger for growth. These successes, he said, would create "an atmosphere of almost universal hostility to its own social order." It is the premise of this article that such questions should again be explored, to search out the kind of system toward which the U.S. should direct its evolution.



Jordan Baruch

a complex relationship

Wil Lepkowski
C&EN, Washington

This article delves not into R&D budgets, trade figures, or productivity statistics but rather into ways of looking at a troubled technological economy with new lenses. But numbers do have a socko quality when used sparingly to make a point. And the point to be made here is that the U.S. balance of trade in manufactured goods is in a shocking decline. The projected deficit in such goods in 1978 will be $18.4 billion as part of the total projected $43.8 billion trade deficit.

By contrast, Japan enjoyed a $63.6 billion trade surplus last year in manufactured goods. The bottom line is that the U.S. dollar is going to continue its decline on the world monetary markets. And the question is how the U.S. is going to adapt to what is really a new global equilibrium in the 1980's.

According to Michael Boretsky, senior economic analyst at the Commerce Department, the reasons for the continuing decline are:

- Slower economic growth overseas.
- The Organization of Petroleum Exporting Countries' inability to absorb higher levels of imports from the U.S.
- Increased abilities of the rest of the industrial countries to innovate, helped along by the shared resources of U.S. multinational corporations.
- A phenomenal export drive on the part of foreign countries since 1973 to obtain dollars to pay for their huge oil imports and thus avoid paying for the imports with their own real estate or other objects of permanent wealth.

The response to the gloom has been a series of jerky motions by the Administration in the form of unreassuring pronouncements by the President, his trade negotiator Robert Strauss, his Treasury Secretary Michael Blumenthal, and other high-level advisers, plus diplomatically worded reprimands by Japan and West Germany.

Fortunately, with the present outlook so dim, President Carter is looking toward the future. He has assigned Commerce Secretary Juanita Kreps to organize a Cabinet-level panel to see what can be done about moving the U.S. back to the technological front row. Her assistant secretary for science and technology, Dr. Jordan Baruch, will be conducting the study's day-to-day details and Presidential science adviser Frank Press will oversee the whole operation. Many longtime observers of civilian technology efforts in Washington are skeptical.

But a Congressional friend of Baruch's says, "If there is an opportunity not to fail, Jordan will find it. He is the type who will use systems analysis, politics, three martinis, and his enormous amount of energy, all combined with good disciplinary approach in economics."

Says Dr. Press of the study: "The principal motivation for the review is based on the idea that industrial innovation is central to the economic well-being of the country. It is seen as providing a basis for economic growth and as intimately related to such important concerns as productivity, inflation, unemployment, and the competitiveness of U.S. products in both domestic and world markets. This must be done, of course, consistent with other national goals. We do not want, for example, to overturn carefully conceived regulations that serve important environmental, safety, or health goals."

These are the questions the White House wants Baruch's study to answer:

Are new or revised government policies needed to increase industrial R&D efforts consistent with meeting national goals?

Are similar policies needed to increase the investment, entrepreneurial, informational, technological, or other capacities needed for the development and utilization of innovations?

What is the optimal level and scope of direct federal participation in the innovation process?

Are significant changes needed in current policies and procedures to minimize contradicting impacts and maximize mutual support?

Should mechanisms be introduced to assure that proposed legislation and regulations are assessed for their impact on innovation?

What can and should the government do to counter foreign initiatives that might cause U.S. industry to fall behind foreign firms in technology and in world market competitiveness?

What can and should the government do to foster technological innovation in order to improve and expand the U.S. position in export markets?

The categories to be studied will be environmental health and safety regulations, financial and monetary policy, research and development support, procurement policies, international aspects, information and patents, including international licensing agreements, social environment for innovation such as anticipated dislocation in the labor force, and industry structure, including barriers to competition.

Baruch is currently recruiting members for the study panel and for the advisory committee. The committee will meet in public sessions that will run through December.

It is important to keep a sense of history about all this. In the early 1970's, well before OPEC's shattering oil embargo and subsequent oil price rise, the worry was over the same imminent decline of the dollar and the lag in U.S. innovation.

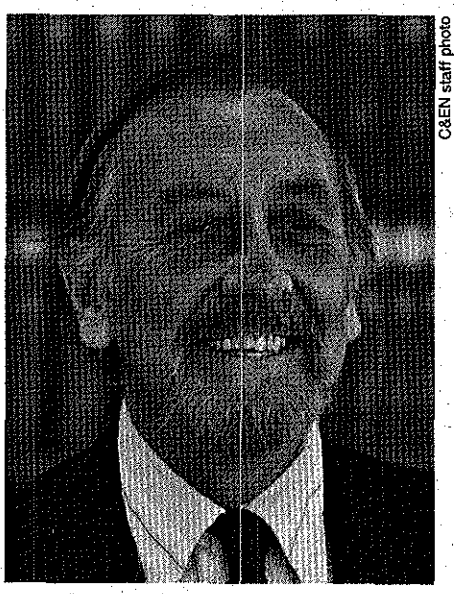
Secretaries of Commerce Peter G. Peterson and Maurice Stans were concerned, Treasury Secretary John Connally gave speeches on the subject, and the White House appointed William M. Magruder to organize a "New Technological Opportunities Program." Fred M. Bucy and Patrick Haggerty of Texas Instruments spoke out against the erosion of the U.S. balance of trade in high technology products. Reports were written on how the Japanese and West German governments spurred industrial innovation and were cutting into our lead. Japan was seen as the number one economic enemy. President Nixon issued the first Presidential message ever on science and technology.

But nothing happened, and the problems, exacerbated by oil, are getting worse.

"We are aware there were a large number of studies similarly performed in the past," says one White House aide. "But this one is different because it is at a level of attention only items of national security are given in the White House. I think we are going to uncover options that haven't been thought of before."

Robert Charpie, president of Cabot Corp. and author of a key Department of Commerce study, "Technological Innovation: Its Environment and Management," issued in 1967, thinks otherwise.

"It is apparent that Baruch has organized the study well and completely," Charpie says. "He is involving all the people who think they should be consulted. It will be exhaustive and comprehensive. But I don't think it will lead to any new results because we know what the problems are."



C&EN staff photo

Ford: security of a life system

He says there are three central issues. "In society at large there is a higher level of antipathy than ever before. It is an aftermath of the 1960's, and it is still there.

"To encourage innovation there has to be the opportunity for the far-seeing entrepreneur to get rich. The way we treat stock options, capital gains, etc., makes it hard for anyone to want to take risks. There just isn't the incentive.

"There is very much greater government presence in the markets to which technology is conveniently applied than in the past. And that presence in the support of science and technology in the private sector encourages people not in the game to play by supporting the unskilled ones in the noncompetitive companies."

At Cabot, Charpie says he spends a lot more time filling out forms and filing reports and reacting to legislative proposals. "We used to be the kind of company that said you could trust the system. But that's no longer true. There is so much stupidity and wasted motion. Our capital budgets have risen to comply with requirements. The regulators persist in saying that environmental and occupational health regulations don't cost the country anything. I don't agree. The capital becomes available for nothing else. We are only now beginning to make peace with that."

Dr. Milton Harris, who made a bundle as an innovator with his own Harris Research Laboratories, which later merged with Gillette Co., more or less agrees with Charpie that regulation is stifling the innovation climate. But he thinks larger forces are at work, too.

"I think we have built up a crisis of expectations," says Harris, who is a former chairman of the American Chemical Society Board of Directors. "We simply couldn't go on the way we were, with exponential rises in research budgets. What this implies is that we are headed for trouble because we are not innovating fast enough. But that is not correct because we can't continue to go on in that exponential way."

"The innovation issue gets mixed up with politics. When Henry Kissinger was Secretary of State he went running around the world setting up technological exchanges with other countries. At the same time, the Commerce Department was warning that we were losing our technological advantage. How can you give away technology and preserve our lead at the same time? If the Baruch exercise undertakes to understand these problems, then I'm all for it."

Harris says he wonders how a society achieves economic vitality where in the past a lot of economic growth was built on waste. "I used to trade my car in every year. But now I've made up my mind to drive it a number of years. We are fighting this crisis of expectations where everyone wants more of everything."

Some believe the innovation issue in the West requires penetrating analysis to make any new study meaningful. Says a staff member at Congress' Office of Technology Assessment: "Science and technology are antithetical to economics as we know it, both, in their ideal, aim at elegance, toward processes that avoid excess friction and that are less costly while achieving their aims. Yet the economic system is built on friction. You need an intermediate commodity called money to transfer the IOU's. Today," he continues, "it is necessary for everyone to be in debt all the time. If you accept the premise that the economy drives technology, there are economic forces that don't allow technology to do what it could for quality of life and less stressful living."

Dr. J. Herbert Hollomon Jr., director of the Center for Policy Alternatives at Massachusetts Institute of Technology and a Baruch predecessor as assistant secretary of Commerce, sees the main issues in decline-of-the-West terms and cannot see how the Baruch study can tackle those issues.

"My concern has to do with a lack of *elan*," Hollomon says. "A looking inward to our own concerns; rites of materialism; a concern with the carnival; big events; the power of the dollar and the buying of votes; hedonism. Historically, a rise in feminism is characteristic of the late stages of most cultures. It all means the weakening of resolve with respect to one's deepest ideological activities."

On the other hand, he says, now is a time of opportunity in that laws are codified, there is a mature civil service, larger concern for world problems, and an appreciation of the interactive nature of society.

Still, he says, "My greatest concern is whether the outpost of western society is sufficiently strong to withstand guerrilla and organized interventions. The other thing is the weakening of the ability of

Allied chairman Connor broods about present conditions

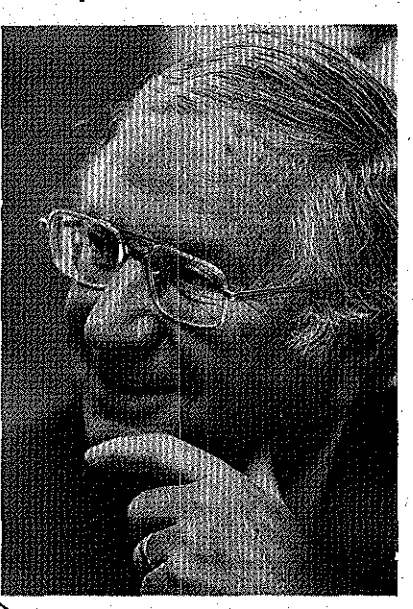
John T. Connor, chairman of Allied Chemical, looked hale and fresh in his office at Morristown, N.J. But he was worried. He knew that the interview was to be about nonmilitary threats to national security and how the innovation process could pull the country out, so that may have magnified his dour view of the government in Washington, and the country.

He listed four threats: inflation; government taxes and spending, especially for recent social programs; weakening of incentives for innovation by overregulation; and bias against business on the part of government, the media, and the universities.

"I have never been more discouraged about the economic future of this country," he says. And taking the larger social look, he terms U.S. society "fragmented" and "undisciplined."

"The real enemy is inflation," he says. "And the government is the prime culprit. It doesn't have the willingness to destroy the causes of inflation. When I was head of Merck, we had an innovative organization that was pre-eminent. It was because it had an environment that was healthy and because it had bright people. There were minimum management controls. And at the time, there were rewards for innovative results that gave great incentive through the patent system. But today the pharmaceutical industry isn't being allowed to innovate. Inventors are being robbed of their fruits through generic manufacturers, through attacks on patents, compulsory licensing, antitrust actions, efforts to make companies throw open their trade secrets, through the demand that innovators should be controlled and everything should be leveled out.

"Our entire law and regulatory process is so burdensome on business that innovative activities and risk-taking are discouraged. At Allied we are not in a position to expand R&D in ways we would like to, because we have to expand spending on toxicological and defensive activities that are not productive. The cost burden as a result of these new regulations is staggering and has to be a burden on invention. The market place won't let you get back your total increased cost. And increased prices lead to inflation. We can't make any labor settlements at less than a 7 to 10% increase. And this is at a time when productivity is increasing at 3%. The result has to be inflationary.



"I recognize a good share of the blame for social and economic problems has to be put on the steps of business people. But there is a tendency for a large number of influential people to blow business's problems out of proportion and in the process burden business with more regulation at greater cost to the taxpayer and higher and higher prices.

"The drift toward egalitarianism is approaching its height, and liberal Democrats seem bent on extending its control. At the same time we have a President whom I would characterize as a populist politician and theologian. He thinks he knows what is best and thinks he has a divine mission to impose it on the people.

"What he did during the campaign is almost an anti-due process and against the U.S. Constitution because in the months before he ran for the Presidency he sat down with a relatively small number of advisers and emerged with theological promises on all kinds of issues which he made a firm commitment on. It's true, not much has emerged as legislation, but that attitude is destructive to government. Anarchy can only be the result."

Connor is bitter over Carter's opposition to the capital gains tax relief proposals being debated in Congress. "During a period of great innovation in this country, capital gains tax relief meant that those who fought the giants and outcompeted them would get the rewards and wouldn't be taxed the same as the corporate executive. I talked to some small business people the other day and they are extremely discouraged."

He also finds it hard to understand the Administration's wish to end the Commerce Department's DISC (Domestic International Sales Corp.) program, which gives tax relief to firms investing in export development. To him, a government that faces huge trade deficits should do all it can to promote its products for exports.

"DISC is an important symbol to us in international trade. We think the President is simply ignorant of the basics in international trade. The academic economists and international bankers are prime advocates of completely free trade and have a logical antagonism toward any trade impediments or subsidies. So they are unrealistic about world trade as it is today but many people in business talk about fair trade because there are these economic necessities that make it possible for a developing nation to protect infant industries against foreign imports. They will do it and continue to. In our situation today, with the necessity for importing more oil, we have to achieve a more balanced trade by having some form of support incentive. DISC is all we have at the moment. People opposing it lose sight of the importance of trade.

"I see no way out unless we have courageous political leadership. It comes back to an enlightened people knowledgeable on economic matters, and people are not knowledgeable until they as taxpayers get hit to the breaking point, as on this capital gains issue. As taxpayers, we are taking a harder look at what the government is giving us in return. I have concluded we are not getting our money's worth. The Department of Energy's budget is higher than the total profits of the oil industry. The taxpayers are saying we don't want them, we can't afford them.

"The solutions will have to come from the people. The people will have to regroup with the assistance of constructive leadership, and that will have to come from political leadership."

western society to improve its capital investment system and the strength of its enterprise system with poverty in the rest of the world. "The solution I foresee is the kind I don't like. That is, a rise in dictatorship. When things get bad enough, the appeal rises for someone to save us. The Nixon Watergate business was only a hint of the convulsions that may take place."

Hollomon doesn't see how Baruch's panel can tackle those issues that are now overriding concerns—those issues that are threats to the security of the U.S.

Should one despair, then, that the Baruch study can be innovative about innovation? That his report can tell the President what really needs to be done to ensure a healthy long-term future?

Not at all. Despair could be the greatest of all nonmilitary threats to national security. Consider the ideas of Dr. John J. Ford, who comes to the field of science policy with a special set of credentials. For 20 years, Ford worked as an analyst for the Central Intelligence Agency in his special field of cybernetics and general systems theory. While there, he also studied communist brainwashing techniques. His subspecialty, however, was the

Business, science policy makers list major nonmilitary threats to national security

Philip L. Abelson, *editor of* Science *and president of Carnegie Institution of Washington*
- Loss of science and technology excellence.
- Interruption of imports of oil.
- Curtailment of flow of scarce raw materials.
- Inability to resolve conflicts between environment and energy.
- Paralysis of economy due to excess state and federal regulations.

Ernest Ambler, *director of the National Bureau of Standards*
- An adequate energy supply is crucial.
- Economic development and productivity improvements are necessary if inflation is to be controlled and the current U.S. standard of living is to be maintained.
- A continued abundance of food on a world scale is a necessary ingredient of U.S. national security. The vagaries of climate may well dictate whether such an abundance will continue.
- An adequate supply of materials is necessary for industry to provide goods at affordable prices and jobs for those who produce the goods.
- Protection of the environment is essential through wise regulations. The application of cost-effective methods of control demand careful analysis and action.

Richard C. Atkinson, *director of the National Science Foundation*
- Any failure to maintain creativity in basic research and the flow of young talent into research.
- The precariousness of the world's food supply, accentuated by global population growth.
- Continued lack of adequate understanding of how the economy works, such as the problems of diagnosis and treating such ills as inflation and unemployment. This carries the seeds of serious economic dislocations and human conflict.
- Lag in productivity growth rate and continued erosion of international competitive position.
- Dependence on foreign natural resources and the slow pace of development of energy alternatives.

William O. Baker, *president of Bell Telephone Laboratories*
- Ignorance.
- Inflation.
- Energy shortages.
- Materials and resource shortages.
- Food shortages and environmental degradation.

Donald Banner, *commissioner of patents and trademarks*
- Inadequate incentives for invention and innovation.
- Inadequate incentives for business investment.
- Inadequate support for basic scientific research.
- Inadequate support for education.
- Inadequate incentives for optimizing agricultural output.

Michael Boretsky, *senior economic analyst for the Department of Commerce*
- A growing leadership crisis in the country.
- The rapidly declining technological advantage with respect to the rest of the world.
- The growing dependence on foreign energy sources.
- Growing disinterest of the business community in national security and well being.
- Growing "mosaicization" of American society—each ethnic and minority group going its own way.

Joseph Coates, *analyst for the Office of Technology Assessment*
- Basic isolation of the public from balanced, complete information on national security concerns.
- Resistance in almost every quarter in coming to grips with long-range realities involving readjustment to problems of energy, materials, etc.
- Growing vulnerability of the U.S. technical system to misfire and collapse through failure to take an integrated approach to technological development.
- Total absence of anything like a true reward structure in the government bureaucracy.
- Failure to attend to the shifting nature of work that is undergoing a revolution with no one watching it.
- Long-term weather changes, such as those due to the carbon dioxide buildup from burning of coal.
- Fundamental obsolescence of the U.S. Constitutional system.

Charles A. Mosher, *chief of staff of the House Committee on Science & Technology*
- Escapism—excessive time and attention to being entertained; and absorption in trivialities.
- Defensive living—excessive emphasis on being sustained and protected from any discomfort, as a matter of right; the public's demand for paternalistic institutions.
- Smugness—an apathetic content-

way the Soviet Union employed cybernetics to achieve social and military aims. Ford is one of the founders of the American Cybernetics Society and is a protégé of Warren McCullough, who helped build the foundations of cybernetics in the U.S.

Ford brings to this subject what could well be the prototype of policy thought patterns needed to deal scientifically with complex, contradictory problems.

"An innovation process," he says, "would by its nature have to respond to the articulated threats. We are good in the boardroom at perceiving particularized threats, such as drops in profits, but less adept at perceiving global threats, and at devising responses to them. If we really wanted to perceive threats, we would, in our innovation process, be looking at how our decisions create instabilities with the potential of producing the same disruptive social effects as military instabilities."

He believes the five major nonmilitary threats to national security are: the knowledge gap or the question of how we look at the world, the "entropy trap," the lack of larger systems of control, narcissism, and lack of social purpose.

On the knowledge gap, he believes the U.S. is "heir to a 400-year-old condition of reductionism, an approach to understanding nature by analyzing its parts. Because it worked in the empirical sciences and their disciplines, it was transferred to other things. But wholes are more than the sum of their parts. The U.S. is suffering from such a hardening of concepts that it can't even detect reductionism as a threat," Ford says.

"Bureaucracy is an expression of reductionist thinking in that it is dedicated to programs or parts of programs about how to do something rather than deciding what to do and where to go. There are no policies around the question of where the U.S. is going with current policies—where they will lead to if, to take one example of processes not looked at, the investment patterns of banks at the international level persist along present patterns. That system isn't even questioned in terms of survival of the U.S. capitalist system and the quality of life process."

Ford calls his second perceived threat an "entropy trap. Entropy, the measure used in the Second Law of Thermodynamics, says that all systems tend to disorganization. Entropy is the measure of disorganization. Living systems fight this tendency by sucking free energy from their environment and thereby causing entropy to increase elsewhere. This is another way of describing the essence of the evolutionary process—organization of ideas and process through man's intellect," he says. "Mankind has organized social activities to counteract the destructive aspects of the second law. The whole notion of governance is to prevent disorder. The challenge is to make the leap from physical nature and apply it to human society. Most of the places from which the U.S. is sucking energy are

ment with present comforts in what is for most Americans an over-privileged existence; a "so-what, can't be bothered" mood.

- Cynicism—concerning all public institutions and most public policy.
- Pandering by the media and politicos to all of these debilitating trends; the lack of galvanizing public leadership; little or no demands, standards, reasons, or rewards to achieve excellence.

Paul Orrefice, *president of Dow Chemical*

- Diminishing industrial capacity of the U.S. and its weakening international trade position.
- Failure of government to support programs that will enhance capital formation in the U/S. and thus help expand and modernize productive sectors. This failure saps the morale of all who work in business and industry.
- The seemingly constant knocking of the U.S. and its institutions by those who claim to know it all but who also offer no constructive or realistic solution.
- The undermining of U.S. institutions by those who find endless fault with U.S. society.
- Rapid erosion of the work ethic through government welfare programs.

Russell W. Peterson, *director of Congress' Office of Technology Assessment*

- Population growth.
- Oil depletion.
- Food shortages.
- Biological deterioration.
- Unemployment.
- "Understanding each of these threats requires a long-term and global perspective. Very few people have such a holistic perspective to bring to bear on today's decision making. This is the greatest need of our time."

Frank Press, *White House Science Adviser*

- Energy supply—an uninterrupted supply of energy, adequate to meet U.S. needs and allow economic growth, is essential. Science and technology play a key role in conservation of current resources, their increased production, and transition to alternative resources and energy technologies.
- Critical mineral supply—The U.S. is dependent on imports for many critical nonfuel minerals. Many of these are essential to defense technologies. A major interagency review of the nation's nonfuel mineral policy is now under way. Science and technology have long advanced the ability to exploit new mineral resources, improve the economics of their production, and provide substitute materials.
- Industrial-economic strength—The health of the U.S. industrial economy is essential to economic stability and growth around the world. Advances in science and technology increasingly contribute to industrial growth. The President recently has commissioned a major interagency study to determine ways that industrial innovation might be stimulated.
- Nuclear safeguards—Science and technology can help substantially in developing alternatives to the nuclear power systems that depend on the production of plutonium, such as the fast breeder reactor. In addition, they can play a role in improving the safeguards of all nuclear materials, their processing, transportation, and storage.
- International development—one of the principal approaches to peace is to assist developing nations in their efforts to fulfill the needs and aspirations of their people. Ultimately, lasting world peace and the stability and security of all nations depend on this. By using science and technology to help the people of developing nations, the U.S. can reduce the number of trouble spots where the political instability based on poverty can serve as the basis for new revolutions and wars that might involve the U.S. and its adversaries.

Irving Shapiro, *chairman of Du Pont*

- Capital formation, linked with the possibility of tax reform with respect to business. The more difficult it is to raise and commit money to new plants and expansion, the less expansion and fewer jobs.
- Lack of an energy policy.
- Inflation.

William S. Sneath, *chairman of Union Carbide*

- The continuing national energy problem and potential ramifications of growing dependence on foreign oil.
- The growing population imbalance between have and have-not nations.
- Runaway inflation that could lead to internal strife.
- Major shifts in political philosophy triggered by inflation and overtaxation.
- Decline in national traditional scientific and technological innovativeness.
- Government overregulation creating an unrealistic risk-free environment and in the process stifling creativity in technological progress.
- Growing threat to U.S. competitiveness posed by companies owned or controlled by foreign governments.
- Lack of common national purpose.

populated by people who know it is being done and are beginning to perceive the meaning."

His third threat is the lack of larger systems of control. "Bureaucratic, private, and public organizations are closed systems processing only what they are set up to process, with little if any interactive relationships with sister organizations. But these are not separated compartments. They interact often in destructive ways to produce counterproductive effects. To control the interactions between bureaucratic cells, we need a sense of their interconnectedness. As a consequence, the pursuit of national purpose by the process of governance becomes a structurally impossible dream."

Narcissism is a fourth threat. Ford says, "There is a growing tendency of people and institutions to pursue their own individual whims and fancies. To a certain extent, the current fad of self-realization, self-understanding, etc., could increase our knowledge of man. But pursued as an end rather than as a means, it weakens the likelihood of joint purposeful behavior. If this tendency persists and grows, the systemic difficulties could be exacerbated by the pathological conditions accompanying fragmentation. That would be the social pathological equivalent of entropy, namely anomie, a condition characterized by diffused anxiety and isolation."

Ford perceives the lack of social purpose as a fifth threat. "There is little likelihood under the present way of operating that we could formulate an adaptive structure without a broadly defined concept of systemic purpose. And since we are talking about global threats historically perceived, any definition of purpose must be equally perceived. In other words, we are really talking about security of the life system."

"The counter to entropy is communication and information. You increase the amount of circulating information in society. Information is one form of energy that is not degraded when it's used. The other thing is love, which increases with use and which is part of a communication process by which systems can persist in an entropic environment. So I suppose that with respect to the innovation process, dedication to these objectives might involve love and knowledge, communicated so as to inform. And the more done on the local level the better."

Ford's prescription may be too drastic for a policy panel, since it strikes at concepts of how science does things. But if the threats to security are knocking at the door, perhaps the biggest need is an examination of where the enemy is. The words of the poet Edna St. Vincent Millay seem most appropriate for ending this symposium.

Upon this gifted age, In its dark hour
Rains from the sky a meteoric shower
Of facts—; They lie unquestioned, uncombined.
Wisdom enough to leech us of our ill
Is daily spun, but there exists no loom
To weave it into fabric. □



When you compound with

EVANSTAB® THIODIPRO-PIONATES

your customers get a better product. You get even more!

From shipment to shipment, you get consistent quality with Evanstab® Thiodipropionate additives.

You also get a wide selection. And you get delivery on short notice; products tailored to your specifications; and personal service second to none whether your needs are large or small.

Many manufacturers are profiting from the use of Evanstab® Thiodipropionate additives listed below:

EVANSTAB® 12 Dilauryl Thiodipropionate*
EVANSTAB® 18 Distearyl Thiodipropionate*
EVANSTAB® 13 Di(Tridecyl) Thiodipropionate
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Women Chemists Committee seeks funds to bolster Garvan Medal

A drive to raise money to support the Garvan Medal has been launched by the society's Women Chemists Committee. The medal is presented annually to recognize "an American woman for distinguished service to chemistry."

The recipient of the Garvan Medal receives a check for $2000, a gold medal, and a bronze replica of the medal. The income from the original endowment, however, isn't large enough to earn sufficient interest to support the award. As a result, the principal is being spent and eventually will be exhausted unless additional money is raised, explains Dr. Nina M. Roscher, chairperson of the Women Chemists Committee.

The second oldest national ACS-sponsored award (the Priestley Medal is the oldest), the Garvan Medal was established in 1936 by the late Francis P. Garvan. The funds for the medal were turned over to ACS to be administered by the society.

Originally the award consisted simply of the gold medal. However, in 1962 a bronze replica and a $1000 honorarium were added. In 1968 the amount was increased to $2000 in keeping with a newly established ACS policy of requiring a minimum honorarium of $2000 for each ACS-administered award.

As a result of the increase in the honorarium and rising administrative costs, the income earned by the fund is no longer sufficient to pay the medal's annual commitment. Currently the fund earns about $1200 income annually. The expenses of the medal amount to about $3400 annually.

The question of funding has generated considerable debate about the future of the medal over the past several years. Two basic points of view emerged—keep the medal as it is now; modify or drop it. Most of those who favor keeping the medal believe that if it is discontinued, women rarely will be named as recipients of national ACS awards (to date, no woman has ever received a national ACS award other than the Garvan). This largely is because there are few female chemists relative to male chemists. The lack of recognition of achievement would, in turn, hurt efforts to improve the status of women in chemistry.

Those who favor modifying or dropping the medal altogether argue that it is sexist. Its existence, they say, discourages consideration of women for the other professional awards.

