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The Critical Technologies Approach: Controlling Scientific Communication for the National Security

Valerie M. Fogleman*
James Etienne Viator**

I. INTRODUCTION

For several decades now, the United States has been engaged in a technological race with its adversaries, and potential adversaries.¹ The balance of power between the United States and the Soviet Union has been maintained mainly by preservation of the United States' slender technological "lead time."² This technological edge, which has been under constant attack by the Soviet Union's superior spending on military research and development,³ largely resulted from the rapid devel-

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1. See *Supercomputers: Hearings Before the House Comm. on Science and Technology*, 98th Cong., 1st Sess. 175 (1983) [hereinafter *Supercomputers Hearings*] (statement of Edith Martin, Deputy Under Secretary of Defense for Research and Advanced Technology). Dr. Martin argued that "[t]here is no turning back on our early decision to gain leverage from our superior technical potential. The often used term 'arms race' is a misnomer. We are really immersed in a technological race with our adversaries." *Id.*; see also *Transfer of Technology: Hearing Before the Permanent Subcomm. on Investigations of the Senate Comm. on Governmental Affairs*, 98th Cong., 2d Sess. 277 (1984) [hereinafter *Transfer of Technology Hearings*] (statement of Richard Perle, Assistant Secretary of Defense for International Security Policy) (declaring that "maintenance of our technological superiority . . . is, quite literally, the foundation upon which our deterrence posture rests").

2. See Report of the Secretary of Defense, Caspar W. Weinberger, to the Congress in the FY 1985 Budget, FY 1986 Authorization Request and FY 1985-89 Defense Programs 272 (Feb. 1, 1984).

3. See Address by Fred C. Ikle, Under Secretary of Defense for Policy, Defense Policy for the 1990's (May 3, 1984), reprinted in 3 *WORLD AFF. J.* 45, 45 (Summer 1984). The Soviet Union's technological position is strengthened by the graduation in the Soviet Union of about 300,000 scientists and engineers each year, compared to about 80,000 in the United States. *Defense Department Authorization and Oversight: Hearings on H.R. 5167 Before the House Comm. on Armed Services*, pt. 4, 98th Cong., 2d Sess. 1202 (1984) [hereinafter *Hearings on H.R. 5167*] (statement of Edith Martin, Deputy Under Secretary of Defense for Research and Advanced Technology).

opment of science and technology in American universities and research laboratories.⁴ The encouragement of scientific advancement⁵ by the Department of Defense (Defense) has been jeopardized, however, by the access of America's adversaries and potential adversaries to those scientific advances. In the mid-1970s, faced with evidence that the Soviet Union was using American science and technology to advance Soviet military power,⁶ Defense proposed an extensive system of controls on the release of American scientific and technological information.

The cornerstone of Defense's structure of controls on scientific and technological information is the Militarily Critical Technologies List (MCTL). The MCTL covers numerous goods and technologies regarded as "militarily critical" because their acquisition by the United States' adversaries and potential adversaries would result in otherwise unachievable military advances. Controls based on the MCTL are aimed at prohibiting transfer of the scientific and technological ideas used to produce goods rather than the control of the goods themselves.

Using the MCTL as a guide, Defense and other federal agencies have prohibited scientists from publishing, presenting, teaching, or receiving "militarily critical" information.⁷ Controls that are generally applied to classified information have been adopted by executive order for unclassified and privately-sponsored information,⁸ and various ex-

4. See DEPARTMENT OF DEFENSE, BASIC RESEARCH PROGRAM 6 (1983).

5. See generally Norman, *Pentagon Seeks to Build Bridges to Academe*, 228 SCI. 303 (1985) (stating that broad support of university research is considered part of Defense's legitimate mission).

6. See, e.g., DEPARTMENT OF DEFENSE, SOVIET MILITARY POWER 75-78 (2d ed. Mar. 1983) (describing loss of technology to Soviet Union); CENTRAL INTELLIGENCE AGENCY, SOVIET ACQUISITION OF WESTERN TECHNOLOGY 4-10 (1982) (unclassified version of study indicating significant loss of technology to Soviet Union). The Soviets have acquired Western science and technology through open publications for over twenty years. See, e.g., A. DULLES, THE CRAFT OF INTELLIGENCE 56-57, 239-40 (1963) (describing Soviet acquisition of knowledge from American scientific and technical journals).

Suppression of American scientific information to prevent its acquisition by the Soviet bloc also dates back over twenty years. See, e.g., F. ROURKE, SECRECY AND PUBLICITY: DILEMMAS OF DEMOCRACY 28-32 (1961) (describing suppression of American scientific information during Cold War era). This article will examine the current movement by Defense to control American scientific ideas, which began in the 1970s.

7. For examples of scientific information that has been subjected to control, see Appendix to this article.

8. See, e.g., Exec. Order No. 12,356, 3 C.F.R. 165 (1983), *reprinted in* 50 U.S.C. § 401 note at 56 (1982) (classifying and safeguarding data); DEFENSE DIRECTIVE 5400.02, WITHHOLDING OF TECHNICAL DATA FROM THE PUBLIC, 32 C.F.R. pt. 250 (1989) (unclassified data); Final Rule Adding VHSIC to Munitions List, 48 Fed. Reg. 28,633 (1983) (supplementary information) ("All integrated circuits and related technical data which do not meet [VHSIC specifically designed for military applications] criteria will remain under the export controls of the Department of Commerce."). For discussion of the "force of law" of Executive Orders, see Fleishman & Aufses, *Law and Orders: The Problem of Presidential Legislation*, 40 L. & CONTEMP. PROBS. 1

port control laws have been interpreted to cover the dissemination of scientific ideas on university campuses.⁹

The MCTL has become a compendium of American science and technology.¹⁰ The details of the list's contents are classified,¹¹ thereby inhibiting scientists' best efforts to discover whether their ideas may be legally disseminated. Technologies in the process of emerging from basic scientific theories are included in the MCTL's controls.¹² Although voluminous, the MCTL is not exclusive,¹³ and Defense and other agencies have the option of controlling unlisted scientific and technological information.

Although we agree with the goal of the controls (the preservation of the United States' technological lead over its adversaries and potential adversaries), we believe that Defense's approach to controlling scientific information has the potential to stifle, and has stifled, scientific creativity. When scientists are hindered in determining whether their ideas can be legally disseminated,¹⁴ scientific advancement necessarily slows as caution overrides innovation. The desire to publish a scientific theory is outweighed when balanced against imprisonment and heavy fines if Defense or another agency perceives potential military significance in that theory. Defense officials have found military significance in Apple computers,¹⁵ dialysis machines,¹⁶ and grain.¹⁷ The potential

(1976); Note, *Presidential Legislation by Executive Order*, 37 U. COLO. L. REV. 105 (1964).

9. See, e.g., Export Administration Act, 50 U.S.C. app. § 2403 (1982 & West Supp. 1990) (technical data controls); Arms Export Control Act, 22 U.S.C. §§ 2751, 2778 (1982) (Munitions List controls); 10 U.S.C. § 130 (1988) (control over data subject to export control).

10. See *Technology Transfer: Hearings Before the Technology Transfer Panel of the House Comm. on Armed Services*, 98th Cong., 1st Sess. 262 (1983) [hereinafter *Technology Transfer Hearings*] (statement of David Wilson, Co-Chairman, Working Group on Export Controls, DOD-University Forum).

11. An unclassified version of the MCTL is available from the National Technical Information Service. See DEPARTMENT OF DEFENSE, THE MILITARILY CRITICAL TECHNOLOGIES LIST (1986).

12. See Wallerstein, *Scientific Communications and National Security in 1984*, 224 SCI. 460, 466 n.11 (1984). The Militarily Significant Emerging Technologies Awareness List (METAL) supplements the MCTL. *Id.* at 465.

13. See 45 Fed. Reg. 65,015 (1980).

14. See BASIC RESEARCH PROGRAM, *supra* note 4, at 8. The *Basic Research Program*, a publication designed to attract scientists to Defense-sponsored research, states:

A final word on relevance: we find that all too often good ideas are never brought to DoD's attention because the researcher does not see an immediate "military application." This is unfortunate, since the extramural researcher is not usually the person who should make this determination. We in DoD are interested in all good ideas, and it is the responsibility of the scientific program managers, not the researchers, to decide on the applicability of a particular research project.

Id.

15. *Transfer of Technology Hearings*, *supra* note 1, at 163 (statement of Richard Perle, Assistant Secretary of Defense for International Security Policy).

for finding military significance in theoretical ideas akin to $E=MC^2$ is greater.¹⁸

This article traces the evolution and breadth of Defense's critical technologies approach to controlling scientific and technological information.¹⁹ The information controls stemming from this approach are constitutionally and statutorily sound. The federal agencies with the power to apply the controls have defined them more narrowly than they did in the late 1970s and nearly 1980s. Public confrontations between agency personnel and scientists over the publication of research findings appear to be a thing of the past. Nevertheless, the creation and continued existence of the broad framework that now exists for controlling scientific and technological information has the potential to jeopardize the very scientific and technological preeminence that the framework seeks to preserve. Instead of emulating the closed Soviet system of scientific research, the United States would be better served by maintaining the tradition of open scientific research that has served it so well in the past.

II. THE CRITICAL TECHNOLOGIES APPROACH

The critical technologies approach depends on the MCTL, a guide devised by Defense to control exportation of technology that could be used to endanger the national security of the United States. Although Defense recognizes that technological advances cannot be maintained indefinitely,²⁰ it also realizes that preservation of the United States'

16. *Technology Transfer Hearings*, *supra* note 10, at 66 (statement of Lionel Olmer, Under Secretary of Commerce for International Trade).

17. *U.S. Embargo of Food and Technology to the Soviet Union: Hearings Before the Subcomm. on International Finance of the Senate Comm. on Banking, Housing, and Urban Affairs*, 96th Cong., 2d Sess. 92 (1980) [hereinafter *Food and Technology Embargo Hearings*] (statement of W. Graham Clayton, Jr., Deputy Under Secretary of Defense). The MCTL reportedly contains items of such doubtful military significance as cigar-making machines and mattress fillers. *Technology Transfer Hearings*, *supra* note 10, at 287 (statement of Rep. Zschau).

18. *Cf. Cheh, Government Control of Private Ideas—Striking a Balance Between Scientific Freedom and National Security*, 23 *JURIMETRICS J.* 1, 23 & n.151 (1983) (inquiring whether $E=MC^2$ (scientific speech) or Marxist theory (political speech) is more revolutionary).

19. This article has purposely not attempted to differentiate between science and technology, but has used the terms interchangeably. It is our contention that a useful differentiation is impossible when considering the "gray areas" bordering basic and applied science. Defense's attempts to differentiate between basic and applied science have, in large part, caused the existing friction between Defense and the scientific community.

20. *See Department of Defense Policy Statement on Export Control of United States Technology: Hearing Before the Subcomm. on International Economic Policy and Trade of the House Comm. on International Relations*, 95th Cong., 1st Sess. 11 (1977) [hereinafter *Defense Policy Hearing*] (statement of Ellen Frost, Deputy Assistant Secretary of Defense for International Economic Affairs).

technological lead time could be crucial.²¹ The MCTL is designed to identify goods and technologies that are not possessed by, or available to, controlled countries (primarily Soviet bloc nations),²² but which could result in significant military advances if acquired by them.²³ Emphasis is on control of technology rather than control of end products:²⁴ while the importation of a high-technology product could yield a military advantage to a country, a greater advantage would accrue if the expertise to manufacture that product were acquired.

The MCTL exists in classified and unclassified form. The classified version has over 700 pages supplemented by an additional 10,000 pages of documentation,²⁵ while the unclassified version has only 243 pages.²⁶ This difference means that Defense and other government agencies applying the MCTL to a technology have access to voluminous data not available to the exporter of the technology.²⁷ The government agency involved has the power to prohibit dissemination of unclassified technological data²⁸ if, in the opinion of an official, that data

21. See Martin, *The DOD Science and Technology Program: Some Management Perspectives*, 24 ARMY RES. DEV. & ACQUISITION MAG. 1, 1 (Sept.-Oct. 1983). Dr. Edith Martin was Deputy Under Secretary of Defense for Research and Advanced Technology. *Id.*

22. Controlled countries include Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and the Soviet Union. See Export Administration Act, 50 U.S.C. app. § 2403-1(d) (1982).

23. See *id.* § 2404(d)(2) (Supp. V 1987).

24. *Id.* § 2401(8) (1982). Technology is "the information and knowhow . . . that can be used to design, produce, manufacture, utilize or reconstruct goods, including computer software and technical data, but not the goods themselves . . ." *Id.* § 2415(4) (Supp. IV 1987).

25. See *Transfer of United States High Technology to the Soviet Union and Soviet Bloc Nations: Hearings Before the Permanent Subcomm. on Investigations of the Senate Comm. on Governmental Affairs*, 97th Cong., 2d Sess. 557 (1982) [hereinafter *High Technology Hearings*] (statement of Michael Lorenzo, Deputy Under Secretary of Defense for International Programs and Technology).

26. See DEPARTMENT OF DEFENSE, *supra* note 11.

27. "Exporter" is used broadly and includes individuals or industries with a proprietary interest in technology and university scientists involved in the discovery of scientific knowledge. See *infra* note 70 and accompanying text.

28. The authors agree that classified "[s]cientific, technological, or economic matters relating to the national security" should be controlled. See Exec. Order No. 12,356, § 1.3(a)(6), 3 C.F.R. 169 (1983), reprinted in 50 U.S.C. § 401 note at 51-52 (1982). Classified data does not create the same problem of uncertainty as unclassified data potentially subject to export controls or to being classified in the future. Scientists involved in classified research are aware in advance of restrictions imposed on their research. In the university context, classified research is either practiced in separate facilities (e.g., Lawrence-Livermore Laboratory, University of California) or in restricted on-campus facilities (e.g., Georgia Tech University). Because the elaborate safeguards required to control classified data are contrary to free academic exchange, many universities refuse to allow such research on campus. See Wilson, *National Security Controls on Technological Information*, 25 JURIMETRICS J. 109, 117 (1985).

Authority to classify data top secret, secret, or confidential may be delegated to government officials either by the President or by agency heads and officials designated by the President as having original classification authority. Exec. Order No. 12,356, § 1.2, 3 C.F.R. 167-68 (1983), reprinted in 50 U.S.C. § 401 note at 52 (1982). Classification authority stems almost entirely

could contribute to the military superiority of a controlled country. The difficulty of delimiting this discretion is apparent. The MCTL could theoretically prohibit dissemination of all scientific and technological data in the United States.²⁹ If technical data can contribute to a controlled country's military significance, it is irrelevant whether the data is classified, unclassified, or private: it can be controlled.

A. Origin

The concept of a militarily critical technologies list originated in a 1976 Defense Science Board Task Force Report, commonly referred to as the *Bucy Report*, after the Task Force's chairman, J. Fred Bucy.³⁰ The *Bucy Report* recommended that technology transfer be curtailed by

from the executive branch. Although Congress periodically conducts oversight hearings, monitoring of the classification procedure is difficult because of the large number of classifiers, and the amount and nature of documents classified. See generally English, *Congressional Oversight of Security Classification Policy*, 1 GOV'T INFO. Q. 165, 171 (1984). In 1980, about 7000 government personnel had original classification authority. More than one million classification decisions are made annually, leading to about 16.5 million derivative classification actions (i.e., paraphrasing, generating classified information in a new form, and marketing new material). *Id.* at 170.

One of Congress's rare exercises of classification authority was the "born classified" concept of the Atomic Energy Act of 1954, Pub. L. 83-703, 68 Stat. 714, codified at 42 U.S.C. § 2014(y) (1982). Under the born classified concept, "restricted data" is automatically classified at its inception and requires a positive act to declassify it.

