A European Defense Initiative

The idea that European nations band together for a strictly European version of SDI is gaining support

Bonn. West Germany's Minister of Defense, Manfred Wörner, last week gave the European debate about the Strategic Defense Initiative (SDI) a significant new twist when he announced his support for a proposal that Europe launch its own effort to develop a protective shield against cruise and short-range nuclear missiles.

Such an idea already has a growing band of supporters in both Germany and France. Indeed, when French President François Mitterrand issued his famous "non" to the U.S. invitation to participate in the Strategic Defense Initiative during the Economic Summit in Bonn last May, he made it clear that France was not objecting to the idea of building military systems in space—merely to acting as what he described as a "subcontractor" to the United States in such an activity.

Since then, two topics have tended to dominate public discussion in Europe in this area. One has been the terms under which European companies and governments will be admitted to the SDI research program; the other has been the proposal, launched by France, for a parallel European program of joint technology projects, known as Eureka, which is being given a strictly civilian tag (*Science*, 12 July, p. 141).

Tucked neatly between the two, however, is another project which is steadily gathering momentum in political, industrial, and military circles for a strictly European version of SDI. This would use many of the same technologies as are being currently discussed in the United States, but primarily to defend Europe against the weapons it is most directly threatened by—primarily medium- and short-range ballistic missiles, nuclear bombers, and cruise missiles—rather than the long-range intercontinental ballistic missiles (ICBM) which are the main focus of SDI itself.

Such a plan appears to offer three major attractions: a boost for European aerospace companies, much as SDI has been in the United States, but under the direct sponsorship and therefore control of European governments; a complementary strategy to SDI, meeting the criticism that anti-ICBM technologies could leave Europe vulnerable to other weapons (an argument partially accepted in the Pentagon, which is already studying many of the same ideas); and finally, a step toward the political integration of Europe, building it up to a third superpower through a joint defense strategy, a move viewed with somewhat less enthusiasm from Washington than from Paris.

The political hurdles are obviously enormous. However, at the technical level, the proposed European Defense Initiative (EDI) appears to present comparable—though often less demanding—challenges than SDI, and, just as in the United States, would provide a way of capitalizing on many of the new technologies that have been developed either under individual space programs, or under the aegis of the Paris-based European Space Agency.

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"Much of it could be done quite easily either by adapting technologies that exist already, or by using those which are likely to be developed by European companies working on SDI research contracts," says David Hobbes, secretary of the science and technology committee of the North Atlantic Assembly in Brussels.

The technologies most likely to be involved in an EDI would fall into four categories:

- Upgraded surface-to-air missiles, based on the idea that the technologies needed to shoot down missiles could be based on those already used against aircraft. (Indeed, the U.S. Patriot missile, conceived before the Anti-Ballistic Missile Treaty (ABM) of 1972 and currently under final development, was originally intended as just such a dual-purpose weapon.
- New advanced antimissile technologies, for example, using directed-energy beams or kinetic energy weapons. Experience in both of these technologies is already being offered by European governments, particularly Britain and Germany, as prime contenders for inclusion in the SDI research program.
- Satellite-based remote-sensing techniques for acquiring data on incoming missiles and aircraft. France has been wooing West Germany assiduously for 2 years to share the costs of an observation satellite based on its own remote-sensing SPOT satellite, whose first civilian launch is due next month.
- Advanced communication, command and control technologies, already highly developed in Europe for applications to both military and space systems, for example, in the development of the European Space Agency's Spacelab, although they would have to be considerably more sophisticated to operate in a hostile military environment.

France has a long tradition of official enthusiasm for large-scale, prestigious technological programs, stretching from the fountains at the Palace of Versailles to, more recently, the success of the launcher Ariane. Thus, although at one level SDI has met with opposition in French diplomatic circles because of the threat it poses to the nation's independent nuclear deterrent, it has also whetted appetites and imaginations among military, industrial, and political leaders alike.

Leading members of the armed forces, for example, have in recent months become increasingly outspoken in their demands that France explore the potential military applications of its newly acquired competence in a range of space technologies. Many, such as Air Force General Pierre Gallois, argued that the activities of both the United States and the Soviet Union in this domain make Europe's exploration of the military use of space "essential" for its future independence and security.

Further, "Europe possesses the technical, industrial, and scientific means to begin its own studies of space-based defense programs," Defense Minister Charles Hernu said in a recent television interview, shortly before announcing that a new office was being created within the Ministry of Defense to begin a close analysis of precisely such questions.

"European countries should get together to see if there is the possibility at

the government level to launch a European research initiative in the domain of space-based defense," he said, adding that "if our European partners do not do it, then I think that France, even on its own, should launch a program of this type."

Hernu's enthusiasm is shared by many of France's leading aerospace, weapons, and electronics manufacturers, several of whom (with the government's backing, despite its words of caution) are already engaged in discussions with the United States about accepting SDI contracts, but are equally keen to explore similar technological opportunities in Europe.

