The Washington Post
Thursday, October 16, 1986

PETER BEHR

Plugging the U.S. Knowledge Leak

The United States has quarreled with its trading partners over autos, TV sets, oranges, steel bars and semiconductors. Next comes a battle over knowledge.

The protection of American inventions, laboratory research and intellectual property from unfair exploitation has moved to the top of the Reagan administration's agenda for the next round of international trade negotiations.

It also has become a prime issue for leaders of universities and government labs, who argue that the basic research at their institutions constitutes America's best remaining competitive edge in world trade.

There are now suggestions that some of that research be put off limits to foreigners or that access be limited, at least temporarily. Call it a "buy American" approach to government-funded research and development.

Richard M. Cyert, president of Carnegie-Mellon University—one of the nation's centers of research on advanced industrial processes—says the competitive importance of the U.S. research establishment must be recognized.

"The United States, in my view, is in an analogous position to being on the frontier in colonial times. We really are fighting for our economic life. Unless we are able to do some things in universities to help in this, I think our whole way of life, our whole standard of living in this country is going to go down the drain."

Cyert said he would be willing to consider a proposal that would boost federal research support for American universities—with the requirement that the research work be restricted to U.S. citizens.

"I'd be interested in it, if we limited the period . . . . I'd be willing to go along with that for a little while. I'm sure it would be unpopular, in the sense that we like to think of ourselves as world citizens.

"It's obviously something I'm uncomfortable with. . . . But we want to have America get some temporary advantage from the research that we can do. . . . The notion that somehow you want to do something for your country should not be something that a university president is ashamed of," said Cyert.

Congress is not considering such a proposal. But it has approved and sent to President Reagan

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legislation called the Federal Technology Transfer Act of 1986.

The bill's main purpose is to help American companies, universities and other institutions tap research in the nation's 700 federal laboratories. The labs would be authorized to enter into cooperative joint research arrangements aimed at speeding their technology into commercial use.

Foreign companies aren't prohibited from joining in such cooperative ventures, but preference is to be given to American firms that agree to manufacture in the United States.

Senate Majority Leader Robert J. Dole (R-Kan.), and Sen. John D. Rockefeller IV (D-W.Va.) added a section that is aimed at assuring that American companies get reciprocal access to foreign labs. In reviewing proposals by foreign companies, federal lab directors "may examine the willingness of the foreign government to open its own laboratories to U.S. firms," the legislation says.

Although the bill has strong congressional backing, there is some question whether Reagan will sign it.

Access to American research facilities—government and university—will become even more important in a competitive sense as these laboratories try to push their discoveries into the marketplace more rapidly.

University of Michigan has set up an "intellectual properties" office to help inventors obtain patents and to offer advice and aid in turning the inventions into products or commercial services. Like Carnegie-Mellon and most other major universities, Michigan is expanding its connections with American manufacturing companies.

In all of these area, universities must walk the narrow line between advancing the U.S. national interest and maintaining a tradition of open access to all. It is a microcosm of the free-trade, fair-trade dilemma confronting Congress and the administration.

Gilbert R. Whitaker, dean of the University of Michigan's Graduate School of Business Administration, notes that the school still looks actively for non-American MBA candidates.

"The Japanese send 10 to 15 students a year. Now we're getting increasing numbers of Koreans. They're obviously here to learn something about American culture and American business to take back with them. We're trying to learn similar things about their culture," he said.

Whitaker believes that the United States has more to gain through a continuing exchange of ideas, technology and expertise. "We'd like to get technology from elsewhere to put together with our knowledge. . . . We don't have a monopoly on brains."

Cyert agrees, with one qualification. "One of the great accomplishments of the United States has been the dissemination of its knowledge and technology around the world. . . .

"We want the bucket to leak. We do want the stuff out there. To the extent we can hold back a little bit, say by some restrictions on licensing, or on access to the most up-to-date [research], it would give us a little bit of a comparative advantage."

The search for that advantage promises to transform the way universities, company managers and politicians think about the American research establishment.

U.S. Competitiveness: A Campaign Code Word

Can It Spark Offensive on Complacency?

Fifth of a series

By David S. Broder
Washington Post Staff Writer

"Competitiveness," said Secretary of Labor William E. Brock, a longtime student of political fashions, "is the new code word in Washington, and Washington needs code words. It doesn't think in sentences very often."

Brock's comment at a recent conference reflects both the sexiness of the competitiveness issue and its lack of precision. Substantively, the issue is one of the most complex. But talking to voters such as those The Washington Post interviewed this week in Knoxville, Tenn., it comes down to two very simple, basic, human questions:

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- What kind of jobs will there be for our children here, where we live?
- What is the chance of maintaining the American standard of living for that next generation?

The fear that gnawed at many Americans in those living-room interviews is that the Land of Opportunity is becoming a Nation of Reduced Expectations and Limited Options, because of its inability to meet the challenge of economic competition.

The shock effect of the trade deficits of the last few years has been compared with that of the Soviets' launching of Sputnik in the late 1950s. The question is whether a national effort to end what is perceived as economic-scientific-educational "complacency" will result.

A response is visible in many local communities and a growing number of states. Many would

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welcome seeing the next president act to push such programs to the national level, but there is a risk of government once again promising more than it can deliver.

Alice Rivlin, the Brookings Institution economist and former director of the Congressional Budget Office, argues that "competitiveness is the wrong word," because it implies that through some stratagem Americans can reassert economic supremacy in the world. "There's no way to recreate the advantages the United States had at the end of World War II," she said.