29. See, e.g., *Technology Transfer Hearings*, *supra* note 10, at 21 (statement of Peter Sharfman, Program Manager, International Security and Commerce, Office of Technology Assessment) (observing that "it is difficult to identify any technology which has no military relevance"); *id.* at 262 (statement of David Wilson, Co-Chairman, Working Group on Export Controls, Defense-University Forum) ("[MCTL] seems to be a catalog of all technologies in the country today."); *Extension and Revision of the Export Administration Act of 1979: Hearings and Markup on H.R. 3231 Before the House Comm. on Foreign Affairs and its Subcomm. on International Economic Policy and Trade*, 98th Cong., 1st Sess. 201 (1983) [hereinafter *Extension Hearings*] (statement of William Schneider, Jr., Under Secretary of State for Security Assistance, Science and Technology) (maintaining that "[n]early all new technology developments have direct or indirect military application").

30. See DEFENSE SCIENCE BOARD TASK FORCE ON EXPORT OF U.S. TECHNOLOGY, AN ANALYSIS OF EXPORT CONTROL OF U.S. TECHNOLOGY—A DOD PERSPECTIVE (1976) [hereinafter *BUCY REPORT*]. It has been suggested that the Defense Science Board was formed due to the requirement in the Export Administration Amendments of 1974, Pub. L. No. 93-500 § 9, 88 Stat. 1552, 1555 (current version at 50 U.S.C. app. § 2403-1(a) (1982)), for Defense's review of applications for exports to communist countries. See Walsh, *Controls on Trade and Technology: Pentagon Puts Stress on Know-How*, 197 SCI. 1261, 1262 (1977). An alternate theory is that formation of an outside group to advise Defense was necessary because Defense's credibility in reviewing export licenses needed salvaging as a result of the agency's tendency to forbid the export of anything and everything. *Multinational Corporations and United States Foreign Policy: Hearings Before the Subcomm. on Multinational Corporations of the Senate Comm. on Foreign Relations*, 93d Cong., 2d Sess. 272 (1974) [hereinafter *Multinational Corporations Hearings*] (statement of J. Fred Bucy, Executive Vice President, Texas Instruments, Inc.). See generally UNITED STATES COMPTROLLER GENERAL, THE GOVERNMENT'S ROLE IN EAST-WEST TRADE—PROBLEMS AND ISSUES 46 (1976) (stating that other agencies viewed Defense as obstructionist).

controlling: (1) "arrays of design and manufacturing know-how"; (2) "keystone manufacturing, inspection, and test equipment"; and (3) "products accompanied by sophisticated operation, application, or maintenance know-how."³¹ By closely controlling critical technologies, the *Bucy Report* argued, export restrictions on noncritical technologies could be relaxed.³² This result would benefit industry as well as the federal government—the two groups represented on the Task Force.³³

31. BUCY REPORT, *supra* note 30, at xiii. The quoted language—with the exception of the word "products," which is replaced by "goods"—is repeated in the Export Administration Act of 1979 as the criteria for developing the MCTL. See 50 U.S.C. app. § 2404(d)(2) (Supp. V 1987). Although the Task Force deliberated for two years before publishing its recommendations, those recommendations closely paralleled convictions expressed by the chairman, Mr. Bucy, before the group was formed. In 1974, Mr. Bucy testified to Congress that "[t]he transfer of technology knowhow which upgrades the strategic military capability of Communist countries should be prohibited. We must recognize that while many product sales have no military significance, almost all knowhow sales provide the purchaser with the capability to increase his 'war making' capacity." *Multinational Corporations Hearings*, *supra* note 30, at 280.

Although the Bucy Report focused primarily on controlling technology exports to all communist nations, United States policy has differentiated between Soviet bloc nations and the People's Republic of China (PRC). For example, in the early 1980s, exports to the Soviet bloc were discouraged; exports to the PRC were encouraged. See generally Simon, *Technology for China: Too Much Too Fast?*, 87 *TECH. REV.* 38, 47 (Oct. 1984) (explaining that many building-block technologies including electronics and advanced materials were exported to the PRC). *But see* S. REP. No. 522, 99th Cong., 2d Sess. 19-20 (1986) (recognizing potential danger to United States of Chinese acquisitions of American technology).

32. BUCY REPORT, *supra* note 30, at 28-29.

33. It is not suggested that Mr. Bucy was concerned with anything other than the best interests of the United States, but only that he saw those interests as being synonymous with the best interests of Texas Instruments. Mr. Bucy stated "that in no case should goods of strategic military value to communist economies be sold to them by this country." *The Role of the Export-Import Bank and Export Controls in U.S. International Economic Policy: Hearings Before the Subcomm. on International Finance of the Senate Comm. on Banking, Housing, and Urban Affairs*, 93d Cong., 2d Sess. 577 (1974) [hereinafter *Export-Import Bank Hearings*]. Mr. Bucy perceived no significant national security problem in exporting other products of high technology without the know-how to manufacture them. *Id.* at 578. He viewed national defense and economic realities of technology transfer as being intertwined, *id.* at 579, stating that it was "axiomatic in high technology industries that the only adequate payment for know-how is market share." *Id.* at 575. Mr. Bucy stated:

Industry in this country must be more careful about knowhow sales to state-owned competitors, which create competition in Communist economies. A communist competitor[] can enter foreign markets without pricing restraint if it serves its political purpose, whereas a free enterprise competitor must have a price that yields a profit It is common sense for us to be cautious about providing such state-controlled enterprises with the knowhow to compete with us.

Multinational Corporations Hearings, *supra* note 30, at 275; see also Bucy, *Protecting "Militarily Critical Technology,"* 53 *ELECTRONICS* 26 (Jan. 17, 1980) (advocating United States adoption of critical technologies approach and emphasizing that "technology-intensive firms [such as Texas Instruments] already use concepts similar to the critical technologies approach to protect their competitive position"). See generally R. CARRICK, *EAST-WEST TECHNOLOGY TRANSFER IN PERSPECTIVE* 84 (1978) ("It almost seems that arguable and disputed economic views about technology transfer are dressed [in the *Bucy Report*] in apparently respectable strategic clothing."). Cf. *Export-Import Bank Hearings*, *supra*, at 391 (statement of C. Lester Hogan, Vice Chairman of

Participation by universities was planned but failed to materialize.³⁴

Despite their lack of contribution to the *Bucy Report*, the universities were included in the report's findings. After noting that export controls have not traditionally been applied to universities, the report recommended that government-to-government scientific exchanges³⁵ and training of communist nation citizens "at the more significant laboratories of U.S. technical institutes and universities"³⁶ be monitored and controlled. The report and Mr. Bucy appear to disagree on this point. Mr. Bucy repeatedly stressed that science should remain unfettered,³⁷

the Board, Fairchild Camera & Instrument Co.) (arguing that "policy guidelines . . . involving sensitive technology should be set by [officials and experts] who are not connected with any individual company interested in the results").

According to one commentator, fears that the export of advanced plants and equipment to the Soviet bloc would lead to an influx of Soviet goods on western markets has not occurred. Amann, *Technical Progress and Soviet Economic Development: Setting the Scene*, in *TECHNICAL PROGRESS AND SOVIET ECONOMIC DEVELOPMENT* 5, 9 (R. Amann & J. Cooper, eds., 1986).

34. See *Export-Import Bank Hearings*, *supra* note 33, at 272 (statement of J. Fred Bucy, Executive Vice President, Texas Instruments, Inc.) ("It is my hope [that the Task Force] will be as balanced as we can make it, by selecting from industry, universities, and people within the Government.").

35. *BUCY REPORT*, *supra* note 30, at 38. Between 1972 and 1974, the United States and the Soviet Union entered into ten cooperative agreements in science and technology, including agriculture, atomic energy, environmental protection, oceanic studies, space, and transportation. See, e.g., Cultural Relations Agreement, June 19, 1973, United States—U.S.S.R., 24 U.S.T. 1395, T.I.A.S. No. 7649 (contacts, exchanges and cooperation). See generally CONGRESSIONAL RESEARCH SERVICE, 95th Cong., 1st Sess., *TECHNOLOGY TRANSFER AND SCIENTIFIC COOPERATION BETWEEN THE UNITED STATES AND THE SOVIET UNION: A REVIEW* 14-23 (Comm. Print 1977) (prepared for the Subcomm. on International Security and Scientific Affairs of the House Comm. on International Relations) [hereinafter *SCIENTIFIC COOPERATION REVIEW*]. Under the agreements, scientific visits were exchanged, joint research was conducted, and conferences and symposia were organized. *Id.* at 8.

Mr. Bucy was especially critical of the Apollo-Soyuz program, considering that the Soviets "may have benefitted greatly from this project." *Transfer of Technology to the Soviet Union and Eastern Europe*, Hearing Before the Permanent Subcomm. on Investigations of the Senate Comm. on Governmental Affairs, 95th Cong., 1st Sess. 17 (1977) [hereinafter *Soviet Union Hearing*]. A congressional study of the Apollo-Soyuz program, however, determined that the program had equally benefitted both parties and had resulted in little technology loss to either. *SCIENTIFIC COOPERATION REVIEW*, *supra*, at 124-25.

The scientific cooperation program substantially ended in 1980 due to the reaction by American scientists to Soviet treatment of the physicist, Andrei Sakharov. Ties were tentatively reestablished in 1985. See *US, Soviet Science Academies Move Toward Renewal of Ties*, 15 *SCI. & GOV'T REP.* 1, 1 (Feb. 1, 1985).

36. *BUCY REPORT*, *supra* note 30, at 38-39. Mr. Bucy has referred to these "citizens" as foreign graduate students. *Soviet Union Hearing*, *supra* note 35, at 13.

37. See, e.g., Address by J. Fred Bucy, Armed Forces Communications and Electronics Association (Jan. 11, 1979), reprinted in *U.S. Export Control Policy and Extension of the Export Administration Act: Hearing Before the Subcomm. on International Finance of the Senate Comm. on Banking, Housing, and Urban Affairs*, pt. 2, 96th Cong., 1st Sess. 307, 307 (1979) [hereinafter *U.S. Export Control Policy Hearing*] ("Science is directed to obtaining knowledge. Scientific information and data are exchanged around the world, and in so doing add to man's understanding. It should continue to flow freely"); *Soviet Union Hearing*, *supra* note 35, at 3

and that communist nations do not wish to acquire American science because “[t]hey are highly skilled in scientific theory.”³⁸ The *Bucy Report*, however, concluded (with no discussion) that “[scientific] exchanges *obviously* have the potential to transfer technology very actively.”³⁹

Defense began implementation of the *Bucy Report* by compiling a critical technologies list to be used as a guide by the Department of Commerce (Commerce) and the Department of State (State) in preparing their export control lists.⁴⁰ Commerce’s list, known as the Control List, is authorized by the Export Administration Act (EAA).⁴¹ Under the EAA, Commerce promulgates the Export Administration Regulations (EAR) to control goods and technology with a dual use, that is, with potential military and civilian uses.⁴² Licenses issued for items on the Control List differ depending on the nature of the item to be exported, its end-use, and its destination. Most items are exported under general licenses, which are neither applied for nor issued.⁴³ Items not qualifying for general licenses require validated licenses, which cover specific exports. Applications for validated licenses must be made.⁴⁴

A “General License Technical Data Publicly Available” (GTDA) (technical data available to all destinations) covers scientific and educational data communicated by academic instruction as long as the data is communicated through catalog courses and associated teaching labora-

(“Science is devoted to the collection and expansion of knowledge. In contrast to technology, science has no boundaries and the free and open exchange of science benefits all those engaged in research”).

38. *Soviet Union Hearing*, *supra* note 35, at 23. Mr. Bucy stated that “[d]istinguishing among science, technology and products [was] critical to the formulation and implementation of a national policy. The [Soviet bloc] nations don’t want science, which they can get free through our scientific publications and exchanges or for the price of tuition at major graduate schools and technical institutes.” *Id.*

39. *BUCY REPORT*, *supra* note 30, at 7-8 (emphasis added). Mr. Bucy may consider any scientific exchanges between American and Soviet students to be a threat to national security. He suspects that Soviet students will “renew[] contacts with former classmates after graduation from U.S. universities, to glean whatever information they can.” *Soviet Union Hearing*, *supra* note 35, at 17.

40. *Defense Policy Hearing*, *supra* note 20, at 4 (statement of Ellen Frost, Deputy Assistant Secretary of Defense for International Economic Affairs).

41. 50 U.S.C. app. § 2403(b) (Supp. V 1987). The Secretary of Commerce has primary responsibility for controlling civilian exports through the Control List.

42. 15 C.F.R. § 799.1 (1990); 55 Fed. Reg. 25,086-89 (1990) (interim rule). The Control List is frequently revised to reflect changes in export policy. *See, e.g.*, 51 Fed. Reg. 36,212 (1986) (final rule revising Control List based on Coordinating Committee (Cocom) review); 49 Fed. Reg. 12,678 (1984) (interim rule expanding and clarifying export controls on certain commodities as a result of Cocom review).

43. 15 C.F.R. § 771.1 (1990).

44. *Id.* § 772.2.

ories.⁴⁵ University-based research is likewise “normally” covered by a GTDA license if it is considered to be “fundamental research.”⁴⁶ Once data enters the public domain, it may be exported under a general license.⁴⁷

The regulations extending a GTDA license to publicly available technical data and information resulting from fundamental research were proposed by Commerce in 1986.⁴⁸ Publicly available technical data included material disseminated in the public domain to interested scientific or engineering disciplines or the general public and material communicated at open gatherings.⁴⁹ The proposed regulation defined open gatherings as conferences, meetings, seminars, or trade shows which “all technically qualified members of the public are eligible to attend.”⁵⁰

As a general rule, research conducted in universities by scientists, engineers, and students would be considered fundamental research.⁵¹ But if academic researchers accepted national security contract controls on government research that affected communications with people other than citizens or permanent residents or that affected publication,⁵² the research would no longer be categorized as fundamental research.⁵³ In

45. *Id.* §§ 779.3(a)(3), (d).

46. *Id.* § 779.3(b)(2).

47. *Id.* § 779.3(a)(1).

48. 51 Fed. Reg. 17,986 (1986). Commerce—with input from Defense, Justice, and State—was responsible for revising the regulations, together with the academic community, the National Academy of Sciences, and the National Science Foundation. *See* EAST-WEST TECHNOLOGY TRANSFER: A CONGRESSIONAL DIALOG WITH THE REAGAN ADMINISTRATION, JOINT ECONOMIC COMMITTEE, 98th Cong., 2d Sess. 37 (Comm. print 1984) [hereinafter *DIALOG*]. The White House Office of Science and Technology Policy established an Advisory Committee on Scientific Communication in 1984 to “ensure an appropriately balanced representation of the scientific and engineering communities in those areas of science and engineering most directly impacted by the technical data regulations . . . and related laws and regulations.” 49 Fed. Reg. 34,320 (1984).

49. 51 Fed. Reg. at 17,988.

50. *Id.*

51. *Id.*

52. *Id.* at 17,988-89.

53. *See also* Advanced Technology Systems, Final Report, Control of Unclassified Technology with Military Application 1, 11 (Apr. 15, 1983) (submitted to Director of Defense for Counterintelligence and Security Policy) (recommending that Defense apply controls via contract restrictions and commenting that “[v]iolation of these requirements would be tantamount to violation of the export control laws”).

An interagency working group established to recommend how the revised regulations should treat scientific communications recommended in 1985 that breach of prepublication controls should not trigger EAR sanctions. Report of Working Group on Export Controls and Scientific Communications 1, 9 (Apr. 5, 1985). The Working Group regarded publication as “the paramount mechanism of scientific communication in our system” and recognized the harm to the American scientific community of restrictions placed on it. *Id.* at 5. The proposed regulations rejected this recommendation by specifying controls with the right to prohibit publication or to prevent dissemi-

such a case, breach of contract controls would trigger EAR sanctions, which include imprisonment of up to five years, or fines up to \$50,000, or both.⁵⁴ If information were released to persons not citizens or permanent residents, knowledge or intent to export would be presumed.⁵⁵

In October 1988, Commerce again proposed export controls for technical data under the EAR.⁵⁶ The proposed regulations were completely rewritten.⁵⁷ Commerce states that the only change in the section containing definitions of terms such as "technical data," "export," and "release" was to exclude certain categories of immigrants from the definition of foreign nationals covered by export controls.⁵⁸ The final regulations, published in October 1989, focused on product development, production, and use.⁵⁹ Although the regulations excluded fundamental research as a general rule, they firmly established the proposition that export controls were approximately applied to scientific research in universities.