To resolve the issue, the Women Chemists Committee conducted a survey in 1976 of selected women ACS members



C&EN staff photo

Roscher: more than $5000 so far

to find out their opinion of the Garvan Medal. The majority of those responding to the survey favored the continuation of the medal and the initiation of a fund-raising drive. Last year an informal request for money was made in the summer edition of the *Women Chemists Newsletter*, which goes out to more than 9000 women. To date, Roscher says, the committee has received more than $5000 from this single solicitation. Those contributing included many graduate students and retired chemists as well as currently employed women.

Last November the Women Chemists Committee petitioned the ACS Board Committee on Grants & Awards for permission to contact companies and foundations for support of the award. In the petition, it also was proposed that, if any company is willing to give $5000, the award in that year be designated the Garvan Medal sponsored by that company. The request was voted on and approved at the board Committee on Grants & Awards meeting in December.

Members of the Women Chemists Committee then were asked to suggest organizations that might be contacted. A list of companies and foundations was drawn up and in June letters soliciting contributions were mailed to about 10 of them. Another appeal for funds will be made in the August edition of the newsletter, Roscher says. Contributions also are solicited from individual members of the society, Roscher adds, and can be sent payable to ACS for the Garvan Medal Fund, care of the Women Chemists Committee. □

More Dieting in Detroit

The squeeze of '79: downsizing spreads to the big cars

"In 1959 we designed what we thought would sell. Today the primary design objective is to suit the law."

So says Richard G. Macadam, design vice president for Chrysler, echoing a lament made by many U.S. automen. The 1979 models that are now popping up in showrooms are geared as much to beating a legal deadline as they are to cruising smoothly down an Interstate. Congress has said Detroit must increase the average fuel-efficiency of its cars in steps to 27.5 m.p.g. by 1985, and for the model-year that is just beginning the requirement inches up to 19 m.p.g., *vs.* 18 for the '78s.

For buyers, this will mean not only slightly better mileage but higher sticker prices. Citing, among other things, the cost of making their cars more fuel-efficient, the Big Three have raised their prices about 4% as the new model-year begins, and further hikes may be ahead. Inflation long ago drove the automakers to abandon single-shot increases for an entire model-year. Now the hikes come in bits and pieces. Ford's Mustang, for example, increased in price 14% from the start of the '78 model-year to now. The average price of a U.S.-made car, including taxes and licensing fees, has risen to $6,830, from $5,600 three years ago.

Downsizing, begun in the '76 model-year by GM with its Cadillac Seville and Chevrolet Chevette, has spread to most of Detroit's bigger '79 cars. Chrysler has introduced a New Yorker that looks much like the large cars of old; yet it is 800 lbs. lighter and 9 in. shorter than last year's version. GM shortened its Cadillac Eldorado by 20 in. and slashed 1,150 lbs. from its body, thus slaying, presumably for good, the last of GM's giants. The few remaining 1978 Eldorados are selling briskly to speculators who hope to make a resale killing.

That leaves Ford's bigger autos—the Lincoln Continental and Mark V—the only full-size cars not going on a diet for 1979. It will be the last year, though, for Ford's yachts; the company is pushing them as collector's items at collector's prices. The Mark V lists at $13,067 and is expected to sell well. That presents a problem for Ford. To meet the 19-m.p.g. average this year, the company must offset the thirst of its big models with increased production of little cars. But sales of its mainstay in that field, the Pinto, dropped after the disclosure in July that Pintos of '71 through '76 model-years have fuel tanks that have ruptured in rear-end crashes. So Ford redesigned the tank and is pushing Pinto sales hard. In July, the company began an incentive plan that pays dealers up to $325 for each '78 Pinto sold.

As exteriors shrink, automakers are turning more and more to front-wheel drive as a way to maintain interior space; it eliminates the transmission hump in the floorboards. Buick's Riviera has front-wheel drive for 1979. In the spring, GM will introduce a front-wheel drive Chevy Nova. Ford has lagged behind GM and Chrysler (with its Omni/Horizon) in getting into front-wheel drive; its only entry in the field now is the Fiesta, which it makes in Spain and sells in the U.S. But Ford intends to produce a front-wheel-drive car domestically by 1981.

More attention is being paid to aerodynamics—designing "slippery" vehicles with less wind resistance and better fuel economy. As Ford's design chief, William Bordinat, told TIME Detroit Correspondent Paul Witteman: "We never gave a damn about aerodynamics before. Now it has become important." For 1979, Ford has two aerodynamically designed offerings, the Mustang and the Capri, complete with contoured rear-view mirrors and sloping hoods. American Motors, whose mainstay nowadays is its Jeeps, has also struck a blow of sorts for slipperiness by replacing its boxy Gremlin with a sleeker-looking liftback called the Spirit.

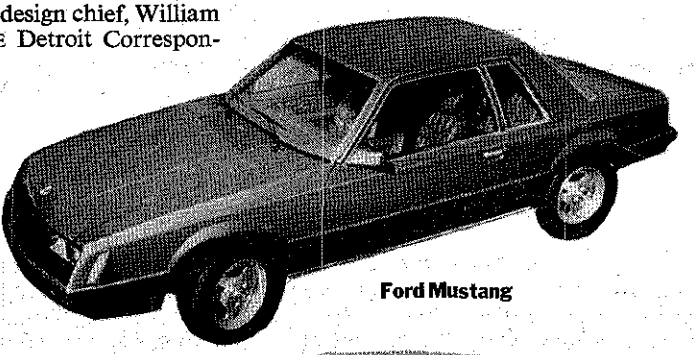
In their grille-to-grille battle with imports, U.S. manufacturers have shown some progress. Two million foreign-made cars were sold through early September, a record, but their percentage of U.S. sales dipped to 17.9%, from 18.1% last year. Overall, sales are expected to reach 11.4 million cars in calendar '78, falling just short of the 1973 record of 11.44 million.

As Detroit rolls toward the 1985 fuel-economy deadline, there is no consensus on what cars of the early '80s will look like, but there are clues in the '79s. Like some of them, cars of the next decade will use more lightweight plastics and aluminum and will become even smaller. Chevrolet General Manager Robert D. Lund predicted last week that 7 of 10 Chevys sold in 1985 will be compacts or subcompacts. Engines will be smaller and more fuel-efficient, using fuel injection and turbocharging (which force feeds air into the engine and improves combustion) to maintain at least some of the peppiness of a gas-guzzling V8. Buick has a turbocharged V6 on its '79 Riviera, and other GM divisions plan to use it next year.

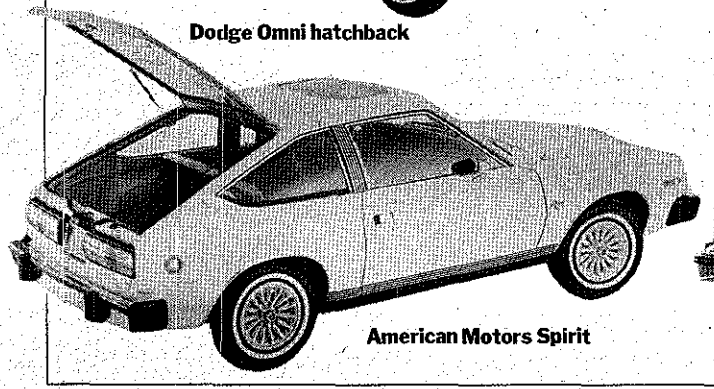
But none of the cars of the future will remotely resemble the machine parked last month in Westchester County, N.Y. Alongside the expected lineup of restored Ford Model T's and A's was a 1968 Cadillac DeVille convertible (12 to 13 m.p.g.) owned by Bradley T. Flynn of Pelham Manor. He entered it in a "special category" at the seventh annual Mount Kisco Lions Club antique-auto show. ■



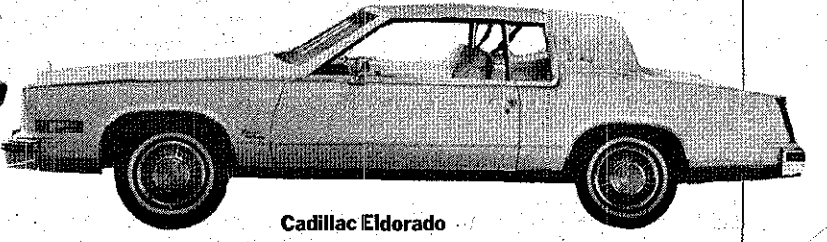
Dodge Omni hatchback



Ford Mustang



American Motors Spirit



Cadillac Eldorado

Costlier Oil

And a bigger cartel too?

Amid the most elaborate security operation that Norwegians had seen since World War II, 70 representatives of ten Arab countries gathered in Oslo last week to discuss their favorite topic: oil. The news that came out of their three-day conference was about as chilly as the city's 50°F. weather. The Arabs not only wanted to bust the two-year freeze on oil prices with a substantial increase in 1979, they also called for a plan under which oil prices would continue to rise in step with the cost of other raw materials.

The countries represented at the meeting were members of the Organization of Arab Petroleum Exporting Countries, a subgroup of OPEC that accounts for more than 60% of its production. Given the Arabs' weight in OPEC councils, it is almost certain that some price increase, possibly along the lines of the Saudi Arabians' suggestion of 5% on Jan. 1 followed by subsequent hikes of 2% or 3% at "relatively frequent intervals," will be adopted when all the cartel's members meet in Abu Dhabi in December.

By way of explanation, OAPEC spokesmen argued that a sizable increase was warranted because "persistent erosion" of the dollar and inflation in the developed countries had cut the real price of a liquid barrel of oil almost by half since 1973. Some other delegates also stressed Arab pique at the Camp David agreement. Iraqi Oil Minister Tayeh Abdul-Karim blasted it as "a policy of surrender" and made clear that he thought the Saudi policy of "moderation" on oil prices had done nothing to advance the Arab cause in the Middle East peace negotiations. Saudi Representative Abdul Hadi Taher replied bluntly that Middle East politics should scarcely be "the most important factor" in OPEC price policy.

The Norwegians had invited the Arabs to Oslo in hopes of selling them some of the equipment and expertise they have developed in exploiting their own North Sea oil deposits. The Arabs, in turn, want the Norwegians, as well as other non-OPEC oil producers like Britain and Mexico, to link up with the cartel in some fashion, the better to expand its power to keep prices high. While the Norwegians emphasized that they had no intention of joining OPEC, Energy Minister Bjartmar Gjerde acknowledged the interest of his country in "prolonging" the benefits it has been getting from its North Sea reserves and noted that Norwegians are beginning to feel "sort of in between" the industrial world and the oil exporters. It may only be a matter of time before Norway and other in-between nations form a group that will remain out of the cartel but "con- with OPEC on prices and other oil ers. ■

Executive View/Marshall Loeb

Rebel with Many Causes

The Organization Man, wrote William H. Whyte in the final paragraph of his 1956 classic, must fight The Organization. William Whyte, meet Fletcher Byrom. A feisty fellow, Byrom lives by the philosophy that the highest form of loyalty is to battle organizational rigidities and inertia.

Just after World War II, admirals had been nervous about the stocky, ingot-size metallurgist from Penn State who badgered them to scrap their old anti-aircraft guns and start developing surface-to-air missiles. Byrom won that round —and he won the Navy's Distinguished Civilian Service Award. A few years later, by-the-book bosses at Koppers Co. fumed when they learned that their young executive disobeyed orders and put in a costly distillation process. When it proved enormously profitable, they hailed him.

Because it is hard to keep a good rebel down, Byrom became president of Koppers at 42. In the 18 years since, sales of the Pittsburgh conglomerate (chemicals, metals and forest products) have almost quintupled to well over $1 billion, and Byrom, by cheerfully delegating authority, can now spend half of his 16-hour days spreading his eclectic messages to bureaucrats, business people, reverend clergy and irreverent students. He draws his ideas from many intellectuals—a catholic collection that includes Social Activist Saul Alinsky, Semanticist Senator S.I. Hayakawa, Anthropologist Margaret Mead. Byrom always argues that people have to break down the barriers within and between corporations, state governments, whole nations. Make room for individualism and incentive.



Koppers' Fletcher Byrom

His own company, he is happy to say, has no organization charts, no procedure manuals. He encourages managers to take risks, even make mistakes; they will learn from them. Says he: "We don't want good administrators, because that implies efficient operation of the status quo." He advises junior executives and foremen: "We, top management, will set standards. It is up to you to decide how to get things done."

The same good sense should apply to the shotgun marriage between Government and business, in Bryom's view. Instead of telling companies how to combat pollution or industrial accidents, the Government should set short-term and long-term goals, then use a tax system to reward companies that exceed them and penalize firms that fail. Exasperated by the managers and regulators who think that they can make sweeping decisions from a distant pinnacle, he likes to say, "Santayana defined fanatics as those people who know what they are doing is what God would be doing if he only had all the facts."

Byrom despairs of the rigidities that prevent companies from allying to exploit technology and the economies of great size and cooperation. To remain competitive in the world, he says, U.S. steelmakers should be building modern plants with 10-million-ton capacity at deepwater ports. Since no one company can justify spending so much, the Government should allow several steelmakers to join in such projects. To stop the alarming erosion of America's capital base, he contends, companies should be permitted to take their full depreciation allowances within one year—so long as they invest them all—instead of being obliged to stretch them over many years. Fast depreciation would cost the Treasury some tax revenues, but only for the first year. After that, tax collections would go up because profits would rise—and so would investments.

Instead of myriad local water districts, he continues, the U.S. needs large regional authorities to handle pollution and potability and development of water resources. A Constitutional convention might even be called to reorganize America's rigid internal boundaries. Says Byrom: "I don't think the state of Pennsylvania should exist. And the world is sufficiently interdependent that we will come to realize, maybe 50 years from now, that the concept of sovereign nation states is fallacious."

Strong talk from a corporate chief. But Fletcher Byrom's business is to deal with change. He is unsure what kind of institutions should replace those that exist today, but of one thing he is certain: we had better start planning right now for the competitive demands of the 21st century.

PLENARY SESSION POPULAR AT ACS MEETING

The nearly 7000 chemists and chemical engineers who gathered in Miami Beach last week for the American Chemical Society's 176th National Meeting were faced with the usual wide array of technical and social activities. These ranged from the unusually large number (2400) of technical presentations to the unique assembly of registrants at a plenary session.

The presidential plenary session, organized and chaired by ACS president Anna J. Harrison, was the first such session in recent years at an ACS meeting, and it played to an overflow crowd. Speaking at the session on the protection of human health and the environment were Dr. Eula Bingham, head of the Occupational Safety & Health Administration, and Douglas M. Costle, administrator of the Environmental Protection Agency. Their talks were followed by remarks from a panel of eight distinguished chemists representing various fields of chemistry.

With its successful inauguration, the plenary session may be heading for a permanent niche in ACS national meetings—at least at fall meetings. The ACS Council last week voted to include such sessions at the next two fall meetings—in Washington, D.C., next year, and in San Francisco in 1980.

Among a number of other things, the council also authorized formation of two probationary ACS divisions—one on geochemistry and one on small chemical businesses. And the council gave its approval for establishing an Alaska local section.

Relating to the controversial issue of the Equal Rights Amendment to the U.S. Constitution, the ACS Council went on record as supporting "the achievement and protection of equal rights and opportunities for all persons and believes ACS should encourage its members to personally support all efforts which will accomplish these goals as rapidly as possible." And it agreed that it is not "appropriate for ACS to determine the location of national meetings on the basis of the status of ratification of [ERA] by the states." Considering the council's action on this matter, the ACS Women Chemists Committee decided not to seek council action on its resolution calling for future ACS national meetings to be held only in those states that have ratified ERA.

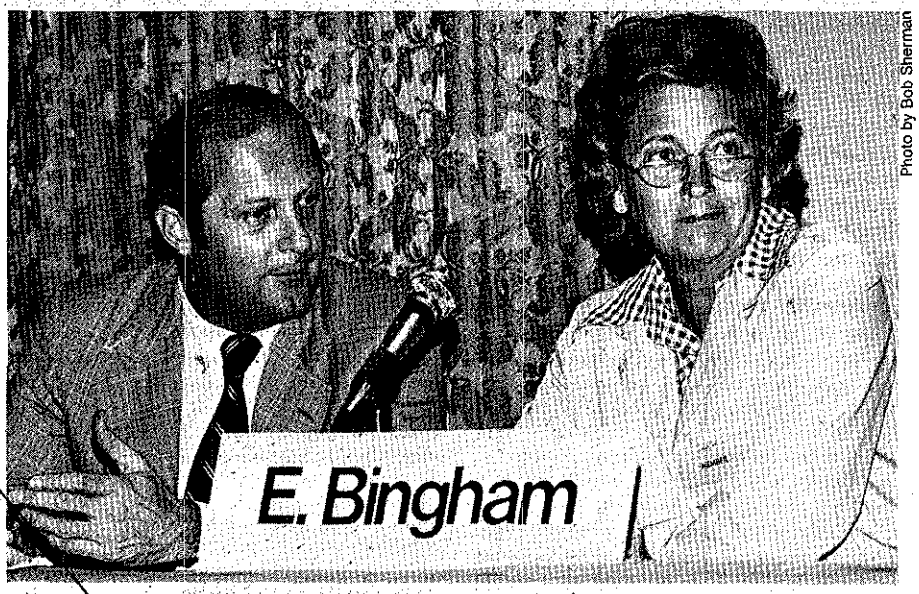


Photo by Bob Sherman

EPA's Costle (left) and OSHA's Bingham answer questions at plenary session

On another controversial issue the council debated the validity of the petition nominating Dr. Alan C. Nixon as a candidate for director of Region VI in this fall's ACS national elections. The problem arose because the California Section's national elections committee sought petition signatures on stationery with the local section letterhead, a possible violation of recently instituted ACS bylaws on fair election procedures. In fact, this problem seems to point up confusion in the wording of those bylaws. Ultimately, however, the council voted to accept Nixon as a petition candidate for Region VI director, despite the alleged irregularities in the nominating petition, thus overriding the action of the Committee on Nominations & Elections, which had voted unanimously to disallow the nomination.

The council also acted on nine petitions to amend the ACS constitution and/or bylaws, adopting seven of them, recommitting one, and refusing to take urgent action on another. The seven that were adopted aimed at such housekeeping procedures as how to withdraw a petition from the council's agenda and how society committees should relate to the Council Policy Committee.

The petition that was recommitted to the Committee on Constitution & Bylaws, with the stipulation that it be brought before the council again at the fall 1979 meeting in Washington, D.C., would provide that voluntary local section dues as well as division dues, at the request of these bodies, be billed with annual ACS dues.

The council eliminated the need to act on a ninth petition in Miami Beach simply by not granting it urgent action status—the only way it could have been acted on at this meeting. The petition would have allowed a reduction in ACS dues for one or the other of a husband-wife pair, if both are ACS members. The proposed reduction would have been the amount of the dues allocation to C&EN, and would have eliminated one of the subscriptions to C&EN.□

Soviets to let Levich go after six-year fight

After a six-and-a-half year struggle supported by protests and pressure from U.S. and European scientists and political leaders, Dr. Veniamin G. Levich finally will be allowed to leave the Soviet Union. Permission for the eminent physical chemist and his wife, and 17 other Soviet families, to emigrate will be issued shortly, according to assurances received from Soviet president Brezhnev and other officials by Sen. Edward Kennedy

In business, the rate at which a new industrial process can supplant an earlier one is inversely proportional to the magnitude of existing installed capacity. In addition to the capital expenditure for procuring and operating new facilities, the cost of conversion must include those segments of the old network (labor and equipment) to be retired. Hence, acquired capital represents inertia against change. Similarly, the sprawling bureaucracy of our government and other social institutions did not develop overnight. But the price of alternatives (though I am sure more efficient ones could be organized) increases with the complexity and manpower of the agency to be dismantled.

Another ramification involves various attitudes apparently fostered by capital-enhanced stagnation. "Protecting one's investment" has survival value in the short run. But relying on inefficient organizations and facilities merely because they exist, and change is more difficult, can be catastrophic. Eventually, institutions devote more effort to self-perpetuation (maintaining the status quo) than toward their assigned purposes. (Certain agencies of our government and military, I fear, have already reached this stage). An example of the above principles appeared in the recent news. The state of Ohio shelved plans to switch to environmentally cleaner low-sulfur coal because the high-sulfur coal is currently mined locally and thousands of jobs were at stake. (I do not advocate unemployment; however, the cost of change must include relocating these workers).

Unless one can predict future events with absolute certainty, over accumulated capital cannot be avoided. It can definitely be minimized, however, "Sunset laws" and "closed-cycle accounting" (cost seldom reflects the expense of disposal except in the case of deposit bottles) seem reasonable. On the other hand, a known set of social priorities would be useful to establish a system of values for ranking alternatives based on those aspects of a changing society which are to be preserved. After all, as the world changes, so must society—rationally or cataclysmically.

D. Wayne Berman

Pasadena, Calif.

SIR: I wish to congratulate you on the initiation of discussions on "Innovation and national security," (C&EN, July 17, page 25). I hope this is only the first of a series on this subject.

The views of Dr. John J. Ford deserve serious consideration by the technical community. Reductionism and bureaucracy have grown to massive proportions in large corporate research organizations with the resulting tendency toward suppression of innovative thought and action.

I have to wonder if you did not include the remarks of John C. Connor to illustrate one of the problems so precisely described by Ford. Connor repeats the old refrain of big business that they are taxed too much and this is hurting small business! If he is really interested in the independent inventor why does he not support a special subsidy for them, to be paid for by increased taxes on those large corporations whose research expenditures are low in relation to investment? By what logic does he arrive at the conclusion that the budget for the Department of Energy should be less than oil company profits? Perhaps DOE's expenditures should be even higher now to save us from economic ruin later.

I suggest that ACS sponsor a series of local seminars on innovation in the U.S., with special effort being made to obtain participation by nontechnical corporate executives and managers. Participation by independent innovators and by other technical societies should be encouraged, both in planning and in presentations. One year of hard work along these lines could produce invaluable data for the use of those already working to reverse the decline of innovation in U.S. science and industry.

Eugene F. Hill

Granada Hills, Calif.

The drug arecoline

SIR: Science/Technology Concentrates (C&EN, July 24, page 19) referred to two recent papers in *Science* and in the process perpetuated an error. The drug arecoline was incorrectly referred to as "arecholine" in one of the original papers and in the concentrate, thereby implying a relationship to choline that does not exist.

Arecoline is not a choline derivative but is the chief alkaloid in seeds of the areca palm. Arecoline does not "act by increasing concentrations of acetylcholine in the brain," but is thought to stimulate directly certain types of acetylcholine receptors.

Indianapolis Ray W. Fuller

Dilemma of toxic risks

SIR: Frank J. Weigert, in his letter, "Determining toxic risks" (C&EN, July 24, page 4), is one of the first to speak out for more logical mathematical modeling of the risk from low concentrations of carcinogens. For a variety of compelling reasons, economic and environmental, our thinking should begin to move along the lines he outlines instead of in the opposite manner advocated by regulatory agencies.

The dilemma is particularly apparent in the energy area, where carcinogens are involved in both nuclear and fossil fuel plants. The BEIR report on radiation, a massive compilation of human epidemiology and animal experimentation, arrives at the conclusion that the response to incremental dosages is exponential; that an algebraic increase in radiation above background produces a percentage increase in the probability of cancer. In mathematical terms, $P = Ae^{kD}$, where A is the background response, and D the exposure above background.

This is also the approach of the Rasmussen report (WASH-1400), which has been severely criticized by antinuclear people, who prefer the more "conservative" linear model. This, despite its scientific meaninglessness, is the one used by most working biometrists. On the other hand, research on chemical carcinogens, sponsored by the Energy Research & Development Administration, Environmental Protection Agency, and Occupational Safety & Health Administration, is being fitted into models which fit their political needs for closer regulation of the workplace and environment, and of energy sources which compete with nuclear energy. One such model [Crump, Guess, and Deal, National Institute of Environmental Health Sciences (preprint); Hartley and Sielken, *Biometrics*, **33**, 1 (1977)] is $P = 1 - e^{(c\sum_{i=1}^{k} i(a+bD))}$, where c is a function of duration of exposure, and D the dose rate from k sources. Such models will have a slope greater than the linear model and may be convex upward. To paraphrase W. C. Fields and the old temperance "mellerdramas," they overemphasize the importance of the fatal first exposure, not to Demon Rum, but to some chemical which has served society well.

A table (see table below) showing the relationships of hypothetical dosage response curves which are congruent at $P = 0.10$, $D = 20$, and $P = 0.50$, $D = 100$, for the four models discussed may be instructive. It will now be seen that Weigert's proposal, with probably the best logic, is by far the least conservative at very low dosages. But what disturbs me far more is that ERDA is allowed to play by one set of rules, while the rest of us poor mortals have to go along with EPA-OSHA thinking. This means that for carcinogens of equal potency, we have to clean up over four times as much!

Winslow H. Hartford

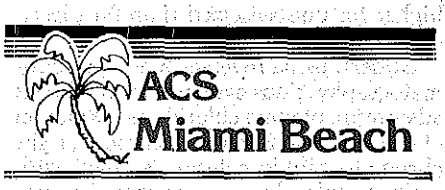
Associate Professor (retired), Chemistry & Environmental Science, Belmont Abbey College, Belmont, N.C.

Approximate hypothetical probability of cancer by models

Dosage above background	Weigert	BEIR (exponential)	Linear	Crump, Hartley et al.
100	0.50	0.50	0.50	0.50
10	0.022	0.018	0.050	0.067
1	0.0001	0.0016	0.0050	0.0069
0.1	$<10^{-6}$	0.00016	0.00050	0.00069
0.01	$<10^{-9}$	0.000016	0.000050	0.000069

Effect of regulations on innovation probed

I&EC symposium speakers cite cases where inconsistent, undue government regulation is depressing industrial productivity, efficacy of R&D



An ever more intrusive government may have encountered a minor Waterloo in pursuit of the risk-free society. There has been concern that regulations, amendments, laws, guidelines, and the like have had a major, measurable, and so far depressing effect on industrial productivity and on the efficacy of research and development. Those suspicions, invariably denied by the regulators, always have been abroad among the R&D community. They were voiced again last week in Miami Beach at a Division of Industrial & Engineering Chemistry symposium on effects of government regulations on innovation in the chemical industry.

Until now there has been no way to make the case for either side except by an annual, general, economic balance sheet. Now some objective, quantitative measures have been made that illustrate the negative effects of overregulation. Even if there were no such measures available, the case against overregulation has been aided by legislation that implicitly recognizes the problem. It may be ironic, as one observer put it, that the government is again trying to overcome the effects of too much law by passing more laws.

There are many who speak with telling effect against such proliferation. One is Dr. Bruce Merrifield, vice president, technology, for Continental Group Inc., who notes that the big regulatory push began about 1960. Prior to that time there were few performance regulations, although a number of other kinds of regulations existed, particularly product safety regulations. Since 1960, at least 15 major legislative acts have appeared and must be dealt with by industry. The chemical industry is particularly affected.

Merrifield cites rising income as among the forces that have contributed to this growth of regulation. Rising incomes often result in demands for new social legislation and are usually coupled with the increased sophistication of engineering and science. In the drug industry, the effect of regulation has been to discourage innovation. Merrifield notes that it now takes a U.S. drug firm about eight years and $54 million to bring a new drug to the market place.

A great threat to chemical innovation, Merrifield says, is the inconsistency of government regulations administered by different and often administratively competing agencies. This inconsistency causes companies to withdraw financial support from projects at critical times and leaves managements unable to predict acceptability of products or processes in many cases. This leads to another related concern—namely, regulation of the innovative processes themselves. Thus, the overall effect of regulation is altogether pernicious. R&D, Merrifield notes, is being squeezed out by a growing proportion of nondiscretionary work made necessary by regulation in a total environment of a fixed, or in some cases a decreasing, resource pool.

The remedies for the maladies of overregulation, says Merrifield, include pre-enactment impact studies for all regulatory acts as well as redress of grievances that already have resulted from regulations. Merrifield's prescription for regulatory relief also calls for consistency within government and recognition that a risk-free world is impossible. It also would be appropriate, he says, to institute zero-based regulating along with zero-based budgeting to reduce the complications in the regulations. There is no doubt that some regulations are necessary. But having said that, he notes, many R&D administrators find it hard to live with most of them.