According to Jean-Luc Lagardere, for example, the president of MATRA, "without a military program in space, neither France nor Europe can expect a seat in the front row." MATRA has already been the lead company responsible for the development of the SPOT remote-sensing satellite, and had hoped to become the main contractor for a purely French military version, known as SAMRO, before the project was dropped for lack of money.

Even President Mitterrand himself has voiced support for a greatly expanded military use of space. In a widely quoted speech delivered in the Dutch city of The Hague last year, he suggested that Europe should adopt as a long-term goal the launching of its own manned space station with vaguely military functions.

French officials argue that such a space station—or, as a first step, a joint French-German military observation satellite—would be primarily defensive, stressing, for example, that it could be used for the independent verification of arms control agreements. But it is also seen, particularly if equipped with all-weather radar, as a suitable base for monitoring the possible launch of short- and medium-range Soviet missiles, and thus as an essential element in any anti-missile defense.

In Germany, enthusiasm for a European Defense Initiative is more divided, and is already threatening to pour more salt on the wounds caused by the debate 2 years ago over the siting of U.S. cruise and Pershing missiles on German soil (which would themselves be among the prime candidates for protection), and Chancellor Helmut Kohl's subsequent enthusiasm for SDI.

As in France, several German aerospace companies, particularly those already negotiating possible SDI contracts, have reacted enthusiastically to the idea. At a recent press conference in Munich, for example, Hanns Vogels, the chief executive of Messerschmitt-Bölkow-Blohm (MBB), said he hoped the company would be able to make a "contribution" to any European initiative that might emerge.

Within German military circles, too, there is growing support for the idea that a leading role in a space-based defense system, even if in partnership with France, would place the country back among the front ranks of strategic powers, a position from which it is currently excluded due to the ban on its possession of nuclear weapons.

Such ideas also have keen supporters in political circles, particularly from members of the German Parliament representing constituencies such as the states of Bavaria and Baden-Württemberg in which aerospace and defense companies like MBB and Dornier are based.

The French are convinced Europe must become a major power in space.

Furthermore, although any explicit military linkage with Eureka is quickly denied—particularly within the Ministry of Research and Technology in Bonn, which keeps a strict distance from military projects—German support for Eureka is widely held in Bonn to have been partly stimulated by the prospect of it becoming the common research "trunk," to use French Defense Minister Hernu's description, for advanced technologies in both the civilian and military sectors.

Indeed , last week's statement by German Defense Minister Wörner in favor of a strictly European Defense Initiative came on the same day that the Council of Ministers agreed in Bonn to devote up to $700 million over the next 5 years to Eureka. Kohl directly linked civilian and defense interests with the comment on this decision that "the common interests of Europe and the United States on security issues require a balance in the economic and technological development of each."

However, a long list of obstacles, often based on a combination of technical, economic, and political arguments, very similar in form to those being raised on both sides of the Atlantic against SDI, are being developed to counter any separate European initiative.

Many claim that, despite the optimism of military and industrial circles, the technical problems could still prove insurmountable. Critics, including Dietrich Schrooer of the International Institute for Strategic Studies in London, argue that diffuse European targets are likely to prove much more difficult to defend effectively than U.S. missile silos; others point to the formidable detection problems raised by the brief flight times of short- and medium-range missiles.

The second major obstacle is that an EDI, like the SDI, would be in direct violation of the ABM Treaty in its operational stage. "You cannot really make a distinction between anti-long-range missile systems, and defense against short- and medium-range missiles," says Wolfgang Biermann, a staff member of Germany's opposition Social Democrat Party which is shortly expected to issue a public statement opposing the project.

"Whether you are talking about preemptive strikes against short-range missiles, or attempts to shoot down medium-range missiles—which would be violating the ABM Treaty—it might be technically feasible to produce a defensive system, but we feel it would be inherently destabilizing," says Biermann.

Thirdly, there is the question of cost. Many European governments have been attracted by the SDI offer largely because the United States will be picking up most of the bill.

European countries are already finding it difficult to find the funds necessary to meet existing commitments to modernize their armed forces. Their treasuries are likely to look critically at any proposal for a significant increase in defense-related funding; even the project for a joint French/German military satellite, for example, is estimated to cost at least $750 million, if not more.

On top of these remain the constant difficulties of persuading European countries to work together, particularly when it is a question of sharing sensitive technologies with potentially important fallout for their often competitive high-technology industries. The observation satellite project, for example, was temporarily shelved last year partly because of disagreements between French and German engineers over the sensing techniques it would use, and has only recently been revived in the context of joint French/German discussions on an EDI.

Furthermore, the credibility of France's commitment to joint European projects was severely dented last month by its decision to withdraw from a consortium created with four other countries (Britain, Germany, Italy, and Spain) to

build a new generation of advanced fighter aircraft.