State's export control list, known as the United States Munitions List, is authorized by the Arms Export Control Act.⁶⁰ Exports covered by the Munitions List are single (military) use goods and technology.⁶¹ Such exports are regulated under the International Traffic in Arms Regulations (ITAR).⁶²

To export either an item or technical data concerning an item on the Munitions List, a license must be obtained from State,⁶³ but data

nation to noncitizens as the type of national security controls covered by the EAR. 51 Fed. Reg. at 17,989.

54. 15 C.F.R. § 787.1(a)(i) (1990). The sanctions for willful violations include imprisonment of up to 10 years and/or fines up to \$250,000. *Id.* § 787.1(a)(ii)(1988).

55. 51 Fed. Reg. at 17,987. In a 1978 case involving the ITAR, the Ninth Circuit held that the nonmilitary use of an article for which technical data had been unlawfully exported was a factor in determining whether the exporter had the necessary *scienter* for culpability. *United States v. Edler Indus.*, 579 F.2d 516, 522 (9th Cir. 1978).

56. 53 Fed. Reg. 40,074 (1988).

57. *See id.* at 40,075.

58. *Id.* at 40,075, 40,080.

59. 54 Fed. Reg. 40,643-51 (1989); *see* 15 C.F.R. pt. 779 & Supp. 5 (1990).

60. 22 U.S.C. § 2751 (1982). In addition to controlling the Munitions List, the Secretary of State may review any export license application for foreign policy export controls. 50 U.S.C. app. § 2405(a)(5) (Supp. V 1987).

61. 22 C.F.R. § 120.3 (1990).

62. *Id.* pts. 121-30.

63. *Id.* § 123.1. Technical data includes "[i]nformation which is directly related to the design, engineering, development, production, processing, manufacture, use, operation, overhaul, repair, maintenance, modification, or reconstruction of [defense articles]." *Id.* § 120.21(c). Also included is classified information relating to defense articles and defense services, *id.* § 120.21(a), and data covered by an invention secrecy order. *Id.* § 120.21(b).

Technical data must be significantly and directly related to items on the Munitions List. *United States v. Edler Indus., Inc.*, 579 F.2d 516, 521 (9th Cir. 1978). In practice, State requires a reasonable connection between technical data and goods on the list. Determinations are made on

“concerning general scientific, mathematical or engineering principles” for items on the list are specifically excluded from the ITAR.⁶⁴ Licenses list the country of ultimate destination, which must be the country of ultimate end use.⁶⁵ If technical data subject to the ITAR are to be disclosed to a national of a country other than that designated on the license, written approval from State is required.⁶⁶ Without this approval, the communication to the national of the third country is a constructive reexport of the data. An unauthorized export occurs even if an unauthorized individual from a third country overhears an authorized communication.⁶⁷ As in the EAR, the export of technical data is broadly defined to include oral, visual, or documentary disclosure regardless of the method by which the data are communicated.⁶⁸ Also, as in the EAR, sanctions include imprisonment or fines.⁶⁹ Once data have entered the public domain, they are no longer subject to the ITAR.⁷⁰

Universities are exempt from disclosure requirements for export-controlled data in the case of foreign nationals only if the foreign nationals: (1) are bona fide, full-time regular employees; (2) have their permanent abode during their employment in the United States; (3) do not come from a controlled country; and (4) have been informed in writing by the university that they may not transfer technical data to other foreign nationals without the prior written approval of State.⁷¹

Beginning in the mid-1970s, Commerce and State used the Defense-initiated critical technologies approach to update their respective export control lists.⁷² Implementation resulted in the *Bucy Report's* directive being broadened to control not only design and manufacturing know-how, but also the means to manufacture end products, including “the scientific know-how, and the processes which allow you to transfer

a case-by-case basis. See Comment, *The Regulation of Technical Data Under the Arms Export Control Act of 1976 and the Export Administration Act of 1979: A Matter of Executive Discretion*, 6 B.C. INT'L & COMP. L. REV. 169, 181 & n.110 (1983) (citing telephone conversation between student author and official of State's Office of Munitions Control (Feb. 1982)).

64. 22 C.F.R. § 120.21(c) (1990). The ITAR's restrictive definition of technical data is a response to the Ninth Circuit's restrictive interpretation in *United States v. Edler Indus.*, 579 F.2d 516, 520-21 (9th Cir. 1978); see Letterman, *U.S. Controls on Exporting Technical Data: An Analysis and Selective Practitioner's Guide*, 9 HOUS. J. INT'L L. 59, 68 (1986).

65. 22 C.F.R. § 123.9 (1990).

66. *Id.* § 125.1(c).

67. See Letterman, *supra* note 64, at 87.

68. 22 C.F.R. § 125.2(c) (1990).

69. *Id.* § 127.3(b).

70. *Id.* § 125.1.

71. *Id.* § 125.4(b)(10).

72. *Defense Policy Hearing*, *supra* note 20, at 7 (quoting BUCY REPORT, *supra* note 30, at xiii).

science into a specific application.”⁷³ Controls, therefore, were applied not only to a product’s technology but also to the scientific ideas from which the technology emerged. Scientists became “exporters” whenever they shared with foreigners, either in the United States or abroad, any militarily critical information they had created.⁷⁴

Defining which technology was militarily critical and determining at what point science became technology were obviously difficult tasks, and because no bright line could be drawn, controls on science began to be formulated despite Mr. Bucy’s frequent assertions that science was not technology⁷⁵ and despite assurances by Defense⁷⁶ and Commerce⁷⁷ officials that science would not be subject to export controls. In August of 1977, Secretary of Defense Harold Brown issued an interim policy statement outlining guidelines for controlling the export of technol-

73. *Id.* (statement of Ruth Davis, Deputy Director of Defense for Research and Advanced Technology).

74. The EAR provides that: “technical data may be released for export through: (i) Visual inspection by foreign nationals of U.S. origin equipment and facilities; (ii) Oral exchanges of information in the United States or abroad; and (iii) the application to situations abroad of personal knowledge or technical experience acquired in the United States.” 15 C.F.R. § 779.1(b)(2) (1990).

The ITAR provides that:

[u]nless otherwise expressly exempted . . . a license is required for the oral, visual or documentary disclosure of technical data to foreign nationals in connection with visits by U.S. persons to foreign countries, visits by foreign persons to the United States, or otherwise. A license is required regardless of the manner in which the technical data is transmitted (e.g., in person, by telephone, correspondence, electronic means, telex, etc.).

22 C.F.R. § 125.2(c) (1990).

75. *See, e.g., Transfer of Technology and the Dresser Industries Licensing Actions: Hearing Before the Permanent Subcomm. on Investigations of the Senate Comm. on Governmental Affairs*, 95th Cong., 2d Sess. 144 (1978) [hereinafter *Dresser Industries Hearing*] (statement of J. Fred Bucy declaring that “[s]ince the meaning of technology is often misunderstood, I emphasize that technology is neither products nor science”); *Export Licensing of Advanced Technology: A Review, Hearing Before the Subcomm. on International Trade and Commerce of the House Comm. on International Relations*, 94th Cong., 2d Sess. 213 (1976) [hereinafter *Export Licensing Hearing*] (statement of J. Fred Bucy) (“[W]e must clearly distinguish between ‘science’ and ‘technology’. ‘Science’ is simply knowledge of the physical world and its phenomena. ‘Technology’, on the other hand, is the application of science to the manufacture of useful products.”).

76. *See Dresser Industries Hearing, supra* note 75, at 109 (statement of William Perry, Under Secretary of Defense for Research and Engineering) (“Technology transfer is not simply sending a piece of paper to somebody or writing a report or writing a journal article. Technology transfer involves the transfer of manufacturing and engineering know-how. That is what Fred Bucy was describing.”).

77. *Export Licensing Hearing, supra* note 75, at 241-42 (statement of Betsy Ancker-Johnson, Assistant Secretary of Commerce for Science and Technology) (“[Technology is] that kind of knowledge, that know-how which is applied, namely for products or processes. All of the current scientific exchanges that we have, international conferences, the publication of papers in scientific journals, would continue precisely as it has, unabated. We are only focusing in on that kind of know-how—and I use that term as Mr. Bucy has just suggested, that kind of know-how which issues in design and manufacturing.”).

ogy.⁷⁸ Defense officials recommended that the guidelines, which reiterated the conclusions of the *Bucy Report*, be incorporated into Commerce procedure and disseminated to all industrial exporters.⁷⁹ The head of the ad hoc steering group, whose year-long study was the basis of the policy statement, described Defense's new policy as "the first major zero-base, total review of the export control system since its inception two-and-a-half decades ago."⁸⁰ He added that although exportation of technological know-how was to be tightly controlled, scientific inquiry would be unrestricted.⁸¹

This assertion, however, is inconsistent with the policy statement, which specified that "[t]his policy shall be applied without regard to whether the exporter is a government department or agency, a commercial enterprise, an academic or non-profit institution [or] an individual entrepreneur"⁸² The policy statement explicitly mentioned scientific and technical exchanges as examples of technology transfer, adding that "[w]hen the potential for inadvertent transfer of critical technology is considered to be high, Defense shall formulate and recommend to the responsible agencies restrictions on the amount, extent or kind of interpersonal exchange in a given transaction. Visitor control mechanisms within the Department of Defense will be improved."⁸³ Under the new policy Defense coordinated with other agencies to identify, maintain, and continuously update a list of specific technologies and/or end products, the export of which were restricted on the basis of national security.⁸⁴

In 1978, Defense broadened the scope of its critical technologies approach by asserting itself into the dominant position in the triennial review of the multinational Cocom export list.⁸⁵ The Cocom (or Coordinating Committee) is an informal organization of fourteen western countries plus Japan whose members secretly negotiate revisions to a list of military, strategic, and nuclear items every three years. Although

78. UNITED STATES DEPARTMENT OF DEFENSE, INTERIM DOD POLICY STATEMENT ON EXPORT CONTROL OF UNITED STATES TECHNOLOGY, NEWS RELEASE 410-77 (Sept. 2, 1977) (containing Aug. 26, 1977 memorandum from Secretary of Defense Brown to Secretaries of Military Divisions) [hereinafter DEFENSE POLICY STATEMENT].

79. *Export Licensing: Cocom List Review Proposals of the United States: Hearings Before the Subcomm. on International Economic Policy and Trade of the House Comm. on International Relations*, 95th Cong., 2d Sess. 103-04 (1978) [hereinafter *Cocom List Review*] (statement of Ellen Frost, Deputy Assistant Secretary of Defense for International Economic Affairs).

80. See Kozicharow, *DOD Revises Policy on Export*, 113 AVIATION WEEK & SPACE TECH. 11 (Sept. 1977).

81. See *id.*

82. DEFENSE POLICY STATEMENT, *supra* note 78, at 1.

83. *Id.*

84. See Kozicharow, *supra* note 80, at 12.

85. *Defense Policy Hearing*, *supra* note 20, at 17.

members generally agree that items on the list will not be exported to Soviet bloc nations, unilateral exceptions are not unusual.⁸⁶

State was the primary United States agency-contributor to the Cocom review, but Defense participated in all thirteen interdepartmental technical task groups established to review the Cocom list, chairing seven.⁸⁷ Defense thus ensured that, although the critical technologies list was not sufficiently advanced to be incorporated in the revised Cocom list, task groups negotiating revisions to the list would follow the critical technologies approach.⁸⁸

Meanwhile, Defense was developing the critical technologies list by the establishment of nine industry-government committees.⁸⁹ "Critical" was interpreted broadly to include technologies available outside the United States and those that were no longer state-of-the-art.⁹⁰ One Defense official freely admitted that intelligence personnel generally lacked the technological expertise necessary to precisely assess military implications of technology exports.⁹¹ Implementation of the approach also proved to be difficult, with one Senator describing Defense's review of export licenses as cursory and inadequate.⁹²

One set of licenses in particular drew congressional attention. Dresser Industries of Dallas had applied to Commerce for validated licenses to export technical data for a turnkey factory and for a computer-controlled electron beam welder to manufacture oil drilling rock bits.⁹³ The turnkey factory was to be built in the Soviet Union. Al-

86. See *Cocom List Review*, *supra* note 79, at 3-5.

87. *Id.* at 102 (statement of Ellen Frost, Deputy Assistant Secretary of Defense for International Economic Affairs).

88. *Id.* at 83 (statement of William Baraclough, Deputy Assistant Secretary of State for International Trade Policy).

89. *Id.* at 103. The groups studied: (1) acoustic array technology, (2) array processor computer technology, (3) computer network technology, (4) diffusion bonding technology, (5) high energy laser technology, (6) infrared detection technology, (7) jet engine technology, (8) large scale integration/integrated circuit production technology, and (9) wide-body aircraft technology. *Id.* At the request of Defense's Director of Research and Engineering, Battelle Columbus Laboratories identified strategically significant technologies for study by Commerce. See 116TH REPORT ON U.S. EXPORT CONTROLS 11 (1977).

90. See UNITED STATES COMPTROLLER GENERAL, ADMINISTRATION OF U.S. EXPORT LICENSING SHOULD BE CONSOLIDATED TO BE MORE RESPONSIVE TO INDUSTRY 17 (1978); see also R. CARRICK, *supra* note 33, at 85-86 (implementation of *Bucy Report* will depend "on what exactly is meant by such imprecise but inevitable and colourful words as 'key,' 'strategic,' 'critical,' and 'significant'"); Root, *Trade Controls That Work*, 56 FOREIGN POL'Y 61, 78 (1984) ("allies have reached to this grammatical challenge by proposing adverbs to modify the adjectives, such as 'very' significant, 'clearly' serious, or 'really' critical").

91. *Export Licensing Hearing*, *supra* note 75, at 5 (statement of Edwin Speaker, Office of Deputy Director for Scientific and Technical Intelligence, Defense Intelligence Agency).

92. *Dresser Industries Hearing*, *supra* note 75, at 158 (statement of Sen. Jackson).

93. *Id.* at 2. The rock drill bits manufactured by Dresser were capable of drilling deep wells. This capability would enable the Soviet Union to produce oil from deeper, previously inaccessible

though neither the rock bits nor the electron beam welder were on the Control List when Dresser applied for validated export licenses,⁹⁴ the unpublished technical data (e.g., blueprints, training, specifications, and know-how)⁹⁵ and the computer control were subject to export restrictions.⁹⁶

Defense reviewed the Dresser license applications, determined that the technology involved was not on its critical technologies list, and approved the licenses,⁹⁷ which were then issued by Commerce.⁹⁸ Public criticism of the licensing soon followed, causing Defense to request J. Fred Bucy of the Defense Science Board to review Dresser's application.⁹⁹ Mr. Bucy determined that deep-well technology had potential military application.¹⁰⁰ Defense, however, considered the military significance of the export to be insufficient to recommend denial of the license and recommended suspension instead.¹⁰¹ Meanwhile, President Carter approved both of Dresser's licenses.¹⁰²

The congressional committee that later investigated Defense's review of the licenses was highly critical of the agency's procedure¹⁰³ and its narrow interpretation of national security.¹⁰⁴ The committee stressed that national security centered around whether an export could be of military significance.¹⁰⁵ In doing so, however, it equated military strength with economic strength.¹⁰⁶ In the case of the oil drilling equip-

oil reservoirs. *Id.* at 97.