If you can't beat 'em, join 'em, seems to be the approach of Michael Michaelis, of Arthur D. Little Inc. A recent study completed by ADL for the government concludes that federal funding of civilian R&D should be formulated in a larger context of industrial innovation, and that federally funded R&D, of itself, is insufficient to bring about significant technological changes in the private sector of the economy. Michaelis claims that it was probable that the study eventually contributed to the official approval for a Cabinet-level review of domestic industrial innovation. The study is due to be made public in the spring of 1979.

In the meantime, Michaelis points to the recently enacted Federal Grants & Cooperative Agreements Act of 1977 (C&EN, July 10, page 19) as an opportunity to come to grips with the innovation-depressing effects of government regulation.

Three types of relationships are specified in the act. One is straight procurement by the government. The second is an assistance relationship that doesn't actually involve the government in work performance. The third is an assistance relationship that does involve the government in work performance. Assistance means that the government pays all or part of the costs of a project, and this could mean that industry can enlist the government in financing work.

Michaelis regards the act as a "sleeper" in the fight to turn around the dismal innovative record of U.S. industry in recent years. Productivity, he notes, is down 25% and the decline in patents issued to U.S. citizens and companies has come at the same time that patents to foreign groups and individuals have doubled. The call is now for "institutional arrangements" to stimulate innovation, he says.

Despite the appearance of the act in February 1978, there has not been a stampede to get in on the benefits. In fact, some industrial observers suggest that "apathy is rampant." This has been manifested most notably in the lack of response to a call by the White House's Office of Management & Budget for comments and participation in implementation conferences following the act's signing.

Of all the chemical industries, the drug industry is the most highly regulated. Dr. Jean DiRaddo, projects manager at the Center for the Study of Drug Development at the University of Rochester, notes that even the discovery process itself is subject to regulation. That probably makes pharmaceutical innovation unique among the technology-based disciplines. Control over the innovation of drugs is exercised by the Food & Drug Administration under authority contained in basic legislation enacted in 1938 and 1962 and supplemented by many other amendments and authorizations that have progressively tightened FDA control. Key items in the legislation are the New Drug Application (NDA) procedure, which requires safety tests before marketing of a new drug, and a requirement for informed consent for an Investigational New Drug (IND).

DiRaddo noted that most drug legislation is aimed at avoiding risks. FDA is required to prevent harm from drugs but it has no mandate to promote health or to maximize benefits obtained from drugs. It is not surprising, therefore, to learn that innovation is being inhibited by regulation.

But what is innovation, DiRaddo asks. Pharmaceutical innovation can occur because of the synthesis of a new compound with a new structure [or new chemical entity (NCE)], by the discovery of a new pharmacologic action, by modifying the structure of an existing drug, by pragmatic modifications of the forms of drugs in use, by the discovery of new therapeutic effects not predictable from models, and by chance. The problem is how to measure the amount of innovation produced by one or all of these forms.

In a project under way at the University of Rochester, DiRaddo and her associates are using the number of NCE's taken into human testing stages of development as an absolute measure of innovation. They consider this a valid measure, since it represents a firm's decision that a compound is worth further testing, as well as being the first time that an NCE is placed outside the firm. An NCE that is selected for human testing still may have unknown therapeutic properties but its pharmacologic and toxicologic properties are known already.

DiRaddo believes that an important contribution of the Rochester project is that it allows detection of the effects of policy changes in drug regulation about six years earlier than was previously possible. Six years, on the average, are required for the total of IND and NDA stages in FDA regulatory procedures.

Other measures used in the project are the national origin of NCE's appearing on the U.S. market and a comparison of patterns of marketed drugs in the U.S. and the U.K. from 1972 to 1976.

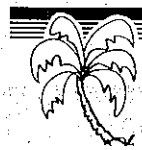
The Rochester project considered information on 1103 NCE's. A total of 859 were from 36 U.S. companies and 244 were from 10 foreign companies. The annual rate of NCE's tested in humans by U.S. companies rose from 70 in 1963 to 94 in 1965 and then declined sharply to a mean value of 62 for the period from 1966 to 1974. Constant changes in regulatory procedures make interpretation difficult, DiRaddo says, but there is little doubt that the declines in NCE's are attributable to FDA requirements.

In recent years there has been a strong shift of drug studies abroad. Between 1963 and 1969, only 8% of U.S. NCE's were first tested abroad. In 1973, this number rose to 34%, and to 47% in 1975 (incomplete data). The effect is particularly noticeable in larger companies.

The total time required for clinical investigation and approval of a successful NCE in the U.S. has risen from 31 months in 1966 to 82 months in 1975. A comparison with corresponding circumstances in the U.K. reveals that 2.5 times as many drugs are introduced in the U.K. as in the U.S.

More important than the numbers, DiRaddo says, are the clinical implications the data suggest. For one thing, delays in introducing certain cardiovascular drugs have resulted in a substantial increase in the mortality of patients in the U.S. A conservative estimate of this mortality is 10,000 lives per year. □

Monomer migration in polymers clarified



ACS Miami Beach

Migration rates of residual monomers may be linear functions of concentrations in amorphous polymers but not in glassy polymers below their glass transition temperatures. This summary of independent work described in a Macromolecular Secretariat symposium on chemical and physical lifetime limits of macromolecular materials may revise current thinking about whether certain concentrations of residual monomers in plastic packaging materials pose human health hazards.

Additional implications include effects of desorption of plasticizers or stabilizers on useful lifetimes of plastics, and partitioning of drugs between polymers and tissue fluids in drug delivery systems.

Dr. Isaac C. Sanchez of the National Bureau of Standards finds that partition coefficients of polyethylene oligomers between polyethylene and heptane solvent can be computed reliably from temperature, pressure, and density parameters of polyethylene, oligomers, and heptane, plus heats of mixing of oligomers in polyethylene and heptane. He uses straight-chain hydrocarbons from C_5 to C_{20} as model oligomers. Heptane simulates a fatty food.

Sanchez also has calculated partition coefficients between polyethylene and ethanol. Little information is published on this system for comparison, however. His further work will include esters and 3% acetic acid as solvents, polar additives, and other polymers.

When concentrations of residual monomers in such glassy polymers as polyvinyl chloride and polyacrylonitrile are very small, however, partition coefficients are not linear but rise exponentially with decreasing monomer concentrations, concludes Dr. Seymour G. Gilbert of Rutgers University. For many resin grades this finding may mean that at residual monomer levels of less than 0.1 ppm, there is zero effective migration from packaging into food contents.

Working with Dr. Joseph Miltz and Jack R. Giacin, Gilbert injected small, known amounts of vinyl chloride into vessels containing PVC and water or vegetable oil. He measured amounts of vinyl chloride in the water or vegetable oil at equilibrium and determined amounts absorbed by PVC by difference. PVC had been heated beforehand to reduce vinyl chloride to below 5 ppb.

Above 4-ppm initial vinyl chloride concentrations, partition coefficients rose as linear functions of concentration. Below 4 ppm, they rose exponentially. Gilbert explains his findings in terms of active site theory. In this theory, there are three types of vinyl chloride. One type is freely diffusible. A second type is bound to active sites but can diffuse. The third type is so tightly bound to active sites that it is nondiffusing. With relatively large initial vinyl chloride concentrations, a large proportion of vinyl chloride is diffusible. At smaller concentrations, proportions of vinyl chloride immobilized in active sites increase, and partition coefficients rise exponentially.

PVC containing 20% plasticizer gave similar results but had lower affinities for vinyl chloride. Gilbert says the presence of plasticizer reduces the number of active sites. He concludes that more vinyl chloride may be removed from plasticized PVC than from unplasticized PVC during processing. He also concludes that the amount of residual vinyl chloride that produces zero effective migration may be higher for unplasticized than for plasticized resin.

Gilbert, using inverse-phase gas chromatography, finds evidence for nonlinear adsorption of vinyl chloride as a function of concentration. In this technique, a gas chromatographic column is filled with resin granules, known amounts of monomer are injected into the chromatograph, and retention volumes are calculated from retention times.

Gilbert finds retention times and volumes increase as amounts of injected vinyl chloride decrease. By plotting reciprocal temperatures vs. logarithms of reciprocal retention volumes, he expects to find that activation energies of diffusion increase exponentially with decreasing amounts of vinyl chloride injected.

Similar exponential increases of activation energies of diffusion of acrylonitrile in polyacrylonitrile already have been found by Gilbert using inverse-phase gas chromatography. He concludes there exist residual acrylonitrile concentrations low enough that they are immobilized in active sites and thus nondiffusible.

Morris Salame of Monsanto also finds exponentially increasing activation energy of acrylonitrile with decreasing initial residual monomer concentrations. He measures diffusion rates from containers made from a glassy 30/70 styrene-acrylonitrile barrier polymer into 3% acetic acid or carbonated beverages. The polymer has a glass transition temperature of about 100° C.

When initial acrylonitrile concentrations are 10 to 15 ppm, the activation energy to move acrylonitrile molecules among resin interstices is 15 kcal per mole, Salame reports. At 3-ppm concentrations, activation energy is 20 kcal and rises to 30 to 40 kcal at concentrations below 0.1 ppm. The increase in activation energy results in a nonlinear relationship between migration rate and monomer content.

He measures acrylonitrile concentrations in 3% acetic acid or carbonated beverages at levels of less than 1 ppb by sparging solutions and analyzing sparged gas for the monomer by gas chromatography with a nitrogen detector.

Chemical & Engineering NEWS

September 18, 1978
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- ***Dr. Veniamin Levich,*** *eminent physical chemist, has been granted permission to emigrate from the Soviet Union.* (*Page 6*)
- ***EPA bars sale of MMT,*** *Ethyl Corp.'s additive that boosts octane in unleaded gasoline.* (*Page 7*)
- ***At least 20% of cancer cases*** *in the U.S. may be job-related, according to joint epidemiological study.* (*Page 7*)
- ***Capital spending by U.S. industry*** *will remain low unless government policies change, Texaco president predicts.* (*Page 7*)
- ***Camera catches people*** *at work and at play at ACS's 176th national meeting, held in Miami Beach.* (*Page 8*)
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- ***Unicelpe,*** *association of single-cell protein producers in Western Europe, aids member firms in product testing and in solving common problems.* (*Page 12*)
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- ***Technology news*** *includes I&EC symposium on effect of federal regulation on innovation, monomer migration rates in polymers, new method of dewatering sludge for use in fertilizers, cellulose scrap as building material, degradable epoxies, polymers that convert light to mechanical energy.* (*Page 21*)
- ***Today's weeds*** *may be tomorrow's chemical sources of rubber, other hydrocarbons, and oils, says Department of Agriculture research chemist.* (*Page 25*)
- ***Candidates*** *for ACS president-elect, directors of Region III and Region VI, and director-at-large give their views on society goals and concerns.* (*Page 30*)
- ***Dr. Thomas H. Althuis,*** *ACS's fifth Chemistry & Public Affairs fellow, is a senior research scientist with Pfizer.* (*Page 46*)

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Letters

Gasohol as motor fuel

SIR: The remarks quoted by Dr. Lindquist (C&EN, Aug. 7, page 106) do not give a very balanced view of current gasohol possibilities. The economics and energy balance have been the subject of extensive study at the University of Nebraska (Dr. W. A. Scheller and others) and the situation is by no means static. Bear in mind:

1. Starting with corn grain, using traditional technology, there is indeed a net loss of energy in producing alcohol. However, the partial utilization of field wastes as fuel converts this into a modest positive balance.

2. The major energy requirement is in the alcohol plant, where it can be provided as coal or electricity.

3. There is ample scope for energy saving in the distillery, using vapor recompression and other heat economy techniques.

4. Alcohol can be produced from all kinds of low-value agricultural by-products.

There seems to be a possibility of producing at least a portion of our liquid fuel requirements from renewable resources (basically from sunlight) and it should be given a fair chance.

Concord, Calif. P. H. Blanchard

Tannin-containing substances

SIR: The item, "OSHA issues tentative carcinogen list" indicates that tannin is a Category I, confirmed carcinogenic substance, and that as a result exposure to it would be severely regulated (C&EN, July 31, page 20).

This should result in some interesting conflicts, especially if commercial products containing even trace amounts of tannin are to be regulated and handled as confirmed carcinogens. Tannins are widely distributed throughout the plant kingdom. The average individual probably ingests several grams of tannin each week. Coffee, and especially tea, is rich in tannin, as are also red wines, and to a more limited extent beer. Many, if not most, of the items offered in the produce section of the local supermarket contain tannins. Presumably canned goods derived from these items would also contain tannin. If the bureaucracy is right, we now have a choice: continue eating meat and run the risk of circulatory disease due to ingestion of cholesterol, or become vegetarian and run the risk of cancer due to tannin. If much of what we eat is not banned, imagine the Occupational Safety & Health Administration trying to regulate its production and distribution. Being a farmer may be dangerous to your health because of the crops being grown. In fact the soil itself may contain tannin from decaying vegetable matter.

Besides food, individuals come in contact with tannins quite often from other sources. Just consider the forest and products derived from it. The bark of many wood species contains appreciable tannin. Perhaps OSHA will prohibit the gathering of firewood and outlaw the use of Christmas trees. Those species normally used as Christmas trees are all rich in bark tannins. Deeply colored heartwood generally contains tannin, and these are the wood species also used in furniture. Can anyone imagine OSHA regulating all of the industries involved with wood, such as the construction industry, because the wood contains tannin?

Bureaucracies, such as OSHA, should either exhibit some competency or be made liable for their action. The overwhelming use of tannin-containing substances by mankind through millennia was evidently not even considered by OSHA when classifying tannin as a Category I carcinogen.

Herbert A. Schroeder
Associate Professor of Wood Chemistry, Colorado State University, Fort Collins

Letter to the Editor

C&EN encourages readers to contribute to this letters section. However, please keep letters reasonably short, 400 words or fewer. As we receive a heavy volume of letters, persons writing letters are limited, as a general rule, to one letter within any given six-month period.

Safety training

SIR: Safety training in our academic institutions has lagged well behind today's increased awareness of chemical hazard and the continuing promulgation of federal regulations.

I would like to suggest consideration of the idea that the American Chemical Society either recommend or require that all chemistry graduates (at all degree levels) receive at least two credits' worth of safety, hygiene, and toxicology as part of their curriculum.

Academic institutions, if left to their own devices, will be 10 to 15 years late in providing this basic and sorely needed training. They need to be encouraged gently, or perhaps more firmly, by tying the course into our accreditation requirements.

James A. Kaufman
Member, ACS Division of Chemical Health & Safety (Probationary), Wellesley, Mass.

More on innovation

SIR: Regarding the editorial "Innovation and national security" (C&EN, July 17) and a recent letter "General lack of concern" (C&EN, Aug. 14), I believe a more fundamental principle underlies this discussion: the ability to weather change. The key to survival in a varying environment is adaptation. Thus the capacity to adjust connotes security. A major threat, therefore, is capital-enhanced stagnation: accumulating available natural and social resources in standing machinery to the extent that innovation is curtailed.

THE GREEN SHEET

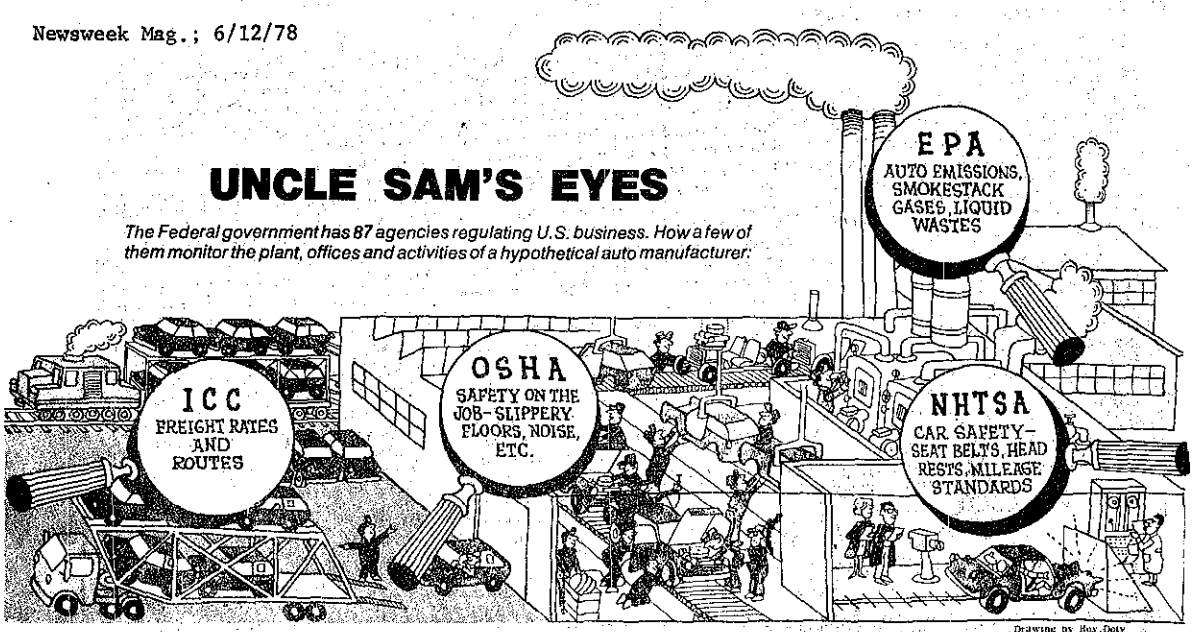
News About the U.S. Department of Health, Education and Welfare

File w/ editorials

Newsweek Mag.; 6/12/78

UNCLE SAM'S EYES

The Federal government has 87 agencies regulating U.S. business. How a few of them monitor the plant, offices and activities of a hypothetical auto manufacturer:



Drawing by Roy Doty

The Regulation Mess

In the mind's eye of American business, 1984 is already here. Big Brother, in the garb of the government regulator, has infiltrated virtually every corner of private enterprise, imposing standards for everything from smokestack effluents to the shape of toilet seats. Alphabetical watchdogs proliferate: the likes of EPA, OSHA, NHTSA and CPSC, mostly accepted by business as well-meaning but roundly condemned for pickiness, overzealousness and bureaucratic tunnel vision. But times and the national mood are changing, and the regulatory monster may be in for a leashing.

Jimmy Carter has made a start on redeeming his campaign pledge to reduce bloated bureaucracy: his aides say he has reduced federally mandated paperwork by 12 per cent since his Inauguration. The Civil Aeronautics Board has pushed successfully for lower air fares, and other Federal agencies are beginning to whittle down their rule books. And lately, with inflation soaring back to double digits, the effort to cut the sheer cost of regulation has taken on a new head of steam. Twice during the last two weeks, the President's economic advisers have proposed to block major new health rules, on the ground that they were inflationary.

There's a sense, even among thoughtful members of the watchdog Establishment, that the systems intended to protect the public sometimes abuse it, that the regulators' prescriptions for some problems create even bigger ones, that they've got their priorities confused. "Is it possible," asks Harrison Wellford, executive associate director of the Office of Management and Budget, "that we are spending money on the safety of swimming-pool slides when we can eliminate carcinogens from drinking water?" Beyond that, there's a feeling that the regulators may be using the wrong tools. Should they simply keep forcing companies to follow the rules, or should they set up incentives that make it pay to obey? Should they specify how their goals are to be met, or leave industry free to find its own procedures?

The regulatory apparatus leaves itself wide open to scrutiny. There are now no fewer than 87 Federal entities that regulate U.S. business, and to complete the 4,400 different forms they dispense requires 143 million man-hours of executive and clerical effort each year. The regulators are proposing so many new rules that the Federal Register has ballooned in size to nearly 70,000 pages annually. Companies complain that many of the rules are simply unnecessary. One agency often requests information already on file with another, they say, and at times rulings of one regulator conflict with another's.

UNWINDING THE TANGLE

The biggest beef against regulation, however, is its sheer cost. Economist Murray Weidenbaum of the Center for the Study of American Business at Washington University estimates the total annual bill at $103 billion. Most of the cost is borne by business, which passes it on to the consumer. Weidenbaum estimates that equipment mandated by the regulators accounts for $666 of the average price of this year's car, and that government requirements add $1,500 to $2,500 to the price of a new house. All told, chairman Barry Bosworth of the Council on Wage and Price Stability estimates that regulation adds 0.5 to 0.75 per cent to the cost of living each year.

The cutting edge in Carter's program to unwind this tangle is his effort to deregulate the airline industry. While a deregulation bill has moved glacially through Congress, the President's activist Civil Aeronautics Board has already achieved many of his aims through administrative action. "Air travel is becoming significantly cheaper and it's because of the President," says Simon Lazarus, the chief of Carter's regulatory-reform section. Elsewhere, the President has directed agency heads to take more personal responsibility for rule making, and he has told the bureaucrats to write their rules in plain English. "We realize we've lost credibility in the regulatory area," says OMB's Wellford. "There is still support for clean air and water, but the public is more conscious now of the trade-offs."

The pressure is beginning to show results. The Occupational Safety and Health Administration, perhaps the most reviled of all watchdogs, has repealed 1,100 of its more than 10,000 rules, and administrator Eula Bingham says that henceforth "OSHA's going to be looking for the whales, not the minnows." Douglas Costle, chief of the Environmental Protection Agency, now insists that before proposing a new rule his aides consider one more option: doing nothing. And the White House has stepped up its own efforts. Carter's economic advisers have begun spotlighting new regulatory moves that look particularly inflationary. The first was OSHA's proposal to reduce the incidence of lung-damaging cotton dust in textile mills. Then last week, it was disclosed that the White House economists were asking EPA to revise its

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THE GREEN SHEET

News About the U.S. Department of Health, Education and Welfare

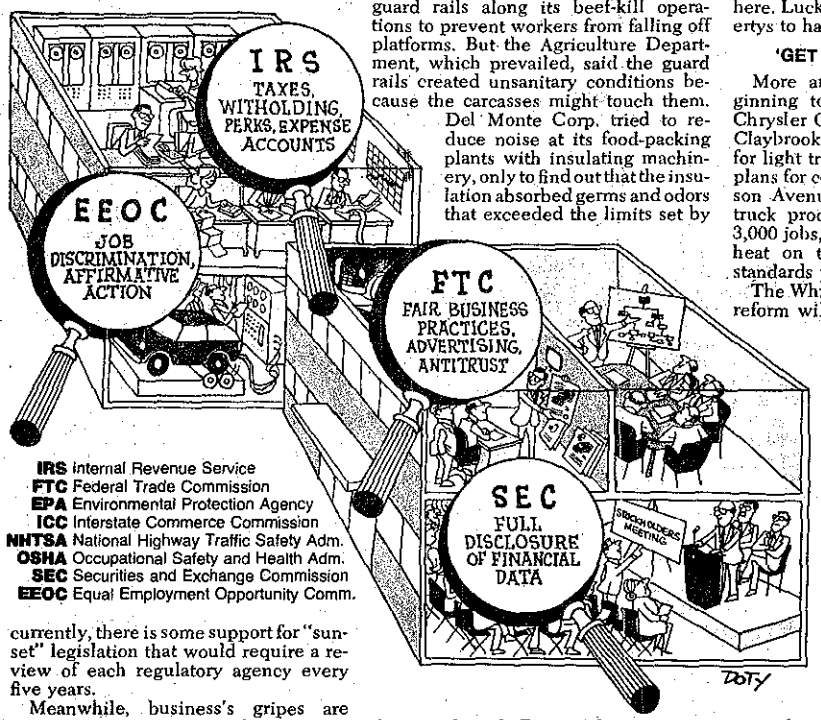
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proposed new regulations for stricter control of air pollution.

Congress's attitude also seems to be changing. Last November, when the White House published a proposed Executive order on "improving government regulation," a coalition of thirteen senior senators promptly informed the President that the regulatory agencies were creatures of Congress and that he should keep his hands off.

THE GRIPES ARE MOUNTING

But last February, faced with the opportunity of creating yet another regulatory body, a consumer protection agency, Congress thought it best to vote no. And



IRS Internal Revenue Service
FTC Federal Trade Commission
EPA Environmental Protection Agency
ICC Interstate Commerce Commission
NHTSA National Highway Traffic Safety Adm.
OSHA Occupational Safety and Health Adm.
SEC Securities and Exchange Commission
EEOC Equal Employment Opportunity Comm.

currently, there is some support for "sunset" legislation that would require a review of each regulatory agency every five years.

Meanwhile, business's gripes are mounting. Among its complaints:

▪ The regulators are overzealous do-gooders. Some press health issues with such moral fervor that it becomes unthinkable for industry to discuss the costs. Joan Claybrook, head of the National Highway Traffic Safety Administration, has won a reputation in Detroit as "the Dragon Lady." But that doesn't impress her old mentor, Ralph Nader, who has chastized her for caving in to industry interests. "Regulators today are like the prohibitionists of the teens," says political scientist Irving Kristol. "Instead of trying to regulate, they try to eliminate evil from the world, and you just can't eliminate evil from the world."

▪ Regulators have little sense of cost-benefit trade-offs. Union Carbide, for instance, spent $95 million in recent years to achieve a 90 per cent reduction in objectionable liquid discharges from its plants. New requirements to reduce the discharges by an added 5 to 6 per cent would have cost an estimated $200 million. Carbide and other companies with the same problem convinced Congress that it should relax the rules.

▪ Regulations are ludicrously rigid. U.S. Borax has found, for instance, that in Los Angeles the purity requirements for water that can be dumped into the city's sewer system are stricter than those for drinking water.

▪ Regulators cannot agree with one another. OSHA recently told the Dubuque Packing Co. in Iowa to install guard rails along its beef-kill operations to prevent workers from falling off platforms. But the Agriculture Department, which prevailed, said the guard rails created unsanitary conditions because the carcasses might touch them.

Del Monte Corp. tried to reduce noise at its food-packing plants with insulating machinery, only to find out that the insulation absorbed germs and odors that exceeded the limits set by the Food and Drug Administration.

Other types of complaints abound. Ingersoll-Rand has joined in a class-action suit against the EPA rather than give the agency proprietary information on its air compressors that might find its way into competitors' hands. Companies in the Houston area say they are now paying a price for having cleaned up their air in previous years: no new plant can be built in the area unless existing plants reduce their pollution by the amount the new one would add.

HOW TO COPE WITH RED TAPE

Environmental-impact statements are proving a problem for every company—so much so that at least one company has adopted as a rule of thumb what it calls the "150 per cent statement": always furnish 50 per cent more data than was given for the last similar project, and hope for the best. This week, the White House plans to issue guidelines calling for shorter, clearer statements.

For smaller companies, the mere existence of so many regulators means trouble. The Chester Dairy in Chester, Ill., for instance, has but 27 employees—yet it must report to at least twelve different regulators. Farmer John Meats, a small Los Angeles meatpacker, has found one way to cope. "This is a family-owned organization," says vice president Bernie Clougherty, "and as the red tape comes in, we just hand it out to one of the family. We've got twelve Cloughertys here. Luckily, there are enough Cloughertys to handle it." So far.

'GET THE ACT TOGETHER'

More and more companies are beginning to fight back by themselves. Chrysler Corp., for example, found that Claybrook's proposed mileage standards for light trucks might force it to jettison plans for converting its huge East Jefferson Avenue plant in Detroit to light-truck production. Fearing the loss of 3,000 jobs, Michigan politicians put the heat on the Administration, and the standards were reduced.

The White House hopes its regulatory reform will help avoid such confrontations in the future. Carter's strategy counts heavily on a seemingly simple new rule requiring advance notice of proposed new regulations—a move that will give industry more chance to react and help the White House coordinate policy. "We need to get our Federal act together," says Wellford, who is pushing the reorganization effort for the OMB.

As Carter has already learned, actually reducing regulation isn't as easy as it sounds. Businessmen tend to have a kind of brier-patch reaction to the regulatory agencies, loudly protesting rules they find convenient in practice. The nation's 14,000 interstate truckers have grown and prospered in the maze of rules and rates set by the Interstate Commerce Commission, and most of them were far more dismayed than pleased when Carter suggested a dose of competition. Congress too, despite its "new mood," hesitates to offend either industry or the bureaucracy.