"For the future, 'winning' means advancing together through expanded trade with other major countries, and realizing that we can't always be the leader, but we don't always want to be the follower."

At the other end of the political spectrum, Heritage Foundation president Edwin J. Feulner Jr., asked, "Who can be against competitiveness? It's a meaningless word."

Maybe, but in the political realm it is thought to have a potency which encourages possessiveness. "If there's one issue I'd like to have royalties on in the next 18 months," said Democratic pollster Harrison Hickman, "it would be competitiveness."

Robert Teeter, whose surveys are used by many Republicans including Vice President Bush, remarks, "It may not be a red-hot issue right now, but it could be at any moment, especially if the economy turns down. And the candidates and parties want to be sure they don't get caught on the back of the wave."

That may explain why, when the Congressional Caucus on Competitiveness announced it was open for business at the start of the 100th Congress last January, more than 190 House and Senate members signed up.

Charles McMillion, the policy director of the caucus' support group, the Congressional Economic Leadership Institute, identified through a computer search more than 5,000 "competitiveness bills" introduced in the last Congress. "And that," he adds, "was before it got hot."

'A Sense That We Are Falling Behind'

"Among the voters we interview," said Democratic pollster Geoff Garin, "there is an increasing tendency to think of the economy in global terms . . . and a sense that we are falling behind. There is very widespread resentment about unfair restrictions [on American goods] by other countries. But Americans are also saying that we could have done better as a country, we should have done better, and we better do it now. And they're ready for someone to call America to a higher standard."

That call—in varying notes—is being sounded by almost all the prospective 1988 presidential candidates. And it is a theme of the closing phase of the Reagan administration.

In February, just before the Tower commission issued its critical report on the Iran affair, the president sent Congress a bulky package of competitiveness proposals, involving 13 separate bills and amendments to seven other existing pieces of legislation.

President Reagan, who has emphasized market forces as the main instrument for economic progress, went further in this set of measures than ever before in defining a role for the federal government in education and training, in basic research and in remedying predatory trade practices by other nations. The Democratic cochairmen of the Competitiveness Caucus, Rep. Buddy MacKay (Fla.) and Sen. Max Baucus (Mont.), welcomed the president's initiative but said it could only be the starting point for a long-term agenda.

"Not sufficiently aggressive," MacKay said. "Weak tea," Baucus agreed.

Many of the Democratic presidential hopefuls are vying to show themselves tougher than their rivals in the trade legislation debate which is central to the competitiveness issue.

The front-runner, former senator Gary Hart of Colorado, early on chose to define himself as a critic of "the new protectionism" that he said some of his fellow-partisans were offering as "snake oil medicine" for curing trade imbalances. Import restraints, he warned in a speech last year, "enshrine U.S. industrial weakness, sanction inefficiency and concede the superiority of our competition . . . . The new protectionism is the new economic defeatism and isolationism . . . ."

Hart advocated retaliatory measures only against specific, proven violations of international trade rules and cautioned that "if we could somehow wave a wand and abolish all the illegal trade barriers, the trade deficit would only fall about 10 percent." An overvalued dollar and uncompetitive industries are far more fundamental problems, he said.

Competitiveness A Complex Issue On 1988 Agenda

Lessons of the VCR Revolution

How U.S. Industry Failed to Make American Ingenuity Pay Off

Second of a series

By Boyce Rensberger
Washington Post Staff Writer

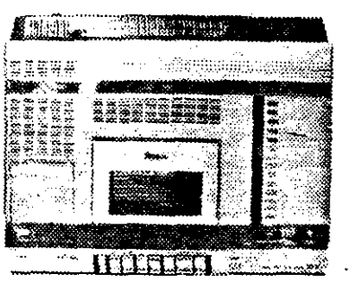
The videocassette recorder is an American invention, conceived in the 1960s by Ampex and RCA. The first VCR for home use to reach the U.S. market, in 1971, was the American-made Cartri-Vision.

By the mid-1970s, however, every American manufacturer had judged the VCR a flop and had left the business.

Today not one American company makes VCRs. All of the 13.2 million units sold in the United States last year—36,000 every day for a total of $5.9 billion—were made in Japan or Korea.

Even RCA, once a proud, patent-holding pioneer of the new technology, is now simply a middleman, buying Japanese VCRs and reselling them under its own label.

The story of the VCR, according to many experts, illustrates some of the reasons why American industry is losing its global competitiveness. It challenges the popular notion that a loss of innovative capacity lies at the heart of this country's eroding economic position. While there is evidence that American innovation may have lost some vigor and that other nations are gaining fast, many experts believe the United States is still the world leader in scientific and technological innovation.



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"The problem is not so much with American innovation," said Harvey Brooks, a specialist in technology and public policy at Harvard University. "Our scientists and engineers still lead the world in the origination of new ideas. The problem is what happens after that point. Where we're falling behind is in the ability to develop new ideas into products and to manufacture them to the high standards that we've come to expect from the Japanese."

The VCR is an example.

In the early '70s several companies in the United States, Holland and Japan unveiled VCR prototypes with great fanfare. Industrial-sized video recorders were already common in television studios, and the key to the home market seemed to be scaling down size, cost and complexity of operation. Most of the problems seemed near solution when the prototypes were demonstrated.

One hitch, it developed, was that the cassette would record only one hour of program. Market research showed that people wanted to get two hours on a tape, enough to record a movie. Cartri-Vision, named when cassettes were cartridges, was a one-hour machine that industry analysts say failed for that reason and because the recorder came built into a 25-inch TV set.