94. Rock drill bits were removed from the Control List in 1972, and electron beam welders without computer controls were removed in 1973. *See id.* at 14. In July, 1978, President Carter, in response to Soviet treatment of dissidents, placed exportation of oil and gas drilling equipment to the Soviet Union on the Control List. *See generally* Huntington, *Trade, Technology, and Leverage: Economic Diplomacy*, 32 FOREIGN POL'Y 63, 76 (Fall 1978) (describing foreign policy controls). Defense did not review Dresser's export license due to this foreign policy control (which is under the jurisdiction of the Secretary of State), but reviewed the case for the export of unpublished technical data, which is subject to national security controls. *Id.*

95. *Dresser Industries Hearing*, *supra* note 75, at 14 (statement of Peter Sullivan, Assistant Counsel for Subcommittee).

96. *Id.*

97. *Id.* at 16-17.

98. *Id.* at 29.

99. *Id.*

100. Bucy, *An Assessment of Rock Drill Bit Technology*, reprinted in *Dresser Industries Hearing*, *supra* note 75, at 9-10.

101. *Dresser Industries Hearing*, *supra* note 75, at 29 (statement of William Perry, Under Secretary of Defense for Research and Engineering).

102. *See id.*

103. *See id.* at 158.

104. *See id.* at 95, 111-12; *cf.* REPORT OF THE PRESIDENT TO CONGRESS, 95TH CONG., 2D SESS., INTERNATIONAL TRANSFER OF TECHNOLOGY 9-10 (Comm. Print 1978) (defining national security as including political, economic, and military aspects).

105. *Dresser Industries Hearing*, *supra* note 75, at 97 (statement of Sen. Percy).

106. *Id.* at 112.

ment, therefore, the committee concluded that Defense should have considered whether the Soviet Union's capacity to produce oil had been increased.¹⁰⁷ The committee's criticism of Defense stood in sharp contrast to its high praise of Mr. Bucy's recommendation to deny the permit based on criteria outlined in the *Bucy Report*.¹⁰⁸ In recommending denial of the permit, however, Mr. Bucy had been instructed by Defense to base his decision on the broad strategic impact of the export in addition to its military significance,¹⁰⁹ a criterion that was not in Defense's statutory mandate.¹¹⁰

During review of Dresser Industries' licenses, the critical technologies list contained 138 technologies and measured less than three pages.¹¹¹ Defense described it as "an initial candidate listing identified for study by industry and government."¹¹² Technologies on the list were chosen because the end products were embedded in existing and projected weapon systems.¹¹³ No presumption existed that an unlisted technology was not critical.¹¹⁴

Congressional interest in Defense's review of export licenses provided the impetus for increased attention to development of an export control policy by Defense.¹¹⁵ Other agencies were also investigating export controls. In response to a congressional request for review of the effect of export controls on trade, the Comptroller General's Office published a report recommending that Defense's review of export licenses be transferred to Commerce.¹¹⁶ Commerce, meanwhile, completed a study mandated by Congress to determine the impact on national security and foreign policy of publicly available technical data.¹¹⁷

107. *Id.*

108. *Id.* at 143, 157 (statement of Sen. Jackson).

109. *Id.* at 144 (statement of J. Fred Bucy, President, Texas Instruments, Inc.).

110. See Export Administration Amendments of 1974, 50 U.S.C. app. § 2403-1(a) (1982).

111. *Dresser Industries Hearing*, *supra* note 75, at 133.

112. *Id.* at 142 (Defense's response to questions by Senate Committee).

113. *Trade and Technology: Hearing Before the Subcomm. on International Finance of the Senate Comm. on Banking, Housing, and Urban Affairs*, 96th Cong., 1st Sess. 32 (1979) [hereinafter *Trade and Technology Hearing*] (statement of William Perry, Under Secretary of Defense for Research and Engineering). Defense had requested the military services to submit candidate technologies. The 800 technologies submitted were formulated into a working list of 138 technologies. *Id.*

114. *Dresser Industries Hearing*, *supra* note 75, at 142.

115. *Id.* at 112 (statement of William Perry, Under Secretary of Defense for Research and Engineering).

116. UNITED STATES COMPTROLLER GENERAL, *supra* note 90. The report conceded the difficulties involved in defining critical technology or know-how, *id.* at 17, but recommended that Commerce technicians be given overall control over export administration by terminating review by Defense, NASA, State, and Energy. *Id.* at 34.

117. UNITED STATES DEPARTMENT OF COMMERCE, EXPORTS OF TECHNICAL DATA BY PUBLICATION OR OTHER MEANS OF PUBLIC DISSEMINATION, *reprinted in* OFFICE OF EXPORT

Commerce found that monitoring all of the 1.5 million technical and scientific reports published each year would be cost-prohibitive but suggested that monitoring could be feasible if its scope were narrowed pursuant to the critical technologies list.¹¹⁸

In January 1979, Defense completed the first list of military critical technologies,¹¹⁹ the same month that Mr. Bucy delivered a stinging criticism of the agency's tardiness in producing a list that industry could use.¹²⁰ The list identified fifteen broad categories of applied science and engineering.¹²¹ Industry-government groups, assigned to each category to determine specific component technologies, identified elements of design, manufacture, testing, utilization, and maintenance. These elements were to be controlled by inclusion in a Military Critical Technology Product and Information List, to be supplemented by a list of technology transfer mechanisms subject to export controls.¹²²

In May 1979, Congress again attacked the failure of the national export control policy. Precipitating the criticism were reports that American-designed trucks, manufactured at the Kama River truck factory in the Soviet Union, were being used with military units.¹²³ Export licenses for technology to construct the truck plant had been granted on the understanding that only civilian trucks would be manufactured.¹²⁴ The apparent failure of the export control procedure,¹²⁵

ADMINISTRATION, UNITED STATES DEPARTMENT OF COMMERCE, EXPORT ADMINISTRATION REPORT (Apr.-Sept. 1977) app. D, 137 (1978) [hereinafter EXPORTS OF TECHNICAL DATA]; see Export Administration Amendments of 1977, Pub. L. No. 95-52, § 120, 91 Stat. 235, 243.

118. EXPORTS OF TECHNICAL DATA, *supra* note 117, at 137. Commerce realized that the cost of monitoring based on the critical technologies list would still be significant because thousands of articles would have to be reviewed each year and also that "this effort does not take into account [sic] the other transfer mechanisms that would also need to be monitored, such as public symposia, exhibits, and corporate reports." *Id.* at 138. Commerce concluded its report by recommending against any form of monitoring. *Id.* at 142.

119. See OFFICE OF TECHNOLOGY ASSESSMENT, TECHNOLOGY AND EAST-WEST TRADE 93 (1980).

120. Address by J. Fred Bucy, Armed Forces Communications and Electronics Association Symposium (Jan. 11, 1979), reprinted in *U.S. Export Control Policy Hearing*, *supra* note 37, at 307.

121. See OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 119, at 93.

122. See *id.* at 93-94.

123. See 125 CONG. REC. 15,581 (1979) (statement of Rep. Ichord).

124. See *id.* Forty American companies negotiated contracts worth more than \$550 million to construct the Kama River truck plant. For an account of the plant's construction and types of technologies involved, see Schaum, *Kamaz Foundry, U.S.A. on Display*, 66 MODERN CASTING 42 (Mar. 1976); see also G. HOLLIDAY, TECHNOLOGY TRANSFER TO THE USSR, 1928-1937 & 1966-1975 154-65 (1979) (describing interaction between Soviet management and Western exporters at the Kama River truck factory).

125. One of the more critical export licenses to construct the Kama River truck factory was approved by the President following denial by Defense. See *Multinational Corporations Hearings*, *supra* note 30, at 226 (statement of Roger Shields, Deputy Assistant Secretary of Defense).

and political infighting within Commerce,¹²⁶ set the stage for the elevation of Defense's critical technologies approach to the status of official export control policy.

Statutory adoption of Defense's critical technologies approach was facilitated by congressional renewal of the EAA (under which Commerce controls dual use exports).¹²⁷ The lengthy hearings and debates on the Act's renewal focused on the necessity of balancing the needs of industrial exporters with the protection of national security.¹²⁸ Because of concern that the United States' competitiveness in world trade could be weakened by an overly stringent and badly administered export control policy, the effect of export controls on science was barely addressed. On the rare occasions during the hearings when science was discussed, agency officials assured Congress that scientific research would not be

Commerce determined that no national security risk existed because comparable technology was available from Western Europe and Japan. Commerce recognized that the trucks could be used as military logistical support but concluded that the trucks did not fill a "tactical or combat military role." *Hearings on S. 1487 Before the Subcomm. on International Finance of the Senate Comm. on Banking, Housing, and Urban Affairs*, 92nd Cong., 2d Sess. 50-51 (1972) (statement of Harold Scott, Assistant Secretary of Commerce for Domestic and International Business).

Licenses for spare parts for the Kama River truck factory were revoked in January 1980 following the Soviet invasion of Afghanistan. *Trade and Technology Hearing*, *supra* note 113, at 511 (response by Commerce to subcommittee questions). Immediately following the export license's revocation, a manufacturer from an allied country exported similar products to the Kama River truck factory. *See* Root, *supra* note 90, at 70.

The foreign policy controls on exports destined for the Kama River and ZIL truck factories were removed in 1990. 55 Fed. Reg. 3205 (1990) (to be codified at 15 C.F.R. § 799.1).

126. Lawrence Brady, Deputy Director of Commerce's Office of Export Administration, after testifying to a House subcommittee that the export control process was "a shambles," cooperated with Congress to the obvious disapproval of other Commerce officials who argued that Commerce should retain control over exports. *Compare* 125 CONG. REC. 19,940 (1979) (letter to Sen. Jackson from Juanita Kreps, Secretary of Commerce (June 18, 1979)) (stating that "Mr. Brady has not been 'demoted' nor has any action been taken against him") *with id.* at 19,940-41 (memo to Juanita Kreps, Secretary of Commerce from Lawrence Brady, Deputy Director, Office of Export Administration) ("I would like to address the matter of my demotion . . . I believe your letter confirms my testimony on the export control system. It is in essence, a 'shambles.'").

127. *See supra* notes 41-42 and accompanying text.

128. *See, e.g., Extension and Revision of the Export Administration Act of 1969, Hearings and Markup Before the Subcomm. on International Economic Policy and Trade of the House Comm. on Foreign Affairs, pt. 1*, 96th Cong., 1st Sess. 535 (1979) [hereinafter *Hearings and Markup 1*] (statement of Rep. Wolff) (arguing that export items critical to national security would be the only items remaining controlled); 125 CONG. REC. 26,812 (1979) (statement of Rep. Lagomorsino) (stating that "we have struck a reasonable and realistic balance between preserving the national security . . . as well as providing greater security for business"); *id.* at 19,965 (statement of Sen. Jackson) (stating that "we are simply trying to find a solution that will address properly and effectively the national security area and, at the same time, not create an impasse in trade and commerce"); *id.* at 19,960 (statement of Sen. Stevenson) (stating that "we can . . . protect the national security against improvident exports of technologies without unnecessarily injuring our economy and hence our national security").

controlled.¹²⁹ Science was mentioned peripherally during the debates, but application of export controls to science was never seriously addressed.¹³⁰

It is doubtful whether many members of Congress even considered that export controls would affect scientific communications.¹³¹ The know-how and technology discussed related to industrial exports.¹³²

129. See, e.g., *Extension and Revision of the Export Administration Act of 1969, Hearings and Markup Before the House Comm. on Foreign Affairs, pt. 2, 96th Cong., 1st Sess. 98 (1970)* [hereinafter *Hearings and Markup 2*] (statement of Ruth Davis, Deputy Under Secretary of Defense for Research and Engineering) (“Without [limiting controls to practical know-how] we would find we were suggesting that one might want to control the transfer of scientific knowledge, and that would absolutely be against all of our principles in the United States.”); *Hearings and Markup 1, supra* note 128, at 696 (statement of Stanley Marcuss, Commerce Senior Deputy for Industry and Trade) (“[The proposed registration system] does not include information exchanged by way of universities or educational institutions and so forth.”).

130. Representative Ichord, author of the critical technologies amendment that gave statutory authority to the MCTL, briefly mentioned scientific exchanges as one method of transferring technology. See 125 CONG. REC. 24,041 (1979). Representative Ichord’s primary concern, however, was “to effect export controls to protect the domestic economy, to protect foreign affairs and to protect the national security.” *Id.* at 26,813. Congress’s Office of Technology Assessment determined that even people recommending that scientific exchanges be monitored only favored restraining commercial exchanges. Restraints on academic exchanges were thought to violate academic freedom. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 119, at 27.

The only scientist in the Senate, Senator Schmitt, suggested that export controls on technology “[flew] in the face of something we cannot control,” 125 CONG. REC. 19,964 (1974), but no discussion of their application to science ensued. During the same debate, Senator Moynihan discussed the freedoms of inquiry, association, and dissent as being essential to science. *Id.* at 19,965. Moynihan’s point, however, was that because science did not flourish in totalitarian societies, the Soviets were attempting to import American scientific and technological innovations. *Id.* Senator Hayakawa argued that “technological breakthroughs are most likely to occur in free countries where researchers and scientists can proceed with their own experiments” *Id.* at 19,943. It is unlikely that Senators Moynihan and Hayakawa would have spoken of the freedoms of the American scientific community had they intended that the Act they were debating be applied in derogation of those freedoms.

See also Memorandum to Frank Press, Science Advisor to the President, from Larry Hammond, Deputy Assistant Attorney General, Office of Legal Counsel, Department of Justice 4 n.7 (May 11, 1978), reprinted in *The Government’s Classification of Private Ideas: Hearing Before a Subcomm. of the House Comm. on Government Operations, 96th Cong., 2d Sess. 268, 271 n.7 (1980)*. The Justice Department memorandum, which discussed the ITAR, stated:

It is by no means clear from the language or legislative history of either [the Mutual Security Act of 1954 or the Arms Export Control Act] that Congress intended that the President regulate noncommercial dissemination of information, or considered the problems such regulation would engender. We therefore have some doubt whether § 38 of the Arms Export Control Act [which controls export of unclassified technical data] provides adequate authorization for the broad controls over public cryptography which the ITAR imposes.

Id.

131. The sponsor of the critical technologies amendment, Representative Ichord, believed that 99 out of 100 members of Congress did not understand what his amendment involved. See *Export Control Extension*, 1979 CONG. Q. ALMANAC 300, 304.

132. See, e.g., 125 CONG. REC. 20, 109 (1979) (statement of Rep. Bingham) (discussing “technology—the knowledge of how to produce things”); *id.* at 19,957 (statement of Sen. Steven-

The critical technologies approach endorsed by Defense offered a method of reducing the number of exports requiring licenses,¹³³ while ensuring that technologies critical to national security would not be exported.¹³⁴ Hence, scientific communications were generally beyond the scope of the debaters' concerns.

B. Congressional Approach

In September 1979, Congress statutorily adopted Defense's critical technologies approach.¹³⁵ The relevant section of the EAA reads:

The Secretary of Defense shall bear primary responsibility for developing a list of militarily critical technologies. In developing such list, primary emphasis shall be given to—

- (A) arrays of design and manufacturing know-how,
- (B) keystone manufacturing, inspection, and test equipment,
- (C) goods accompanied by sophisticated operation, application, or maintenance know-how, and
- (D) keystone equipment which would reveal or give insight into the design and manufacture of a United States military system,

which are not possessed by, or available in fact from sources outside the United States to, controlled countries and which, if exported, would permit a significant advance in a military system of any such country.¹³⁶

The MCTL was to be developed in accordance with the *Bucy Report's* criteria.¹³⁷ Commerce's Technical Advisory Committees were to advise the Secretary of Defense in addition to the Secretary of Commerce.¹³⁸

son) (arguing that "control on technology by the United States simply gives the business to some other nation, a foreign competitor . . . with the result that our economy is hurt").

133. See, e.g., *Hearings and Markup 2*, *supra* note 129, at 95 (statement of Ruth Davis, Deputy Under-Secretary of Defense for Research and Engineering) (maintaining that "inherent in procedures that . . . Defense is invoking . . . is the presumption that there is a small list of technologies which are significant to national security"); 125 CONG. REC. 24,041 (1979) (statement of Rep. Ichord) ("Even looking at this [critical technologies] approach has resulted in the removal of 162 commodities from the export control lists.").