Nonetheless, the White House timetable aims to give first priority to cutting regulation in transportation, focusing on the airline industry this year and postponing a confrontation over trucking. A "fundamental look" at OSHA is on the agenda next year, with future priorities on financial institutions and the communications industry.

And Carter's people don't hesitate to suggest some fairly sweeping reforms—

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The Nation

Wash. Star; 6/8/78

Bad News for Young Women Smokers

BOSTON — Healthy young women who smoke heavily are about 20 times more likely to have a heart attack than equally healthy non-smokers, a new study indicates.

The researchers said their survey suggested that 75 percent of the heart attacks suffered by otherwise healthy women under 50 years of age are caused by cigarettes.

They warned that such attacks are likely to increase as more teen-age girls take up smoking. The study, conducted at Boston University Medical School, was published in today's edition of the New England Journal of Medicine.

Legionnaires' Disease Source Sought

BLOOMINGTON, Ind. — Phase II of an effort by health detectives to locate the source of bacteria that caused 11 cases of Legionnaires' Disease began today with samples collected at two Indiana University buildings.

George F. Mallison, an environmentalist with the National Center for Disease Control in Atlanta, arrived yesterday to help find the source of the outbreak of the pneumonia-like disease, which killed three victims.

FRAUD RECOVERY
cont'd from p.1

mitted a bill for an abortion for the woman, he said.

ACROSS THE country, federal investigators have turned over the names of 1,950 doctors and pharmacists to state agencies for further investigation and possible criminal prosecution, William Hendrickson, special agent of the Office of the Inspector General, said.

The antifraud drive began in April after HEW officials reported that more than $2 billion was being lost annually in the health insurance programs because of overpayments, duplicate payments, payment for work not done, and ineligible patients.

Called "Project Integrity" federal investigators are working with state agencies to comb through bills submitted by medical personnel in search of fraudulent practices. Millions of records are reviewed with the help of computers.

THE THREE state groups aiding in the latest crackdown are the Illinois Department of Law Enforcement, Illinois Department of Public Aid, and the Illinois Bureau of Investigation.

Among the items the computer looks for as signs of possible abuse are: a patient who visits a doctor 40 or more times a year; a doctor who makes 25 or more house calls on the same patient in one year; a patient who receives 25 or more injections in one year; and a doctor who performs more than one tonsilectomy on the same patient, according to John White, assistant HEW regional audit director.

Hospital Costs Bill Surrvives First Attack In House Committee

By Cristine Russell
Washington Star Staff Writer

A compromise version of the Carter administration's plan to cut rising hospital costs has survived an initial attack by House Commerce Committee opponents which could have effectively killed the controversial legislation for this year.

But the fight is far from over. The hospital cost containment bill may face a minefield of amendments from those who feel the proposed action goes too far and those who argue that it does not go far enough.

Consideration of such amendments by the 43-member committee was postponed today because of pending business on the House floor, but is expected to be rescheduled for tomorrow or early next week.

The compromise pushed by the health subcommittee chairman, Rep. Paul Rogers, D-Fla., and ranking minority member of the subcommittee, Rep. Tim Lee Carter, R-Ky., would give hospitals a two-year period to curb rising health costs by 2 percent a year before a mandatory federal control scheme would be triggered.

Hospital costs, which represent over 40 percent of the health care budget, have grown annually at a double-digit inflation rate for a decade. Proponents estimate that the cost control plan would save $30 billion over the next five years.

It was a coalition of those concerned that voluntary controls are not strong enough and could adversely affect hospital workers' wages and those who advocate a hospital industry-backed all-voluntary plan which threatened the future of the legislation in a key vote yesterday.

A surprise motion to send the compromise bill back to the health subcommittee for reconsideration, introduced by Rep. Bob Gammage, D-Texas, was defeated by a vote of 24 to 16. Gammage's supporters included most of the committee republicans as well as some of the liberal democrats, but Rogers was able to use the proxy votes of several absent members in his favor.

A Roger's aide later said that "It would appear that their best hope has fallen short," but cautioned that there would still be "varying amendments on both sides" which could still call the outcome into question.

cont. from previous page

not only in cutting regulatory red tape but in changing the basic way rules may be applied. One idea being studied, for example, would offer tax credits as incentives for recycling waste products rather than simply outlawing discharges. "Incentives are not a panacea, but it's a way of changing behavior," says Bill Drayton, a planner for the EPA. Similarly, EPA is toying with the idea, rejected by Congress last year, of charging penalties for each car sold that exceeds specified emissions levels. That amounts to heresy to many on both sides of the issue; environmentalists call it a "license to kill," while some automen see it as an appalling disregard of law itself.

But this willingness to consider new approaches may be the most important part of Carter's reform program. The nation, says Wellford, is "entering a period of limits. There's no free lunch, and there is a trade-off for everybody." That sounds almost like a sensible goal—a welcome novelty in the regulatory world. It won't be easy to get there, but a start has been made.

—DAVID PAULY with JANE WHITMORE in Washington, JAMES C. JONES in Detroit, PAMELA ELLIS SIMONS in Chicago and bureau reports

Wall St. Jrnl; 6/9/78

U.S. May Require That Labels on Food Give More Details

* * *

Three Agencies Set Hearings This Year on What Data Consumers Want to See

By a WALL STREET JOURNAL *Staff Reporter*

WASHINGTON—The government wants to know what Americans want to know from their food labels.

The Food and Drug Administration, the Agriculture Department and the Federal Trade Commission said they will hold jointly a series of public hearings this summer and autumn to ask consumers what kind of information they want on labels. The government is considering increasing and standardizing information people get about what they eat.

Each of the agencies regulates some aspect of food labeling and marketing. The Agriculture Department covers red meat and poultry, while the FDA has jurisdiction over other foods. The FTC regulates food advertising.

Among the points on which they seek comments are:

—Whether all foods should have dates stamped on the packages to help consumers determine freshness.

—Whether all foods should be required to list their ingredients, perhaps by percentage. Currently, only some foods must do so.

—Whether raw commodities should be labeled for their nutritional content. Such labels currently are required only for products that make a nutritional claim.

The agencies will also consider questions about labeling and naming of "imitation" products, and about the practice of adding vitamins and minerals to foods that don't naturally contain them.

The agencies said the strategy they hope to devise after the hearings "may involve changes in current leabeling regulations, new regulations or recommendations for new legislation."

The government plans five sets of hearings between August and October in various parts of the country. The agencies said Carol Forema, the assistant agriculture secretary for food and consumer services, and FDA Commissioner Donal Kennedy will preside over at least some of the hearings.

Mr. Kennedy has said recommendations probably won't be proposed until next year and mightn't take effect until early 1980.

THE GREEN SHEET

News About the U.S. Department of Health, Education and Welfare

Editorials & Op-Ed

Chgo. Trib; 6/9/78

Joan Beck

California's fury hits the new elite—bureaucracy

The stunning victory of California's Proposition 13 has not only produced a heady new political issue, but it has also inspired the biggest crop of metaphors since Shakespeare.

The Jarvis-Gann amendment is a "green hulk rising out of the swamps of the West," according to one opponent. It is "apocalypse," a "terrible swift sword," the "tip of the iceberg," a "Pandora's box," a fiscal "straightjacket," a "new Boston tea party," a "kick at the machine," and a "war with machetes." It will "cut off their heads," create "a vast boiling sea of anxiety," produce "aftershocks" and unloose "a stampede of Trojan horses" that Gov. Jerry Brown must "lasso." And it marks the start of a new kind of class conflict pitting taxpayers against a rising "political class."

There's more than metaphor to that phrase, "political class." And as taxpayers outside California begin plotting how best to get their own taxes Jarvisized, the concept of "political class" deserves some thought.

It might not be overworking the metaphor too much to suggest that our supposedly classless society is developing an enormous, new political class. We have, it can be argued, a privileged, powerful, well-entrenched aristocracy whose members lay down the rules for the rest of us and assume they have the right to levy whatever tribute they wish on us.

Our political class spends 44 per cent of the nation's total income, with little accountability. [The Department of Health, Education, and Welfare alone has been wasting $6 billion a year, according to HEW Secretary Joseph A. Califano Jr.] And, in ostensibly doing good for the nation, the political class has done very well for itself, in hundreds of princely ways.

In fact, it takes imperial motifs to describe the opulence with which members of the political class now surround themselves. The new Senate Office Building, for example, "would make a Persian prince green with envy," in the words of Sen. William Proxmire [D., Wis.]. HEW is "an empire that would be the envy of pharaohs or the ancient Chinese emperors," says Time.

Federal wage levels are estimated to range from 13 to 20 per cent higher than pay in comparable jobs in the private sector. Washington, whose major industry is government, is now the richest of all metropolitan areas in the nation. Two adjoining bedroom counties top all others in median family income.

Members of the political class who work for the federal government don't have to retire—ever. They are free from the cost-ineffective Social Security system because they have their own better deal. Their salaries are protected against inflation; even their pensions have rare cost-of-living adjustments annually.

The political class doesn't have to worry about measuring up to private sector competition. Except for a few hundred top political appointees, members of the political class have job security even a tenured professor would envy. It's so hard to fire a federal employe that it's rarely even tried any more; it's easier to keep on paying a poor worker a salary and give him nothing to do.

Increasingly, the political class is being seen as despots, however benevolently intentioned. What monarch ever issued a Federal Register with 70,000 pages of proposed new regulations every year? Or what rulers ever managed to make the ruled pay an estimated $103 billion a year for being regulated?

The political class, moreover, has managed to convince so many others of its benevolence that they have been willing to overlook its increasing despotism. Even as it grows out of control, the political class has ardent defenders who insist it can't be curtailed at all without a repudiation of "liberal values." It alone can accomplish humane tasks handled privately in the past, and, despite a catalog of costly blunders, it is an efficient, effective way to get things done, supporters argue.

By its nature, metaphor exaggerates and it's tempting to push this one too far. But the metaphor can also illuminate. And the concept of "political class" does help explain some of the ferocious battles over Proposition 13 in California and the reasons such a drastic step was necessary. And as tax revolt spreads, it may help to remember that it will be in part a class battle.

The Chronicle of Higher Education; 6/20

■ Briefly Noted

Labor Secretary Ray Marshall says he will use $20-million from the $8.3-billion Comprehensive Employment and Training Act to finance 33,600 summer jobs for young people. . . . A House of Representatives subcommittee has tentatively approved legislation to guarantee schools and colleges at least 40 per cent of state allocations for energy conservation under a three-year, $900-million program proposed by the Carter Administration. The full House Interstate and Foreign Commerce Committee takes up the measure (H.R. 6831) this week. . . . The Office of Education has issued final regulations for three programs aiding disadvantaged college students—Upward Bound, Talent Search, and Special Services to Disadvantaged Students. They were published in the May 24 *Federal Register*. . . . The Immigration and Naturalization Service has published final regulations that limit to one year the time a non-immigrant alien student may engage in practical training in this country. The rules appeared in the May 24 *Federal Register*. . . . Proposed rules setting eligibility standards for the award of grants to major research libraries were published by the Office of Education in the June 6 *Federal Register*. The public has until July 21 to comment. . . . July 18 is the deadline for public comment on proposed new regulations, published in the June 1 *Federal Register*, governing the transfer and lease of federal real estate for educational or public-health purposes. . . . In two "notices of intent" published in the May 20 *Federal Register*, the Office of Education said it planned to issue regulations designed to improve college counseling and guidance programs, and the Public Health Service said it would propose new regulations for the National Health Service Corps dealing with the assignment of medical personnel to localities with shortages of health professionals. The public has until July 5 to comment on both notices.

■ People

Eleanor Holmes Norton, former chairman of New York City's Commission on Human Rights, has been confirmed by the Senate as a member of the Equal Employment Opportunity Commission. President Carter has said he will name her chairman of the commission. . . . Howard A. Glickstein, professor of law at Howard University and former staff director of the U.S. Commission on Civil Rights, has been named to direct President Carter's reorganization of federal civil-rights agencies.

The Chronicle of Higher Education; 6/20

U.S. Control of DNA Studies Advances in Congress

House subcommittee approves bill to require government licensing of all research facilities

WASHINGTON

Congress has moved closer to providing for federal regulation of all "recombinant DNA" research with the approval by a House of Representatives subcommittee of a bill that would authorize the licensing of DNA research facilities.

The bill, approved by the Subcommittee on Health and Environment, would also authorize the regulation of any other recombinant DNA activity—including on-site agricultural experiments and the transportation of cell cultures containing recombinant DNA—that is not conducted in a licensed facility.

Recombinant DNA research involves the insertion of genetic material—deoxyribonucleic acid, or DNA—from one organism into simpler organisms, such as bacteria. While the combination of genetic materials may lead to great benefit in medicine, agriculture, and other fields, critics say the experiments could create new diseases or strains of bacteria resistant to conventional treatment.

Experiments with the recombinant DNA that are conducted at institutions receiving federal funds—including nearly all universities—are now regulated by guidelines issued last July by the National Institutes of Health. Commercial research, however, such as that carried on by drug and agricultural companies, does not come under the jurisdiction of the N.I.H. guidelines.

In addition to the licensing and regulation of DNA research, the House bill would authorize:

▶ The regular inspection of laboratories, equipment, materials, and records used in conducting DNA research.

▶ The establishment of "local biohazards committees"—including local government and community representatives—which would consider applications for licenses of any DNA research facilities in their respective communities.

▶ The establishment of a 13-member public commission to study the entire realm of DNA activities, including the history of DNA research and the assessment of the risks involved in such work. As defined in the House bill, the commission would go out of existence after two years.

▶ The establishment of a permanent, 17-member advisory committee to assist the Secretary of Health, Education, and Welfare in preparing regulations and issuing licenses for recombinant DNA research. Eight members would be scientists involved in such research, and nine would be public representatives.

Public oversight of the controversial research has been a much-debated issue among legislators and researchers in several university communities.

Apparently fearful of leaving too much authority over the research in the hands of the Secretary of Health, Education, and Welfare, subcommittee members approved a series of amendments that consistently strengthened the role of the proposed advisory committee.

Approval for All Licenses

As now written, the bill would require the committee's approval of all licenses for facilities conducting so-called "P-4" experiments—high-risk experiments requiring the most stringent safeguards.

In addition, the H.E.W. Secretary must consult with the advisory committee on the licensing of facilities carrying out "P-3," or moderate-risk, research. The Secretary would have final authority to issue "P-3" licenses, however.

Although the provisions for the expanded role of the advisory committee passed easily in the subcommittee, H.E.W. spokesmen voiced concern that the job of the committee, as redefined by the amendments, might become a full-time one. The spokesmen said the best-qualified persons would probably be unwilling to take on such a workload.

The language of the House bill makes no distinction between commercial and non-commercial DNA research. A provision that would exempt certain kinds of information about experiments from the requirements of the federal Freedom of Information Act—on the ground that they constitute "trade secrets"—applies equally to university and industry researchers.

Guidelines Challenged

A provision in an earlier version of the bill authorizing $61.5-million in grants to up to 10 centers involved in the "P-4" research was dropped from the present subcommittee bill.

As Congress worked on legislation designed to regulate recombinant research, the year-old N.I.H. guidelines for DNA studies, which are the only federal guidelines now in effect, have been challenged in U. S. District Courts both here and in New York.

An environmental organization, Friends of the Earth, and an individual living near Fort Detrick, a former Army base in Frederick, Md., where the N.I.H. plans to conduct "P-4" recombinant research, have each sued the N.I.H., charging that the institutes failed to issue a required environmental-impact statement before releasing the research guidelines. They are seeking a halt to all federal funding of DNA research.

A hearing on the Washington suit is scheduled for this week. No hearing date has been set for the New York suit. —ELLEN K. COUGHLIN

The Chronicle of Higher Education; 6/20

■ Human Protection Commission Approves Psychosurgery

Performed under strict limitations and controls, psychosurgery—a controversial form of brain operation that alters human behavior and emotions—has been endorsed by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research.

After studying psychosurgery performed during a 10-year period, the federal commission concluded that a ban on all psychosurgical procedures would not be the "appropriate response" to the risks of harm and abuse. Instead, the commission recommended a series of safeguards, including asking the Department of Health, Education, and Welfare to restrict psychosurgery to institutions with medical review boards that can strictly monitor its use.

Interested persons were given until July 22 to comment on the recommendations, which were published in the May 23 *Federal Register*.

The Chronicle of Higher Education; 6/20

■ President Urges Elimination of More Advisory Units

President Carter has told the heads of federal departments and agencies that they need to make further reductions in the number of advisory committees under their jurisdiction.

In an initial review, 60 agencies recommended the elimination of 304 advisory groups—25 per cent of the total. In a memo to department heads, however, President Carter urged the officials to "rethink the need for your committees."

The Department of Health, Education, and Welfare has proposed eliminating 91 of its 352 advisory groups, including four of its seven higher-education advisory panels.

THE GREEN SHEET

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Science-Government Ties 'Re-Cemented,' Carter Says

The Chronicle of Higher Education; 6/20

Top research and health advisers are sworn in

WASHINGTON

In a White House ceremony that President Carter characterized as "a great step forward in re-cementing the relationship" between the scientific community and the federal government, three top federal officials in the research and health fields were sworn in this month.

Those taking the oath of office were Frank Press, formerly of the Massachusetts Institute of Technology, as Presidential science adviser; Richard C. Atkinson, formerly of Stanford University, who was elevated from acting director to director of the National Science Foundation; and Peter Bourne, a longtime Carter associate and internationally recognized drug authority, as director of the Office of Drug Abuse Policy.

Speaking extemporaneously, the President used the ceremony to indicate that his Administration would strive for a close working relationship with the scientific community.

'Integral Part' of Administration

Mr. Press, he said, will be "an integral part of my own Administration. He attends the Cabinet meetings. He attends the senior staff meetings. And whether it might be new weapons systems, scientific aspects of SALT negotiations, problems with defense experimentations that might lead to new opportunities there, or whether it involves problems with weather determination or in many instances problems involving social sciences, he has been very helpful in helping me to make the right decisions."

Alluding to the fact that Mr. Atkinson, an experimental psychologist, is the first social scientist to head the National Science Foundation in its 26-year history, Mr. Carter observed, "I think it is significant that we are now departing from the physical sciences to some degree in seeking a broader scope for research and development in determining how we can deal with the complicated world that we face in years to come." White House aides later said that the President's remark did not presage a decline in support for the physical sciences, but simply reflected the fact that the new director's professional background was in tune with the growing federal interest in the societal implications of research.

Referring to the N.S.F. budget, Mr. Carter added, "There are about $800-million that are channeled into innovative thought processes to decide how our world might be shaped by human beings in these trying times." The N.S.F. directorship, he continued, "is a position that must have the trust and confidence of the scientific community and all its disciplines, and I am grateful to have a man of his stature and ability and reputation to serve in this position."

Mr. Bourne, who was associated with the President when he was governor of Georgia, was described by Mr. Carter as "having become perhaps, I think, the world's foremost expert on drugs." He added, "Dr. Bourne is also an expert on medicine and gives me and [H.E.W. Secretary] Joe Califano a great deal of help in determining the policies for the future in that field."

"So this is a morning," the President concluded, "when we are taking a great step forward in re-cementing the relationship between scientific knowledge, the probing of new areas of human comprehension on the one hand, and the political application of that knowledge on the other, for the benefit of all mankind and womankind."

—DANIEL S. GREENBERG

The Chronicle of Higher Education; 6/29

■ Computer Executive to Head Student-Assistance Bureau

Ernest L. Boyer, U. S. Commissioner of Education, has chosen an executive of a data-processing company as deputy commissioner in charge of the Office of Education's new Bureau of Student Financial Assistance. The choice of Leo L. Kornfeld, vice-president of Automatic Data Processing, Inc., and a former consultant to several colleges and universities, reflects "the call for new leadership and management skills by [H.E.W.] Secretary [Joseph A.] Califano," said Mr. Boyer. "We are determined to see to it that student aid is delivered efficiently and effectively." Mr. Kornfeld's bureau will consolidate the management of eight student-aid programs.

Wash. Star; 6/17

The Ear

CHECK YOUR WALLETS . . . Ear hears that Jimmy Carter thinks Henry Reuss, the Wisconsin Democrat and frightfully important chairman of the House Banking and Currency Committee, should have Arthur Burns' job as Farouk of the Federal Reserve Board. There are pros and cons, Earwigs. He *is* adorably stuffy. But he *doesn't* smoke a pipe, or paint terrible pictures, and his hair's *completely* wrong.

ONCE MORE, WITH FEELING . . . Three years ago, this dynamite French singer named John Paul Vignon (rhymes with Filet Mignon) cut a record. It was various sexy songs about thighs and things in French. It was called "You." As he crooned the scorchy lyrics, a Sexy Female Voice murmured them in English. It was a flop, 'wigs. The record company decided the Voice wasn't sexy enough. Well, now the Nelson Barry Company's bought it. It's re-issued the disc, with a picture of the Voice on the cover. It's sold out in Dayton already. The Voice belongs to Farrah Fawcett Majors.

IT PROBABLY BEATS KAY'S SANDWICH SHOP . . . Joe Califano's wife Trudy's birthday was last week. A pal gave her one of those cute aprons emblazoned *"Let's Eat at the Office."*

The Chronicle of Higher Education; 6/20

Congress Eyes Cuts in Funds for Education

Threat of a Presidential veto intensifies debate

WASHINGTON

Under pressure from President Carter and conservative Congressmen to keep down federal spending, the House of Representatives last week weighed an appropriations measure that would allocate $3.74-billion for higher-education programs in fiscal 1978, $460-million more than the President requested.

At least one controversial amendment, sponsored by Rep. Robert H. Michel, Republican of Illinois, threatened to slash the increases earmarked for student-assistance and other education programs in the massive, $61.3-billion bill to finance the Departments of Labor and Health, Education, and Welfare in the fiscal year that begins Oct. 1.

A bitter fight over abortion that wracked Congress for weeks last year before winding up in the courts, was also expected to erupt again. The bill contained language that would prohibit the use of H.E.W. funds to pay for abortions for female welfare-recipients, except when the mother's life was endangered.

A similar amendment was attached to the Labor-H.E.W. appropriations bill last year. Currently, Medicaid funds are being provided for abortions while several court appeals are pending.

Despite early indications that Congress might support cuts in education programs and warnings from President Carter that he would veto any spending measures he considered excessive, the full House last week was expected to approve the $3.74-million for higher-education programs recommended by the Committee on Appropriations.

Senate Panel's Recommendations

A Senate appropriations panel recommended $3.05-billion for higher-education programs—only $214-million more than the Administration's figure—in its version of the bill. The full Senate Committee on Appropriations was expected to make its final spending recommendations late last week.

Under the House bill, the vast majority of the higher-education funds would go for student aid. The total for that purpose was $3.3-billion, an increase of $375.2-million over the Administration's budget request and $664.9-million more than the amount available this year.

The bill included enough money to raise the maximum Basic Educational Opportunity Grant from its present $1,400 level to $1,800—the maximum authorized by the Higher Education Amendments of 1976 for the 1978-79 academic year. The Carter Administration had proposed a ceiling of $1,600.

The House committee's bill also included substantial increases for health-manpower programs, including an allocation of $26-million for loans to health students—despite the Administration's recommendation that funds not be provided for the program.

—ANNE C. ROARK

a positive involvement in the production and consumption of goods. I'm not an economist, as you know, but it is not conceivable to me that this fact in itself would not have a retarding effect on the economy as a whole.

I recall that after World War II we were very much concerned with the economy of the European nations after the devastation of the war. We developed quite effective programs to stimulate and raise the economies of Europe, including those of some of our enemies. We developed Marshall Plans—some people said for reasons of altruism and I suppose some altruism was involved—but basically because the vitality of the American economy was related to the economic vitality of other nations with whom we had to trade. Now America itself has a group of people within the nation that is, in effect, an economically underdeveloped group, and it seems to me fairly clear that this must have some relationship to the vitality of the overall economy. The minorities in America are equal in numbers and economic potential to Canada and a host of other countries. I can't understand why the rationale of, say, the Marshall Plan and our aid program, does not operate here.

Q. Perhaps we may see our former enemies and our allies as potentially productive in ways that we may not see as applying to minorities in our own country.
A. I don't understand that. People are productive to the extent that they are permitted to be productive. I certainly don't buy the argument that minorities in America are genetically unproductive, that blacks in America by virtue of being black are inherently doomed to be tax consumers. They are relegated to being involuntary parasites on the economy because they are excluded from a more positive dynamic involvement in production. The economic burden inherent in American racism is part of a total pattern of racist policies and practices. I tell corporate executives who will listen to me that they should become actively involved in the fight to improve the quality of education for minorities in our public schools. They should not leave this to civil rights agencies for two very simple reasons. First, they pay very high taxes for public education and they should not accept criminally inferior education at the high price they and other citizens pay. Second, in attempting to comply with affirmative action and equal employment requirements of the government, they have to spend more to prepare the casualties of an inferior public education system so they can function efficiently. This is double taxation. It is a matter of just sheer self-interest for American corporations. When neglect is remedied by proper training there is absolutely no difference in the efficiency of minorities or any other previously excluded group.

Q. Do you see any connection between the increasingly popular thesis that cities in decline are simply manifesting a phase in the natural cycle of growth and decline of cities, and the fact that minority concentrations in central cities are growing? And do you think this is an area where the interests of minority groups and business leaders are parallel?
A. I am not one to accept uncritically any theory of natural cycles. If you took that kind of perspective you would have no major progress in medicine or public health. I guess there was a time when people thought plagues were a natural cycle. The problems of cities are not God-given or natural in the sense that there is nothing human intelligence can do about them. The problems of our cities are problems of will and commitment, and in America, probably are symptoms of racism. A tremendous amount of investment has been made in American cities. In almost every deteriorated city a great deal of building construction is underway—commercial building—luxury apartments, cultural facilities. It is a tactical problem. There will have to be significant modifications in racism if the cities are to be saved. To me the only problem is how to get the leaders of business and industry and our economy to see this in a tough-minded, self-interested way.

Q. If it is in their interest, why don't they see it?
A. I think it is because of the past. It is difficult to make the necessary adjustment to the present and the future when you are encumbered by past behavior patterns. You generally do this only when it becomes starkly clear that if you don't, things that are very valuable to you are likely to be lost. We have not reached that point yet, but I think we're close to it. And, to me, this is the hope for both race relations in America and for our cities.

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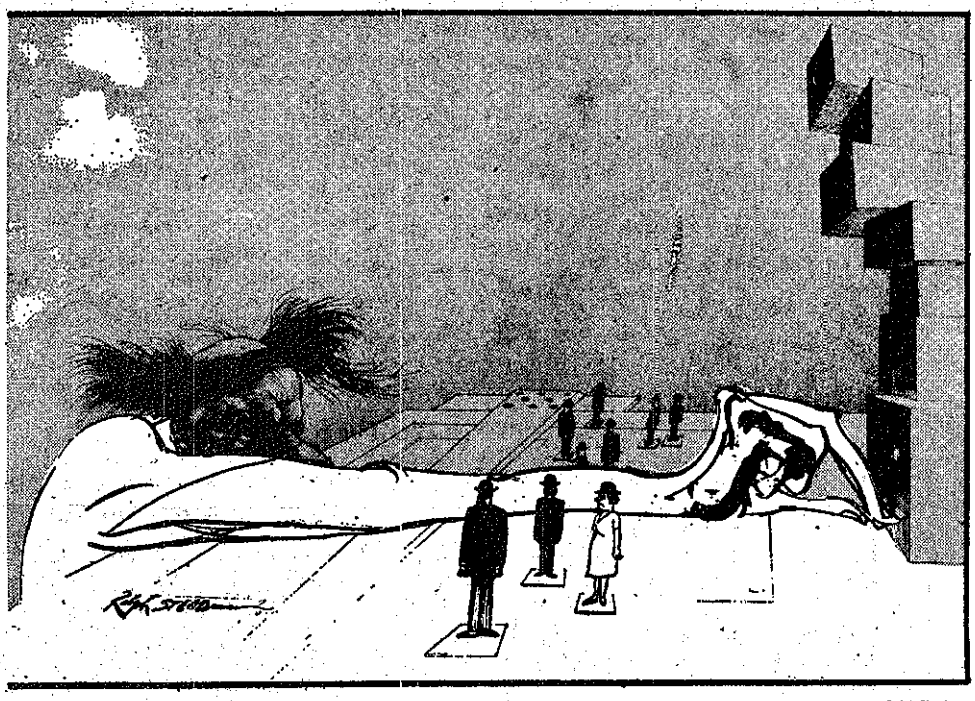
Editorials & Op-Ed

NY Times; 6/6

A Society *of* the People. And *by*. And *for*.