Despite the Japanese and Dutch activity in VCR development, the American firms did not think of

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COMPETE From A1

themselves as involved in an important global competition. It was an insular stance, common in many U.S. industries, that would later be seen as one of the causes of America's mounting trade deficit.

"Around 1974 RCA aborted its VCR project," said Frank McCann of the company's Consumer Electronics Division, now owned by General Electric. "It seemed clear the consumer just wouldn't buy it. What we didn't appreciate back then was that the Japanese would keep working on the VCR."

Within two years, both Sony and JVC (Japanese Victor Corp.) developed two-hour VCRs. Rising to beat the competition, Matsushita came out with a four-hour machine.

Pattern of U.S. Reluctance

What would come to be called the VCR revolution, accounting for an appreciable share of the U.S.-Japan trade imbalance, had been won by the Japanese. The United States lost, according to many analysts, not because American scientists and engineers had abandoned their heritage of Yankee ingenuity but because American industrial managers were unwilling to invest the resources to apply that ingenuity long enough to make a good idea pay off.

"It's not as if the United States is caught by surprise by what the Japanese or anybody else is doing," Brooks said. "Our people know what's possible. What we've been surprised by is the rapid commercialization of ideas in Japan."

Brooks said a common U.S. pattern is to avoid investing in new products that aren't fairly sure to return profits quickly and to withhold marketing a new advance in an existing product line as long as its predecessor is selling well. And, until recently, U.S. companies have not planned seriously to compete in international markets.

Japan, by contrast, holds global economic dominance to be a national goal, invests long and heavily in research and development and devotes far more of its best engineering expertise to sophisticated manufacturing methods.

Such factors have given Japan the advantage even though its scientific and technological innovativeness remain well behind that of the United States in all but a few narrow fields.

Although the United States spends more in total dollars on research and development (R&D) than Japan and the next two closest competitors, West Germany and France, combined, according to figures gathered by the National Science Foundation, those competitors have been increasing their spending dramatically in recent years.

In relation to the size of each country's economy, all four countries are now investing about the same in science and engineering research.

In 1986 the United States spent 2.8 percent of its gross national product on R&D, only a modest increase from the 2.6 percent spent in 1970.

Japan, by contrast, has increased its spending faster. In 1970 it invested 1.9 percent in R&D, but climbed steadily to match the United States' 2.8 percent by 1985, the last year for which figures are available. West Germany spent 2.1 percent in 1970 and grew to 2.6 by 1985. France went from 1.9 percent in 1970 to 2.4 percent in 1986.

Many analysts say, however, that the U.S. figures are misleadingly high because this country spends nearly one-third of its R&D money on military research, a far greater proportion than is spent by Japan or West Germany. If military spending is subtracted for the most current figures, the United States spends only 1.9 percent of its GNP on research and development, while Japan spends 2.6 percent and West Germany 2.5 percent.

Some experts note that it is not necessary to be the creator of a marketable idea to make money manufacturing the product. "Americans and especially members of the scientific community have exaggerated the purely economic benefits that flow from leadership at the scientific frontier," Stanford economist Nathan Rosenberg said.

As the costs of high-tech innovation rise, he said, the economic advantage goes to the imitator who can skip the costs of basic research, learn from the innovator's mistakes and come to market quickly with an improved version of the product.

Britain and the jet engine offer an older illustration. Although widely cited as an example of a major industrial power that has slid into global economic impotence and, in some ways, a declining standard of living, Britain continues to be one of the world's leading scientific innovators—second only to the United States as an originator of important fundamental technological advances.

"When a country falls behind in competitiveness, the last thing they fall behind in is innovation," Harvard's Brooks said. "The first thing is manufacturing and marketing."

Although Britain invented the jet engine, U.S. imitators—doing to Britain what Japan now does to the United States—reaped most of the economic benefits.

Britain's pioneer jet airliner, the Comet 1, turned out to be a financial disaster. Only when Boeing and Douglas picked up the idea, added some improvements and manufactured it to higher standards, did jet airliners sweep the world's aviation market.

What has slipped in the United States, Rosenberg contends along with many others, is the ability of industry to capitalize on "next generation" improvements in good ideas, regardless of where the idea originated.

"To a far greater degree than we once believed," Rosenberg said, "a first-rate, domestic scientific research capability is neither sufficient nor even necessary for economic growth." More critical is the sophistication of the nation's manufacturing ability.

Different Cultures at Work

Many observers attribute much of Japan's rise to what amounts to a cultural difference between the way U.S. and Japanese scientists and engineers work.

American engineers often prefer to work in research and development rather than in manufacturing. In the United States, the engineer who invents a product holds higher status and earns more money than the engineer who figures out how to manufacture it to high standards and keep it profitably low in cost.

One painfully obvious result, according to many, is that while the United States still spawns plenty of brilliant ideas, there are too few first-rate engineers to design good products based on the ideas. And when they are designed, those products often contain many times more defects than do Japanese counterparts.

"The relatively lower status and lower pay that have characterized careers in [U.S.] manufacturing represent an impediment to attracting first-rate people. Engineering departments in colleges and universities have largely ignored the field until very recently," a panel of the National Academy of Engineering concluded in a 1985 report. "In sharp contrasts, in both Europe and Japan the status of technical education and of careers in manufacturing is higher."

By having better brains in manufacturing, the Japanese and the Europeans are able to develop superior manufacturing methods and technology.

