

# F. A. S. NEWSLETTER

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to provide information and to stimulate discussion. Not to be attributed as official FAS policy unless specifically so indicated.

## SCIENCE IN THE SERVICE OF PEACE

In an address before the FAS annual meeting at Washington, D. C., on April 26, Senator George McGovern of South Dakota proposed a four-point program for bringing the scientific and economic resources of the nation to bear on problems and opportunities resulting from defense cutbacks. The address is reprinted below. (A report on problems of economic conversion appears on page 2 of this issue.)

As a politician I speak to you tonight with considerable humility—for the practice of politics has fallen behind the swift pace of science. Politics has enlisted science in the conduct of war on an incredible scale. But it is an open question whether the politician and the scientist can walk together in the service of peace. As Max Born reminds us in the current issue of the Bulletin of Atomic Scientists, science in the service of peace is an urgent hope—not an achieved reality.

The hope of which Professor Born writes—a hope we share tonight—is that the great power of science may be harnessed to an enlightened politics for the blessing of mankind.

In the world of science, a large area of agreement has been mapped, standards have been achieved, and techniques developed to deal with the most complex problems in an orderly, civilized manner. Petty and irrelevant issues of nationality and race, of birth and geography, have been largely erased, and the resultant cooperative efforts have brought great successes in fathoming the secrets of nature.

But the march of science combined with the limitations of politics poses a grave danger to mankind.

These two factors—the incredible advance of science and the limitations of politics—have written much of the history of the Twentieth Century. Twice, the world has been brutalized by wars made possible by the failure of politics and made terrible by the success of science. This is one of the few audiences capable of comprehending what a third major political failure might mean to our planet.

There are those who would blame our current difficulties on science. If only the atomic bomb had not been built. . . . But, to blame scientists for our predicament is like blaming farmers for agricultural surpluses while the world is cursed by hunger. Our farmers have produced food in abundance. It is now up to the political leaders of the world to find a way to use this blessing of the Lord in a world of hunger.

By the same token, political leaders, scientists and citizens of the world must together find a way to apply the great

powers of science to the betterment of man, not his destruction.

### Conflict Without Victory

Today, there is the prospect that major war may be fore-sworn, tacitly if not by formal agreement—not so much because of mutual trust as mutual fear. However horrible the wars of the past, there was always the prospect of victory. No longer can we contemplate victory in a major conflict.

It is difficult to grasp the concept of conflict without victory, as witness Senator Goldwater's fast-selling book, "Why Not Victory?" Yet, the growing awareness of this fundamental change in international relations wrought by the advent of nuclear weapons has led both the Soviet Union and the United States to ease the tensions of the cold war. The nuclear showdown during the 1962 Cuban missile crisis was a sober moment of truth for the nuclear powers.

Testifying before a House Subcommittee on March 18, Admiral Hyman G. Rickover said that "history turned a corner" in October of 1962. "Never since has the cold war been the same, and the American people, in an informal but perceptive way, sensed the difference," he said.

But conflicting interests between nations will doubtless continue and perhaps in ways dangerous to our society.

Are we prepared to fight the battles of a warless world—the battles against human misery—the battles for human dignity and opportunity?

No country is so supremely equipped for such conduct as the United States. We have the necessary resources and talents, but for years, we have dedicated a major portion of them to our military forces. Ever since the cold war joined nuclear weapons to our fears of international Communism, we have given the military leaders a blank check and asked them to buy us maximum security. "The military became like the poor boy allowed to roam freely in a large toy shop before Christmas," Admiral Rickover has said. Not equipped for so complex a role, our military men became the victims of salesmanship by our industrial organizations, said the Admiral. All of this to the applause of Congress and communities across the land fortunate enough to secure defense contracts or military bases. This is the "military-industrial complex" that the retiring President Eisenhower saw as the chief threat to American life.