Following are excerpts from an extemporaneous speech made by the Governor of California to the Voluntary Action Center and Junior League, in San Jose. The Governor's office made the transcript available.

By Edmund G. Brown Jr.



Ralph Steadman

People sit back and wonder why their taxes keep going up, why it is that government keeps getting bigger. And it has gotten bigger. It has taken a dramatic jump forward under the leadership of individuals whose entire philosophy and public utterances are to the exact opposite. I refer not only to my predecessor, but to President Carter's predecessor.

So I think we have to ask ourselves, and I'm not raising this as a political question, but as just a way to understand the nature of reality that we all face. Why is it that despite the public philosophy of those in key positions, government gets bigger and bigger, more complex, more involved, and your taxes keep going up?

The very simple reason is that it takes more than words to put some limit on that growth. There are certain needs and obligations in the community that just have to be taken care of, and if you don't do it, through some volunteer movement, some other arrangement outside of the public sector, then inevitably government will take the task and assume those obligations.

If you take, let it be the mentally ill, the narcotic-abuse program, the alcohol programs, child-care, nursing homes, hospitals, training activities, and you meet every need that can be identified, you would have to double and possibly even triple the existing government activity that we now have at the state, local, and Federal level.

■

Something as straightforward as police activity—how many police can you hire and how many are patrolling the streets? The ratio will never be high enough unless people assume a greater degree of responsibility for their own defense and protection. That's not to say that we don't need police—sure we have to have them—but unless the public sector in its manifestation of security by police activity will link itself with the citizens, then all the money in the world will not make the streets safe.

In Santa Ana, there is a police chief who has inaugurated a community-oriented police program and has involved the community through neighborhood meetings, through block captains, in their own security along with the activities of the police.

There is no substitute for neighborhoods, for mutual-support systems in the private sector. Whether it be neighbors who know each other, who have some responsibility for someone other than themselves and their family—you can't get away from it. The idea that you can put it on government, if you want to, is going to triple your taxes because then you have to hire a full-time person who doesn't have the commitment involved in it that you would to do that kind of work.

■

That's my simple message: that voluntarism is not a luxury, it is a necessity for a civilized society that wants to truly meet its human needs. And we have to expand it in a dramatic way across a broad front of government and human activity. We have to find some way to re-create the spirit of neighborliness and mutual self-support that existed before the mobility and the anonymity and increasing information flow that has been the product of this very prosperous society.

When the historians write the pages of California and the United States of America in the 20th and 21st centuries, what are they going to find? I don't want to see just one big government because everything in government at one point or another tends to get politicized; it's an adversary relationship.

When we take these basic human needs, give them to a professional class, everyone else sits back and pays their taxes and gets more and more irritated because they want to know why they're going up. That's because you can't just have rights to things, because for every right you have to have a correlative duty or obligation. There is no escaping that.

You may think you have more mobility and freedom and liberty—a "do-your-own-thing" kind of ethic—but in reality it comes back in the form of government, taxation, crime and mental confusion.

■

That's what we have in this culture today, and unless you who have been in the forefront accelerate your efforts even further, and all of us who have some degree of responsibility magnify and expand what we're doing, then we really face a civilization that is not what I think anybody wants. And that's why voluntarism is so important.

When I went back to Williams, Calif., where my great-grandparents came from Germany in the 1850's, I walked into a nursing home. It was a very nice place, people were working hard cleaning and making sure the residents were attended, but I thought to myself, here's a place where elderly people are sent when they reach a certain age, and are paying $600-$700 a month for strangers to take care of people that not too many years before would have been upstairs in the bedroom, on rocking chairs sitting in the living room. It would have been a part of the context of normal life.

But in order to expand the productivity, the freedom, the mobility, the prosperity, we have segregated, we have specialized, so we have nursing homes for the old, child-care for the young, mental hospitals for those who act in a rather strange way or are different from the rest of us. And schools that start early and keep going till one's mid-20's, longer if possible.

We're institutionalizing everybody. And I'd like to de-institutionalize everybody, I'd like to have a community that has a more human spirit to it. I think people are ready for that. I think they are ready to do something more than what they are doing now, because they can understand the needs, they're not going to go away, people are living longer, they are going to need more care, and it isn't all the work of specialists—that is a myth.

■

Dying for people is not a sickness, it's not something we necessarily have to go to a hospital for, it's part of the

THE GREEN SHEET

News About the U.S. Department of Health, Education and Welfare

TIME: 10/10

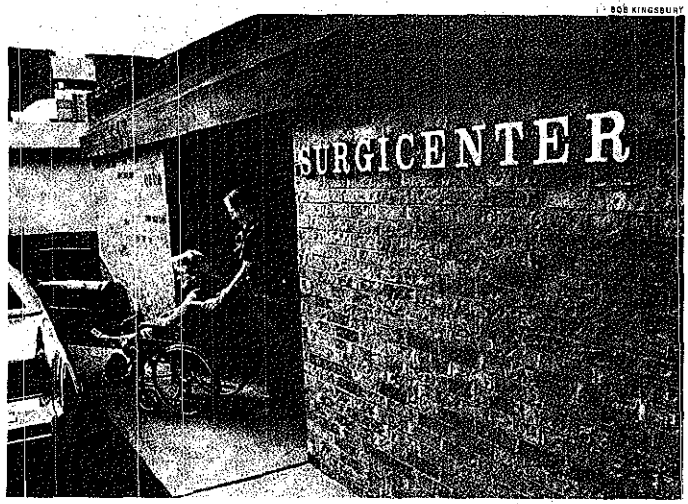
Medicine

Come-and-Go Surgery

Major savings for minor operations

They are usually open only nine hours a day, provide patients with nothing more to eat than a little orange juice and crackers, and shuttle them in and out of the operating room so fast they hardly realize that they have been under the knife. Surgical factories? Not quite. In the past few years, more than 70 such private, one-day surgical centers have opened in the U.S. Undertaking minor surgery of all kinds—from face lifts to vasectomies to repair of hernias—the clinics discharge patients almost as soon as they shake off their postoperative grogginess. The only radical surgery performed is on medical bills. By never keeping anyone overnight, they are able to undercut typical hospital costs for operations by as much as 50%.

BOB KINGSBURY



Patient leaving Phoenix's Surgicenter three hours after minor operation

Nothing more to eat than orange juice and crackers.

The first such independent outpatient surgical clinic was opened seven years ago in Phoenix by two anesthesiologists, Drs. Wallace A. Reed and John L. Ford. Since then, some 46,000 patients have passed through the six operating rooms of their Surgicenter. While the establishment has only recently begun to show a profit, it has spawned three satellite Surgicenters —in Sacramento and Palo Alto, Calif., and in Louisville—and inspired dozens of unaffiliated imitators in other cities. Says Ford: "Up to 40% of all surgery can be done on a come-and-go basis. Our objective is to keep people from being hospitalized who don't really need to be."

Typical of the Surgicenter's cases is that of Andrew Dunham, a blond, 23-year-old Phoenix truck driver whose severely injured finger became badly infected and required surgery. Had his doctor chosen to operate in a hospital, Dunham would probably have been kept at least one night, perhaps longer. Instead, the surgeon—one of more than 300 doctors in the Phoenix area who occasionally use the Surgicenter—directed him to the facility at 10:45 one morning last week. Half an hour later, he was wheeled into an operating room and given a general anesthetic. In just 20 minutes, the surgeon had made an incision, cleaned out the infection and sutured and splinted the finger. After about an hour in the recovery room, Dunham got up and was taken home. Total elapsed time: 2½ hours. His bill for using the facility: $170.

Most people are delighted not only by the low costs and quick exits but by the cheerful, comfortable informality of the small clinics, including friendly follow-up phone calls that nurses make to the patients' homes. If unexpected trouble does occur, the patient can be quickly taken to a nearby hospital. But because patients are carefully screened and examined beforehand by the surgeon, there are rarely any complications, and according to the clinics, there has not been a single fatality in more than 80,000 operations.

The medical Establishment's reaction to the clinics has been mixed. Concerned that the private centers would skim off patients and dollars at a time when they are hard pressed to keep their facilities in full use, many hospitals have established their own one-day surgery units. Some doctors are wary of recommending the private clinics, none of which have yet received the approval of the Joint Commission on Accreditation of Hospitals. By contrast, the American Medical Association has backed the idea for several years. The American College of Surgeons is reconsidering its initial opposition to the independent clinics, as opposed to hospital-affiliated ones. And while some insurance companies and Blue Cross plans originally suspected that the centers were merely a dodge to collect insurance payments for unreimbursable doctors' office surgery, many have become convinced that they are an excellent remedy for the nation's burgeoning surgical bill. ■

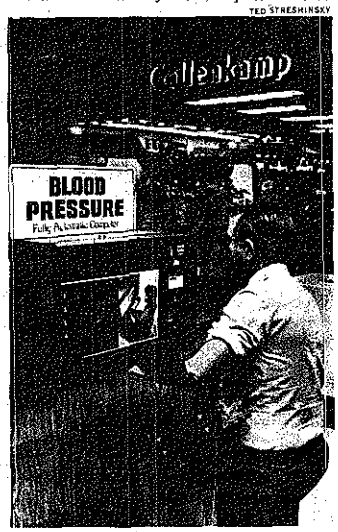
TIME: 10/10

Medical Robot

A slot machine for blood pressure

Jeanette Williams, 73, a San Francisco housewife, used to see her doctor every week to make sure she was winning her battle against hypertension, or high blood pressure. Now she merely stops by a shopping center near her home, where she consults a curious-looking machine that resembles an armrest-equipped chair in a college lecture hall. Taking a seat, Mrs. Williams rolls up her sleeve, puts her arm into a vinyl cuff, deposits 50¢ in the slot and pushes a button. On the console in front of her, the words light up: TESTING—REMAIN STILL. The vinyl cuff tightens noticeably around her arm. Moments later her blood pressure flashes on the screen.

TED STRESHINSKY



Taking blood pressure in San Bruno, Calif.

Cheap, fast and impressively accurate.

The robot blood-pressure machine —or sphygmomanometer—that has sharply reduced Mrs. Williams' dependence on her physician is one of the latest marvels of medical technology. Introduced in 1976 by Vita-Stat Inc. of Tierra Verde, Fla., and now produced by other firms as well, the coin-operated gadgets have appeared in some 1,300 shopping malls, drug and department stores, factories and hospital lobbies across the country. They are not only cheap and fast —a reading takes a little more than a minute—but impressively accurate. Comparing their results with those obtained by conventional means, Dr. Joseph Chadwick, director of the health-systems program at SRI International (formerly the Stanford Research Institute) in Menlo Park, Calif., concluded that the machines are "more consistent than a well-trained blood-pressure technician."

Like ordinary sphygmomanometers, they work by measuring the surge of arterial blood that occurs immediately after the tightened cuff is slightly released. The major difference is that the precise moment of maximum flow, when the heart is pumping hardest—represented by the upper, or systolic, blood pressure—and that of minimum flow, or diastolic reading, are not determined by a doctor or technician listening for the coursing blood with a stethoscope pressed against the forearm. Instead, that job is done by a tiny microphone in the cuff, which sends its signals to the machine's miniature "brain"—tiny silicon chips or microprocessors. Programmed to recognize the noises, the microprocessors not only instruct the machine when to pump up and deflate the cuff, but also determine the exact time for taking the two readings. If there are any disturbing outside sounds or arm movements, Vita-Stat's machine flashes three zeros on the screen and refunds the customer's money.

By referring to a chart fixed to the machine, users can tell whether their blood pressure is outside the normal range for their age. If so, that should be prodding enough for them to seek medical counsel. Hypertension is probably the leading cause of death in the U.S., yet can be easily treated, even in its most severe forms (TIME cover, Jan. 13, 1975). For those who are already under treatment, like Jeanette Williams, the machine is an enormous convenience. Says her husband Eric, 74: "It's easy to use, easy to read, and we have confidence in it." ■

F.I.G. w/ editorials
-9-

THE GREEN SHEET

News About the U.S. Department of Health, Education and Welfare

EDITOR'S NOTE: The story below is part of a lengthy cover story from the Oct. 10 edition of TIME Magazine entitled "Revolt of the Old - The B ttle over Forced Retirement." We have chosen not to run the story in its entirety because of its length.

TIME; 10/10

The Pains and Pleasures of Being "Thrown Out" at 65



IRA WYMAN

"At My Prime"

Do not go gentle
into that good
night,
Old age should
burn and rave
at close of day
Rage, rage
against the
dying of the
light.

At 69, the Rev. Shirley B. Goodwin fights for his elderly compatriots with a zest that captures the spirit of Dylan Thomas' immortal advice to mortal man. Forced to retire four years ago as social relations executive of the Protestant Episcopal Diocese of Massachusetts, he has been crusading ever since against what he sees as the injustice of being "thrown out." Says Goodwin: "I was perfectly healthy and able to do my job. In fact, I was sort of at my prime. I had held the job for 13 years. I dealt with everything from alcoholics to prison reform. If it had to do with people, I had to do with it."

Unlike those who give way to the depressions of unwanted retirement, Goodwin has found an outlet for some of his energies in his very anger. He has turned his white-shingled home in Lexington, ten miles from his old office in Boston, into a headquarters for his campaign to improve the care of the aged in his community. His initial target was Lexington's Golden Age Club, which Goodwin felt was not concerned with the aged poor, many of whom were forced to live on welfare. Goodwin helped found a rival organization, the Council on Aging, which obtained $5,000 from the Federal Government to begin to meet the needs of the majority of some 2,500 townspeople 65 and older. He fought successfully for the ouster of a town manager who opposed the hiring of a staffer for the council. Now local government puts up $17,000 a year from which the Council on Aging pays a full-time coordinator and helps finance such services as "Meals on Wheels" for the old.

"Things are improving because old people are fighting for their rights," says Goodwin, "I make too much noise to be forgotten." Nonetheless, he is far from satisfied. Although he and his wife Estelle, 67, live in relative comfort on their $900-a-month income of pension plus Social Security, he no longer is eligible for benefits he had in his old job, such as housing and car allowances and health insurance. He sees rising property taxes as a constant menace to old people trying to cling to the comfort—and memories —of their homes. Goodwin pays $1,500 taxes a year on his house and half-acre lot, which he bought 17 years ago for $22,500. "The city is spending thousands of dollars on conservation lands because it doesn't want Lexington to change," he says, "but it is forcing the elderly out of town with high taxes. The town is spending $15 million on kids, $17,000 on old people. Do you see a problem there?"

When not campaigning, Goodwin keeps busy cleaning up the damage done his trees by a freak blizzard last May. He insists on cutting his own firewood "because it keeps me in good shape and I enjoy it." He thrives on challenges. The Rev. Shirley Goodwin is raising hell from retirement.



CHUCK TRAINES

"It's a Relief"

G. Arthur Kuechenmeister retired 13 months ago from his $25,000-a-year job as a tire technologist for Uniroyal, with a sense of serious foreboding. "The worst part of it is the feeling that you're washed up, you're through," he says. "You feel that your life is over with, you're no longer a part of the team, the group. They don't want you any more."

But now that he has had a chance to savor the life of pensioned leisure (his after-tax income is roughly the same as his take-home pay the year before), Kuechenmeister finds the ordeal not only bearable but downright pleasant. "It's a relief to be retired," he admits in almost surprised tones. "I'm satisfied. I'm happier not working than I was working. The tensions are gone. If I want to stay up to midnight to watch a football game, I don't have to worry about getting up the next morning."

The transition from secret dread to relief was not abrupt. In the first few months after retiring, Kuechenmeister would drop in at Uniroyal's international division offices in Detroit just to see how projects were going in his department. Having spent 39 years with the company, he could not divorce himself easily from "the things you started but weren't completed when you left."

Since last April, though, he has not been back. He prefers now to work in the flower gardens around his comfortable three-bedroom home in Grosse Pointe Park, read books and play with his daughter's six-year-old son. He keeps in shape with twice-weekly games of golf and tennis. He finds himself "taking better care of the lawn, the house, the cars." He and his wife Helen, 63, make occasional treks to Colorado and Florida, but he does not share all his activities with her. Says he: "We have made an effort to have separate interests so we're not together 24 hours a day."

One thing that Kuechenmeister is trying to improve is his modest portfolio of investments. "I have some investments that I'm going to seriously work at," he says. "This is an outlet I see that will certainly be taxing my intellect."

Kuechenmeister's feeling of contentment contrasts with the tone of an article he wrote last winter for Uniroyal's company magazine criticizing forced retirement. "The thing I was objecting to," he says, "is that someone picked a mandatory point. Age isn't a very good criterion." After reading the story, one of his former bosses offered him what might have seemed like a dream deal: a four-month consultancy at the company's Venezuelan plant. But the months were May through August, and Kuechenmeister discovered he no longer wanted a job that would deprive him of "the most beautiful time of the year in Michigan."

There remains, Kuechenmeister admits, a weed in his garden of pleasures. "Prices and salaries keep going up, but pensions don't," he observes. "I'm a little worried, but there's nothing I can do about it." One impractical dream: "If I only knew we were going to die at 70, say, we could spend all we have in the years that are left."

THE GREEN SHEET

News About the U.S. Department of Health, Education and Welfare

Wash Post; 12/18

RICHARD COHEN

Even With Power, Staff, You Can't Go Home Again

NEW YORK—THE Secretary of Health, Education and Welfare was coming home. He was in a government car with a government press secretary and a government aide. He had been preceded by what amounts to a government advance man. The advance man had gone to the sixth floor of an apartment house in the Crown Heights section of Brooklyn and he had told the woman who lives there that Joseph Califano, the secretary of almost everything that really matters in Brooklyn, used to live in her apartment and he would like to stop by. He was coming home.

So now Califano, who was in Brooklyn on other business, was standing before the woman and he was going through the motions. He was asking her if he could come in and he was telling her that he used to live there, but the truth of the matter is that he did not live there. He used to live down the hall. Someone had changed the numbers on the apartment doors.

Califano knew that right off. He sensed it the minute the elevator arrived at the sixth floor. He started to turn to the right but the man from the regional office said it was to the left. "It's to the right, isn't it," Califano asked and the man from regional said, "No, Mr. Secretary. It's this way." Everyone went off to the left and Califano followed and he wanted to have everything stopped like it was a movie, freeze the frame, while something was said about following your instincts and not listening to staff people.

After all, Joe Califano had made that turn from the elevator about a million times. He lived in that building until he was 17 years old and he made that turn for his meals and to change his clothes after school and to get his skate key and to play the games you play on rainy days. When you live in an apartment house you know the floors you're on from the sound of the elevator's motor and you know your neighbors by the smells of their cooking and you know after 17 years of this sort of thing which way to turn when you get off the elevator. There are things you know.

But the thing had been set up and the advance work done and the woman already briefed, if that's the right word, and so now Califano was touring the wrong apartment, looking for the things that were the same as in the real apartment—things like radiators and wall moldings and the layout of the rooms. When he spotted something like that, he would remark that he remembered it and then quickly and politely he left the place and went down the hall to the right apartment. There was no one home.

It seemed to be a bust—a nice idea with no payoff and some would say it was quintessential Califano. Some would say it was Califano to a T, a liberal without apologies who talks about the poor, for instance, but is against providing them with government money for abortions. People don't like that. They don't expect it of bright, liberal Joe Califano and so when he goes to the sort of parties where you have to sit on the floor and balance your plate on your knee, women in million-dollar dresses crawl over to him and give him bloody murder. Joe Califano, they say, you don't know what it's like to be a woman or poor, or, God forbid, a poor woman. Joe Califano, you have no heart—all staff and no heart.

Out on the street there were men doing nothing at the corner and all around there were signs that the neighborhood was fighting for survival. Califano walked around pointing at this and pointing at that, saying what it used to be and then he walked over to St. Gregory's which is both the school he attended and the church where he worshiped.

It is a wonderful Romanesque church, built for Italian immigrants, and it probably has its counterpart somewhere in Italy. It has a separate bell tower and a graceful, columned porch and once it was more than just a church. Once when you told people you went to St. Gregory's it defined who you were.

There was a woman in the church and her name was Helen Garcia. She was short and old and was waiting for Califano when he arrived. There was word that he might come, so she had gone through the records. She knew a lot about Califano—about his baptism and the marriage of his parents and that sort of thing. It all happened in this church.

"I knew your grandparents," she said to Califano. "I knew Mrs. Scotto, too. Mrs. Scotto—that would be an aunt."

"Yeah," Califano said. "They lived at 1329 and I lived at 1340."

"Do you remember Father Foley?"

"Yeah, he married my mother and father."

"He baptized you, too, Father Foley. I checked the records. He would have loved to have been here. He's retired and living in Flushing. Yeah, he would have loved to have been here, Father Foley."

The old woman continued to talk. She remarked on the wonders of the church and she called the roster of relatives and neighbors now gone, on the attendance of the Sunday mass of the old days, how it was so jammed in there you couldn't get the collection basket down the aisle.

Califano listened and then he started to walk around the place and now when he said he remembered this or he remembered that, there was a touch of wonder in his voice, the edge of excitement. He had been that way, actually, ever since he had walked over to St. Gregory's. It had started in the school. He was standing in the middle of the large room, talking about how little that room had changed. There was a poster on the wall and it showed a mother and an infant and it said, "Respect Life."

Joe Califano was home.

cont. from previous page

scanners that EMI, Technicare and the Syntex Corporation are marketing. Putting the scanners on wheels, the theory goes, will cut capital costs by making them available to more hospitals on a joint time-sharing basis.

Several hospitals in Miami and Los Angeles have already begun using mobile scanners. Another is scheduled to begin serving several hospitals of Chicago's South Side. A variation on this plan is being tried by two hospitals in Kansas City: Both have their own scanners, but they are time-sharing the computer-processing part of the equipment.

Coupled with the scale-down of prices is a public relations campaign aimed at convincing policy makers and ordinary citizens that the CT scanners are more cost-effective than H.E.W. acknowledges.

Technicare, for example, is relying heavily on a study done by Dr. Ronald Evans, director of the Mallinckrodt Institute of Radiology in St. Louis, in conjunction with the Arthur D. Little organization. Dr. Evans estimates that patients, insurance companies and the Government will spend a total of about $1 billion this year on all CT examinations of the brain.

Dr. Evans contends that this is no higher than the amount that will be spent on examinations done with older technology—technology that usually gives less information than the scanners.

And so the battle rages. Will supposedly cost-conscious hospital trustees and administrators succumb to the blandishments of the salesmen and take on the newest and brightest in machinery only to find it expensively redundant in the years ahead? Or will they keep the rubber bands snapped tightly around the institutional wallet? Will the industry be able to beat down the H.E.W. barriers? How many companies will survive the shakeout (which, on past form, is bound to come)?

There is no easy diagnosis. Only time will tell.

NY Times; 12/18

Regulating Hair Dyes

To close an apparent loophole in Accounting Office has recommended giving the Food and Drug Administration authority to regulate chemicals in hair dyes, and urged the agency to require warning labels on hair dyes that contain potentially dangerous ingredients. The recommendation rises, ultimately, from a finding in 1975 that many hair dyes could damage the genetic equipment of bacteria, and further tests showing that some hair dye ingredients could cause cancer when fed to laboratory animals. The drug agency tried to extend its powers to hair dyes in 1963, but Federal courts held that the dyes were exempt under existing law.

The relevance of such findings has been questioned by industry groups who point out that people do not drink the dyes, that tests of the dyes on the skins of animals have shown no carcinogenicity, and that studies of professional hairdressers have shown no increase in cancers.

NY Times; 12/18

WASHINGTON, Dec. 17 (UPI)—There are 2.3 percent more college students this fall than there were in 1976, according to preliminary statistics released by the National Center for Education Statistics. The center, a unit of the Department of Health, Education and Welfare, said that the gain was greater at private colleges, whose enrollment increased by 3.9 percent, than at public ones, with a 1.1 percent increase.

College enrollment declined 1.5 percent last year, and the center had predicted a 2.5 percent increase this fall. The preliminary statistics indicated that 11,487,967 students were enrolled in colleges, universities and technical schools this fall.

File Calif. Trials

THE GREEN SHEET

News About the U.S. Department of Health, Education and W

NY Times; 12/18

The Government Puts a Damper on the Scanner Bonanza

By HARRY SCHWARTZ

CHICAGO—Hailed by medical authorities as a revolutionary advance in diagnostic science, the CT scanner was greeted with somewhat less disinterested joy by the medical-equipment industry when the computerized X-ray device first made its appearance five years ago.

And no wonder. Sales of the machines, which for the first time enabled physicians to get a true visualization of such vital soft tissues as the brain and pancreas, went through the roof.

For example, at the Technicare Corporation—one of the first companies in the field—sales soared from $18.9 million in the fiscal year ended June 30, 1972, to $164.4 million in the year ended last June 30. Profits over the same period, in an almost perpendicular curve that electrified the stock market, soared from about $600,000 to $16.4 million.

Now, however, some of the initial enthusiasm is oozing out of what almost overnight became a half-billion-dollar industry. True, some 1,200 of the scanners are operating in hospitals and in radiologists' offices, and several hundred more are on order.

But, as became clear at a meeting of the Radiological Society of North America here last month, price cutting is endemic in the industry. Profit margins are consequently coming under pressure. And the market for CT scanners, which only a year or two ago seemed as limitless as the ailments the devices can help pinpoint, is being squeezed by the Federal Government: The Department of Health, Education and Welfare, fighting to hold down escalating medical costs, is trying to clamp restrictions on sales of the machines.

CT (for "computerized tomography") scanners have been selling for about $300,000 to $400,000 each. In most parts of the country, a hospital that wants to buy equipment costing more than $100,000 (in some states $150,000) must get a certificate of need from a local health-planning agency. H.E.W. officials are encouraging the agencies to say no to CT scanners.

All of that is bad news not only for Technicare but also for other big producers such as EMI Medical, a subsidiary of EMI Ltd., and the General Electric Company.

Technicare estimates that this year 35 to 40 percent of hospital applications to buy scanners have been rejected. An equal number of would-be hospital customers, convinced that a negative ruling was inevitable, decided not even to go through the red tape.

Dr. Harry Cain, director of H.E.W.'s Bureau of Health Planning and Resources Development, has a succinct comment on the industry's woes: "I'm delighted."

As was evident at the radiology meeting here, however, the manufacturers of CT scanners are not taking their setback sitting down. They have moved on three fronts:

- Trying to get prices below the H.E.W. ceiling.
- Developing mobile, truck-mounted scanners that can serve multiple markets.
- Starting public relations campaigns aimed at winning over policy makers and the public to their cause.

This improbable tug-of-war is being fought over a hybrid—a combination computer and X-ray machine. Together with the consoles, cathode-ray display tubes and related equipment, it can weigh several tons.



H.E.W., seeking to pare medical costs, pursues a diagnostic instrument.

The CT scanner's great advantage is that it permits visualization of soft tissue and all soft-tissue organs anywhere in the body. Ordinary X-rays picture only bony structures clearly—the skull, for example, but not the soft tissue of the brain. Soft tissue can ordinarily be "seen" by conventional X-ray only if the camera is given some opaque substance to track, such as the barium a patient has to swallow to have his esophagus and stomach checked.

The scanner, on the other hand, requires no such extraneous help. By measuring changes in radiation, it produces multiple vertical or oblique pictures of the body or brain in slices. A series of such "tomograms" taken close together helps to produce an almost three-dimensional effect.

CT scans can spot tumors, blood clots, anatomical malformations and a host of other abnormalities with minimal inconvenience to the patient. Much of the information so obtained was formerly available only through exploratory operations or through procedures that had the triple disadvantage of being dangerous, uncomfortable and expensive.