A related difference that yields poorer quality American products, according to a study of computer manufacturers done jointly by two experts in technology management, one an American and the other a Japanese, is that Japanese engineers move easily back and forth between R&D and manufacturing.

American R&D engineers, according to the study, not only come up with a new product idea, they produce the final specifications and simply turn them over to a separate manufacturing division. Japanese R&D engineers design only to a rough prototype stage, leaving the final specifications to manufacturing engineers.

Often a key R&D engineer will then move with the product to the manufacturing division, a step rare in the United States but part of the normal career ladder in many Japanese firms.

Under the Japanese system, experts in manufacturing technology

are free to complete the design in accordance with their knowledge of sophisticated manufacturing methods. They may modify the product design to ensure more reliable quality after manufacture. They may even invent new methods to make the product. As a result, the Japanese product can be made more easily, more cheaply and with much lower risk of defects.

The study was done by D. Eleanor Westney of the Massachusetts Institute of Technology's Sloan School of Management and Kiyonori Sakakibara of Hitotsubashi University in Tokyo.

Other key differences between the Japanese and American styles of managing engineering talent, according to Westney and Sakakibara, include:

■ Japanese firms invest far more time and money in advanced training for their engineers than do American firms, partly because they have little fear that highly talented individuals will be hired away by rival firms. It is traditional for Japanese engineers to stay with an employer for life. One result is that hundreds are sent abroad to study for months or years—most often at American universities, which many Japanese regard as the best in high-technology fields. At MIT, for example, there are more than 100 Japanese engineers taking classes at any given time. Japan's much vaunted "fifth generation" computer project, in which the country hopes to leapfrog American computer technology, is based largely on innovations borrowed from U.S. computer scientists at MIT.

■ While many Japanese engineers are soaking up the most advanced R&D skills and knowledge in U.S. universities, far fewer American engineers go to Japan, even to learn what Japan does best, advanced manufacturing technology.

■ Although engineers everywhere often engage in "bootleg research," using company resources to pursue personal projects on the side, American firms try to discourage such activities because the engineers may then leave to exploit their ideas in new, spinoff entrepreneurial firms. Japanese companies encourage such sideline research, confident that the engineers will stay and turn the new ideas into valuable products for the company.

Another important difference, cited by many analysts and illustrated by the history of the VCR, is the greater willingness of Japanese firms to spend money over longer periods of time to bring a new product idea to fruition. U.S. firms are often run by professional business managers, untrained in engineering, who make decisions to maximize short-term profits.

In Japan, which has no business schools, high-technology firms are more likely to be run by engineers who showed management skills and who have advanced up the corporate ladder. They plan much further ahead and are willing to forgo short-term profits for a long-term advantage.

"American investors need earnings trends quarter to quarter. The Japanese are much more patient," said G. Stephen Burrill, head of a high-technology consulting group at Arthur Young, an accounting firm.

Next Battle: Biotechnology

Electronics has been one of Japan's oldest arenas of high-tech competition. One of the newest is biotechnology, another field pioneered chiefly in the United States and which promises a multibillion-dollar market supplying medicine with more effective drugs and diagnostic tools and supplying agriculture with various products to enhance crop yields. Japan's approach to biotechnology illustrates what many scientists see as another of that nation's advantages—Japan's method of creating government-supported consortiums of private corporations.

U.S. biologists invented gene splicing, also called recombinant DNA technology, and developed most of the methods of applying the technology. Although a swarm of new American entrepreneurial biotech firms has emerged, the Japanese are pushing hard to capture much of the market. Many leaders of U.S. biotech firms believe it will be hard, though not impossible, to stay ahead of Japan.

The once unquestioned dynamism of the United States in the world marketplace is being tested as never before, forcing Americans to confront dramatic changes in standard of living, expectations and values. This is the second of six articles exploring these changes and their causes.

As in many other fields, a key feature of Japan's drive is its unusual degree of cooperation among related industries and universities and the Japanese government's strong encouragement and financial support for a coherent national program in this area.

While antitrust laws prevent U.S. biotech firms from collaborating and while tradition leads many to pursue their goals apart from federal labs, Japan's Ministry of International Trade and Industry (MITI) has created a consortium of 14 major corporations to collaborate on biotech. Global domination in biotechnology is an official national goal under one of Japan's 10-year "Next Generation Projects."

Howard A. Schneiderman, vice president for R&D at Monsanto, a major biotech firm, sees his company as having to compete not just with other firms but with all of Japan.

"Monsanto, du Pont and Eli Lilly cannot cooperate in biotechnology," Schneiderman said. "We must be competitive, at arm's length. Yet Monsanto must be able to compete scientifically and commercially in biotechnology with MITI's consortium of 14 great companies in biotechnology and must compete with Japan's national commitment to biotechnology."

Monsanto's answer, and that of many other firms, is to seek collaboration with U.S. science-oriented universities.

"No MITI consortium in Japan, no industrial combine in the U.S. or elsewhere can duplicate or compete with the basic research capabilities of America's great research universities," Schneiderman said.