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## FAS Election Results

Newly-elected FAS officers and Council members assumed office at the FAS Council meeting on April 27, in Washington, D. C. News of the Council meeting will be printed later; the following is the new listing of officers and Council members.

**Chairman:** Prof. Peter G. Bergmann, Chairman, Dept. of Physics, Yeshiva University, New York, N. Y.

**Vice-Chairman:** Dr. Jack Orloff, Chief, Laboratory of Kidney and Electrolyte Metabolism, National Heart Institute, National Institutes of Health, Bethesda, Md.

The Executive Committee is composed of the Chairman, Vice-Chairman, and the following members appointed by the Council: Dr. Allen I. Janis (Secretary), Dr. Gary Felsenfeld (Treasurer), Prof. Robert R. Wilson (Retiring Chairman), Dr. and Mrs. Martin Gellert (Newsletter Editors), Prof. Owen Chamberlain, and Prof. Hans J. Morgenthau.

### Newly-elected Delegates-at-large (term expires 1966)

Dr. Owen Chamberlain	Dr. Charles E. Osgood
Dr. William C. Davidson	Dr. Arthur H. Rosenfeld
Dr. John T. Edsall	Dr. Cameron B. Satterthwaite
Dr. Bernard T. Feld	Dr. Walter Selove
Dr. Hans J. Morgenthau	Dr. Louis B. Sohn
Dr. Jay Orear	Dr. John S. Toll

### Other Delegates-at-large (2-year term expires 1965)

Mrs. Ruth Adams	Dr. Gerald Holton
Dr. Peter Axel	Dr. Ernest C. Pollard
Dr. Donald G. Brennan	Dr. John R. Stehn
Dr. Freeman J. Dyson	Dr. Stanislaw Ulam
Dr. Gary Felsenfeld	Dr. Robert Williams
Dr. Maurice S. Fox*	Dr. Hugh C. Wolfe
Dr. W. A. Higinbotham	

(\* Appointed by the Council to fill vacancy due to resignation of Lincoln Wolfenstein.)

## FOCUS ON DEFENSE CUTBACKS; NEW PROBLEMS AND PROPOSALS

The recent cracks in the Cold War facade, added to the Administration's economy drive, serve to point up an area of concern which has been in the minds of Congressmen, Defense Department officials, members of the defense industry and economists for some time now. This is the problem of how this country's arms industry can convert to peacetime pursuits as national security needs are met and the international political situation improves. The problem, as well as the opportunities it presents, has already been the subject of study by a number of the country's economists, who have been reporting their conclusions in a variety of places, i.e., to the Senate subcommittee on Manpower, to the Defense Department, before the Electronics Industries Association, in a symposium published in the Bulletin of the Atomic Scientists, and in several economic reviews. These studies have been concerned not only with the magnitude and distribution of the overall problem but also with suggestions for facilitating the conversion of this segment of the country's economy.

The extent to which American industry will have to make changes depends primarily on what the projected cuts in defense will be, and estimates of this factor vary.

Thus, Roswell L. Gilpatric, former Deputy Secretary of Defense, writing in the April issue of Foreign Affairs, has estimated that present defense spending could be cut by 25 per cent by 1970, basing his estimate on a continued easing of tensions between the U. S. and Russia without assuming any basic shift in the world situation or a formal accord for limiting arms. The Pentagon apparently sees things rather differently. According to authoritative estimates from that source, annual defense spending will not decline more than about 4 or 5 per cent in the next five years, barring a sudden dramatic disarmament agreement with the Soviet Union. A detailed analysis of future defense spending under various possible disarmament conditions was contained in a report entitled "Defense Conversion Potentials," prepared by a group of economists and submitted to the Defense Department by Dr. Murray L. Weidenbaum, senior economist of the Stanford Research Institute. Dr. Weidenbaum estimates that without actual disarmament or arms control, the military budget will decline by several billion dollars in the next few years, then will begin a relatively slow increase at an average annual rate of 1 per cent between now and 1975. This contrasts with a likely increase in total goods and services during that period of 3½ per cent per year. Thus the defense market outlook, according to Dr. Weidenbaum, is for maintenance of a high level of defense demand in an area of the economy that is no longer a major growth area but rather one characterized by continued instability and fluctuation.