That was the sort of competition the CT scanners started bowling over when they came out in 1972. The first devices were brain scanners that made locating tumors and other brain abnormalities far simpler, quicker and safer than ever before.

Total-body scanners appeared in 1975 and, like the brain scanners, have become progressively more sophisticated. The first brain scanners required four and a half minutes of radiation to produce a tomogram. At last month's meeting here, the Picker Corporation introduced a body scanner that the company said could produce a tomogram in one second flat. Other machines can turn out a tomogram in two to five seconds.

James Morrisey, marketing director for EMI Medical, is certain that the trend toward more sophisticated machines will continue, but he doubts that improved technology will make much of a dent in the sales resistance implicit in H.E.W.'s regulatory stance.

At last month's meeting he glumly estimated that only 200 new machines would be ordered in 1978. (He expects 80 percent of them to be sold by three companies—EMI, Technicare and General Electric.) Other manufacturers say that is a gross underestimate, perhaps even a public relations effort to elicit some of the legislative help the industry may need to get H.E.W. off its back.

The scanner industry needs all the help it can get. As recently as four years ago there were only two companies in the field; now there are 15 or 20. The pattern is typical of growth industries. Early entrants like Technicare get an armlock on the market at first but then are forced on the defensive as latecomers barge in for a share of the rewards.

Technicare, in fact, will soon be facing some new competition from an old friend, Siemens A.G. of West Germany. Siemens had been marketing about 20 percent of Technicare's output but recently served notice that it planned to break off that arrangement and go out on its own.

H.E.W., however, shows no signs of relenting in its tough stand on CT scanners. Dr. Cain is already looking ahead to next year and Congressional re-examination of the Health Planning Act of 1974. He hopes the certificate-of-need requirement will be extended beyond hospitals to physicians' offices.

H.E.W. would like to see a scanner purchase allowed only when it seems likely that the machine will serve 2,500 patients or more a year. And, if there is already a scanner in a community, H.E.W. would like to see that machine serving 4,000 patients before a second one could be installed.

The heart of the Government's argument is cost. Until fairly recently, it cost about $400,000 to buy a body scanner and about that much again in annual operating costs. Dr. Sidney M. Wolfe of the Health Research Group, a consumer organization affiliated with Ralph Nader, asked H.E.W. some months ago to declare a moratorium on the purchase of additional scanners. He predicted that "total annualized expenditures for CT scanners will be nearly $1 billion by the end of 1977 and $1.7 billion by 1980," of which nearly $600 million "may be net profit."

Purchases of that order could put a heavy financial burden on the nation's chronically undercapitalized hospitals. Bad economics makes for bad medicine, H.E.W.'s Dr. Cain asserts. "If you have a scanner in every community hospital," he said, "they just won't have enough business. As a result they'll try to pay for the machine either by charging a very high price per scan or by scanning everybody they possibly can. Everybody with a headache will get a brain scan."

The industry sees it differently. In 1977 Technicare executives contend, the total amount of money spent on scanners in the United States will be $400 million—less than half of Dr. Wolfe's estimate.

One reason for the disparity may lie in dramatic price declines that have hit the scanner industry, a reflection of intensified competition. The competition has become so sharp that a brisk secondhand market has sprung up. Pfizer Inc. is selling reconditioned units for $85,000, and EMI Medical is doing the same for $129,000. Ohio-Nuclear, a Technicare subsidiary, has announced a new series of machines in which the lowest priced model goes for $96,500. Another new entrant in the field is Omnimedical, a small California company that is turning out a new type of brain scanner that sells for $119,500.

These prices suggest that the days of really wide profit margins are gone. Such prices also suggest that the industry is making "Woolworth"-type machines that could easily fall within the H.E.W. cost guidelines.

That same strategy seems to be at work behind the truck-mounted CT

cont. on next page

THE GREEN SHEET

News About the U.S. Department of Health, Education and Welfare

F/C 9 Editor. '77

Editorials & Op-Ed

NY Times; 12/1

Social Security: 40 Billion Untaxed Dollars

To the Editor:

Dr. Eveline Burns states in her Nov. 22 letter that, because of the tax-deductible status of employer Social Security taxes, "the general taxpayer must make good the lessened tax yield," thus putting a strain on general revenues.

Note well that such employer S.S. taxes flow to S.S. payees tax-free, so there exists a significant part of national income that completely escapes taxation—about $40 billion in 1977, rising to about $100 billion by 1986.

How come this tax-free status? The readers of The Times are entitled to know. Such status arises from an administrative ruling of the Treasury Department and not from a statutory enactment. This ruling is I.T. 3447, C.B. 1941-1.191, which stated that Social Security cash benefits should be free of income tax since they were a "gratuity"! At a hearing of the Committee on Ways and Means on March 1, 1967, Stanley Surrey, then Assistant Secretary of the Treasury for Tax Policy, gave this explantation of the ruling:

"The exclusion of Social Security retirement benefits is a tax anachronism granted administratively in the days when benefits were low and the Social Security system was in its infancy and viewed as a "welfare" program.

Since Social Security benefits are not subject to a means test, they are not "welfare"; thus we have a tax-free treatment that is supported by an assumed nonexistent status.

Tax logic would call for including one-half of Social Security benefits in taxable income; thus, a large segment of national income would become taxable and the strain on general revenues of tax-deductible contributions would be materially eased.

Two further comments: (1) The alleged regressive nature of S.S. payroll taxes is largely offset by the benefit formula, which heavily favors the lower incomes. (2) Dr. Burns's proposed percentage addition to Federal income tax earmarked for the S.S. trust fund would reach all taxpayers, including the retired—thus the income realized from savings of those who saved would be shared by those who did not.

RAY M. PETERSON

Port Washington, L.I., Nov. 22, 1977

The writer is a fellow of the Society of Actuaries.

Wash. Post; 11/30

Rowland Evans and Robert Novak

Re-Centralizing Power

While the public is not fully aware of it, federal bureaucrats are confounding President Carter's campaign promise of close-to-the-people government by transferring authority from the field back to Washington.

That unannounced process is far advanced in the departments of Housing and Urban Development; Health, Education and Welfare; and, less clearly, Labor. Judging from his campaign emphasizing his non-Washington base and extolling government closer to the people, voters expected that one distinctive Carter label on the federal leviathan would be less, not more, centralization.

This represents neither broken promises nor changed principles by the President. Rather, ensnarled in the details of office, Carter simply has not come to grips with what his administration should stand for. While nobody doubted, for better or for worse, the direction of Richard Nixon's presidency after 10 months, the Carter presidency has neither set nor sought a theme.

The Washington bureaucrats have leaped to fill this void with a vengeance, tightening federal regulation and devising plans for federal direction of the nation's affairs. But their successful drive to concentrate all power in Washington is most significant, considering the lingering belief of longtime Carterites that regionalizing power still ought to be a dominant Carter theme. A glance at what is happening at Labor, HUD and HEW follows:

• *Labor.* All regional directors have been eliminated, a move that brings field offices directly under Washington's supervision. Department officials say the regional directors never had much power, so the change does not mean much, but White House staffers say centralization is undeniable.

• *HUD.* There is no argument about more centralization. Not only have the number of field offices been reduced but their authority has been sharply cut back as well. "The feeling is we had to return the full decision-making to Washington," one HUD official told us.

• *HEW.* A reorganization in July removed program responsibilities from regional directors, returning them to Washington. Like Labor, HEW's field offices will be directly supervised by Washington instead of regional offices. Office of Education employees in the field are being brought back to Washington. HEW spokesmen say Secretary Joseph Califano wants "central responsibility."

Califano leads the vanguard of bureaucrats triumphant in the first year of the Carter administration. Reluctantly selected for his post by Carter at the urging of Washington insiders (headed by Vice President Mondale), Washington insider Califano has emerged as a Cabinet star in the President's opinion (but not in the opinion of his White House staff).

That is remarkable in view of Califano's personification of more spending, more regulation and more centralization. It is explained by other administration officials not as a conversion in Carter's philosophy but as his turning in relief to one member of a generally undistinguished Cabinet who has his work completed on time and his department under control.

Califano's triumph as a master bureaucrat is not isolated. Officials who believe in more, not less, government dominate the administration. Many are graduates of the Ralph Nader school of consumer protection, but more reflect the archetypal bureaucrat predating Ralph Nader by centuries. In the words of one relatively conservative Cabinet member: "This administration is filled with people who *like* to regulate other people."

For example, HUD is proposing a plan (devised largely by Assistant Secretary Robert Embry, former Baltimore City housing commissioner) that would require suburbs to put in public-housing-cluster programs or lose federal money. Such social engineering can stir up political dogs that Carter might prefer to keep sleeping.

That is why friends of the President, motivated only by his political welfare, wish Carter would consider at greater length whether he should not fulfill his promises, explicit and implicit, of decentralization, deregulation and a less intrusive role for government.

But most of the bureaucrats are pushing for still more government in 1978, to satisfy the left as well as themselves. Moreover, even if Carter belatedly puts his mind to it, it is too late in the day to unscramble the eggs of greater centralization and regulation. The cost may be not only the loss of a distinctive Carter theme but also a big-government thrust that is beginning to run strongly against mass opinion.

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Wash Post; 12/1

Heartfelt Exercise

"GET SOME EXERCISE" has long been one of the standard prescriptions from doctors to people whose sedentary ways may be leading them toward coronary disease. The advice was never seen as being much more than a medical establishment hunch that heart attacks could be avoided through regular exercise, the more intense the better. Earlier this week, a report to the American Heart Association suggested that the conventional wisdom may be soundly based after all: Strenuous sports like swimming, tennis, running, cycling and mountain climbing, it said, have definite protective effects against heart attacks.

The study, which involved 17,000 Harvard alumni aged 35 to 75, says that the protection afforded by strenuous exercise extends even to those who are overweight or who have high blood pressure. Among the Harvard men, those whose exercise burned fewer than 2,000 calories a week had a 64 per cent greater risk of heart attacks than alumni who used up more than 2,000 calories a week. (A squash player or a runner expends more than 660 calories an hour).

The findings come at a moment when the death rate from heart and blood-vessel diseases is falling sharply. In 1973, 1,062,000 deaths from cardiovascular disorders were recorded. In 1975, with a larger population, only 975,000 such deaths occurred. Last July, an official of the National Heart, Lung and Blood Institute said that "great changes" are occurring in the lifestyles of American men and women. Besides the increase in such high-exercise sports as tennis and jogging, he noted that dietary changes are also contributing to the decreases in cardiovascular deaths.

What the Harvard study confirms is that the so-called mysteries of the human body are not so complex after all. In this instance, the heart is a muscle that becomes stronger the more strenuously it is flexed; it needs fewer beats to pump more blood with less effort. As for inducing people to take up strenuous exercises, the Harvard study offers only persuasive advice. The final word—"get off the sofa and into the sweatsuit"—can be uttered only by a person's restless voice from within. Few people take up hard exercise with the idea of avoiding a possible coronary in the distant future. They are more likely to start sweating it out because of the immediate rewards—perhaps the emotional delights of testing one's stamina or the competitive pleasures of doing in one's 40s and 50s what others in the neighborhood gave up doing in their 20s. If the result is motion, the motive doesn't matter—although we can think of worse ones than protection against a heart attack.

THE GREEN SHEET

News About the U.S. Department of Health, Education and Welfare

Wash Post; 12/1

'The Abortion Debate—And Arthur'

In an otherwise pedestrian (and ludicrously slanted) pro-abortion article ["The Abortion Debate—And Arthur," Outlook, Nov. 20], Stanley Karnow erupts with one remarkable thought. Says Karnow, " . . . we do not, thank heaven, live in a society that eliminates 'undesirables.' "

What other reason can he offer for over 1 million abortion deaths a year in the United States?

ROBERT J. MARQUETTE

Oxon Hill

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I am puzzled by Stanley Karnow's reasoning. On the one hand, Karnow generalizes on the basis of one dramatic case, whereas it is probably true that many lives that have escaped being cut short by abortion have come to share not only the sorrows but also the joys of the human condition.

On the other hand, Karnow seems to think that it is not morally admissible to "eliminate" Arthur at the age of ten. How can he consistently hold that the boy should have been "eliminated" at an earlier stage of his life? In fact, the philosophically relevant premises involved here are a) the moral principle that there is no right to kill innocent human beings (even if their lives turn out to be a burden for the taxpayer) and b) the factual truth that there is no way to draw a line between non-human and human life once the conception has taken place.

Hence, if infanticide is morally wrong, the only rational thing to conclude, I'm afraid, is that abortion is too.

ALFONSO GOMEZ-LOBO,
Department of Philosophy,
Georgetown University.

Washington

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I read with interest Stanley Karnow's touching pro-abortion "Point of View" article about Arthur, the neglected and disturbed 10-year-old. The tragedy is not that Arthur wasn't aborted (as Karnow maintains), but that he wasn't adopted. At the time of his birth, adoption by white couples of biracial children was becoming commonplace. Perhaps Arthur's mother was unaware that he had a good chance of being adopted.

We have a beautiful and loving six-year-old adopted daughter (a local biracial child like Arthur) and she is my best argument against abortion. Should all children like her be aborted because of the chance they might turn out to be like Arthur?

I am aware that our Monica's natural mother might have opted for abortion, and I am so grateful to her, especially during this Thanksgiving season, for choosing to give life to this child. Because of her choice, we are not denied Monica's gleeful giggles, shining eyes and gentle hugs.

EILEEN MERELLA

Bowie

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Stanley Karnow tells us about Arthur, "an emotionally troubled boy" suffering from "chronic and reactive depression." The questionable morality of Arthur's mother, his undesirable home life and his mental and physical conditions are cited by Karnow as supporting evidence of his position that the government should encourage abortions among what he terms "the indigent elements of society that need it most." He does not tell us what the basis is for his conclusion that the need for destruction of unborn babies is greater in one stratum of society than in another.

Arthur is going to "cost the taxpayers at least a couple of hundred thousand dollars" for taking care of him the rest of his days because he was not killed when in his mother's womb, Karnow tells us. He goes on to tell us that Arthur's mother "probably would not have borne him had she been able to raise a couple of hundred dollars for an abortion." He just has to mean that it is a good deal, a good stroke of business, for us taxpayers if pregnant women will spend a couple of hundred dollars and thereby save "a couple of hundred thousand dollars" for us. I could go along with this type of reasoning if he were discussing the abortion of "undesirable" cattle, but not of human beings.

Karnow indicts our American society because it "tends to confuse morals and justice" and, therefore, "cannot bring itself to escape the burden of thousands of Arthurs yet to be born." The logic of that indictment escapes me. Is it that if the government encourages abortions, our society would be acting morally and justly? I just cannot believe that he really thinks so. I cannot think of a statute that would be more immoral or against public policy than one encouraging the doing away with those who later in life might be "undesirable" or burdens to the taxpayers.

H. C. MCDONNELL

Luray, Va.

NY Times; 12/1

Science High Schools: Califano's 'Catch 22'

To the Editor:

While Secretary Califano's first three questions regarding admission policies to Brooklyn Tech, Stuyvesant and Bronx Science High Schools—whether all students are equally informed of the existence of these schools and of courses that prepare for the entrance tests, and whether the tests are given in locations equally accessible to all—are unexceptionable, his final question, "Are the admission tests themselves free of racial or cultural bias?" harbors the inevitable Catch 22 [letter Nov. 22].

Many Federal civil rights agencies have held as a matter of policy that the way to measure the bias of a test is by its *effects*. That is to say, a test that excludes or gives substantially lower scores to a minority group is considered biased against that group. According to this view, the only test that is free of bias is a test that would pass applicants in more or less exact proportion to their distribution. A "good" test would be one that, if taken by, say, 1,000 whites, 500 blacks and 100 S.S.A.'s (Spanish-surnamed Americans), would pass approximately 100 whites, 50 blacks and 10 S.S.A.'s.

Arguments can be made for this approach. Your Nov. 21 issue revealed the ongoing, even increasing segregation in New York City public schools, and it is well known, from reading test scores and the like, that minority schools give consistently poorer preparation in basic skills to their students than do identifiably white schools. Therefore, a so-called "objective" test in mathematics or English grammar would simply reflect the unequal opportunities based on race or national origin in the New York City primary school system, and perpetuate these inequities on the high school level.

For me, three years at Bronx Science (1949-52) were a nightmare I wouldn't wish on anyone, but many people obviously feel differently, and for them I would find precious little reassurance in Secretary Califano's disclaimer—unless (and I strongly doubt he will avail himself of the opportunity) he chooses to tell us in very specific terms what he and H.E.W. mean by "admission tests free of racial and cultural bias." I don't think he means that they don't contain questions on Jewish history.

CARL SCHIFFMAN

Roxbury, Conn., Nov. 22, 1977

The writer served as investigator for the Connecticut Commission on Human Rights and Opportunities and for the United States Equal Employment Opportunity Commission.

News & Observer; 11/4
(Raleigh, NC)

Califano talk is postponed

By OWEN DAVIS
Business Editor

A meeting scheduled today between a group of tobacco-state congressmen and Joseph A. Califano Jr., secretary of the U.S. Department of Health, Education and Welfare, has been postponed by Califano.

Before the postponement Thursday, Rep. Charles G. Rose III, D-N.C., said he would join the congressmen who planned to meet with Califano about the anti-smoking campaign the secretary has been waging. Rose was in Raleigh to address the annual meeting of FCX Inc., a Carolinas farmer cooperative.



Charles G. Rose III

But later in the day, the meeting with Califano was postponed indefinitely.

Rose, a member of the House Agriculture Committee, said the congressional group would be headed by Rep. Carl D. Perkins, D-Ky., whose committee oversees HEW operations. Perkins, Rose noted, is a burley tobacco farmer himself.

"Rep. Perkins is going to tell Califano to let the tobacco program alone," Rose said. "What Mr. Perkins and others of us hope is that Mr. Califano will worry about the department of HEW and leave the problems of agriculture to Bob Bergland (agriculture secretary).

"Mr. Califano is really running off at the mouth about something he has no jurisdiction over."

Califano has suggested that the government stop subsidizing tobacco farmers through its price supports program in an attempt to cut down on smoking. He also said the government had a clear obligation to counter "seductive" advertising claims by the cigarette industry.

An HEW task force has prepared a memorandum containing 35 anti-smoking proposals, including the end of tobacco price supports and an offer of welfare payments to farmers to ease the economic burden.

Gov. James B. Hunt Jr. said Thursday that Califano should be invited to North Carolina to learn about tobacco farming and meet with some farmers.

Rose replied, "We're going to have to educate Mr. Califano with a two-by-four, not with a trip."

Nearby, Agriculture Commissioner James A. Graham said Califano "must be a madman."

Rose said a federal cigarette tax bill introduced Monday by two Northeastern congressmen would have no chance of reaching the House floor this year. He said it was too early to tell how much support there was for the bill.

The bill would set a uniform federal tax on cigarettes of 31 cents per pack, with part of the tax rebated to states that elminated their own tax. The current federal tax is 8 cents.

"A uniform tax rebatable to the states would cut down on smuggling, but it also would cut down drastically on cigarette consumption," Rose said.

Burlington, IA. Hawk Eye; 10/30

Public hearing scheduled on social services ideas

By Elizabeth Shero

Children from "troubled" homes are being indiscriminately placed in foster homes without attempts to first solve the family's problem, according to the Dept. of Health, Education and Welfare.

And HEW will make additional funding available to local departments of social services if they can create programs that will solve family problems and prevent children from having to be sent to a foster home.

"They are waving a carrot, and the carrot is more funding," said Don Rhodes, organizer of a task force of professional social workers who met Friday to discuss ideas for new programs.

The product of this discussion will be presented in a public hearing Monday, Oct. 31 at 10 a.m. in rooms 202 and 203 of the agriculture building at Southeastern Community College.

Rhodes said Iowa has a "tracking system" so that no children in foster care were ever "abandoned," but wanted ideas for new services that could prevent family crisis situations, such as child abuse, that might require that a child be placed in a foster home.

Suggestions included a "crisis intervention team" which might include a nurse, a social worker, and somebody from Parents Anonymous, a self-help group for parents who abuse their children. The team would be available around the clock to go to the home, give immediate help and counseling and then refer the family to the proper agency.

Using the resources of Southeast Iowa Homemakers to give parent counseling in the home was another idea. Homemakers, a service group, primarily serves the elderly and those who have been hospitalized and need some help with housework.

A program that would substitute a "parent partner" for the parent during hours when parents could not be home was offered as a way to give children the structure and discipline their parents could not. Periodic 'team meetings" between the parents and the partners would allow the parent the opportunity to learn from the partner's experience.

Input from Monday's public hearing will be added to a report that will be sent to the state Department of Social Services for forwarding to HEW in Washington.

Dodge City Daily Globe; 10/22
(Kansas)

Talent search begins 10th year

HAYS—Western Kansas Talent Search, funded by the U.S. Department of Health, Education and Welfare and sponsored by Fort Hays State University here, now begins its 10th year of helping needy, bright, young people get back into their education.

This program extends to some 60 counties in western Kansas (approximately two-thirds of the land area of the state and involving a population of some 600,000 people).

The helping hand of the talent search staff is being held out to those youths who have demonstrated aptitude bu' who have a financial and-or cultura need for counseling and direction toward further education.

The scope of activities of talent search ranges from motivation of youths (even those who may have "dropped-out" at one stage or another of their education); vocational and academic counseling by testing or otherwise; supplying information as to financial aid sources to cover tuition, supplies etc., together with the facts of requirements of public or private post-secondary schools available for selection by the youth; all the way through to later follow-up by Talent Search by phone, letter or in person to ascertain whether the youth did enroll and if financial aid was obtained.

The very able, experienced staff of talent search stands ready and available at four offices as well as in the field to provide this help and guidance to such youths. The offices are located at Hays, Salina, Colby and Garden City and run by project counselors who coordinate their efforts with the project director, William R. Berger, at the Hays office.

If the youth has need and aptitude and is not older than age 27, he-she should contact the project counselor in the particular area by writing or phoning (collect if necessary) as indicated:

William R. Berger, project director, Western Kansas Talent Search, Fort Hays State University, Hays 67601, 913-628-5881-2; Earl Martin, project counselor, Western Kansas Talent Search, Box 1035, Garden City 67846, 316-275-7694; Donna Auer, project counselor, Western Kansas Talent Search, 135 Sixth; Colby 67701, 913-462-6781; or Ernie Ruelas, project counselor, Western Kansas Talent Search, 861 Willow drive, Salina 67401, 913-827-7771.

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News About the U.S. Department of Health, Education and Welfare

St Louis Globe-Democrat; 10/28

Official warns against hospital costs

Hospitals that contribute to rising health care costs through waste and duplication of services could face the possible loss of federal financing, a Department of Health, Education and Welfare official suggested Thursday.

HEW provides 40 per cent of the cost of operating some hospitals through federal medical care programs, "but there is no guarantee we will continue to pay," said Thomas J. Higgins, newly appointed regional director of the agency.

HIGGINS, 32, who was here Thursday for the last of eight regional public hearings on a proposed national health insurance plan, said if he were responsible for approving funds for new hospital construction in an area where adequate services already exist, "I would have to think twice about it."

The public's concern about rising health care costs, including duplication of medical services and equipment by hospitals "that are a mile apart," is encouraging and apparently is having an effect on hospital boards, he said.

Most members of a hospital's board of directors "are a Who's Who in the business community. They have served on the board because it has been pretty much of a prestigious position.

"But they are beginning to realize now that they have to do something about health care costs," said Higgins, who was an Iowa state legislator for five years before he became HEW regional director at Kansas City Oct. 2.

Three congressional committees have been working on bills to control hospital costs, including a proposal to limit hospital construction to $2.5 billion annually nationwide. Without the ceiling, hospital construction is expected to hit $7 billion annually.

EARLIER THIS year, President Carter called for congressional action to limit increases in hospital costs from the present 14 per cent annually to 9 per cent, a proposal opposed by the American Hospital Association.

An association spokesman said a widespread cutback in patient services will be necessary if the ceiling is approved.

The hearing at Kiel Auditorium was one of 100 scheduled throughout the country to obtain public comment and opinions on national health insurance, Higgins said.



Thomas Higgins

A summary report on the hearings will be submitted next month to federal officials as a step toward national health insurance legislation, he said.

Tennessean; 11/5

Legislators Hear Plea

State Law Legalizing Laetrile Sales Urged

By MATT YANCEY

KNOXVILLE (AP) — A Gatlinburg businessmen who distributes Laetrile asked a legislative committee yesterday to write a law allowing the controversial cancer drug to be manufactured and sold in Tennessee.

"The use of Laetrile is not illegal in Tennessee," Douglas Heinsohn told the committee. "But positive legislation is necessary as a protection for physicians against undue pressure and possible harassment from state agencies, insurance carriers and private peer groups."

TENNESSEE lacks any laws that specifically deal with Laetrile, its use, manufacture or sale.

Heinsohn also asked the committee to make it illegal for insurance companies to deny malpractice coverage to physicians who prescribe Laetrile or refuse benefits to patients who have used the drug.

The special committee, chaired by Rep. Ted Ray Miller, D-Knoxville, was appointed by the 1977 legislature to study the Laetrile issue. Miller said one more hearing may be conducted in Nashville to answer questions raised in the Knoxville hearing and at a similar hearing last month in Memphis.

LAETRILE is banned by the U.S. Food and Drug Administration as being ineffective against cancer and possibly dangerous. However, under pressure from cancer patients, several states have approved laws allowing its use.

"There is just an awfully good chance that the State of Tennessee is going to legalize the possession, sale and distribution of Laetrile," said Rep. Buddy Scruggs, R-Knoxville. He asked Dr. Robert Temple, an FDA physician, what the federal agency would do if Tennessee took such action.

Temple replied the FDA would likely consider a great influx of cancer patients coming to Tennessee to receive Laetrile as interstate commerce and a violation of the federal Food and Drug Act.

HEINSOHN, who already has won two court fights this year with the FDA over his right to distribute Laetrile and apricot seeds, accused the agency of dishonesty in citing claims that the drug has caused deaths.

Testimony in the two-day Knoxville hearing centered on the charge by the FDA and organized medicine that Laetrile has never been scientifically proved effective against cancer.

But patients, researchers and physicians who have used Laetrile say evidence shows it has helped cancer victims and they should be allowed to have it as an alternative to conventional treatments.

DR. HAROLD Manner, chairman of the department of biology at Loyola University in Chicago, said he injected a combination of Laetrile, Vitamin A and various enzymes into 84 mice with breast tumors.

Within four to six weeks, he said, 90% had complete regression of mammary tumors and the rest had partial regressions.

Temple charged that Manner's test lacked the required scientific controls. And Temple called the claims of the Laetrile advocates "one of the biggest frauds in medical history."

San Francisco Chronicle; 11/8



UPI Telephoto

Tennis Elbow

Joseph Califano had his arm in a sling and Defense Secretary Harold Brown wore a grimace yesterday as they attended a meeting at the White House. The secretary of Health, Education and Welfare has a tennis injury that required surgery.

THE GREEN SHEET

News About the U.S. Department of Health, Education and Welfare

File w/ California

National Journal; 6/25

EXECUTIVE REPORT

HEW's Califano Wants to Set The Great Society in Motion

The head of HEW hopes to push a wide range of social service initiatives and also show the public that his department is manageable.

BY JOHN K. IGLEHART

Joseph A. Califano Jr., Secretary of Health, Education and Welfare, helped design the Great Society when he worked in Lyndon B. Johnson's White House. Now he is trying to make it work.

"I'd like to demonstrate to the American people that HEW can be managed," he said in an interview with *National Journal*. "The importance of that is to show that we can make investments in social services and social programs for the most vulnerable in society in an efficient way, as well as a compassionate way, that government can indeed do a lot of these things and that government should indeed do a lot of these things. . . ."

Sitting in a Kennedy-era rocking chair and sporting a bandaged thumb hurt while playing tennis, Califano said the big difference between working in the White House and heading HEW was a sense of being "on the firing line." Another was the feeling that as Secretary, he enjoys far more freedom than did Cabinet officers under Johnson.