134. See, e.g., 125 CONG. REC. 24,050 (1979) (statement of Rep. Bingham) (stating that MCTL will allow focus "on the items that are important to national security").

135. Export Administration Act of 1979, Pub. L. No. 96-72, § 5(d)(2), 93 Stat. 503, 508 (codified at 50 U.S.C. app. § 2404(d)(2) (Supp V 1987)).

136. 50 U.S.C. app. § 2404(d)(2) (Supp V 1987). Subparagraph (D) was added in 1985. See Pub. L. No. 99-64, § 106(a)(1), 99 Stat. 120, 128 (1985).

137. See 50 U.S.C. app. § 2404(d)(2) (Supp. V 1987); see also *supra* text accompanying note 31 (listing BUCY REPORT criteria); 125 CONG. REC. 19,936 (1979) (statement of Sen. Stevenson) ("[The EAA] provides the statutory basis for implementing the critical technologies approach recommended in the report of the Defense Science Board Task Force.").

138. 50 U.S.C. app. § 2404(h)(2) (Supp. V 1987) (current version at 50 U.S.C.A. app. §

Both Congress and Defense assumed that the MCTL would be short.¹³⁹ The initial version of the MCTL was to be published in an appropriate form in the *Federal Register* by October 1, 1980.¹⁴⁰

National security controls were to be sharply delineated from controls for foreign policy.¹⁴¹ Foreign policy controls were curtailed,¹⁴² while controls for national security purposes were strengthened.¹⁴³ The Control List, prepared by Commerce to control the export of certain dual-use products and technology, was to include both types of controls. During enforcement, however, the particular control to be exerted was to be clearly identified.¹⁴⁴ Items of the MCTL on which the secretaries of Commerce and Defense agreed were to be incorporated in the Control List.¹⁴⁵ Scientific exchanges resulting in the export of unpublished technical data were to be reported to the Secretary of Commerce only if commercial agreements were involved,¹⁴⁶ but universities, colleges, and other educational institutions were specifically exempted from this requirement.¹⁴⁷

2404(h)(2) (West Supp. 1990).

139. See, e.g., *Hearings and Markup 2*, *supra* note 129, at 95-96 (statement of Ruth Davis, Deputy Under Secretary of Defense for Research and Engineering) (supporting the "presumption that there is a small list of technologies which are significant to national security"); *Hearings and Markup 1*, *supra* note 128, at 534 (statement of Rep. Wolff) ("I envision this 'critical technologies list' to be quite small.").

140. 50 U.S.C. app. § 2404(d)(4) (1982). The words "in an appropriate form" were inserted in the Act so that parts of the list could be classified if necessary. See 125 CONG. REC. 24,042 (1979) (statement of Rep. Bingham). The current version requires Defense to review the MCTL on an ongoing basis. 50 U.S.C.A. § 2404(d)(5) (West Supp. V 1990).

141. See, e.g., 125 CONG. REC. 20,108-09 (1979) (statement of Rep. Bingham) (maintaining that a clear distinction between national security and foreign policy controls was an important feature of the bill).

142. Foreign policy controls were only to be enforced after both consultation with appropriate industries and countries and a study of alternatives. 50 U.S.C.A. app. §§ 2405(c)-(d) (West Supp. 1990). The President must consult with Congress before imposing *any* foreign policy export control. *Id.* § 2405(f) (Supp. V 1987).

143. In contrast to foreign policy controls, Commerce could exercise national security controls after consultation with Defense or any appropriate government agency. *Id.* § 2404(a)(1). The President was not restrained from exercising national security controls because of an executive agency's failure to specify end-use conditions. H.R. CONF. REP. NO. 482, 96th Cong., 1st Sess. —, reprinted in 1979 U.S. CODE CONG. & ADMIN. NEWS 1180, 1182. This reference was an obvious reaction to Commerce's failure to require end-use conditions in contracts for the Kama River truck factory. See 125 CONG. REC. 26,813 (1979) (statement of Rep. Ichord).

144. 50 U.S.C. app. § 2404(c)(1) (Supp. V 1985). Section 2404(c)(1), which governs national security controls, provides that "goods and technology [in the Control List] shall be clearly identified as being subject to controls under this section." *Id.* Section 2405(l), which governs foreign policy controls, provides that goods and technology in the Control List are to be clearly identified as being subject to controls under that section. *Id.* § 2405(l). The Control List is described *infra* in text accompanying note 309.

145. 50 U.S.C. app. § 2404(c)(2) (1982 & West Supp. 1990).

146. *Id.* § 2404(j)(1) (Supp. V 1987).

147. *Id.* § 2404(j)(2); see also *Hearings and Markup 1*, *supra* note 128, at 696 (statement

One section of the EAA enabled Defense generally to ignore comments made by Commerce.¹⁴⁸ If the Secretary of Commerce recommended a license over the Secretary of Defense's objection, the President would have to break the impasse. If the President overrode the Secretary of Defense's objection, he was required to provide reasons for his decision to Congress together with the Secretary of Defense's recommendation.¹⁴⁹

Passage of the 1979 EAA resulted in a renewed Defense effort to establish the MCTL. Defense employees responsible for developing and administering the list were reorganized under the Under Secretary of Defense for Research and Engineering and the Assistant Secretary of Defense for International Security Affairs.¹⁵⁰ International Security Affairs retained a policy role regarding sensitive cases,¹⁵¹ but Research and Engineering became responsible for developing and implementing MCTL's technology base.¹⁵² Personnel responsible for determining which technologies were militarily critical—and therefore controlled—were thus the same people who determined which technologies to promote in the United States.¹⁵³ Defense officials hoped that coordination of control and promotion functions would be synergistic.¹⁵⁴ By coordinating technology transfer functions, Defense personnel gained leverage by offering certain technologies to allies or by threatening to withhold technologies in exchange for the allies' cooperation in controlling technology transfer.¹⁵⁵

Defense staff members disagreed over the aims and probable results of the MCTL¹⁵⁶ and worried that it would be simply an in-house exercise.¹⁵⁷ By the end of 1979, however, it became certain that the MCTL would reach beyond Defense. Additional monies allocated to

of Stanley Marcuss, Commerce Senior Deputy for Industry and Trade) (maintaining that commercial cooperation agreements refer exclusively to commercially exchanged information, not "scientific exchange [or] scholarly exchange").

148. See Root, *supra* note 90, at 80.

149. 50 U.S.C. app. § 2409(g) (1982 & Supp. V 1987) (current version at 50 U.S.C.A. app. § 2409(g) (West Supp. 1990)).

150. *Technology Export: Department of Defense Organization and Performance, Hearing Before the Subcomm. on International Economic Policy and Trade of the House Comm. on Foreign Affairs*, 96th Cong., 1st Sess. 5-8 (1979) [hereinafter *Defense Organization Hearing*] (statement of William Perry, Under Secretary of Defense for Research and Engineering).

151. *Id.* at 18 (statement of David McGiffert, Assistant Secretary of Defense for International Security Affairs).

152. *Id.* at 5-8 (statement of William Perry, Under Secretary of Defense for Research and Engineering).

153. *Id.* at 19.

154. *Id.*

155. *Id.* at 28-29.

156. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 119, at 94.

157. *Id.*

the critical technologies program¹⁵⁸ permitted extensive hiring of contractors to further develop the approach.¹⁵⁹

Industrial groups completed their input¹⁶⁰ by reviewing items in the Control List for inclusion in the MCTL.¹⁶¹ The Central Intelligence Agency (CIA) and Defense Intelligence Agency (DIA) provided information on foreign availability of critical technologies,¹⁶² and the Navy and Air Force conducted separate reviews.¹⁶³ The industry-government, Navy, and Air Force reviews were combined to form the initial MCTL.¹⁶⁴ The major technologies were subdivided into controllable products and information,¹⁶⁵ and transfer mechanisms were delineated, accompanied by recommendations of available government controls and by suggestions about the ways in which the controls should be invoked.¹⁶⁶ The MCTL now included over 5,000 pages of supple-

158. In 1979, \$2.5 million was allocated to the critical technologies program. *Defense Organization Hearing*, *supra* note 150, at 24 (statement of William Perry, Under Secretary of Defense for Research and Development).

159. *Id.* at 24. The Institute for Defense Analyses was contracted in December 1979 to develop the MCTL for publication in the *Federal Register* by October 1, 1980. See INSTITUTE FOR DEFENSE ANALYSES, THE CRITICAL TECHNOLOGIES PROJECT, Executive Summary I-1 (1981) (IDA Rep. No. R-258).

160. *Defense Organization Hearing*, *supra* note 150, at 27.

161. *International Affairs Functions of the Treasury and the Export Administration Act, Hearings Before the Subcomm. on International Finance and Monetary Policy of the Senate Comm. on Banking, Housing, and Urban Affairs*, 97th Cong., 1st Sess. 71 (1981) [hereinafter *Treasury Hearings*] (statement of Oles Lomacky, Director for Technology Trade, Office of the Under Secretary of Defense for Research and Engineering). The industry-government working groups were supplemented by representatives from the Armed Services, NSA, NASA, Commerce, State, DIA, and the CIA. *Id.*

162. *Hearings and Markup 1*, *supra* note 128, at 413 (statement of Ruth Davis, Deputy Under Secretary of Defense for Research and Advanced Technology).

163. *Treasury Hearings*, *supra* note 161, at 70-71 (statement of Oles Lomacky, Director of Technology Trade, Office of the Under Secretary of Defense for Research and Engineering).

164. *Id.* at 71. Differences existed regarding technical requirements for identifying an item as militarily critical. *Id.* at 44 (statement of Frank Conahan, Director, International Division of the General Accounting Office). The Institute for Defense Analyses defined militarily critical as "[t]echnology not possessed by our principal adversaries that specifically contributes to the superior characteristics (performance, reliability, maintainability, and cost) of a military system, a significant component thereof, or a related strategic product of any such adversary." INSTITUTE FOR DEFENSE ANALYSES, *supra* note 159, at I-13. Militarily critical technologies were defined by selecting significant technologies, and determining whether the technology had military utility and adversary capabilities. *Id.* at I-12. Significant technology was defined as "[t]echnology that specifically contributes to the superior characteristics (e.g., performance, reliability, maintainability, cost) of a system, a significant component thereof, or a related product." *Id.* at I-13. Applying these definitions, any civilian technology not possessed by an adversary or a potential adversary that reduces the cost of any items strategically related to any military system is militarily critical. Inclusion of such technologies on the MCTL implies a broad reading of national security controls.

165. *Hearings and Markup 1*, *supra* note 128, at 412-14.

166. *Id.* at 413.

mental data.¹⁶⁷ Despite the *Bucy Report's* recommendation that certain universities be monitored and controlled, the MCTL's controls did not include controls on university-based research and publications.¹⁶⁸

C. *Application of the Critical Technologies Approach to Science*

In early 1980, international events caused Defense and the American scientific community to reevaluate American-Soviet relationships. In response to the Soviet invasion of Afghanistan, President Carter ordered an embargo on strategic items shipped to the Soviet Union.¹⁶⁹ The President determined that the embargo was necessary in the interests of foreign policy and national security. He directed the Secretary of Defense and other officials to review and revise export controls on high technology and other strategic items to the Soviet Union.¹⁷⁰ In the interim, outstanding export licenses were suspended and no new licenses were issued.¹⁷¹

American disapproval of Soviet actions in Afghanistan was exacerbated by the exile of the Soviet theoretical physicist, Andrei Sakharov,¹⁷² and scientific exchanges between the two nations virtually ceased.¹⁷³ American scientific organizations cancelled joint US-USSR symposia, and individual scientists pledged to boycott all scientific exchanges until Sakharov's exile ended.¹⁷⁴

In this somber atmosphere, Defense reviewed its export controls.

167. *Treasury Hearings, supra* note 161, at 72 (statement of Oles Lomacky, Director for Technology Trade, Office of the Under Secretary of Defense for Research and Engineering).

168. *Id.* at 71. The definition of technology used by the Defense contractor developing the MCTL excluded "research or store of scientific knowledge on which the application concept is based . . ." INSTITUTE FOR DEFENSE ANALYSES, *supra* note 159, at I-14. The fact that science was exempted from items as they were selected for inclusion in the MCTL would not, however, automatically preclude science's subsequent inclusion.

169. Letter from President Jimmy Carter to the Speaker of the House of Representatives and the President of the Senate, *reprinted in* 16 WEEKLY COMP. PRES. DOC. 183 (Jan. 22, 1980). The President exercised his executive and Commander-in-Chief powers and his authority under the EAA. Commerce completed its review of strategic items in March of 1980. In April, 1980, it adopted a more stringent export control policy in regard to the Soviet Union. DEPARTMENT OF COMMERCE, EXPORT ADMINISTRATION ANNUAL REPORT 1980 22 (1981).

170. Letter from President Jimmy Carter, *supra* note 169, at 184-85. Foreign policy controls expire after one year unless they are extended annually by the President. 50 U.S.C. app. § 2405(a)(3) (Supp. V 1987).

171. Letter from President Jimmy Carter, *supra* note 169, at 184.

172. See Jacobs, *Sakharov Exile Triggers Reaction in U.S. Physics Community*, 33 PHYSICS TODAY 133, 133 (Mar. 1980). Sakharov's exile ended in December 1986. See Rich, *Sakharov—A Wind of Change*, 325 NATURE 3, 3 (1987).

173. See Jacobs, *supra* note 172, at 133.

174. *Reactions Escalate to Soviet Actions*, CHEM. & ENG'G NEWS, Mar. 3, 1980, at 6. *But cf.* Feshbach, *Let's Not Boycott Soviet Physicists*, 33 PHYSICS TODAY 160, 160 (Mar. 1980) (condemning Soviet action but advocating caution in not destroying individual Soviet-American scientific communication).

A statement made by the then Deputy Secretary of Defense illustrates Defense's difficulty in distinguishing national security standards (under which the controls were reviewed) from foreign policy considerations.¹⁷⁵ In the aftermath of the Afghanistan invasion, national security controls were applied to technology that "could be used to improve the performance of Soviet military equipment or to improve the productivity of the Soviet defense industry,"¹⁷⁶ a somewhat broader definition than that contained in the EAA.¹⁷⁷

Scientific exchanges by means of symposia, visits, and journals had already been characterized by Defense as effective transfer mechanisms,¹⁷⁸ and extensive dossiers had been compiled on all Soviet science and technology students in the United States.¹⁷⁹ As the national security context changed, so did application of export controls.¹⁸⁰ Stringent restrictions were imposed by Defense on student exchanges in science and technology.¹⁸¹ Attendance by foreigners at scientific symposia was restricted,¹⁸² and individual academic visits were controlled.¹⁸³

An official of the DIA¹⁸⁴ testified to a congressional subcommittee

175. See, e.g., *Food and Technology Embargo Hearings*, supra note 17, at 89 (statement of W. Graham Clayton, Jr., Deputy Secretary of Defense) (declaring that the decision to embargo grain was justified for national security and foreign policy reasons). Mr. Clayton argued that the national security of the United States was threatened by Soviet aggression. *Id.*

176. *Transfer of Technology to the Soviet Bloc: Hearing Before the Permanent Subcomm. on Investigations of the Senate Governmental Affairs Comm.*, 96th Cong., 2d Sess. 29 (1980) [hereinafter *Soviet Bloc Hearing*] (statement of William Perry, Under Secretary of Defense for Research and Engineering).

177. See 50 U.S.C. app. § 2404(d)(2) (Supp. V 1987). Section 2402(d)(2) mandated control of technology that "would permit a significant advance in a military system of any [controlled] country." *Id.*

178. *Soviet Defense Expenditures and Related Programs, Hearings Before the Subcomm. on General Procurement of the Senate Comm. on Armed Services*, 96th Cong., 1st Sess. 70 (1979) [hereinafter *Soviet Defense Expenditures Hearing*] (statement of Jack Vorona, Deputy Director for Scientific and Technical Intelligence, DIA).