Archibald S. Alexander, assistant director of the U. S. Arms Control and Disarmament Agency, who has responsibility for his agency's economic program and who also participated in the study for the Defense Department, believes there are three broad alternatives for future defense spending. First, if no substantial disarmament agreements are reached but the weapons inventory becomes fairly complete, the prospect is for a gradual decrease in defense spending. The second alternative would be a substantial decrease under step-by-step disarmament. Dr. Weidenbaum estimates that this would involve a net reduction from the present annual level of about \$51 billion to \$20 billion by 1975. The third alternative postulated by Mr. Alexander is a total decrease which could only occur if much of the defense industry was obliterated, as in a major war. Dr. Weidenbaum takes as a more realistic version the type of post-World War II disarmament to a level under \$10 billion but finds this unlikely. In any event, barring new freezes in the cold war, the prospect is for the release of an important amount of resources and men from the military to the civilian economy.

### Concentration of Problem

According to the Weidenbaum report, the problem of adjusting to a gradual or substantial decline in military demand is concentrated in a few industries—ordnance, aircraft, ship construction and electronics—the bulk of whose sales are to the Government. This problem is compounded because these four industries cluster in a few regions, notably the West Coast, where they represent a major part of the industrial base of these areas. Defense employment is 10 per cent or more of the manufacturing employment of 15 states according to data

of the Bureau of Employment Security of the U. S. Dept. of Labor. The concentration reaches far greater levels in certain metropolitan areas, such as San Diego, which has 82 per cent of its total manufacturing employment in missiles and aircraft.

The problem of conversion is enhanced by the fact that much of defense employment is in facilities built for the production of specialized defense equipment. This conclusion was reached not only by Dr. Weidenbaum's report but also by Prof. Seymour Melman of Columbia University who made public his views on the economic impact of arms reduction, presented first to a closed meeting with members of Congress. According to Prof. Melman, the problem is one "of redesigning the total operation of enterprises and parts of enterprises." The feasibility of converting defense industries to civilian work has been studied in a number of industries. Thus, according to Prof. Melman, in the airframe industry, a vigorous program of civilian product development could create a civilian industry that could employ about half the industry's employees. The products would include commercial, private and business aircraft, space products, rapid transit, industrially produced homes, sections of commercial buildings, electric power vehicles and hydrofoil boats. Even so, a substantial part of the industry's work force would still need to find employment elsewhere.

The electronics industry is said to face stiff conversion problems according to a research study made by Prof. John E. Ullmann at Hofstra University. The defense program now accounts for 63 per cent of the industry's output and about an eighth of the defense budget is spent on electronics. Again, the problem is one of trying to find ways to convert an extremely specialized industry with no guidelines provided by the post-World War II era. Although expansion of space activities offers little promise for absorbing much of the potential, according to Prof. Ullmann, there are other possibilities such as ground and air traffic control, communications systems, electronic educational devices, electronic libraries for information retrieval, and medical electronics.

The recent indication from Secretary of Defense McNamara that some of the country's naval shipyards may be closed down due to over-capacity serves to point up the problem in still another area. The Senate Subcommittee on Employment and Manpower has released a series of studies on the conversion problem, including one on the possible conversion of the New York Naval Shipyard in Brooklyn.