With that freedom, Califano said he hopes to push a wide range of initiatives. Already the Administration has proposed ceilings on hospital costs *(see Vol. 9, No. 21, p. 790)* and soon will present a welfare reform plan *(see Vol. 9, No. 18, p. 673)*. The department is at work on national health insurance now, and Califano ticked off other priorities, including education.

At the same time, he said he recognized the problem of trying to hold down the department's spending to achieve President Carter's goal of a balanced budget in fiscal 1981. "I see us walking arm-in-arm with (Office of Management and Budget director Bert) Lance down the road toward fiscal responsibility and better services for all Americans," he said.

On other issues, Califano said:

- The Administration's proposal to control health costs could end up combined with a medicare-medicaid reform bill being pushed by Sen. Herman E. Talmadge, D-Ga.
- Carter's edict that a welfare reform proposal costs no additional money applies to the initial year of the program.
- The nation is producing too many doctors and too many specialists. *(See Vol. 9, No. 23, p. 860.)*
- HEW will "take whatever steps are necessary" to get the beleaguered health maintenance program going.
- He will create a high-level council within HEW to design a national health insurance program.
- The time has come "to do something for the middle class" in education financing.

Following is an edited transcript of the June 14 interview:

PERSONAL PRIORITIES

Q: You had tremendous impact on this department in the 1960s, when you worked in the White House. How does it look sitting at the other end of the street?

A: There are several differences. One is the sense of being out front, of being publicly on the firing line, if you will—publicly testifying, publicly holding press conferences. There were lots of press briefings at the White House, but it was always saying what Johnson said, what Johnson thought, what Johnson's program was.

Secondly, operating a massive bureaucracy (145,000 people, $142 billion) is much different than being just a staff member and connecting one good idea after another. You need new ideas, and I hope we have got some—in the hospital area, social security or what have you. But every time I come back to that desk, I am constantly reminded that I am managing the largest domestic department in the government and the biggest user of the taxpayers' money in this country. And that's very different.

I guess the third thing that strikes me as different is a sense of how difficult it is to get the machinery to work, a sense that I really did not have when I was in the White House.

Q: Have we returned to Cabinet government?

A: At the present time, we certainly have Cabinet government. I have a tremendous amount of freedom—obviously within the President's guidelines. And the President sets priorities. The President wants social security put on a sound basis, he wants hospital costs contained, he wants a welfare reform proposal, he wants a national health insurance (plan) sometime next year. But within that and within his general philosophy of bringing more credibility back to the government, opening it up, managing it better, getting it reorganized, I have tremendous freedom, significantly, more freedom than any Cabinet officer, I think—with the possible exception of (former Defense Secretary) Robert (S.) McNamara—had in the Johnson Administration.

Q: What do you hope to do with that freedom? What are your personal priorities?

A: One, I'd like to demonstrate to the American people that HEW can be managed. And the importance of that is not attributed to Califano, that he can manage HEW; the importance of that is to show that we can make investments in social services and social programs for the most vulnerable in society in an efficient way, as well as a compassionate way, that it is worthwhile, that government can indeed do a lot of

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these things and that government should indeed do a lot of these things because if you don't do it through the commonweal, it won't get done in the private sector anymore, it won't get done by an isolated charity. Some of these problems are too big. That I'd like to demonstrate.

I'd like to figure out what the right national health insurance proposal is—right in terms of what makes economic sense, what makes quality health care sense. I'd like to have a chance to do something with secondary education in this country. I don't know what. We are in the process of thinking through the federal roles, and things are in very bad shape. Where does it lead to? What should it lead to? What kind of white collar or pink collar job skills should students be invested with? I'd like to deal with the problem of financing higher education and backing off from that. I mean, there are a lot of other things I'd like to get across, and I think that we are slowly beginning to get across that we have to open up more opportunity in higher education in the very good schools for minorities and for women.



"We don't need as many doctors as we are producing."

HEW AND THE BUDGET

Q: HEW's budget is growing at a rate of about $20 billion a year without any major new programs.

A: That's what I just told the President a week ago.

Q: Given that fact, plus the Administration's new social security proposal that would absorb about $14 billion over the next five years in general revenues, and the President's expressed determination to balance the budget by 1981, isn't it reasonable to assume that the Administration will offer no other new major spending programs in this four-year term?

A: Let me just make a couple of points. One, the $14 billion is not an expenditure unless it gets spent. It's just an insurance policy. So it won't show up as an expenditure. That's really a footnote. Welfare and NHI (national health insurance) are programs that will take years, unquestionably, to phase into place. NHI, obviously, has to cost more money. There is no way to devise a no-cost NHI plan. When those expenditures are going to be made is a question of when we have the system ready to absorb them. I think that we are not precluded from coming up with other new programs and I think we will have some new programs. They may not be massive spending programs, but they will cost some money.

Q: Do you consider yourself or your department on a collision course with Bert Lance's balancing the budget priority?

A: No, no, no. I see us walking arm-in-arm with Lance down the road toward fiscal responsibility and better services for all Americans.

WELFARE REFORM

Q: You say it's not possible to design a no-cost national health insurance plan. Is it realistic to believe that the Administration can design a zero-cost welfare reform plan? If so, what tradeoffs would the Administration be prepared to make to produce the equity desired by the President?

A: First, it should be noted that the President, in a carefully crafted sentence, said that there should be no *higher initial* cost. There are any . . . tradeoffs you can make. It may mean that in the first year, you have very little fiscal relief for the states, for example. But also within that limitation of no additional initial cost, there is $5-plus billion of money now being used in the countercyclical CETA (Comprehensive Employment and Training Act) program that won't be needed within the unemployment (rate) we project in the first year of the welfare reform program. Now obviously, all of those CETA jobs can't be produced in the first year, so that may give us some flexibility as well.

NATIONAL HEALTH INSURANCE

Q: Who will carry the ball in national health insurance planning for you?

A: Internally, I am setting up, in effect, a council, which I myself am going to chair, with the undersecretary, the assistant secretary for planning and evaluation, the head of the Health Care Financing Administration, the general counsel.

Q: Will that be the policy body that designs a proposal?

A: That will be the policy body within the department that will do it. My plan is to have someone who will report to me as a special assistant for NHI who will also be a deputy assistant secretary for NHI to the assistant secretary for health. We haven't selected that individual yet.

HEALTH COST PROPOSAL

Q: You suggested several weeks ago at the Senate Finance hearing chaired by Sen. Talmadge that you thought that cost-control legislation was headed in the direction of a marriage between the Administration's proposal and the Talmadge bill (S 1470). Will the Administration aggressively pursue a wedding of these two proposals?

A: I think the first step is to pursue our legislation through the House and through Sen. (Edward M.) Kennedy's (D-Mass.) committee (Human Resources Subcommittee on Health and Scientific Research) and I think our legislation will come out of the House and I think it will come out of Sen. Kennedy's committee. And then Sen. Talmadge will decide what he wants to do in terms of the Senate Finance Committee.

As I indicated in that testimony, there are some pieces of the Talmadge bill with which we have problems. We don't think there ought to be a cloak of secrecy around what doctors make; we do not think we have the tools to classify hospitals at the present time. . . . Also the bill costs money. There is not one cent saved by the Talmadge bill.

On the other hand, the concept of prospective reimbursement is very attractive and ultimately is the kind of thing we think we ought to be looking at. That's one of the centerpieces of this legislation. But it's no substitute for what we are proposing for the first three years.

Q: But isn't it almost inevitable that these two proposals in some way or another will be combined before we have a bill?

A: Well, you know, I indicated when I testified, that some of the Talmadge legislation will undoubtedly be folded in as that bill works its way through the Senate.

Q: You criticized rather sharply both the American Hospital

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Association and the AMA (American Medical Association) in terms of their opposition to the proposal. What kind of support do you think you have in Congress, at this point?

A: I think the Congress, Congressmen—and we are trying to talk to a significant number of them about the proposal—all recognize that something has to be done about health care costs. The hospital industry has become obese not only to the point of terrific waste and a terrific appetite for unnecessary expenditure, but also as I indicated in the Talmadge testimony again, in some cases endangering life (as when) you have these cardiovascular units which don't operate frequently enough. And we get these terrific death rates as you did in the hospital in Massachusetts. I think that Congressmen realize that.

> "At the present time, we certainly have Cabinet government. I have a tremendous amount of freedom—obviously within the President's guidelines."

And I just had lunch with a Congressman today who said that there is no question in his mind that we have got to do something about hospital costs, that they are out of sight, they are out of control.

I think we'll do something. I don't have any question about that. . . . Now, whether they will dot every "i" and cross every "t" of our bill is another question, but there's no doubt in my mind they'll act on this subject.

HEALTH MAINTENANCE ORGANIZATIONS

Q: You met recently with your staff to discuss the future of the department's effort to foster the development of health maintenance organizations (HMOs). What steps do you think the department will take to correct the problems that plague them?

A: We'll take whatever steps are necessary to get good HMOs off the ground. I think that HMOs are a good idea. I think that they do help to build competition within health care systems. We have been inexcusably inept in getting that program operating, and we may not have enough of the right personnel in the right places. We are going to look at all of that and we are going to move promptly in that area.

Q: Would that possibly include more money?

A: If we need more money up front to get these HMOs off the ground, we will ask for it. Because that kind of money over the long haul . . . is money that pays off. It's money on which you make money.

Q: Do you see the major problem as an administrative one?

A: HMO applications now run about 1,000 pages, I mean, that's worse than an appendix to a defense contract. And I'll guarantee you that there's nobody down there that is carefully reviewing 1,000 pages of material from every HMO.

DOCTOR SURPLUS

Q: There are individuals in your department and also outside economists and academics who are beginning to express serious concern about the number of physicians that will be practicing in this country in 10-15 years, some 600,000, almost double the number we have today. Do you think this is a problem?

A: We think that there are too many physicians in this country. We don't need as many doctors as we are producing. We are not producing them in the right areas. We think we need more primary care physicians, more family physicians. More and more people are coming to realize that as we create more and more specialists—high-priced specialists of one kind or another—we increase the nation's health care bill. We just get people referred to another specialist and it goes on more and more. I was up in Worcester, Mass., recently. My brother-in-law is a gastroenterologist and he is also an internist at the hospital, and he was pointing out to me one of the things that's so difficult to understand about the medical profession (is) the sense that it has total control over its own prices. That is, if he puts his hand on someone's stomach as an internist, it's probably $10 or $15. If he puts his hand on someone's stomach as a gastroenterologist, it's suddenly $50.

SOCIAL SECURITY FINANCING

Q: You've testified now before House and Senate committees on the Administration's social security proposals. Is it realistic to anticipate that, given the reservations expressed by (Senate Finance Committee) chairman (Russell B.) Long (D-La.) and (House Ways and Means Committee) chairman (Al) Ullman (D-Ore.), that the Administration can win enactment of the bill as introduced?

A: I hope so. Let me say that I think that there are different kinds of reservations. Chairman Long has told us that he supported the employer tax, for example, and he made that clear the first day the bill was proposed. He said yesterday (June 13) that he had some reservations about the general revenue financing. I think he has an open mind—and an active and agile mind—and I plan to go talk to him and sit down at greater length on that subject, because I think the kinds of things that he is concerned about—namely, building permanent benefits into the system through general revenues without the discipline of having to impose a tax—are the kinds of things that we deliberately designed that countercyclical, general revenue provision to avoid.

Q: One of the ways to repair the trust funds would be to reduce benefits. Could you say flatly that the Administration would never support that?

A: During the campaign, the President committed himself to stabilize benefits at essentially the present levels, so I do not think that we would go for any reduction in benefits.

Q: How about increasing taxes?

A: The President committed that he would make the system financially sound in the short term without any increase in the taxes on employees, so I think we would be opposed to any increase in the taxes on employees.

EDUCATION PLANS

Q: You seem to have some problems with the idea of creating a separate Department of Education. Would you be inclined to support the so-called Department of Defense (DOD) model of Secretaries within a department?



A: I don't know. Not in the sense of the DOD model. In the sense in which you separate operations from staff, you are still going to need a strong central staff. You must get these things better integrated. Preventive health—there is a major role for education in that area, both in health education and the disaster in immunization for children today. Part of that is the fact that we have gotten separated; OE (Office of Education) and health people just never talk—*never* talk—to each other about immunization. We now have Tom (Thomas K.) Minter working with them trying to

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"Welfare and NHI (national health insurance) are programs that will take years, unquestionably, to phase into place. NHI, obviously, has to cost more money. There is no way to devise a no-cost NHI plan. When those expenditures are going to be made is a question of when we have the system ready to absorb them. I think that we are not precluded from coming up with other new programs and I think we will have some new programs."

put something together. That's not the only lack of integration. We never use the welfare checks we send out every month to put a little card in there and say to those mothers, "You can get your child immunized against these diseases. It will save you all this grief." Because any parent in this country will get their kids immunized, I think.

Q: The Elementary and Secondary Education Act expires this year. Will you have a proposal on that?

A: We may produce something before the year's out, depending on the congressional hearing schedule. We're looking at it now. Whether there will be some changes made in some pieces of it or not, (is) unclear at this point in time .... Whether we have to, the time has come to do something for the middle class, that is, just above those people that are now able to get aid. Specifically in higher education.

Q: That's a notion that you've expressed around the department a good bit. Do you have some specific ideas on this?

A: No, I know the tax credit is a much too expensive way to do it and not as equitable a way to do it. We are looking at it now. Maybe we will come up with loans--making them more eligible for loans. There are a variety of ways. I think we have to ease that pressure.

Q: Do you have any idea of what new directions the National Institute of Education may take?

A: No, but I hope they are more closely knit with the Office of Education and I hope they focus on how children learn. I realize how difficult that is. I'd also like to see some more research on this whole secondary school area: What's the function of a secondary school? Should it be a work-school experience combined? Should there a sharp dichotomy between those secondary schools which are, in effect, preparing students to go on to further education and those which are basically preparing (them) to go into a work force or go to college?

HELPING THE STATES

Q: Do you feel the federal government or state or local governments face a tougher time financially in the future?

A: It depends on where the state and local governments are. States are going into surplus now. California has a surplus of more than $2 billion. Texas has a substantial surplus. I think the Sunbelt states have a much easier time than the federal government. I'm not sure that's true in some of the northern states. If you go into states like New York, where the unemployment rate is higher than it is on the average nationwide; Massachusetts, where they have difficult unemployment problems; some of the New England areas, it's not the same; Michigan and Detroit are different cases. But the southern, Sunbelt states are in better shape than the federal government and going more and more into surplus as time goes by.

Q: Would you then be inclined to lean towards fiscal relief that recognizes the differences there are between states?

A: I don't know if it is possible to devise fiscal relief in that way. For a generation, those kinds of differences in reverse have been handled in effect by the federal tax system. The federal taxes raised the money from the North and put it into the Sunbelt. The issue now is whether we will be able to raise from the Sunbelt, in one way or another, directly or indirectly, and put into the northern states.

Q: Is that something you feel the Carter Administration should strive to do?

A: When you determine that something . . . requires national resources, then I think that you deal with it in the national way. I do not think that there is any direct, "We'll take from the Sunbelt and give to the North" any more than there was, "We'll take from the North and give to the Sunbelt" 25 years ago. There are certain critical needs which are expanding. Health is a national need and right to which we should commonly pool money from the 50 states to make sure that health care is equally distributed among the 50 states. □



"We think that there are too many physicians in this country."

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Fig w/ editorials

cont. from previous page Billings, Mt., Gazette; 7/7

and to recommend changes. Mr. Califano made it clear that most parts of the program are negotiable and declared he was prepared to go back to the President and ask for more money if a good case could be made for it . . . "

The real purpose of these contacts will be to develop backing from governors, mayors, and their congressmen who want to use federally financed "welfare reform" to bail out states and localities from fiscal problems largely of their own making. President Carter, then, in the fall of this year will find himself under increasing pressure to come up with a "welfare reform" that will have the effect of expanding the system, increasing benefits in many areas and bailing out many of the state and local jurisdictions.

When a scaled down version of the same welfare reform proposal was presented to Lyndon Johnson near the end of his term in office, he rejected it as being excessive, in spite of the fact that he was the principal author of the Great Society Programs of the '60s.

Largely through maneuverings within the White House staff, some members of the Cabinet and the persuasiveness of Pat Moynihan, Nixon accepted a variation of the same welfare proposal rejected by Johnson and submitted what he called the Family Assistance Plan to Congress. His personally chosen secretary of HEW, Robert Finch, was humiliated before a session of the Senate Finance Committee when he found that he could not answer the same hard questions that Califano found that he could not answer for Mr. Carter.

After the Senate twice rejected Nixon's Family Assistance Plan — and after Governor Reagan in 1971-72 demonstrated that a large industrial state could bring its welfare system under control and that the direction of true welfare reform lay in greater state authority and responsibility — Nixon was forced to back off his plan for a federalized cash welfare system.

After Ford took office, the same group in HEW and others presented through Secretary Casper Weinberger a variation of the same plan presented to Johnson and to Nixon. The most significant difference in the Weinberger plan, however, was the fact that all persons, single couples and families, would be eligible for a federally administered cash welfare program. When Reagan intervened with Ford in the fall of 1974, Ford rejected (at least for the remainder of his term) the plan submitted to him.

Thus the stage was set for a new President relying on advisers who have followed a fork in the road which can lead only to a deadend or to a system which will result in a short time in over half the people in the United States being eligible for some form of cash welfare payment.

There is still time for President Carter to back up — to go back down the fork of the road he's chosen with his 12 goals and take the other path toward real and effective welfare reform. That method lies through combining current federal resources for the various major welfare programs (such as Aid to Families with Dependent Children, food stamps, housing and public service jobs) into block grants to the states to permit each state to devise its own welfare program on a matching basis.

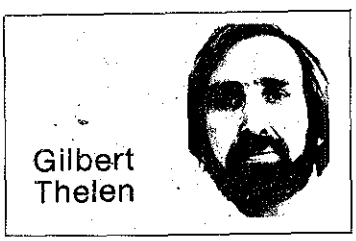
Drug lag irks public

First vitamins, then Laetrile and saccharin. The federal government has harvested a crop of public resentment lately for trying to curb all three.

The backlash is producing the first credible effort in Congress to carve the heart out of the 15-year-old federal law that governs what therapeutic drugs you are allowed to buy.

More than 100 members of the House, liberal and conservative, Democrat and Republican, are sponsoring a bill that would eliminate one of the two major tests a drug must now pass before it can be sold. Under the legislation, a manufacturer would no longer have to prove that a drug is effective in combatting disease, only that it is safe.

THE MAJOR CONGRESSIONAL powers who control the flow of health legislation oppose the bill championed by Rep. Steven D. Symms, R-Ida., so it isn't likely to become law in this session. But the issue the



Symms bill addresses is picking up steam and promises to be around for several years to come.

Prior to 1962, a manufacturer had only to prove that a drug was safe before being allowed to sell it. In that year, on the heels of the thalidomide disaster, Congress inserted a new provision that a drug had to be proven effective for its intended therapeutic use, as well as safe.

The medical justification for the Kefauver Amendment was this: Every medication has dangerous side effects for at least a portion of persons who take it. It is unwise, therefore, to expose anyone to dangers from a drug that doesn't cure anything.

The law was retroactive to 1938, so the U.S. Food and Drug Administration (FDA) began a painstaking review that has resulted in removal from the market of therapeutic drugs that flunked scientific tests for effectiveness. That review continues to this day.

ALTHOUGH THE RETROACTIVE review embroiled the FDA in controversy with manufacturers who were forced to discontinue sale of some old products, the real flap came over approval of new medications.

According to Symms, the effectiveness requirement has produced a "drug lag."

Citing studies by Prof. Sam Peltzman of the University of Chicago, Symms said that prior to 1962 drugs had been approved each year by FDA. "Since passage of the 1962 amendment the entire drug flow has been cut by over 60 per cent," he asserted.

"In 1962, the average drug could be developed, tested and be ready for market after two to four years, at a cost of $1 million and with as little as 1,000 pages of documentation," Symms said. "Today, the average drug takes 7½ to 15 years to be tested." It costs $15 to $20 million — with one expert predicting a $40 million average by the end of this year — and requires up to 200,000 pages of documentation, he said.

THE "DRUG LAG" means that some drugs available abroad aren't approved yet in this country. One such is sodium valproate, a medication that controls a type of epileptic seizure immune to treatment by other drugs.

A number of otherwise law-abiding citizens have turned to smuggling to acquire sodium valproate. One is Dr. Nelson D. Goldberg, himself a drug researcher at the University of Minnesota, who traveled to Mexico for a supply of the medication for his epileptic son. "I resent having to turn to a foreign government for help," Dr. Goldberg said.

Rep. Charles Rangel, a liberal Democrat from New York City, cited concern for the medical problems of his black constituents as his reason for co-sponsoring the legislation of the conservative Symms.

"Hypertension (high blood pressure) is one of the commonest medical problems that blacks encounter," Rangel told the Medical Tribune, a trade publication for doctors. "Effective hypertensive compounds are available in Europe, but not available in the United States because of the FDA regulations."

The American Medical Association, for another, is on record favoring revision of the effectiveness requirements of the drug law. And the 1975 economic report of President Ford questioned the benefits of the effectiveness section: "It is not clear that the average efficacy of drugs after 1962 is any higher than that of drugs previously introduced."

AN INFLUENTIAL VOICE, however, was raised recently in defense of the effectiveness requirement — that of the blue-ribbon review panel on new drug regulation appointed by the secretary of Health, Education and Welfare.

After more than two years of study, the panel recommended retention of the effectiveness test. "If a sponsor is not able to show that a drug is effective for an intended use, any adverse effect is unjustified and the drug should not be marketed," the panel's final report stated.

"The history of drug regulation is riddled with tales about carbolic smoke balls, all-purpose elixirs, and ineffectual 'wonder drugs.' "

The panel said Peltzman's University of Chicago studies, which Symms relies on to make the case for his bill, are flawed. Further, evidence is unconvincing that the effectiveness requirement is responsible for a "drug lag," the panel said.

ON THE QUESTION of drugs sold in other countries but not here, the panel said it is "unclear whether the drugs represent significant advances over drugs available in the United States. Moreover, insufficient weight appears to have been given to adverse reactions from drugs marketed abroad which are not available here."

The report of the blue-ribbon panel is unlikely, however, to slow the anti-FDA momentum in Congress, which began in the controversy over vitamins. Citing the effectiveness requirement of the drug law, the FDA proposed curbing sales of giant-dose vitamins. Congress overrode the FDA last year, after a massive lobbying effort by a coalition of vitamin and health-food forces.

Next came Laetrile, the apricot-pit derivative that is claimed to aid in cancer therapy. The FDA won't approve the compound for sale nationwide, saying there's no evidence it works. Laetrile proponents have managed to legalize its sale in a number of states and are focusing intense fire on Congress to override the FDA. A number of Laetrile backers on Capitol Hill are supporting the Symms bill.

ALTHOUGH THE ISSUE is really different, pro-saccharin sentiment in Congress and the country has further weakened the credibility of the federal food and drug laws.

It could all come together in passage of the Symms bill, said one key House staff member, adding: "Ten years ago nobody thought it could happen that the vitamin crazies would succeed in getting legislation passed to curb FDA's authority to regulate vitamins, but they did. The impact from respected scientists' intellectual arguments and the crazies' pressure may merge (in Symms' bill)."

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LA Times, 7/8

Hospitals Need a Plan to Cap Their Expenses

BY LISTON A. WITHERILL

The Carter Administration's proposal to limit the annual rise in hospital revenues is the first step toward what now seems inevitable: national health insurance. Since hospital costs have been rising lately by 15% a year, the Carter-Califano plan to hold increases to 9% a year seems reasonable.

Yet the call for a "cap" on hospital income, however well-intentioned, stands little chance of working because it does nothing to control increases in what those institutions have to pay for labor, equipment and even ordinary supplies such as bandages. Nor is the proposal a particularly useful move toward national health insurance, for the same reason. In short, any workable plan for tempering the cost of American medicine—now or in the future—must include mechanisms that limit expenses across the board.

Several reasons can be cited for the particularly high inflation rate for hospital services:

—After years of receiving far less than comparable professionals in other industries, hospital workers are now catching up. In fact, their wages are soaring, especially in places where unionization is taking place.

—Medical knowledge has expanded more in the past decade than in all of the rest of the world's history, but putting new technology to work does not come cheaply.

—The law of supply and demand does not apply in medicine, which drives up costs even more. Since doctors control the resources (namely their own services and those provided by hospitals), in effect they control costs. But the demand side of this economic equation does not function, since an ailing patient has little freedom of choice: Sooner or later he *must* seek care, unless he is willing to suffer the consequences of not doing so.

Obviously, the problem of skyrocketing costs in American medicine will not be solved solely by the Carter-Califano plan to put a cap on hospital expenses—especially not within the limited guidelines Califano has put forward. For example, the Administration would exempt from control any wage increase for nonsupervisory personnel (a decision undoubtedly influenced by organized labor). Yet such employe wages comprise approximately 50% of the budget for a community hospital, and as much as 70% for a teaching hospital.

Another difficulty with the Administration's plan is that it would not affect the prices that suppliers may charge hospitals. How, precisely, are the institutions supposed to absorb the inevitable increases in uncontrolled wages and prices? Joseph A. Califano Jr., the secretary of health, education and welfare, has not told us.

Indeed, he seems to think he can push the balloon on one side and not have it pop out on the other. Inevitably, the balloon will burst, and the bang will probably take the form of "creative" accounting. In that event, hospital bookkeepers will have a field day finding ways to obscure true expenditures and thereby escape provisions of the capping proposal.

Even if the Administration subsequently decides to control additional facets of health care, the escape from rampant inflation will be incomplete unless the government takes such steps as these:

—Reducing in absolute dollars payments for hospital services allowed by private insurance carriers and government agencies such as Medicare and Medicaid (Medi-Cal in California), while at the same time providing incentives for care outside the hospital. The objective would be to push patients out of hospital rooms into less-expensive medical settings: doctors' offices, clinics and "surgery centers" (where patients would undergo minor operations in the morning, recuperate in the afternoon and go home at night).

—Forcing hospitals with surplus beds to alter programs that would meet real public needs or to lower overall operating costs by closing sections of their facilities—in some cases, even closing down a whole hospital.

—Emphasizing preventive medicine to deter Americans from seeking help only when a specific illness reaches a point where care is essential—and expensive.

Some attempts, both public and private, are already being made to achieve these goals. The federally mandated Health Services Agencies now being established around the country should make it easier for individual communities to eliminate wasteful duplication of hospital services.

In addition, preventive medicine is beginning to catch on, especially here in Southern California. The Kaiser-Permamente system has long stressed such measures as an annual physical checkup—and, as a result, has experienced fewer hospital admissions per patient than have traditional health-insurance plans, thus reducing the average cost of care for Kaiser patients by 20%.

In the public sector, the Veterans Administration and the armed forces' medical corps have begun paying attention to preventive medicine. The same is true for the Los Angeles County Department of Health Services, which since 1972 has organized its hospitals, health centers and mental-health clinics to provide preventive and curative services to patients in, or close to, their neighborhoods.

These efforts are already bearing fruit. Today, Los Angeles County residents are receiving more for their health dollar than they used to: The budget for local health services has grown only 13% during the past three years—a full 2% below the national rate.

Nevertheless, all of us must ultimately bear the burden of increased health-care costs—through direct individual payments, private insurance plans or government programs. It is in our interest, therefore, to hold these costs down and, to achieve this end, the Administration's measure is no more than a Band-Aid.

What is needed is a bold, comprehensive program that would offer incentives for hospitals both to tighten their belts and to improve their services—with emphasis on outpatient care. Only by taking this double-barreled approach can we hope to curb runaway health costs and, at the same time, meet the medical requirements of all our citizens.

Former director of health services for Los Angeles County, Liston A. Witherill is now vice president of a health and hospital consulting firm in New York.

SF Chronicle, 7/8

Of Vouchers And Education

THE VOUCHER SYSTEM is an approach to education that has been subject to a good deal of lively debate over the past few years. There are elements to the theory that have much to be said for them, and we are pleased to see that it has been given new impetus in a book entitled Parents, Teachers & Children, Prospects for Choice in American Education, put out by the Institute for Contemporary Studies in San Francisco.