179. *Soviet Bloc Hearing*, supra note 176, at 29.

180. See *Food and Technology Embargo Hearings*, supra note 17, at 93.

181. *Soviet Bloc Hearing*, supra note 176, at 29-30 (statement of William Perry, Under Secretary of Defense for Research and Engineering).

182. See Appendix. One meeting in particular drew national attention. The CIA requested the American Vacuum Society's program for its 1980 conference on bubble memories in Santa Barbara. State, acting in cooperation with Defense and Commerce, advised the society to disinvite Chinese scientists and to require all foreign nationals to sign a pledge that they would not divulge unpublished information obtained at the conference to Eastern bloc nationals. See *id.* at 81-82. State, which was trying to improve relations with the PRC, did not want the Chinese disinvited. As a result, the Chinese arrived in Santa Barbara, were disinvited, and then admitted late on the condition they sign a pledge not to divulge information. Wade, *Science Meetings Catch the U.S.-Soviet Chill*, 207 SCI. 1056, 1056 (1980). The society's president, who was warned of the severity of EAR sanctions, agreed to the government's controls. *Id.* at 1058.

183. See Appendix.

184. The DIA and the CIA advise Defense and Commerce on individual licenses and on the types of goods and technical data which should be reviewed by Defense. *Id.* at 207-08 (written

about Soviet abuse of the scientific exchange program.¹⁸⁵ One scientist, who was head of Hungarian research on magnetic bubble memories, had been observed visiting American universities and conferences. Research observed by the Hungarian scientist was unclassified because it had not reached the stage where it could be applied to weapon systems,¹⁸⁶ but Defense believed that the technology "may have military application."¹⁸⁷

On October 1, 1980, Defense met its statutorily mandated deadline under the EAA¹⁸⁸ by publishing the initial MCTL in the *Federal Register*.¹⁸⁹ Unfortunately, the list did not simplify or clarify regulations by identifying militarily critical technology, as Defense had previously indicated it would.¹⁹⁰ Not only was publication limited to the MCTL's table of contents, but unlisted technical data were not precluded from control.¹⁹¹

Congress further aided Defense's controls over science in 1980 by imposing conditions on the funding of a Defense research program on Very High Speed Integrated Circuits (VHSIC). The conditions, contained in the explanatory statement of the conference report accompanying the Department of Defense Authorization Act,¹⁹² made funding contingent on the research's being controlled by the ITAR.¹⁹³ No legis-

answer to committee question by Kent Knowles, Director of Office of Export Administration).

185. *Id.* at 71 (statement of Jack Vorona, Deputy Director for Scientific and Technical Intelligence, DIA).

186. *Id.*

187. *Id.*

188. 50 U.S.C. app. § 2404(d)(4) (1982).

189. 45 Fed. Reg. 65,014 (1980). The Department of Energy also published a list of energy-related militarily critical technologies on October 1, 1980. *Id.* at 65,152.

190. See *Trade and Technology Hearing*, *supra* note 113, at 40 (statement of William Perry, Under Secretary of Defense for Research and Engineering). Secretary Perry states: "We believe that imposition of control on the technology transfer process and simplification and clarification of regulations that apply to militarily critical technologies will meet both the objectives of the Department of Defense and our National Economic objectives." *Id.*

191. See 45 Fed. Reg. 65,015 (1980).

192. Pub. L. No. 96-107, 93 Stat. 803 (1979); see H.R. CONF. REP. NO. 546, 96th Cong., 1st Sess. (1979).

193. H.R. CONF. REP. NO. 546, 96th Cong., 1st Sess. 41 (1979). The provision's origin is unknown. Neither the House nor the Senate committees initiated it; it simply appeared in a conference report. Compare H.R. REP. NO. 166, 96th Cong., 1st Sess. 102-03 (1979) (recommending deferral of VHSIC funding) and S. REP. NO. 197, 96th Cong., 1st Sess. 78 (1979) (proposing funding for VHSIC program) with H.R. REP. NO. 546, 96th Cong., 1st Sess. 41 (1979) (placing VHSIC program under ITAR) and S. CONF. REP. NO. 371, 96th Cong., 1st Sess. 43 (1979) (same). See generally Dickson, *Campus Chiefs Protest DOD Security Rules*, 11 SCI. & GOV'T REP. 5, 5 (May 1981) (describing appearance of VHSIC control provision). The joint explanatory statement read, in pertinent part:

The conferees . . . approved authorization for [the VHSIC] program with the following understanding:

The export of the technology developed in this program would be controlled

lative history exists to explain why the stringent controls were imposed. When VHSIC research was first sponsored by Congress, universities were informed that the program was unclassified and that research could be published.¹⁹⁴

In December 1980, the scientists learned of the change in the treatment of their research when Defense issued guidelines to VHSIC program directors. The program directors were instructed to distinguish between basic and applied research. Applied research, which was controlled under the ITAR, was not to be disclosed at open meetings or symposia, or to foreign nationals. If the program directors had difficulty delineating basic from applied research, they were instructed to forward research results to Defense for a determination. The guidelines declared Defense's preference that only citizens, or immigrants who had declared their intent to be citizens, participate in *basic* research.¹⁹⁵ A Defense official stated that "[i]n general [Defense does] not want to control academic exchanges of a basic science nature, [but we] are concerned possibly about some aspects of [the VHSIC] program, which have military applications."¹⁹⁶

where applicable by the International Traffic in Arms Regulations until the state-of-the-art for such technology progresses to the point where national security permits its transfer to other controls for export. H.R. CONF. REP. 546, 96th Cong., 1st Sess. 41 (1979). Because the condition on VHSIC funding was not part of the Authorization Act, it was not printed in the *Statutes at Large*, and could, therefore, remain in relative obscurity.

Id.

194. See Dickson, *Academe Ponders Defense Curbs on Research*, 11 SCI. & GOV'T REP. 5, 5 (Mar. 1981).

195. See Kolata, *Attempts to Safeguard Technology Draw Fire*, 212 SCI. 523, 526 (1981).

The reference to basic research read:

In the case of basic research supported by the VHSIC program, although such research and its results are not generally controlled, it is the preference of the Program Office that only U.S. citizens and immigrant aliens who have declared their intention of becoming citizens participate. Where this preference cannot be accommodated, the contractor should be directed to the Program Office for resolution.

Id. (quoting Memorandum to VHSIC Program Directors from Larry Sumney, Defense Department (Dec. 12, 1980)).

196. *Treasury Hearings*, *supra* note 161, at 170 (statement of Oles Lomacky, Director for Technology Trade, Office of Under Secretary of Defense for Research and Engineering).

Applying the ITAR to Defense-sponsored VHSIC research does not preclude application of similar export controls to private VHSIC research. The Munitions List only includes "[VHSIC] semiconductor devices that are specifically designed for military applications." 22 C.F.R. § 121.1 category XI (1990). The EAR, however, control other VHSIC technology. See 48 Fed. Reg. 28,633 (1983) (supplementary information to final rule adding VHSIC to Munitions List) ("All integrated circuits and related technical data which do not meet [VHSIC specifically designed for military applications] criteria will remain under the export controls of the Department of Commerce."); see also *Transfer of Technology Hearings*, *supra* note 1, at 264 (statement of Larry Sumney, Prior Director, VHSIC Program) ("We were also satisfied that the EAR would control commercial chips approximating VHSIC capability."). See generally Schmitt, *Scientific In-*

The universities and Defense attempted to resolve the dispute over the VHSIC controls quietly, but private resolution became impossible when a letter written to Defense, State, and Commerce by five university presidents was published on February 27, 1982.¹⁹⁷ The letter protested application of the ITAR and EAR to university activities and questioned Defense's capacity to differentiate basic from applied VHSIC research. The letter suggested that until Defense, State, and Commerce had thoroughly assessed the implications and effectiveness of a policy extending controls to unclassified research, the most sensitive parts of the VHSIC program should be relegated to classified research facilities.¹⁹⁸

Replies from the agencies to the university presidents' letter were uncoordinated.¹⁹⁹ A State official replied that no determination had been made on whether the VHSIC program came under the ITAR.²⁰⁰ Defense officials, realizing that their extensive university research program had been damaged, attempted to mitigate the effects of the dispute.²⁰¹ Defense accepted the Defense Science Board's recommendation to establish a forum of Defense and university representatives.²⁰² The subsequently formed DOD-University Forum²⁰³ created a Working Group on Export Controls to evaluate controls to protect technology vital to the national security while preserving free speech.

Another group was formed under the National Academy of Sciences. In the spring of 1982, the Panel on Scientific Communications

terchange and National Security, 35 *PHYSICS TODAY* 120, 120 (Dec. 1982) (arguing that controls on academic research would necessarily have a deleterious impact on industrial research).

A 1985 Defense security plan restricts VHSIC technology in the hands of American companies and research laboratories from acquisition by foreign countries and manufacturers. The plan includes application of export controls, controls over public disclosure of technical information, and security classification. See *VHSIC Security*, 122 *AVIATION WEEK & SPACE TECH.* 15, 15 (1985).

197. See Kolata, *supra* note 195, at 523.

198. Letter from Donald Kennedy, President, Stanford University; Marvin Goldberger, President, California Institute of Technology; Paul Gray, President, MIT; Frank Rhodes, President Cornell University; and David Saxon, President, University of California to Malcolm Baldrige, Secretary of Commerce; Alexander Haig, Jr., Secretary of State; and Caspar Weinberger, Secretary of Defense (Feb. 27, 1981), reprinted in *Export Administration Amendments Act of 1981: Hearings and Markup Before the House Comm. on Foreign Affairs and its Subcomm. on International Economic Policy and Trade*, 97th Cong., 1st Sess. 136, 136-68 (1981).

199. See Wilson, *supra* note 28, at 120. State and Commerce, which were relatively minor actors in the controversy, responded by separate letters. *Id.*

200. Letter from Under Secretary of State James Buckley (July 8, 1981), cited in Greenstein, *National Security Controls on Scientific Information*, 23 *JURIMETRICS J.* 50, 64 (1982).

201. Wilson, *supra* note 28, at 120. But see Weinberger, *Technology Transfers to the Soviet Union*, Wall St. J., Jan. 12, 1982, at 32, col. 3 (describing how Soviets are aided in acquiring technology by "merely reading the full range of technical literature openly published").

202. After examining export controls, the Defense Science Board recommended in its January 1981 report that a coordination group be created. See Wilson, *supra* note 28, at 120-21.

203. See 48 Fed. Reg. 54,095 (1983).

and National Security (panel) met for the first time under the leadership of Dale Corson, President Emeritus of Cornell University.²⁰⁴ The panel's mandate was to study, evaluate, and recommend a workable solution to the impasse between free scientific communication and national security concerns on technology transfer.²⁰⁵

Concurrent with the work of the panel and the DOD-University Forum, the VHSIC Working Group on Export Control implemented methods of protecting emerging VHSIC technology. Certain elements of the VHSIC program were designated for classification.²⁰⁶ Other VHSIC research was added to the Munitions List when the devices and accompanying technology reached the design state.²⁰⁷ Less advanced VHSIC research was regulated under the EAR.²⁰⁸ By implementing this three-stage approach, Defense not only controlled dissemination of VHSIC technology and prevented its commercial application but also developed a methodology to apply to other emerging technologies supported by Defense.²⁰⁹

Development of the MCTL, meanwhile, continued under a revised executive mandate that included control of "process know-how [that] enhance[d] Soviet military capabilities through contributions to key military support industries [such as] motor vehicular, chemicals, machine tool, computers, ship building, aerospace, and metallurgy."²¹⁰ A revised MCTL, issued in classified form in November 1981,²¹¹ was used by Defense as the basis for its export controls.²¹² Commerce, however, despite determining that identification of critical technology was

204. *Hearings on H.R. 5167, supra* note 3, at 1174 (statement of Edith Martin, Deputy Under Secretary of Defense for Research and Advanced Technology). The two other working groups established by the Forum studied Defense's engineering and science education requirements, and Defense's foreign language and area studies requirements. *Id.* at 1174-75.

205. PANEL ON SCIENTIFIC COMMUNICATION AND NATIONAL SECURITY, COMMITTEE ON SCIENCE, ENGINEERING AND PUBLIC POLICY OF THE NATIONAL ACADEMY OF SCIENCES, NATIONAL ACADEMY OF ENGINEERING, AND INSTITUTE OF MEDICINE, SCIENTIFIC COMMUNICATION AND NATIONAL SECURITY ix-xii (1982) [hereinafter CORSON REPORT].

206. *High Technology Hearings, supra* note 25, at 593 (statement of Stephen Bryen, Deputy Assistant Secretary of Defense for International Economics, Trade and Security Policy).

207. *Id.* at 592-93. Plans for an IEEE workshop on the VHSIC program were aborted when Defense officials advised the workshop's organizers that a discussion of the chips' performance would require participants to show proof of United States citizenship. Willenbrock, *National Security and Open Technical Communications*, 2 IEEE TECH. & SOC'Y MAG. 7, 9 (Dec. 1983).

208. *High Technology Hearings, supra* note 25, at 592.

209. *Id.* at 593; Dallmeyer, *National Security and the Semiconductor Industry*, 90 TECH. REV. 47, 51 (Nov.-Dec. 1987).

210. See Letter from Senator Jackson to Harold Brown, Secretary of Defense (Oct. 1, 1980), reprinted in 128 CONG. REC. 1642 (1982).

211. See UNITED STATES COMPTROLLER GENERAL, EXPORT CONTROL REGULATION COULD BE REDUCED WITHOUT AFFECTING NATIONAL SECURITY app. I, at 32 (1982).

212. *Id.* at 31.

“the essence of export controls,”²¹³ considered the MCTL to be inadequate, and refused to use it as the basis of its export controls.²¹⁴

Within Defense, responsibility for developing the MCTL remained with the Office of Research and Engineering, but the Office of International Security Policy (Policy) became the contact for inter-agency and international development and implementation.²¹⁵ In practice, communication and coordination between the two Defense offices was often inadequate, leading to policy decisions being made by either office alone.²¹⁶ Policy cooperated with Commerce in incorporating the MCTL into the Control List, with technical assistance provided by Research and Engineering.²¹⁷ Defense did not limit its contribution to export decisions to items it considered critical but also commented on “important” items.²¹⁸

In January 1982, Admiral Inman, Deputy Director of the CIA, suggested to the Annual Meeting of the American Association for the Advancement of Science (AAAS) that the scientific community voluntarily adopt a system of prior restraint.²¹⁹ Admiral Inman was concerned

213. CONGRESSIONAL RESEARCH SERVICE, 97TH CONG., 2D SESS., EAST-WEST COMMERCIAL POLICY: A CONGRESSIONAL DIALOGUE WITH THE REAGAN ADMINISTRATION 26 (Comm. Print 1982) (prepared for Joint Economic Committee) (answer by Commerce).

214. UNITED STATES COMPTROLLER GENERAL, *supra* note 211, at 31. Industry considered that the MCTL should be integrated into the Cocom List before it was implemented in the United States. *Id.*

215. *East-West Economic Relations: Hearing Before the Subcomm. on International Economic Policy of the Senate Comm. on Foreign Relations*, 97th Cong., 1st Sess. 50 (1981) [hereinafter *East-West Relations*] (on setting out Defense's responses to questions submitted by the subcommittee).

216. See H.R. REP. NO. 664, 97th Cong., 2d Sess. 42 (1982).

217. *East-West Relations*, *supra* note 215, at 50. Defense officials also envisioned moving some MCTL items to the Munitions List. *Export Controls on Oil and Gas Equipment: Hearings and Markup on H.R. 6838, Before the House Comm. on Foreign Affairs and its Subcomms. on Europe and the Middle East and on International Economic Policy and Trade*, 97th Cong., 1st Sess. 23 (1981) [hereinafter *Oil Equipment Hearings*] (responses by Richard Perle, Assistant Secretary of Defense for International Security Policy).