### Conversion Programs Proposed

Out of these various studies of the conversion from a defense to a civilian industry have come a number of suggestions for developing conversion programs. Thus, Dr. Weidenbaum has suggested that the Federal Government might award defense contractors non-defense research and development contracts. The Defense Department might treat commercial product planning or the development of a commercial marketing capability as allowable costs on military contracts, presumably as a stimulus to this type of research. A tax rebate for commercial research and development by defense contractors would act similarly. Joint industry-Government financing of certain types of commercial research and development might also be arranged. Last December, President Johnson created the Committee on the Economic Impact of Defense and Disarmament and he has recently named Gardner Ackley of the Council of Economic Advisers to head the 10-man group. Senator George McGovern (D-South Dakota) introduced a bill earlier this year to set up a national economic conversion committee to study the problem for a year and make recommendations to the President and Congress.

Whatever the solutions to this problem may be, they will have to take account of one final factor, the impact of increasing automation upon the economy as a whole and upon specific industries. According to a recent study by the Labor and Commerce Departments, employment will be cut in 18 industries and increased in 14 by 1970 as a result of the changes in automation relative to demand. Although the industries involved in the conversion from defense work might not necessarily be affected directly—employment is expected to increase in the electronics industry, for example—automation as it affects the overall picture cannot be overlooked. Beside Sen. McGovern's bill, legislative proposals to study the problems of economic conversion and automation jointly have been introduced by Senators Hart and Humphrey. (N.Y. Times, March 25, 26, 30, April 5, 12, 13, 15, 20)

## McGOVERN: SCIENCE & PEACE . . .

(Continued from page 1)

We have made a maximum effort in war preparation since December 7, 1941. We need now a maximum effort for peace. We need a highly competent agency of government equipped to handle the needs of peace with as much skill as the Pentagon has handled the needs of war.

In the world of the Twentieth Century, national security is indivisible. It cannot be measured by arms alone. Unless we shift more of our vast human and material wealth away from the military sector to other urgent national and international needs, we cannot play our proper role as a great power on the world stage.

No informed person doubts that we have the power to destroy Soviet society, or that they have the capacity to destroy us. The late President Kennedy spoke of the capacity of either side to destroy the world several times over.

Before the substantial increases in our military power of the past two years, Secretary McNamara testified that "there is no question but that today, our Strategic Retaliatory Forces are fully capable of destroying the Soviet target system, even after absorbing an initial surprise attack."

We have been building missiles, bombs, and other weapons steadily since then so that our military capacity is much greater today than when the Secretary made that statement early in 1962.

On August second of last year, I suggested on the floor of the Senate that we might safely divert to other purposes \$1 billion from the military budget of the Atomic Energy Commission and \$4 billion from the budgets of the Army, Navy and Air Force, without weakening the military might of the nation in any way. More recently, former Deputy Secretary of Defense Roswell Gilpatric suggested that if present trends continue, we can safely cut defense spending 25% by 1970.

In recent months, this new look at defense allocations has been taken up by President Johnson. The result is a defense budget for next year that is \$3 billion below this year's budget in new obligational authority. On April 20, President Johnson and the Russian Government simultaneously announced that each country would cut back the production of fissionable material by a substantial amount. A few days later, Secretary McNamara announced the closing of 63 military installations.

### Science and Economic Conversion

The significance to our scientists of any major shift in resources cannot be minimized. By far the largest sponsor of scientific research and development is the Federal Government. In the current year the Government is spending over \$15 billion for Research and Development, compared with only \$5 billion by private industry. Almost 87% of the Federal expenditure—over \$13 billion—goes directly into our space and defense programs. More than half of our nation's scientists and engineers are directly or indirectly employed in the defense effort.

There is a growing recognition of the costs to our society inherent in so heavy a commitment of our resources to the military. Senator Fulbright speaking at the University of North Carolina recently on "the real meaning of the cold war in American life" said, "We have had to turn away from our hopes in order to concentrate on our fears and the result has been accumulating neglect of those things which bring happiness and beauty and fulfillment into our lives. The 'public happiness' in August Heckscher's term, has become a luxury to be postponed to some distant day when the dangers that now beset us will have disappeared."