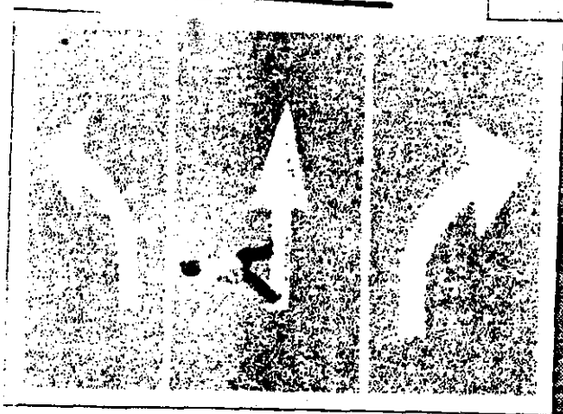
While such corporate-university collaborations are developing, there is controversy as to whether industry's need for proprietary secrecy conflicts with the traditional openness of university research.

Most university-based research in biotechnology is funded by federal grants and some industry leaders, such as Ronald E. Cape, chairman of Cetus Corp., a California biotech firm, worry that spending in this area has not grown significantly in several years. Because Japan's spending on basic biotech research is continuing to grow, Cape forecasts that Japan will take the world lead in biotechnology in the 1990s.

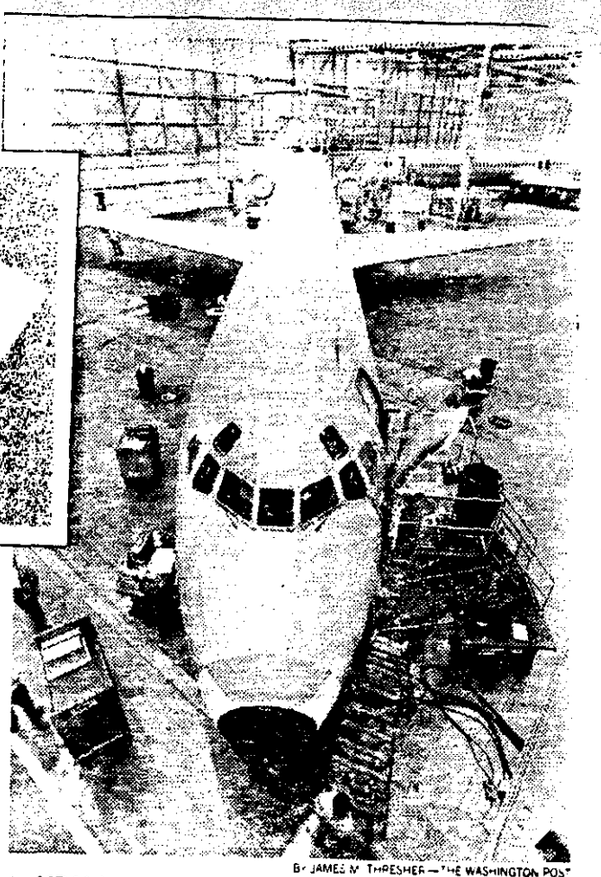
"In 10 years, if what I'm saying is correct," Cape says, "I bet we'll have hearings in Congress and a lot of American industrialists will bitch and moan about how the Japanese have done unfair things in trade. But that is not the case with biotechnology. The Japanese are doing the right thing."

NEXT: The role of education

RUDE AWAKENINGS



The United States may have lost the VCR revolution because industrial managers were unwilling to invest resources long enough to make a good idea pay off.

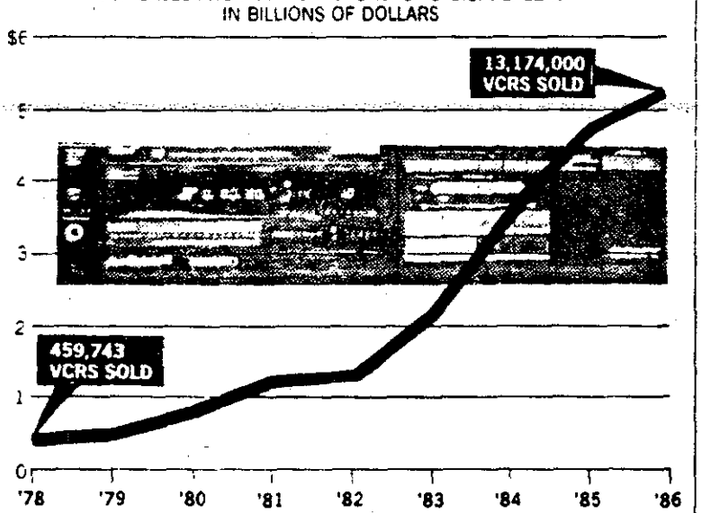


BY JAMES M. THRESHER—THE WASHINGTON POST

An MD80 jet nears completion at a McDonnell Douglas plant in Long Beach, Calif. Britain invented the jet engine, but U.S. imitators, including McDonnell Douglas, improved on the idea and reaped most of the economic benefits—doing to Britain what Japan now does to the United States.