218. *Oil Equipment Hearings*, *supra* note 217, at 45-46 (statement of Richard Perle, Assistant Secretary of Defense for International Security Policy). Secretary Perle remarked:

I think the list will have one very important impact; that is it will enable us to distinguish between things that it is critically important to limit and things that it is not so critically important to limit. There are things that, while not critical, are nevertheless important, and these will necessarily have to be examined on a case-by-case basis.

Id. at 46.

219. Address given by Admiral Bobby Inman, at the Annual Meeting of the American Association for the Advancement of Science (Jan. 7, 1982), reprinted in *Impact of National Security Considerations on Science and Technology: Hearings Before the Subcomm. on Science, Research, and Technology and the Subcomm. on Investigations and Oversight of the House Comm. on Science and Technology*, 97th Cong., 2d Sess. 230, 237 (1982) [hereinafter *Impact Hearings*]. In a subsequent extension of his speech, Admiral Inman rationalized his suggestion for voluntary restraints on scientific information. Inman stated:

Society, acting through its elected and appointed Federal officials—whether in Con-

that national security could be damaged by publication of cryptographic research and certain other technical information, including computer hardware and software, lasers, and even crop projections.²²⁰ Inman later explained that his purpose in suggesting a voluntary system was to spur scientists into action in lieu of anticipated action by the federal government.²²¹ He realized that a system of prior restraint would be unpopular with scientists, but he believed that they would be able to differentiate between controls on scientific research which could be freely communicated and controls on scientific developments sought by the Soviet Union.²²²

Also, in January 1982, the Defense Science Board on University Responsiveness to National Security Requirements published a report which determined that universities could not be exempted from the ITAR and EAR.²²³ The report recommended that guidelines be negotiated for non-Defense-funded research and, if necessary, for non-federally-funded research that could potentially be subject to the ITAR and EAR.²²⁴ At the same time, the Assistant Secretary of Defense for International Security Policy, Richard Perle, threatened to terminate United States defense contracts with allied nations in order to persuade the allies not to export their technology to Soviet bloc nations.²²⁵ By emphasizing that "[t]he age of the technology is irrelevant,"²²⁶ Perle extended the critical technologies approach to technology that was not

gress, the Executive Branch, or the Judiciary, as well as at the local level—sometimes does impose restrictions on its citizens' rights to have or to use information. Examples abound. One of the most interesting is that, in many locations, courts do not publish the names of juvenile offenders.

Inman, *One View of National Security and Technical Information*, 1 IEEE TECH. & SOC'Y MAG. 19, 20 (Sept. 1982).

The idea for voluntary prior restraint is not new. During World War II, the National Academy of Sciences established a Joint Advisory Committee on Scientific Publications to review papers submitted for publication in certain scientific fields to determine if the papers contained militarily significant information. The fields included nuclear physics, microwave radio development, and medical research. See generally Sokal, *From the Archives: Cattell and World War II Censorship*, 10 SCI., TECH., & HUMAN VALUES 24, 24 (Spring 1985).

220. Inman, *Impact Hearings*, *supra* note 219, at 230, 234.

221. *High Technology Hearings*, *supra* note 25, at 249 (statement of Admiral Bobby Inman, Deputy Director, CIA).

222. *Id.*

223. OFFICE OF THE UNDER SECRETARY OF DEFENSE, RESEARCH AND ENGINEERING, REPORT OF THE DEFENSE SCIENCE BOARD TASK FORCE ON UNIVERSITY RESPONSIVENESS TO NATIONAL SECURITY REQUIREMENTS 5-4 (1982).

224. *Id.* at 6-2.

225. Mann, *U.S. Presses 2 Nations on Export of Technology*, 116 AVIATION WEEK & SPACE TECH. 27 (Feb. 1, 1982). Richard Perle, Assistant Secretary of Defense for International Security Policy, told a subcommittee of the President's Export Council that "[i]n the real world, I think it's the only kind of leverage that's likely to work." *Id.*

226. *Id.*

state-of-the-art.

Controls on science were also exerted from a new quarter. The Administration published an executive order on security classification that omitted a previous reference excluding basic research from classification.²²⁷ The executive order, which relaxed the criteria under which information could be classified,²²⁸ included cryptography as a classifiable category.²²⁹ The executive order also authorized agencies to "safeguard" information pending a decision to classify.²³⁰

Meanwhile, Secretary of Defense Weinberger submitted a budget report to Congress that included an expression of concern about technology transferred during conferences and symposia.²³¹ The report included the broad categories of electronics, materials sciences, and life sciences as examples of critical military technologies.²³² Further indicia of technology transfer to the Soviets were contained in an unclassified version of the CIA's report entitled *Soviet Acquisition of Western Technology*.²³³ The report described the role of open literature, conferences, and student scientific and technological exchanges as Soviet technology-acquisition mechanisms.

Against this evidence of the Soviets' acquisition of American science and technology, the Corson Panel published its *Report on Scien-*

227. Draft of Executive Order 12,356, *reprinted in Executive Order on Security Classification: Hearings Before a Subcomm. of the House Comm. on Government Operations*, 97th Cong., 2d Sess. 241 (1982). The provision was reinserted in the final Executive Order. *See* Exec. Order 12,356 § 1.5(b), 3 C.F.R. 170 (1983), *reprinted in* 50 U.S.C. § 401 note, at 51, 53 (1982). It was suggested that the provision excluding basic research had originally been omitted by the Administration because it proposed creating a new category of classified information based on the test of " 'protection in the interest of national security.' " Letter from Frank Press, National Academy of Sciences, to William Clark, Assistant to the President for National Security Affairs (Feb. 26, 1982), *reprinted in Impact Hearings*, *supra* note 219, at 85-86.

228. *Compare* Exec. Order 12,356, § 1.1(a)(3), 3 C.F.R. 167 (1983), *reprinted in* 50 U.S.C. § 401 note, at 51 (1982) (" 'Confidential' shall be applied to information . . . expected to cause damage to the national security.") with Exec. Order 12,065, § 1-104, 43 Fed. Reg. 28,949, 28,950 (1978) (" 'Confidential' shall be applied to information . . . expected to cause *identifiable* damage to the national security.") (emphasis added). *See generally* Rosenbaum, Tenzer, Unger, Van Alstyne, & Knight, *Academic Freedom and the Classified Information System*, 219 Sci. 257, 257-59 (1983) (describing overbreadth of Exec. Order 12,356).

229. Exec. Order 12,356, § 1.3(a)(8), 3 C.F.R. 169 (1983), *reprinted in* 50 U.S.C. § 401 note, at 52 (1982).

230. *Id.* § 1.1(c), 3 C.F.R. 167 (1983), *reprinted in* 50 U.S.C. § 401 note, at 52 (1982). The section states that "[i]f there is reasonable doubt about the need to classify information, it shall be safeguarded as if it were classified 'confidential' " until a determination is made within thirty days. *Id.* The Defense Directive implementing Executive Order 12,356 repeats this language. *See* 32 C.F.R. § 159.13(a)(2) (1987).

231. Report of Secretary of Defense Caspar W. Weinberger to the Congress on the FY 1983 Budget, FY 1984 Authorization Request and FY 1983-1987 Defense Program 81 (1982).

232. *Id.* at 74.

233. CENTRAL INTELLIGENCE AGENCY, *supra* note 6, at 2.

tific Communication and National Security. The report concluded that universities and scientific communication account for "very little of this technology transfer problem."²³⁴ It recommended that controls should not be imposed on basic or applied technologies unless: (1) the technology was "developing rapidly;" (2) the technology "had identifiable direct military applications [or was] dual-use and involve[d] process or production-related techniques;" (3) transfer of the technology would "give the U.S.S.R. a significant near-term military advantage;" and (4) "[t]he United States [was] the only source of information about the technology, or other friendly nations that could also be the source "[had comparatively secure] control systems"²³⁵ If a technology met all four criteria, but was not sensitive enough to be classified, the panel recommended that foreign nationals should be prohibited from direct participation in research and that prepublication review by the federal agency sponsoring the research should occur simultaneously with submission of papers to a publisher. Under no circumstances should the ITAR and EAR be applied to these "gray areas."²³⁶ The panel also advised against extensive use of the voluntary pre-publication system applied to cryptography and recommended that the MCTL be drastically streamlined.²³⁷

Panel Chairman Dale Corson stated that he knew of no way to obtain clear definitions of what was on the MCTL and that "people who are going to be subject to heavy fines through the implementation of [the ITAR and EAR] will not be able to know what it is that the violation is based on."²³⁸ Corson confessed he did not "know how to protect against Pentagon intervention."²³⁹

The Administration initiated an interagency study of the panel's proposals, but the study proved to be ineffectual.²⁴⁰ The Working

234. CORSON REPORT, *supra* note 205, at 1. The panel received security clearance by the CIA and FBI. Out of all the classified and unclassified documents viewed by it, the panel found virtually no evidence of damaging technology transfer via university scientific laboratories or bilateral government agreements. *Overview of International Science and Technology Policy: Hearings Before the House Comm. on Foreign Affairs and Its Subcomms. on International Security and Scientific Affairs and on International Operations*, 98th Cong., 1st Sess. 77-78 (1983) (statement of Frank Press, President, Academy of Sciences).

235. CORSON REPORT, *supra* note 205, at 65.

236. *Id.* at 66.

237. *Id.* at 67. The panel did, however, recommend that the prepublication for cryptology be considered as a future option. *Id.*

238. Corson, *What Price Security?*, 36 *PHYSICS TODAY* 42, 47 (Feb. 1983).

239. *Id.* at 45.

240. The interagency study group met for long sessions but failed to reach a consensus. The study disbanded but subsequently formed again with a broader charter that included the study of nongovernmental scientific research. *See Stifling Scientific Communications to Protect US Technology*, 36 *PHYSICS TODAY* 41, 43 (June 1983).

Group on Export Controls of the DOD-University Forum concluded that it was probably necessary to impose some restrictions so that the transfer of militarily critical technologies such as microelectronics, cryptology, and computer software would be slow.²⁴¹ The group recommended contract provisions in Defense-sponsored research to allow for simultaneous publication review in lieu of information control by the EAR and the ITAR.²⁴² The group determined, however, that items were included in the MCTL by using broader criteria than those specified in the *Corson Report* and recommended that only "gray areas" on the list be controlled.²⁴³

The *Corson Report* did little, however, to limit the growth of Defense's critical technologies approach. In 1982, Secretary Perle suggested to Congress that Defense needed additional authority to impose export controls.²⁴⁴ In his view, even though the EAA provided Defense with extensive authority, that authority was restricted because of a narrow interpretation given to it by Commerce.²⁴⁵ At the same time, Perle actively promoted the MCTL's incorporation within the Control List and the Cocom List.²⁴⁶ Defense determined that the technical data section of the EAR was "the major sieve through which our technology had been leaking"²⁴⁷ and drafted a proposed revision of the section from the MCTL's lists of "arrays of know-how."²⁴⁸ Defense recommended to Commerce that if technical data was included in the

241. Working Group of Export Controls, Controls to Delay the Transfer of "Sensitive" Technology in University Settings, *reprinted in Technology Transfer Hearings*, *supra* note 10, at 258.

242. *Id.* at 260-61.

243. *Id.* at 260.

244. See *Hearings on Military Posture and H.R. 5968, Department of Defense Authorization for Appropriations for Fiscal Year 1983 Before the House Comm. on Armed Services*, pt. 5, 97th Cong., 2d Sess. 142 (1982) (statement of Richard Perle, Assistant Secretary of Defense for International Security Policy). Secretary Perle stated, "We have tried to come to grips with [technology transfer] in the Department of Defense, although the statutory authority of the Department of Defense is, in my judgment, inadequate to play the full role I think we ought to play in developing government positions with respect to technology transfers." *Id.* Perle explained that Defense's role was mostly advisory and that "[a]s a practical matter, it is difficult for the Department of Defense always to say no[,] and bargains are struck, accommodations are made, and the final result is not nearly as careful and deliberate as one would hope." *Id.* at 143.

245. See *Technology Transfer Hearings*, *supra* note 10, at 84, 90 (statement of Richard Perle, Assistant Secretary of Defense for International Security Policy).

246. See *id.* at 195-96. Defense proposals on technical data were also forwarded to Commerce for incorporation into the EAR. See Mann, *Proposal Would Tighten Data Export*, 117 AVIATION WEEK & SPACE TECH. 115, 115-17 (Dec. 6, 1982).

247. *High Technology Hearings*, *supra* note 25, at 556 (statement of Michael Lorenzo, Under Secretary of Defense for International Programs and Technology); see 15 C.F.R. pt. 779 (1990); 55 Fed. Reg. 25,086-89 (1990) (interim rule).

248. *High Technology Hearings*, *supra* note 25, at 556 (statement of Michael Lorenzo, Under Secretary of Defense for International Programs and Technology).

MCTL, there should be a presumption that export of that data to Soviet nations was denied.²⁴⁹ The revisions proposed controlling exports of critical technical data to *all* destinations outside the United States.²⁵⁰

The MCTL, which now included a section on cryptography,²⁵¹ did not narrow the Control List and Munitions List as intended by Congress,²⁵² but rather added a new layer of controls with a wider scope than the original controls.²⁵³ The MCTL was now implemented by an automated data service containing 10,000 pages of supplemental information, including historical files of foreign military sales and munitions licenses, country assessments, and weapon systems reference lists.²⁵⁴ Although the purpose of the MCTL was to supplement items on the Control or Munitions Lists,²⁵⁵ in practice the list was used by some Pentagon officials as the basis for denial of export licenses.²⁵⁶

Defense coordinated the different parts of its critical technologies approach in January 1983 by establishing the internal Steering Committee on National Security and Technology Transfer. This committee formulated Defense policy on export controls pertaining to "unclassified, but militarily sensitive technology."²⁵⁷ Five subcommittees were also formed. The Subcommittee on Contract Controls examined methods for using contracts "as a technology export control mechanism."²⁵⁸ The Subcommittee on Visa Controls examined methods of controlling foreign participation in American research, including a review of patent processes.²⁵⁹ The Subcommittee on Monitoring of Emerging Technolo-

249. *Technology Transfer Hearings*, *supra* note 10, at 156 (statement of Talbert Lindstrom, Deputy Under Secretary of Defense for International Programs and Technology).

250. Mann, *supra* note 246, at 115.

251. *Defense Department Authorization and Oversight Hearings on H.R. 2287, Department of Defense Authorization of Appropriations for Fiscal Year 1984 and Oversight of Previously Authorized Programs Before the House Comm. on Armed Services*, pt. 5, 98th Cong., 1st Sess. 206 (1983) [hereinafter *1984 Defense Authorization Hearings*] (statement of Richard DeLauer, Under Secretary of Defense for Research and Engineering).

252. *See Extension Hearings*, *supra* note 29, at 421 (statement of Allen Frischkorn, Assistant Vice President, GTE Corporation); *see also supra* text accompanying note 139.

253. *See id.* at 459; *id.* at 479 (statement of Rep. Bonker).

254. *High Technology Hearings*, *supra* note 25, at 189-90, 556-57. The automated data service is available to all agencies involved in technology transfer restrictions, including Defense, State, Commerce, and Energy. *1984 Defense Authorization Hearings*, *supra* note 251, at 210.

255. *1984 Defense Authorization Hearings*, *supra* note 251, at 206.

256. *See Debevoise, Trade Restraints—The Legal-Political Dichotomy*, 14 TOLEDO L. REV. 1299, 1309 n.43 (1983) (citing Debevoise's personal conversation with Pentagon officials).

257. *See Technology Transfer Hearings*, *supra* note 10, at 247 (statement of Leo Young, Deputy Under Secretary of Defense for Research and Engineering).