Given the allocation of over half our Federal budget to the production of arms we have neglected other important sources of national strength. Consider the many long postponed opportunities afforded by the transfer of more of our scientific talent and energy to meeting human needs.

Recent cooperative work between physicists and biologists has opened up new techniques for improving the health of man and lengthening his life on earth. More research funds and a greater concentration of scientific energy would yield additional benefits.

New interest has been generated in exploring the world beneath the earth's crust and the oceans' surface, so-called "inner space." Who can calculate the importance of research in these fields, research that may lead to new sources of food, of water, of mineral wealth. Consider, too, the ines-

timable importance of a genuine breakthrough in the fields of weather modification or the desalinization of water.

In transportation and communication, in conservation and education, the application of scientific techniques may yield new answers to problems both old and new.

Much remains to be done to improve the quality and efficiency of our production, our cities, our rural areas, and the lives of our people. How can we better use our resources to prevent unemployment, improve the use of leisure time, bring meaning into the lives of our older citizens, provide new opportunity for our nation's youth? Science and government working together may have the answers to these and other questions.

Whether we make the necessary commitment of our talent and resources to the immense problems of improving the life of man is of more than academic interest. We are in competition with another system that claims to deal with these problems more effectively. The hungry and impoverished half of the world watch the struggle with interest, for eventually they may cast their lot with the system best able to meet their needs.

### Need for Planning

America has all the advantages save one: the totalitarian system can order its population to a maximum effort, while we depend on the slow-moving process of self-government to secure a wiser use of our resources and talent. We must be prepared to take on vigorously these tasks that make it possible for us to flourish in a warless world. I happen to believe that this was the fondest hope of the late President Kennedy and remains as an urgent goal of President Johnson.

A major fear has been that any substantial cut in defense spending would result in painful economic dislocations in communities throughout America. The protests of Congress over each announcement of the closing of obsolete military bases demonstrates the political problems inherent in any attempt to bring about a transfer of resources.

To quiet the fears and prevent economic distress in the wake of new spending patterns, we must plan for the orderly changeover from production for war to production for peace. Such planning is possible. We had it after World War II, with success that surpassed expectations. The problems we face today in such a transfer are different, but they are capable of solution.

To plan and carry out a transfer of resources with a minimum of dislocation, I have introduced in Congress a bill to create a National Economic Conversion Commission to lay out a blueprint for public and private action designed to ease the transition from defense production to production of non-military goods. The Commission would work with defense contractors, local government officials, and Federal agencies to seek ways to prevent the opportunity afforded by an arms cut from becoming a source of economic distress.

There is growing interest in this bill in the Congress, largely because cuts in arms spending that everyone assumed depended on the ironclad agreement with the Soviet Union have already begun in the absence of that elusive agreement. The plain fact of the matter is that we are approaching such a stockpile of weapons that even the more militaristic minded are satisfied that our defense is secure, as secure as weapons can make it.

### Four Point Program

I would like to propose tonight a four-point program of government action that would, I believe, come to grips with the need for a major transfer of scientific and material resources to the solution of some of the problems of a peaceful world. In the same way that our government is now involved in the business of war preparation, I propose that government enter on an equal scale the business of peace. Instead of defense contracts and research in the weapons of war, I propose Federal contracts for the works of peace.

First, I suggest that the Federal Government be given the authority to finance up to 90% of local, State, or regional development projects carefully selected and approved by local and Federal authority. This program, modeled on the Highway Act, would make funds available for school and hospital construction, water resources, transportation, recreation, conservation, and other high priority human needs. Preference would be given to areas faced with a loss of income and employment because of actual or impending defense cutbacks and to areas of chronic unemployment. Every effort would be made to use the channels of private industry in the manner of defense contracts.

**McGOVERN: SCIENCE & PEACE . . .**

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Second, the Federal Government should have the authority to plan and finance entirely development projects which fall primarily in the province of the Federal Government, such as interstate waterways, oceanography, weather control, air and water pollution, space, and the airwaves. Again, preference would be given to programs that use idle plants and skills, and wherever possible, the projects would be contracted through private enterprise in the pattern of defense contracts.