MISSED OPPORTUNITY

VCR SALES FROM MANUFACTURERS TO U.S. DEALERS
IN BILLIONS OF DOLLARS

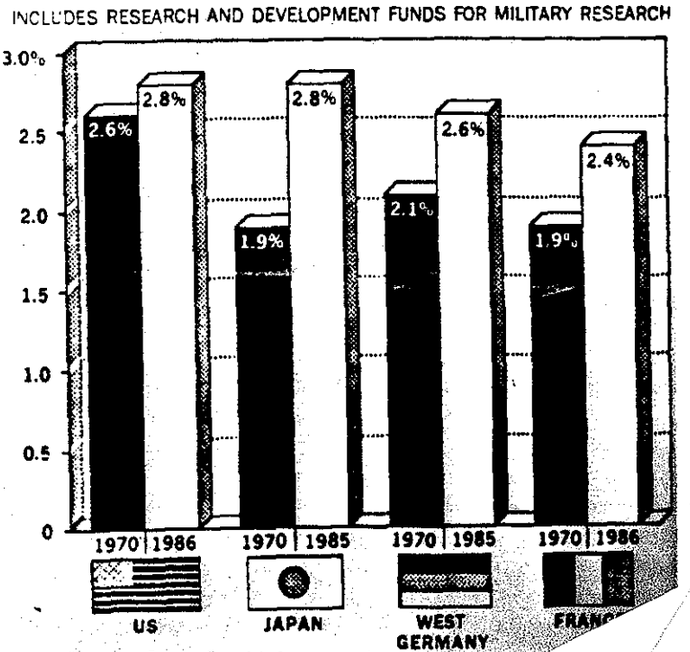


SOURCE Electronic Industries Association

BY JO ELLEN MURPHY—THE WASHINGTON POST

PERCENTAGE OF GNP SPENT ON RESEARCH AND DEVELOPMENT

INCLUDES RESEARCH AND DEVELOPMENT FUNDS FOR MILITARY RESEARCH



SOURCE National Science Foundation

America, the 'Diminished Giant'

As Rivals Strengthen, U.S. Dominance in World Marketplace Fades

Fourth of a series

By Stuart Auerbach
Washington Post Staff Writer

The first made-in-Korea Hyundai automobile rolled into the United States 14 months ago, driven off a Japanese freighter at the port of Jacksonville, Fla.

To those who still regard Korea as the underdeveloped nation depicted in the sitcom M*A*S*H, instead of a budding industrial giant, what happened next was perhaps a surprise.

The low-priced Hyundai swept through this country, setting a record for first-year sales by an imported car—168,882 sold in 1986—and quickly became a name to be reckoned with in the world auto industry.

The Hyundai sailed on winds of change that have drastically transformed the economic shape of the globe—establishing an entirely new relationship between the United States and the rest of the world, making it vastly more difficult for U.S. industries to compete in crucial global markets.

The changes have been so sweeping and have taken place with such astonishing speed—over just 15 years—that they are only partly understood by the American public and policy-makers in government.

RUDE AWAKENINGS
THE CHALLENGE OF THE GLOBAL ECONOMY

But virtually all the experts agree that the era of overwhelming U.S. dominance of the international economy—an era that began after World War II when much of the rest of the world was devastated—is over.

"We have come to a divide," said University of California political scientist John Zysman. "The economic changes we are watching will reshape the international security system. They are fundamental shifts of the power relations among nations."

In the United States, these changes have contributed to serious economic dislocation: the closing of steel mills and auto plants, the conversion of the industrial heartland into the Rust Belt, a loss of millions of manufacturing jobs.

They have raised questions, as C. Fred Bergsten, director of the Institute for International Economics, wrote recently in Foreign Affairs magazine, as to whether

See COMPETE, A18, Col. 1

U.S. Faces Up to Erosion Of Economic Supremacy

COMPETE, From A1

the United States can keep its mantle of world leadership.

At the same time, many experts believe that for all the pain caused in the United States by these changes, the world as a whole is a better place. "We have built a world system where we are now beginning to bring into membership at the highest levels countries which 25 years ago were in poverty," said Henry Nau, professor of political science and international relations at George Washington University.

The most visible symbol of America's loss of global economic supremacy is four years of towering trade deficits, which reached $170 billion last year, coupled with the transformation of the United States in the last year from a creditor nation into what Bergsten called "the largest debtor nation ever known to mankind." The United States now owes about $220 billion more abroad than foreign countries owe the United States.

By the end of this decade, he said, the United States will owe more than a half-trillion dollars and will be paying tens of billions of dollars a year in interest to foreign investors.

Many more signs illustrate how the United States is no longer the preeminent player in the world economy, and how other nations are coming up:

- In 1950, the United States produced 40 percent of the world's goods and services. By 1980, the U.S. share had dropped almost by half, to 22 percent. Meanwhile, Japan's share climbed from less than 2 percent to about 9 percent, and Europe's share rose from 21 percent to almost 30 percent.
- For the first time since World War II, the United States last year lost its position as the world's leading exporter, supplanted by West Germany, with Japan pressing on the United States in third place.
- Last year, again for the first time, the United States ran a trade deficit in high-technology products, considered the wave of the future for the U.S. economy and critical for U.S. national security.
- In 1974 the United States was responsible for the design of 70 percent of the advanced technology in the world. By 1984, this figure had dropped to 50 percent. According to estimates, it will slide further, to 30 percent by 1994.

The 'Four Tigers'

Most surprisingly, at least to Americans who were not paying attention, has been the emergence of a whole new phalanx of competitive nations—the "Four Tigers" of the Pacific Rim—Hong Kong, Singapore, Taiwan and South Korea.

These newly industrialized countries (NICs) join Japan, which a generation ago was considered a developing country, as the most vital growth forces in the world economy. Western Europe, meanwhile, is going through a period of sluggish growth, and most Third World nations have grown relatively poorer.

"The real stakes are the wealth and power of the United States," said Stephen S. Cohen, a Berkeley economist who is codirector with Zysman of the Berkeley Roundtable on the International Economy.

"We will have to get used to living in a world in which we are no longer No. 1 . . . , or at least not No. 1 by much," said Herbert Stein, chairman of the Council of Economic Advisers under Presidents Nixon and Ford who now is a senior fellow at the American Enterprise Institute.