U.S. technology controls could also cause problems. On 4 September, a 30-member delegation of German government officials, industrialists, and scientists arrived in Washington to discuss their potential collaboration in SDI. High on the agenda are the terms of an eventual government-to-government agreement which, officials in Bonn argue, must include adequate provision for the subsequent use in a European context—including, possibly, a European Defense Initiative—of any technologies developed.

U.S.-originated constraints could also place limits on Britain's participation in a European scheme. "I doubt if we would be able to share much technical information [with France and West Germany] because of the bilateral agreements that we have with the U.S," says Farouq Hussein, director of studies at the Royal United Services Institute in London.

Political pressure from the United States is also likely to come at a higher level. Many ideas about the military uses of space technology are being developed in the framework of the Paris-based Western European Union, a body used by France to strengthen its defense links with Germany—but is seen by some as a counterweight to the North Atlantic Treaty Organization (NATO), of whose military components France is not a member.

The United States has already made it clear, in a letter to European leaders from then Assistant Secretary of State for European Affairs Richard Burt, that it supports the idea of a research program for an active antimissile defense based in Europe, but only if it is developed within the context of NATO and its own planning for SDI. Any independent initiative promoted by France through the European Union will inevitably generate an unenthusiastic response in Washington.

Finally, a European Defense Initiative, if fully developed, is also likely to become the new target of a coalition of protest groups, whose flagging energies, drained in the battles against the deployment of the U.S. missiles, have already been revived by a series of mass protests against the "Star Wars" program and the involvement of European governments.

"As an anti-nuclear missile system, I would be very much against a European initiative, just as I am against SDI, since I do not feel you will achieve cost or systems effectiveness with either," says Hans Peter Durr, director of the Max Planck Institute for Physics and Astrophysics in Munich, and one of the guiding forces behind a national petition against "Star Wars" which has already raised more than 13,000 signatures, including many prominent scientists and celebrities.

Durr argues, with a growing group of West German academics and arms control experts, that a case can be made for a European defense strategy using highly advanced microelectronics and other technologies, but one that remains at the level of conventional weapons and would therefore, he says, "decouple the nuclear arsenal" within the defense debate.

However, such ideas do not generate much support in France. Indeed, none of the above criticisms seem likely to significantly deter the French from their conviction that Europe must become a major space power, nor from their hope that a joint defense initiative might provide the same imaginative spark for doing this as President Reagan has been able to do with the SDI.—**DAVID DICKSON**

A Grim Portrait of the Postwar World

"Nuclear winter" may be the least of our worries, according to an international study; starvation seems more likely

A controversial theory that nuclear war will dramatically alter the earth's climate and environment has won a new endorsement from a prestigious scientific group. The group, a branch of the International Council of Scientific Unions, says that "there is substantial reason to believe" that such a war could produce a phenomenon popularly known as "nuclear winter." In addition, the group says, a major war could sufficiently disrupt agricultural productivity to create a substantial risk of mass starvation, even in countries untouched by bombs.

These are the principal conclusions of a 2-year, $600,000-study by the Scientific Committee on Problems of the Environment (SCOPE),* in which more than 300 scientists from 30 countries participated. Released on 12 September during a SCOPE meeting at the National Academy of Sciences in Washington, D.C., the 850-page study reflects the latest research on several aspects of nuclear war, according to Gilbert White, an emeritus professor of geography at the University of Colorado, who served on the steering committee. The chairman was Sir Frederick Warner of the University of Essex.

With regard to postwar climate, for example, the report suggests that temperatures in some regions of the Northern Hemisphere could indeed drop by as much as 35 degrees and that light reaching the earth's surface could be diminished by more than 90 percent, as dust and soot pour into the atmosphere.† But it discounts the relative importance of smoke from forest fires and emphasizes the necessary contribution of fossil fuel combustion in urban or industrial centers. It also highlights the seasonal nature of any adverse effects—if the war occurred in wintertime, ironically, the effect on light and temperature may be slight.

Once in the air, some of the smoke will be eliminated by precipitation. No one knows how much, but the study authors discount recent forecasts by Edward Teller, Fred Singer, and Jonathan Katz in *Nature*‡ that moisture in wood and fuels will condense and ultimately wash a lot of smoke from the atmosphere. "The significance of these quantities of water vapor for precipitation and particle scavenging is easily exaggerated because of a common misconception," they state. Specifically, they suggest that much of the moisture will not condense, and that any precipitation will occur well below the smoke layer.

Smoke that is not eliminated could start to spread to southern latitudes within 1 or 2 weeks, the report says, where it

*_The Environmental Consequences of Nuclear War_ is available in two volumes from John A. Wiley & Sons in New York.

†This is the amount estimated for "northern midlatitude continental interiors" after a summertime conflict in which 12,600 bombs had been detonated, generating roughly 150 million tons of smoke.

‡ 23 August 1984 and 4 October 1984.