Third, the Federal Government should undertake a major program of grants to universities and private laboratories for research into the solution of civilian problems. At present, over half a billion dollars goes to universities each year from military funds. My proposal would stimulate scientific attention to civilian matters.

Fourth, this program could be financed entirely out of funds now allocated for defense spending. This would necessitate the earmarking of funds now being used for defense so that when a cutback takes place the funds will go directly into the civilian economy. In this way, employment and the use of our scientific talent can be maintained and defense cutbacks undertaken with minimum fear of economic distress.

I make this proposal to scientists who have solved some of our most intricate military and space problems, and who are equally capable of solving non-military problems if given the opportunity.

I speak at a time when events make possible the transfer of a significant portion of our resources without endangering our military security or superiority. Indeed, even without any plan for transfer, our military spending will decline. But planning can prevent these cutbacks from causing economic difficulties.

I am proposing that science, industry and government apply experience gained in the partnership for war to a partnership for peace so that man's ancient dream of good life for all may be achieved. Albert Einstein, revered for his humility as well as his brilliance, spoke for all scientists when he said:

"We scientists have ample evidence that the time of decision has come, and that what we do, or fail to do, within the next few years, will determine the fate of our civilization. . . . In the shadow of the atomic bomb it has become even more apparent that all men are, indeed, brothers. . . . We consider the task of the scientists to be untiring in their explanation of these truths to the American people that they may understand what is at stake. Equipped with real understanding, the American people will reject war and will want to seek a peaceful solution . . ."

It is time to heed the words of Einstein—to turn science away from the study of destruction toward its traditional role of improving the world in which we all must live or die.

"There is still hope," writes Professor Born, "but it will only come true if we stake everything on the battle against the diseases of our time."

That battle calls on politician, scientist and citizen to enlist for the duration in the service of peace.

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**PESTICIDE PROBLEMS**

For the past four years, there have been increasing numbers of fish killed in the lower Mississippi River each fall and winter. The cause of this trouble was uncertain until mid-March when the U.S. Public Health Service's Sanitary Engineering Center in Cincinnati, Ohio, issued a report stating that Endrin was found in the blood and tissues of all dead fish examined, and that the symptoms of the disease were similar to that produced by administering Endrin. The report concluded that the fish contained toxic amounts of two common pesticides, Endrin and Dieldrin. The hypothesis is that these toxic chlorinated hydrocarbons were washed into the streams and rivers by rainfall and subsequently were taken up by fish and accumulated in the fat deposits. During the winter months when the fish utilize the fat, the pesticides were released into the circulation and fatal levels accumulated, causing malfunctioning of the nervous system and bloating of the digestive system.

This report stirred up a very complex political struggle between the Department of Agriculture, the Department of the Interior, the PHS, Congress, and, naturally, the pesticides industry. Hearings were initiated in Congress by Senator Ribicoff (D-Conn.) to determine what legislative steps were appropriate, and similar action was taken by the Department of Agriculture.

Secretary of the Interior Stewart Udall testified before the congressional sub-committee about the effect of pesticides on reproduction of lake trout and wild fowl, and pointed out how the pesticides accumulate as they pass up the food chain. He concluded that "we cannot afford to use these toxic chemicals if we cannot control the movement of their residues after use."

Shortly after Udall's testimony, the Senate passed a Ribicoff amendment to a pesticide bill and returned it to the House. The House had passed it Feb. 17 after amending it to prevent public disclosure of pesticide data submitted to the Department of Agriculture. The Senate amendment limited the House restriction to valid trade secrets and eliminated "protest registration", whereby pesticides could have been marketed even after having been shown to be dangerous until more proof was accumulated.

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Chairman . . . . . Peter G. Bergmann

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