The country, experts say, will also have to get used to a greater dependency on trade with the rest of the world than ever before. In 1960, sales abroad and U.S. purchases from foreign countries amounted to just 7 percent of gross national product. Twenty years later, trade accounted for 15 percent of U.S. GNP. Government officials estimate that 5.5 million jobs now depend on exports, and one in four farm acres produces crops for sale abroad.

The decline in both power and standard of living is difficult to accept in this country, which was born out of the limitless optimism of pioneers who saw the American dream as one of continued economic and social enrichment, said former deputy treasury secretary Richard Darman, a former specialist in public policy and management in Harvard University's department of government.

The American psyche, said Darman, is rooted in being No. 1, and most Americans alive today have never lived in a world in which they were not clearly the dominant force.

And, he added, "The day you accept being No. 2, psychologically you are on the way down."

This reordering of the world economomy generally is measured from 1971, when the United States registered its first merchandise trade deficit. But the seeds were planted much earlier, many of them by the United States itself.

There was, of course, the Marshall Plan, to reconstruct war-ravaged Europe.

In Japan, the U.S. occupation authorities set an artificially low exchange rate for the yen to boost Japanese competitiveness. The theory, expressed by then-Secretary of State John Foster Dulles, was that Japan made nothing that any other country wanted to buy.

The postwar institutions set up by the United States to mirror its view of the world also contributed. These included the World Bank and the International Monetary Fund, formed to finance a stable world, and the General Agreement on Tariffs and Trade, established to perpetuate free trade and make sure the world economy did not fall prey to protectionism as it did between the world wars.

"It's a remarkable story of postwar success," Nau said.

The dominance of the United States in world trade, many experts say they believe, was destined from the beginning to be temporary, because it stemmed from unique circumstances following the war, when the country "sat astride the world economy as the only large industrial power undamaged by war," said Commerce Undersecretary Bruce Smart.

Nevertheless, he continued, "we believed our national economic superiority was entirely of our own making, an inalienable right or entitlement, rather than a temporary phenomenon conferred upon us by a unique confluence of circumstances for which we could claim only limited responsibility."

This abnormal situation, some historians and economists believe, lulled the United States into complacency.

But if the United States thought it was entitled to economic preeminence, other countries refused to stand pat. In the new global environment, Japan, not the United States, is the model for other nations.

Korea and Taiwan, for instance, have achieved success following the Japanese model: a combination of free enterprise and competition among domestic producers; heavy protectionism to keep foreign goods out, and strong government guidance to develop the exports-oriented industries that fueled growth. Zysman and Cohen call this system of development "state-centered capitalism."

"Korea and Taiwan had the advantage of seeing Japan develop," said Lawrence Krause, a professor of international relations at the University of California at San Diego.

Singapore Ambassador Tommy T.B. Koh pointed out in a speech last February that the "Four Tigers" of Asia supplied 19 percent of U.S. imports of manufactured goods in 1980, compared with just 5 percent in 1962.

"The world is going to start looking like Japan, not the United States," Krause said. "The less-developed countries see that the way to succeed is through closed home markets and export-led growth," commented GWU's Nau.

Like anyone who has a good deal going, neither the Japanese nor the Asian NICs appear willing to modify their fast-growth economies for the greater good of the global sy

"Just as the U.S. citizen feels entitled to 1950-like preeminence in every field," observed Smart, "the Japanese citizen believes that the tilted playing field of the last 40 years is his by national right."

The current U.S.-Japan battle over semiconductor trade reflects the realization that retaliation may be the only way to force Japan to live up to its new global responsibilities.

The Reagan administration drew the line on semiconductors because they are the building blocks of all high technology. Without a strong semiconductor industry, a country loses the ability to develop more powerful computers and the supercomputers that are vital for national defense.

Underlying the trade dispute are fears within the administration that U.S. national security is at stake if American high-technology innovation is thwarted by Japanese protectionist policies at home and aggressive discount pricing in the United States—the heart of the semiconductor dispute.

A 'Diminished Giant'

The situation is painful for Americans, and the country may be suffering from what has been called the "diminished giant syndrome." But many experts believe that it is better for the world than what came before.

"I think the United States has got to recognize that if we can create a community of common political values and economic growth, it will be worth it even if it costs us a relative share of economic and political power," said Nau. "We may have less power today, but we live in a world that is more peaceful, more stable. We live in a better world than the 1930s."

"The rest of the world is coming of age," said William T. Archey, international vice president of the U.S. Chamber of Commerce.

How America responds to these changes is the subject of the competitiveness debate going on in academia, Congress and the executive branch of government; between business and labor as they try to define new sets of work rules to meet heightened competition from other countries, some of which have added technological advances and high degrees of education to lower wages and less opulent standards of living, and among industrialists seeking a niche in this new economic order of the world.

In Congress, much of the debate concerns changes in U.S. laws to stop what is seen as other countries' unfair trade practices. But the larger issues of competitiveness are being framed beneath the jockeying for trade legislation.

"It depends on how much we invest, how much research and development we do, how well we educate ourselves, how we use our capital," said C. Michael Aho, senior fellow of economics at the Council on Foreign Relations. "Those things never used to matter. Now that we are no longer predominant, they do matter."

The once unquestioned dynamism of the United States in the world marketplace is being tested as never before, forcing Americans to confront dramatic changes in standard of living, expectations and values. This is the fourth of sixth articles exploring these changes. Succeeding articles will address "competitiveness" as a political issue and the outlook for the future.