In its simplest and most general terms, the system means that school-tax money would go directly to the parents of prospective students in a district, instead of to the schools as it does now. The parents could then use the funds to send their children to whichever school — public, parochial or private — they preferred.

This process of selection would place a pressure for self-improvement on schools which is now lacking. The schools would have to compete for the respect, and dollars, of the parents, who would have control of the funds. A school system could no longer operate as an unresponsive bureaucracy, confident of continued financial support regardless of how poor a job it might be doing.

If a school was doing its job, the theory goes, it would get plenty of applications and funding vouchers. If it wasn't, few persons would apply and it would go out of business.

That there is a broad base of support for the idea is borne out in the notably varied list of educators, social scientists and community leaders contributing to the institute's book. They argue that increasing the element of choice will benefit not only the schools, but society in general.

E. Babette Edwards, administrator of the Harlem Parents Union, contends in one chapter that "one way in which parents, particularly poor parents, can establish a formidable presence is to assume control of the financial levers. Education vouchers are one mechanism. Introducing an element of competition for the education dollar would give parents the power to act as change agents to improve the quality of educational services."

There are, to be sure, countervailing opinions that vouchers would only serve to stratify schools along racial and economic lines. The child in Watts, for example, might afford a school in the suburbs, but not the transportation to it. Well-to-do parents would presumably pay more and create their own costly institutional enclaves.

Still, the idea of placing greater choice in the hands of those who use the educational system—the students and their parents—is an attractive and constructive one. The institute is to be complimented for presenting it for further national debate in a many-sided and stimulating document.

Treating People as Equals

A Yank at Oxford rethinks individual rights

Nine years ago, Oxford University offered its prestigious chair in jurisprudence to a relatively unknown Yale law professor who had not even applied for the post. Ronald Dworkin, then only 36, eagerly accepted. A group of his essays, published this year in book form (Taking Rights Seriously; *Harvard University Press; $12), has been hailed by some as the most important work in jurisprudence in years and the most provocative philosophical contribution to that subject by an American scholar.* TIME's *David Beckwith visited Dworkin at his summer home on Martha's Vineyard. His report:*

On a typical morning, the tanned, sandy-haired law professor pulls on a pair of bathing trunks and is soon putputting in his outboard en route to a brisk swim in the surf off his small stretch of private beach. An evening might well include conversation with some of the Vineyard's summer literati, such as Lillian Hellman, William Styron or Anthony Lewis. For Dworkin, the leisure is not mere idling, however, but a way of getting new ideas to augment his own original thinking on individual rights.

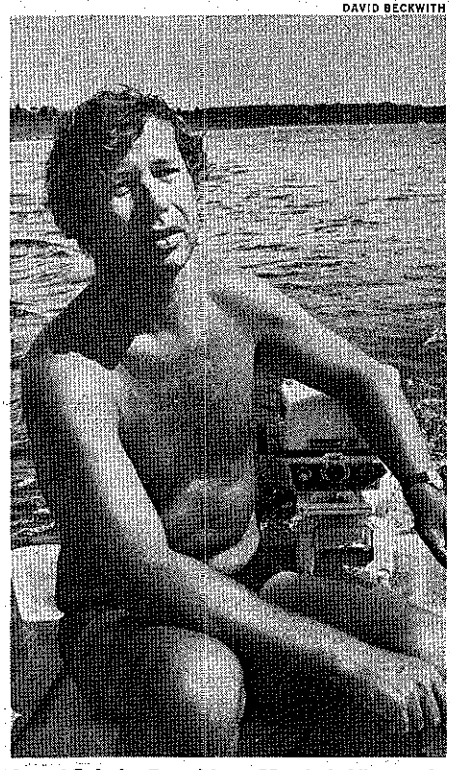
Dworkin's writing launches a frontal attack on the two concepts, utilitarianism and legal positivism, that have dominated Anglo-American jurisprudence in the 20th century. Utilitarianism, the reigning theory about what law should be, dates from Jeremy Bentham's 18th century dictum that laws should provide the "greatest happiness of the greatest number." Legal positivism claims that individuals possess only those rights that have been granted by man-made law.

To Dworkin, legal positivism is much too narrow, and he faults utilitarianism because it can be used by a democracy to justify disregarding minority rights, since minorities, by definition, are not "the greatest number." Instead, Dworkin offers a "rights thesis," an updated version of the classical natural rights theory that guided the 18th century authors of the Declaration of Independence and the U.S. Constitution. The basic tenet of his rights thesis is that an individual has a natural right "to be treated as an equal," or to be accorded respect, dignity and equal consideration by society.

Dworkin insists that the parties in a court case are often entitled to more consideration than is explicitly written down as "the law," and he feels that judges should be encouraged to range widely, asking fundamental questions and applying ethical principles as well as written legal rules to the case.

"Positivism holds that there is never a single correct answer to novel, hard questions of law. I disagree," says Dworkin. "An able judge may properly think he can find the right answer by considering written law—the Constitution, statutes and previous court decisions—plus all other considerations assumed in a society that has respect for other people's rights." Dworkin concedes that different judges may reach different answers to the same case based on their understanding of society's underlying morality, but he thinks the process is evolutionary and well worth doing. Modifying the axiom that "hard cases make bad law," Dworkin quips: "Hard cases make great judges."

DAVID BECKWITH



Legal Scholar Dworkin on Martha's Vineyard
"Hard cases make great judges."

Some Dworkian examples of how his theories would work in practice:

Finding new law Society occasionally has to be forced to treat people as equals. That is the basis of rights. So a judge should act imaginatively when he feels that a minority is threatened with moral and social prejudice. If a specific precedent is not available, the judge should ask whether a principle of justice inherent in the law as a whole covers the case.

Values Conservatives believe society can impose an official set of virtues—such as, talent should be rewarded, or the brighter people deserve more goods. That is a preposterous notion. Why should intelligence be officially superior to any other virtue—color, rhythm or kindness, for example? Obviously, people are not the same. But society should not make prejudgments like "the intelligent life is the morally superior life."

Abortion funding Assuming the Supreme Court's 1973 decision on abortion was correct, the recent decision allowing cutoff of public funding is simply wrong. The state may consistently pay for an appendectomy while denying funds for cosmetic surgery, because that distinction does not involve any controversial moral views. But the supposed difference between an appendix removal and an abortion does depend on a moral position. The state has no business enforcing a moral judgment on a minority.

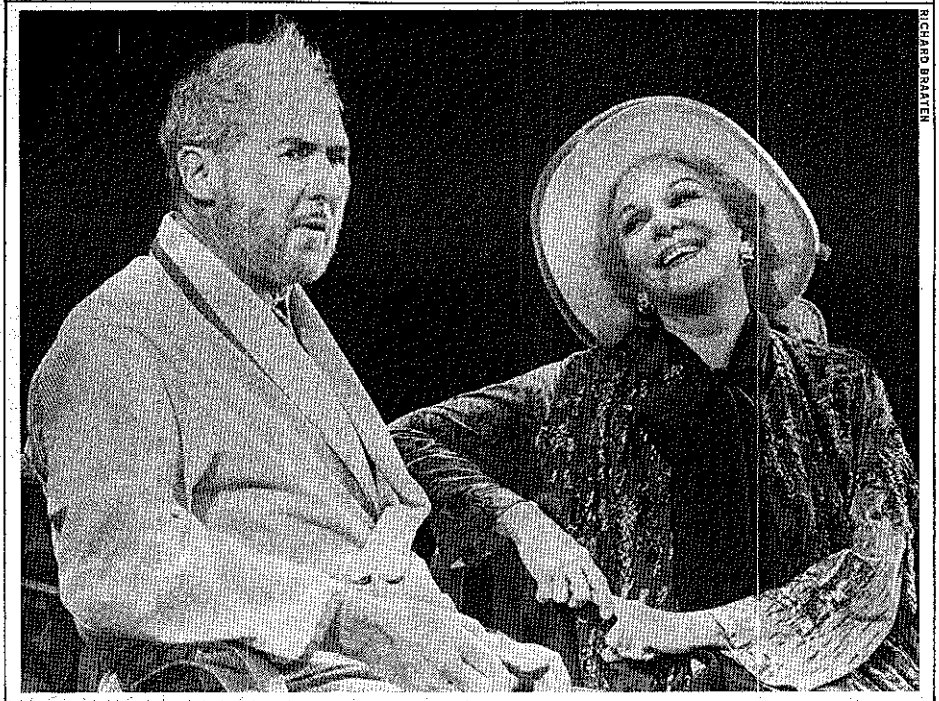
Reverse discrimination A qualified white has no inherent right to be admitted to medical school ahead of a less qualified minority member. Nobody has a basic right to a medical education. But the university does have a right to determine its own admissions policy based on many factors, including intelligence, reduction of racial tension and redress of historical inequities. Whites and blacks are owed respect and consideration, but "the right to be treated as an equal" does not always mean "the right to equal treatment." It does always mean, however, that competing interests will be considered in the decision-making process.

Obscenity Laws should not be founded on personal moral judgments. That is why liberals find themselves in court defending people they disapprove of. Pornographers are carriers of issues of principle, though they may lack principles themselves. Etiquette is a more acceptable basis for legislation than morality; "It's the wrong time and place" is acceptable, but "There's no place" is not.

Dworkin's theories have created shock waves among jurisprudential scholars, and much of the response is sharply critical. Says Duke University Law Professor George Christie: "Dworkin misconceives what legal decision making is all about. He views it as the search for right answers rather than a process for producing adequate justifications for legal decisions. Actual cases are simply too complicated to abstract into clear rights and clear duties."

But one measure of the extent to which Dworkin has succeeded in stimulating his colleagues—whether positively or negatively—is the experience of the *Georgia Law Review.* The editors solicited articles for a special issue on jurisprudence—and found that virtually every contribution addressed the challenging thoughts of the Yank at Oxford. ■

The Theater



RICHARD BRAATEN

Anthony Quayle and Mary Martin at Washington's Kennedy Center

Mary Stage Front Once More

DO YOU TURN SOMERSAULTS? *by Aleksei Arbuzov*

In this jaded day, it takes nerve to present the shockaholic public with a romance unmitigated by violence, treachery, despair, psychosis or death, not even an ugly disease. A similar risk would be to serve Kool-Aid to cocaine sniffers. Surely the hazard is doubled when the offering is built on the doings of two gerontic specimens who do not even talk dirty or expose any personal equipage more intimate than the inside of an umbrella.

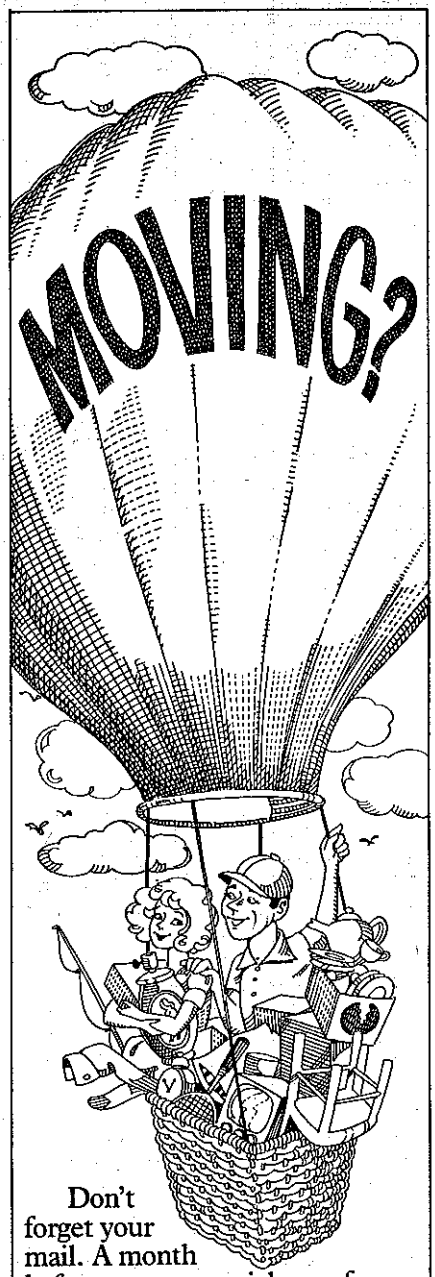
Such are the elected handicaps of *Do You Turn Somersaults?*, which began a five-week run at Washington's Kennedy Center last week. The old parties who fret, fuss, fumble and fudge their way into twilit romance are Anthony Quayle and Mary Martin. But the play is nonetheless an event, for this is Mary's first appearance on the stage since *I Do! I Do!* almost ten years ago. Surely she deserves the rose-colored badge of courage, if nothing else, for choosing this comeback vehicle—a fragile work that could expire of its own sweetness without a strong dose of acting magic.

As it turns out, she also deserves only a jot less credit than Quayle for making the production work. A confection that could easily have dissolved into a soup of mawkish sentiment gets soufflèed into an amusing and often touching entertainment. Director Edwin Sherin had the good sense to keep the sets minimal.

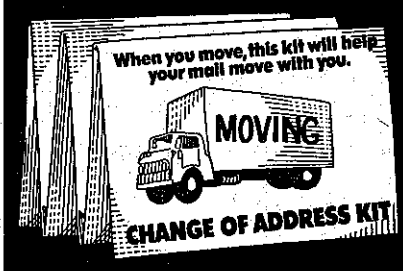
Actually, physical scenery might have been all but dispensed with. So might the premise that the action is occurring in the old city of Riga in 1968. *Somersaults* is one of those plays (*Our Town* is another) for which the audience projects the essential scenery, place and time out of its own bittersweet memory. Rodion, the fuss-budgety doctor, and his patient Lidya, an actress come down to circus cashier, could as well be in Pasadena as Riga. The true location of each is an almost impermeable condition of the solitude to which life has delivered them. The difference is that Rodion defies his loneliness from inside a husk of willful indifference to women, while Lidya denies hers with fantasies and deceptions.

How reluctant love gets born between them is, of course, the stuff of the play. Quayle brings to his portrayal a gritty verve and charm, perfected when he did the same part in London. Martin's Lidya is a scatterbrained and whimsical sprite of a woman whose very casualness with truth seems to put her beyond Rodion's reach. Naturally, love outs—in a scene of bubbly, moonlit tipsiness that finds the two codgers cajoling each other into doing an arthritic Charleston that would vindicate the evening if nothing else did.

Inevitably, Mary Martin has to overcome the audience's expectation that some ghost of Nellie (*I'm Gonna Wash That Man*) Forbush will be hovering about the stage. She manages. Her one ditty is a wistful circus song that proves that at age 63, her heart wisely belongs not to memories of her glittering past but to a riper, richer present. — *Frank Trippett*



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F/C w/ Editorials

CONCENTRATES

Science

Progress in the drug treatment of cancer is evident from reports at the American Association for Cancer Research (AACR) annual meeting in Toronto. Researchers from the Memorial Sloan-Kettering Cancer Center in New York City, for example, reported marked success in the treatment of neuroblastoma, a usually fatal childhood nerve cancer. By using a combination of four drugs—cyclophosphamide, vincristine, trifluorothymidine, and papaverine—in conjunction with other therapy, says Dr. Lawrence Nelson, a Sloan-Kettering pediatrician, more than 90% of neuroblastoma victims treated showed significant improvement.

Testicular cancers also may yield to drug therapy, another group of Sloan-Kettering researchers told the Toronto meeting. One of the most common forms of germ cell tumors, testicular cancer is the fourth most common cause of cancer deaths among men 15 to 34 years of age. Like many other chemotherapeutic regimens for cancer, the treatment for testicular cancer consists of a number of drugs used in varying schedules, including cyclophosphamide, *cis*-platinum, chloroambucil, bleomycin, vinblastine, actinomycin D, and adriamycin. This last drug is used against many types of cancers (C&EN, April 12, page 18).

Nicotine's role in carcinogenesis also was detailed at the AACR meeting by a researcher from Roswell Park Memorial Institute, Buffalo. According to Fred G. Bock of the institute's Orchard Park Laboratories, low to moderate concentrations of nicotine act as a cocarcinogen stimulus when applied to the skin of mice. Although not a carcinogen itself, when tested along with a solution of benzo[a]pyrene and 12-*O*-tetradecanoylphorbol-13-acetate (known carcinogens similar in many respects to cigarette smoke condensate) nicotine solutions helped produce an 80% tumor incidence in mice, compared with a 37% rate when the carcinogenic chemicals were used alone.

A national computer network dedicated to nuclear fusion research has gone into operation. Instituted as part of ERDA's controlled thermonuclear research program, the network is centered at Lawrence Livermore Laboratory in California. A CDC 7600 there is linked to smaller computers at Princeton Plasma Physics Laboratory, Oak Ridge National Laboratory, Los Alamos Scientific Laboratory, General Atomic Co. (San Diego), and Lawrence Livermore's own fusion research laboratory. The network also supplies computing services to small groups at universities and other laboratories throughout the U.S.

The 400-beV super proton synchrotron at CERN is moving toward its goal of experimental availability by the end of this year. A 10-beV synchrotron in operation at CERN (the European Organization for Nuclear Research) will feed the large accelerator. A beam of 10-beV protons has been injected into the super proton synchrotron's 6900-m circumference and bent along the circle, within the confines of the vacuum chamber. When operational, the super synchrotron will be the largest accelerator in Europe; a 400-beV accelerator is in operation in the U.S. at the Fermi National Accelerator Laboratory, Batavia, Ill.

Education

Academic R&D spending spurted 12% in 1975 to $3.4 billion, twice the annual growth rate of the six previous years, NSF reports. But in constant (1972) dollars the increase works out to a more modest 2%. Much of the hike was due to increased federal funding on life sciences research, including release of $150 million in impounded funds to NIH. In all, federal support of R&D totaled $2.3 billion, about two thirds of all separately budgeted academic R&D money, and a 13% increase over 1974. By field, medicine was the big winner at $842 million. Chemistry didn't do quite as well: R&D spending was about $122 million last year.

Technology

A simplified system of national statistics about the basic elements of energy conservation is needed, Du Pont vice president Edward G. Jefferson told the American Petroleum Institute's midyear refining meeting in Los Angeles. Such a system, he points out, would help develop public understanding and commitment and improve the pace of national decision making in energy matters. Jefferson suggests a monthly, national report with appropriate indexes similar to those for consumer prices and unemployment. Three essential trends might be tracked, the Du Pont vice president says: progress in energy efficiency, by contrasting total energy consumption against gross national product or the index of industrial production; the level of petroleum imports; and energy prices.

Energy consumption in Exxon's five U.S. refineries was reduced 14% in 1975 from 1972 levels, the company's refining energy conservation coordinator, R. I. Taylor, told the API meeting. The company, he says, was able to make the savings—the equivalent of 6 million bbl of fuel oil—with an operations-oriented program requiring little capital investment: furnace efficiency improvements, improved insulation, some shutdowns, an "aggressive" program of monitoring and cleaning heat exchangers, and increased employee awareness, motivation, and training. However, further improvements, he notes, will be much more dependent on capital projects.

Iodine may replace chlorine as a swimming pool disinfectant, researchers at Pennsylvania State University believe. Iodine, says associate professor of sanitary microbiology Richard Unz, is more effective against organic matter and ammonia in water, doesn't irritate the eyes, and requires less frequent monitoring. But since iodine is ineffective against algae, it must be used along with a compatible algicide, which Unz has found. He is in the process of patenting the combination of iodine and the algicide as a proprietary package.

Rubber research on artificial hearts progresses

Artificial heart made from polyhexene-based rubber has set survival record implanted in calf, and it's still going strong

One Thursday afternoon late last month, Dr. Rowland H. Mayor, assistant manager of synthetic rubber research for Goodyear, was in Minneapolis. He was at the American Chemical Society's Rubber Chemistry Division meeting, describing Goodyear's research on uses of rubber in the cardiovascular system. Meanwhile, a seven-month-old Holstein bull calf known as 75-052 was in Cleveland. He was chewing his cud.

There is a connection. In calf 75-052's chest was an artificial heart, developed jointly by Goodyear and the Cleveland Clinic's department of artificial organs research. On April 24, 75-052 had set a new record—123 days—for survival with a total artificial heart replacement. At press time he was still alive, eating well, growing normally, and receiving no medication. The air supply lines that power the heart restrict his roaming, but he gets periodic workouts on a treadmill. As 75-052 approaches full bullhood, there is talk of mating him. And there are plans to install a booster to provide more pumping capacity as he outgrows the original implant.

The work at the Cleveland Clinic is under the direction of Dr. Yukihiko Nosé. Other Goodyear scientists involved in the project include Robert M. Pierson, manager of synthetic rubber research, and research chemists Thomas G. Gurley, Donald V. Hillegass, and Richard J. Arconti.

Goodyear notes that natural rubber has played a major role in the development of cardiovascular prostheses. It can closely simulate the elastic properties of natural tissues, it has outstanding stress, strain, and tear properties, and it is fabricated easily by a variety of techniques. Earlier work had led to deproteinized, doubly centrifuged natural rubbers that are also highly biocompatible. That is, they cause little reaction in surrounding tissues, they resist the effects of body fluids, and they are acceptably nonthrombogenic. These "clean" natural rubbers were the starting material for replacement blood vessels and for components of artificial hearts. As it turned out, however, certain synthetic elastomers have proved superior in many applications.

Prostheses for large blood vessels—more than 10 mm in inside diameter—present few problems. Portions of such arteries and veins are routinely replaced in humans by sections of porous knitted tubes made of polyester or of Teflon. But smaller fabric grafts, less than 8 mm in diameter, generally thrombose to the point of complete occlusion. The fabric grafts have the added disadvantage that they are soon transformed by the ingrowth of fibrous tissue into stiff, inelastic tubes; then they lack the distensibility that is an essential characteristic of normally functioning blood vessels.

So, the smaller diameter grafts should be nonporous, to prevent the fibrous ingrowth. However, early tests with simple smooth-walled natural rubber tubes were unsatisfactory. The tubes were nonporous, but clot formation was severe; they closed up in less than 50 days.

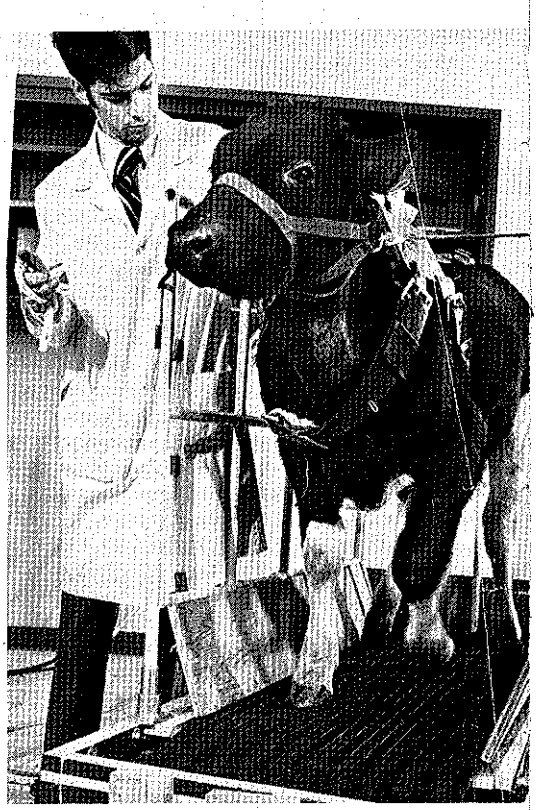
Other studies had shown that all materials caused the deposition of thrombus, consisting of several layers of fibrin and entrapped blood elements. But it also had been observed that if growth were arrested after the initial deposition, the thrombus lining would develop into new tissue that would mature into neointima—an endothelial cell lining similar to the normal artery-blood interface. So the prosthesis needed a textured inner surface to allow anchorage of the thrombus layer, and also to prevent the inevitable clots from breaking loose, possibly to cause fatal blockages elsewhere in the circulatory system.

Grafts were made with inner surfaces textured by various means. In extensive tests on dogs at Akron City Hospital's vascular research laboratory, natural rubber grafts lined with cotton flock stayed open for periods up to a year; 62% remained patent for 50 days or more. Neointima developed and was firmly attached to the inner walls.

It is also necessary to control the thickness of the deposited thrombus, which can depend only on the blood stream for its nourishment; 700 micrometers is about the maximum. Studies at several laboratories had established that clot formation is sensitive to electrical charge changes. The normal vessel lining has an electronegative surface potential that repels the components of the blood. But this repellent effect is lacking on the electrically neutral surface of the rubber tube; precipitation begins there almost at once. The Goodyear workers found that adding acetylenic carbon black to the natural rubber latex made it conductive, providing the electronegativity that prevented excessive clot formation.

Grafts made with the conductive natural rubber were implanted in 12 dogs; 80% of the grafts remained open for more than 50 days. The neointima that was laid down was thin and well-formed. However, those tubes didn't have textured inner surfaces, so the neointima was poorly attached.

The logical next step was to make grafts of the conductive rubber, with textured inner surfaces. Early experiments involved 6- to 12-mm-diameter grafts inserted in the abdominal aortas of test dogs. The results were promising. But when the technique was tried on smaller vessels, the results were disappointing. In tests on carotid arteries, only 4 mm in diameter, the grafts remained open for only three days.



Calf 75-052 with air-driven artificial heart exercises on a treadmill

On the cover

Goodyear researcher Richard J. Arconti blows air through a ventricle of a rubber heart. Heart is identical to one that has kept a Holstein bull calf alive since last December.

File editorials

Closer to creating a consumer agency

Esther Peterson, a 70-year-old grandmother and President Carter's special assistant for consumer affairs, is adept at battling congressmen in the halls of the Capitol. This week she declared certain victory in her often-bitter fight with business over the creation of President Carter's Agency for Consumer Advocacy. "The war isn't over yet," she shrugs, "but we'll win."

While other White House insiders are more guarded about the bill's chances, Peterson is confident that it will get through, probably in June. The legislation barely cleared its biggest hurdle, the House Government Operations Committee, by a vote of 21 to 20 after Peterson, Ralph Nader, and other advocates buttonholed committee members to win their support. Peterson is already talking about the roles that she and the White House envision for the agency—a so-called watchdog empowered to intervene before other federal agencies on behalf of consumer interests and to challenge their decisions in court, as well, if it believes they failed to take the consumer into consideration.

Out of step. Mainly, says Peterson, she and President Carter envision the ACA concentrating on such broad-based issues as chemical and drug control, air transportation rates, deregulation of home heating oil, and deregulation in general. "I don't want it flittering around getting into all aspects of government," she says. "It's going to factor in where it will do the most good."



Consumer champion Peterson: The agency's intention is to see what can be done for consumers without legislation.

A feisty graduate of the union movement who served as an Assistant Secretary of Labor under President Kennedy and as consumer adviser to President Johnson, Peterson has returned to the White House because of a conviction that government needs a mechanism to make it more responsive to consumer needs. She charges that agency opponents are either out of step or that they misunderstand its intent "to see what can be done in the marketplace for consumers without new legislation."

Lobbyists with clout. Whatever their reasons for opposing the ACA, the lobbyists who testified against it were numerous and often powerful. Pulled together mainly by the U. S. Chamber of Commerce, they ranged from such luminaries as former Special Prosecutor Leon Jaworski to the Business Roundtable, the National Small Business Assn., the National Association of Manufacturers, and the National Federation of Independent Business.

The biggest objection to the ACA is its power to sue other agencies. Says Chamber of Commerce President Richard L. Lesher: "Its ability to dictate policy by threats and initiation of litigation is potentially awesome." Supporters argue that litigation will be a seldom-used recourse, but that it is a necessary weapon if the agency is to gain respect. They add that, with a staff of 300 and a tight first-year budget of only $15 million, the agency cannot turn to the courts very often.

Consumerists have fought for the agency for seven years. Enabling legislation almost passed last year but was blocked by a veto threat from President Ford. The current battle has been unexpectedly tough, even though the agency was backed by the White House and was one of Carter's campaign commitments. Although Peterson is pushing for creation of the agency, she emphasizes that she has no desire to head it. She retired recently as a vice-president at Giant Food Inc.

Recalling her battles on behalf of the labor movement, civil rights, and equal opportunity for women, Peterson shrugs that the tough infighting of the current lobbying effort is nothing new. ■