The concerns stretch beyond economic vitality to the international security arena. "As we get less competitive, the burden of maintaining the U.S. policy of national security will get more onerous on the economy," said Cohen, the Berkeley economist.

National Security Concerns

Stephen Krasner, a specialist in international economics and politics at Stanford University, agreed. "You can't think of the United States as the dominant power as it was in the past," he said. "That has to have military implications. It doesn't make sense for the United States to maintain the defense commitment it has in a world in which it is not the hegemonic power in the West."

Does it pay, for instance, for the United States to increase its naval presence in the Persian Gulf, as it did this month, to protect the sea lanes so that Western Europe and Japan can get the oil their economies need? "It would be better if Japan and Europe were protecting interests that are much more vital to them than to the United States," Krasner said.

"Can the world's largest debtor nation remain the world's leading power?" asked Bergsten in his Foreign Affairs article.

"Can a small island nation [Japan] that is now militarily insignificant and far removed from the traditional power centers provide at least some of the needed global leadership? Can the United States continue to lead its alliance systems as it goes increasingly into debt to countries that are supposed to be its followers? Can it push those countries hard in pursuit of its economic imperatives while insisting on their allegiance on issues of global strategy? Can it hold its allies together in managing the security system?"

There is new pressure on the United States to change, to end what some see as a complacency and weakening of the human spirit and to begin to compete fully in the new world environment.

Now, Aho said, "we will see how much vibrancy this economy has."

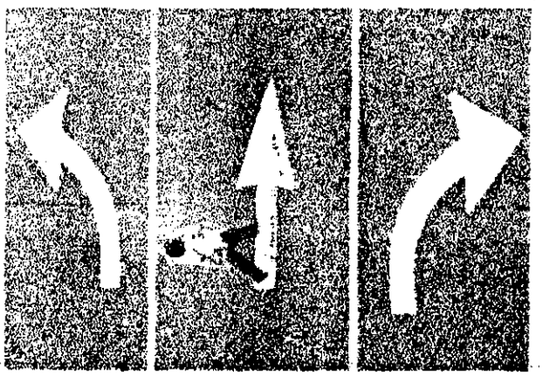
NEXT: Politics of "competitiveness"

RUDE AWAKENINGS



BY JAMES M. THRESHER—THE WASHINGTON POST

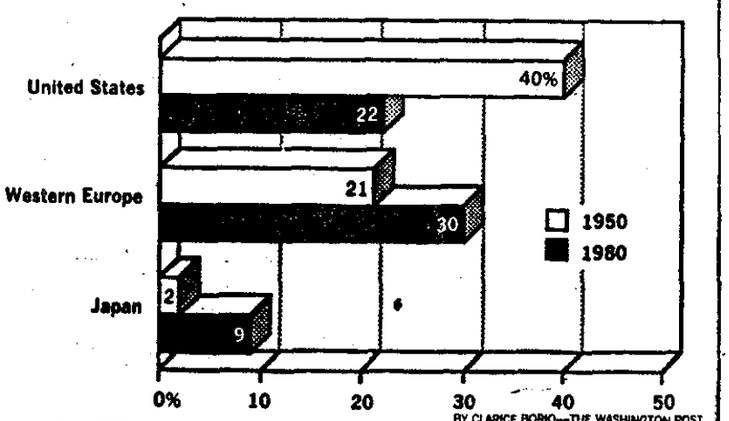
Korean workers prepare Hyundais for export to the United States and Canada. In the United States, the car set a first-year sales record for imports.



Virtually all the experts agree that the era of overwhelming U.S. dominance of the international economy, which began after World War II, is over.

A CHANGING BALANCE: THE U.S. SHARE OF WORLD GNP

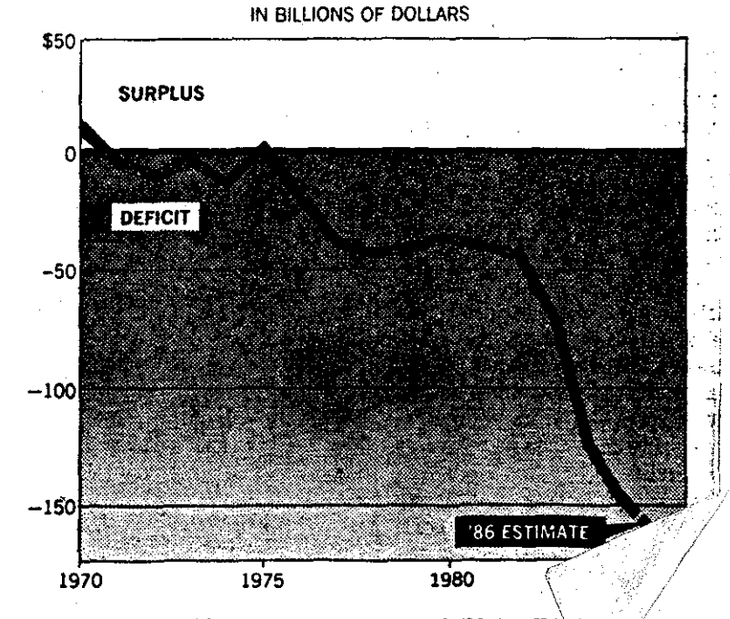
IN PERCENT



BY CLARICE BORIO—THE WASHINGTON POST

U.S. MERCHANDISE TRADE BALANCE

IN BILLIONS OF DOLLARS



SOURCE: U.S. Department of Commerce

BY JO ELLEN MURPHY