258. *Id.*

259. *Id.* Subsequent to the subcommittee's proposal and an interagency review, State implemented a policy of denying visas to foreign visitors who had the potential to be a source of technology loss. The Department of Justice's Immigration Service (or the federal agency involved in acquiring visas) was permitted to impose restrictions on conditional visas or to otherwise condition

gies attempted to establish a mechanism by which new technologies could be screened for military significance.²⁶⁰ The Subcommittee on Scientific Conferences and Trade Shows formulated a directive to control participation and attendance by Defense employees and contractors at meetings where unclassified but militarily sensitive technology was discussed.²⁶¹ Finally, the Subcommittee on Publication and Presentation of Research Papers developed procedures to control information being transferred through the publication and presentation process.²⁶²

The steering committee incorporated the subcommittees' proposals into recommendations which were subsequently included in Defense Directive 2040.2,²⁶³ which formulated Defense policy under the ITAR, EAR, and various other Defense directives and instructions. This directive formally established a Defense International Technology Transfer Panel (IT²)²⁶⁴ composed of representatives of Defense, DIA, CIA, and the Armed Services.²⁶⁵ The directive described defense-related technol-

entry into the United States. See Wallerstein, *supra* note 12, at 464.

260. *Technology Transfer Hearings*, *supra* note 10, at 247 (statement of Leo Young, Deputy Under Secretary of Defense for Research and Engineering). The subcommittee recommended that the "region of emergence" should be based on whether research was classified 6.1 (basic research) or 6.2 (exploratory development). All 6.2 research was to be subject to case-by-case review for potential military usefulness. See Mann, *U.S. Drafts Research Data Controls*, 120 AVIATION WEEK & SPACE TECH. 101, 101 (Mar. 19, 1984).

261. *Technology Transfer Hearings*, *supra* note 10, at 247 (statement of Leo Young, Deputy Under Secretary of Defense for Research and Development). In April of 1984, the Vice Chief of Naval Material sent a memorandum to the Deputy Chief of Naval Material for Technology and the Commander of Naval Sea Systems Command stating: "The Chief of Naval Material does not want Navy Material Command personnel actively participating in non-DOD sponsored symposia, conferences or other similar forums on weapons and associated technologies related subjects." *DOD Policy on Participation of Employees in Non-DOD Sponsored Symposia and Conferences*, 3 AAAS BULL. SCI. FREEDOM & NAT'L SECURITY 2, 2-3 (Sept. 1984) (quoting Memorandum from the Vice Chief of Naval Material to the Deputy Chief of Naval Material for Technology and the Commander, Naval Sea Systems Command (Apr. 2, 1984)). The memorandum named as potential sources of technology loss four civilian Navy employees who were instructors in radar at a continuing education program at George Washington University. The university's programs were unclassified. Marshall, *Do Seminars Leak Navy Secrets?*, 224 SCI. 1409, 1409 (1984).

262. *Technology Transfer Hearings*, *supra* note 10, at 247 (statement of Leo Young, Deputy Under Secretary of Defense for Research and Development).

263. See *id.* Defense Directive 2040.2 was first issued in draft form as Defense Directive 2040.xx. The draft directive exacerbated an internal split between Policy and Research and Engineering. The Under Secretary of Defense for Research and Engineering refused to concur with the directive unless authority for the final Defense position on munitions licenses were retained in his office. See Mann, *Task Force Urges Arms Policy Shifts*, 119 AVIATION WEEK & SPACE TECH. 139, 139 (Oct. 3, 1983). The power struggle was eventually resolved in Policy's favor. See *Technology Transfer Hearings*, *supra* note 10, at 174 (statement of Richard Perle, Assistant Secretary of Defense for International Security Policy).

264. Department of Defense Directive 2040.2 (Encl. 2) (Jan. 17, 1984).

265. *Stifling Scientific Communications to Protect US Technology*, 36 PHYSICS TODAY 41, 42 (June 1983).

ogy as "a valuable, limited national security resource."²⁶⁶ Transfer mechanisms subject to controls included foreign exchanges involving scientists, engineers, students, and other academicians,²⁶⁷ international symposia and meetings on advanced technology,²⁶⁸ and the dissemination of technical reports and data.²⁶⁹ The directive relied on the MCTL for the list of critical technologies to be controlled.²⁷⁰ Supplementing the MCTL was a new list recommended by the Subcommittee on Monitoring of Emerging Technologies. The Militarily Significant Emerging Technologies Awareness List (METAL) listed technologies that had not emerged from basic research.²⁷¹

The procedure recommended by another subcommittee, the Subcommittee on Publication and Presentation of Research Papers, came under attack from the scientific community, however. This subcommittee had recommended that nonsensitive papers based on Defense-sponsored research be submitted to Defense simultaneously with their submission for publication. Defense could not deny publication of these papers. Sensitive papers based on Defense-sponsored basic research were to be submitted to Defense sixty days before they were submitted for publication. Defense could deny publication of these sensitive papers.²⁷²

Many universities protested strongly to Defense about the prepublication review process, warning that they would not accept research contracts containing the restrictions.²⁷³ In response, Defense revised its policy, excluding basic or fundamental research from restrictions. Ap-

266. Department of Defense Directive No. 2040.2 pt. D (Jan. 17, 1984).

267. *Id.* at Definitions (12)(b).

268. *Id.* at (12)(l).

269. *Id.* at (12)(o). The term "technical data" embraces "[c]lassified or unclassified information of any kind that can be used, or adapted for use, in the design, production, manufacture, repair, overhaul, processing, engineering, development, operation, maintenance, or reconstruction of goods or munitions, or any technology that advances the state of the art or establishes a new art in an area of significant military applicability in the United States." *Id.* at (10).

270. *Id.* at pt. E(2)(b). "Critical technology" is defined to include technologies "that would make a significant contribution to the military potential of any country or combination of countries and that may prove detrimental to the security of the United States . . ." *Id.* at Definitions (1).

271. See Wallerstein, *supra* note 12, at 465-66 & n.11. It is difficult to envision how a technology that has not emerged from basic science may be differentiated from basic science itself. "Emerging technologies" appears to be a euphemism for basic science, unless for some unknown reason the subcommittee was attempting to draw a distinction between basic research and theoretical science.

272. See David, *Pentagon Asks for Stricter Controls on Publication*, 307 NATURE 401, 401 (1984).

273. See *Pentagon R & D Chiefs Feuding on Campus Secrecy*, 14 SCI. & GOV'T REP. 1, 1-2 (May 1, 1984) (citing letter from Paul Gray, President, MIT; Marvin Goldberger, President, Cal Tech; and David Kennedy, President, Stanford University to George Keyworth, Presidential Science Advisor, and Richard DeLauer, Under Secretary of Defense for Research and Development).

plied research was to be restricted only rarely, and all restrictions were to be contractually agreed upon before the research was undertaken.²⁷⁴

Defense's revised policy was eventually applied to all federal agencies with its publication in 1985 as a National Security Decision Directive. The directive cited the *Corson Report's* conclusion that scientific communication of fundamental research was only a minor contributor to the Soviet acquisition of militarily critical technology. The directive stated that although the problem could become significant, "[n]o restrictions may be placed [by federal agencies] upon the conduct or reporting of Federally-funded fundamental research that has not received national security classification, except as provided in applicable U.S. Statutes."²⁷⁵

Although the directive permitted the continued application of the export control laws, scientists generally viewed it as a sign that the steady increase of controls on scientific information had ended.²⁷⁶ A Defense official assured the scientists that although the directive did not eliminate the possible classification of ongoing research, such classification would be "a very, very remote possibility."²⁷⁷ Unfortunately, this assurance has not proven reliable.²⁷⁸

Defense's strategy appeared to have changed from confrontation to

274. Memorandum Concerning Publication of the Results of DOD Sponsored Fundamental Research, Reference DOD Directive 2040.2 (Oct. 1, 1984), cited in Shattuck, *FEDERAL RESTRICTIONS ON THE FREE FLOW OF ACADEMIC INFORMATION AND IDEAS* 28 (Harv. Univ. 1984); see Norman, *Universities Prevail on Secrecy*, 226 *SCI.* 418, 418 (1984). Defense's revised policy was announced during a congressional hearing in March 1984. *Scientific Communications and National Security: Hearing Before the Subcomm. on Science, Research, and Technology and the Subcomm. on Investigations and Oversight of the House Comm. on Science and Technology*, 98th Cong., 2d Sess. 138 (1984) [hereinafter *Scientific Communications Hearing*] (statement of Edith Martin, Deputy Under Secretary of Defense for Research and Engineering).

275. National Security Decision Directive 189 (Sept. 21, 1985); see Corson, *What Is Federal Policy on Scientific Communication?*, 40 *PHYSICS TODAY* 144, 144 (Jan. 1987) (determining that the 1985 directive appeared to be similar to the policy advocated in the Corson Report).

276. See, e.g., Branscomb, *Ensuring that Fundamental Research Remains Unrestricted*, 38 *PHYSICS TODAY* 176, 176 (Nov. 1985); Corson, *supra* note 275, at 144; Goodwin, *Reagan Issues Order on Science Secrecy: Will It Be Obeyed?*, 38 *PHYSICS TODAY* 55, 55 (Nov. 1985). The final policy required enforcement of the directive "to the maximum extent possible . . ." See National Security Decision Directive 189 (Sept. 21, 1985).

277. See Smith, *White House Issues Secrecy Guideline*, 230 *SCI.* 152, 152 (1985) (quoting Colonel Donald Carter, Under Secretary of Defense for Research and Advanced Technology).

278. See SHATTUCK & MORISEY-SPENSE, *GOVERNMENT INFORMATION CONTROLS: IMPLICATIONS FOR SCHOLARSHIP, SCIENCE AND TECHNOLOGY* (1988) (noting the tendency by federal agencies to classify research-in-progress rather than classifying before research is commenced); see also *The Computer Security Act of 1987: Hearing Before the Subcomm. on Science, Research and Technology and the Subcomm. on Transportation, Aviation and Materials of the House Comm. on Science, Space, and Technology*, 100th Cong., 1st Sess. 15 (1987) (statement of Donald Latham, Assistant Secretary of Defense for Command, Control, Communications and Intelligence) (describing how an unclassified research program may become partially classified).

conciliation. In September 1985, Defense had released an updated report of the Soviet acquisition of Western technology aimed at increasing public awareness of the problem.²⁷⁹ By demonstrating to scientists that they were one of the targets of the Soviet program, Defense hoped that scientists would practice self-restraint in keeping their ideas from the Soviet bloc.²⁸⁰

In 1984 and 1985, Congress again aided Defense in expanding its critical technologies approach. Section 1217(a) of the Department of Defense Authorization Act of 1984 exempted unclassified sensitive technical data from public disclosure under the Freedom of Information Act.²⁸¹ As part of Defense's implementation of this policy, all unclassified technical documents funded by Defense are labeled. Each category of documents, except those cleared for unlimited distribution, may be labelled with an export control warning if the Defense technical program manager determines that "export-controlled technical data" is contained in the document.²⁸²

279. TECHNOLOGY TRANSFER INTELLIGENCE COMMITTEE, SOVIET ACQUISITION OF MILITARILY SIGNIFICANT WESTERN TECHNOLOGY: AN UPDATE (Sept. 1985). The report was produced by the Interagency Group on Technology Transfer, chaired by an Under Secretary of State. See *Implementation of the Export Administration Act of 1985: Hearings Before the Subcomm. on International Economic Policy and Trade of the House Comm. on Foreign Affairs*, 99th Cong., 1st Sess. 62, 70 (1985) (statement of Stephen Bryen, Deputy Under Secretary of Defense for Trade Security Policy).

280. See Memorandum to AAAS Committee on Scientific Freedom and Responsibility from Stephen Gould, Director, Project on Scientific Communication and National Security (Oct. 4, 1985).

281. Pub. L. No. 98-84, § 1217(a), 97 Stat. 614, 690 (codified at 10 U.S.C. § 130 (1988)); see DOD Directive 5230.25, 49 Fed. Reg. 48,040 (Dec. 10, 1984); Final Rule on Withholding of Unclassified Technical Data from Public Disclosure, codified at 32 C.F.R. pt. 250 (1989).

The provision's purpose was to give "Defense the discretion not to disclose pursuant to a Freedom of Information Act request certain technical information which is in the possession or under the control of the Department of Defense." S. REP. NO. 174, 98th Cong., 1st Sess. 262, reprinted in 1983 U.S. CODE CONG. & ADMIN. NEWS 1081, 1152.

The report of the Senate Committee on Armed Services described the section as authorizing "Defense to withhold from public disclosure certain kinds of valuable technical data with military or space application." *Id.* at 260, reprinted in 1983 U.S. CODE CONG. & ADMIN. NEWS at 1150. The report listed "blueprints and military specifications for weapons and other military equipment, drawings, plans, technical instructions and other similar unclassified technical data." *Id.* (emphasis added). The report did not list scientific research, either in the form of publications or presentations.

282. Department of Defense Directive 5230.24(F)(4)(d) (Nov. 20, 1984). In addition to a distribution statement, export-controlled documents may bear the following notice at the discretion of Defense officials: "WARNING—This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec. 2751 *et seq.*) or Executive Order 12470. Violation of these export laws are subject to severe criminal penalties." *Id.* at (Encl. 3)(8)(a). Technical data is defined as "[a]ny blueprints, drawings, plans, instructions, computer software and documentation, or other technical information that can be used or be adapted for use to design, engineer, produce, manufacture, operate, repair, overhaul, or reproduce any military or space equipment or technology concerning such equipment." *Id.* at (Encl. 3)(7)(a) (incorporating

Pursuant to section 1217(a), Defense required scientific societies to present export-controlled papers in separate sessions that deny entry to foreign nationals.²⁸³ Although several scientific societies refused to hold the sessions,²⁸⁴ Defense promulgated regulations establishing this procedure.²⁸⁵

Section 1217(a) has permitted Defense to control unclassified technical data that it considers to be "sensitive." Thus, Congress has aided Defense in the creation of a new level of unclassified but restricted data. The limits of the new level of restricted data are amorphous, although Defense stated that the restrictions would not be imposed on the presentation of unclassified fundamental research. An exception exists, however, for presentations that Defense believes will reveal data that is "unique and critical to defense."²⁸⁶ The regulations thus attempted to reassure the scientific community that basic-research presentations would be unrestricted, but in doing so they established an exception to control such presentations.

In 1985, Congress renewed the EAA again. The Act had been due for renewal in 1984, but Congress had been unable to agree on all the Act's aspects.²⁸⁷ A major point of contention centered on whether Defense's authority over export controls should be extended.²⁸⁸ This obsta-

by reference Department of Defense Directive 5230.25 (Encl. 2)(6) (Nov. 6, 1984)); see also 32 C.F.R. pt. 250 (1989) (withholding of unclassified technical data from public disclosure).

283. The first implementation of section 1217(a) occurred in April 1985 when Defense required the Society of Photo-Optical Engineers to hold a closed session if the society wished twenty-six scheduled papers to be presented. See Borrelle, *DOD Disrupts SPIE Symposium*, 11 OPTICS NEWS 10, 10 (May 1985). Entry to the session was by driver's license as proof of citizenship. See Klass, *Defense Department Restricts Papers at SPIE Technical Conference*, 122 AVIATION WEEK & SPACE TECH. 19, 19 (April 15, 1985). Canadian and United States scientists could, alternatively, complete an Export-Controlled DOD Technical Data Agreement. Citizens of other nations could only attend export-controlled sessions if their embassies requested the Pentagon to approve the registrant's attendance. See Borrelle, *supra*, at 10.

284. See CHALK & GOULD, REPORT OF AN AAAS SURVEY OF SCIENTIFIC AND TECHNICAL MEETING POLICIES 5 (May 1986).

285. 32 C.F.R. pt. 249 (1989).

286. *Id.* § 249.3. The regulations also include a procedure for Defense to review voluntarily submitted papers for national security concerns. *Id.* § 249.5(f).

287. A last minute attempt to renew the EAA failed due to disagreement between the Houses on provisions concerning South Africa, the role of Defense in export administration (§ 10(g)), and the effects of presidential foreign policy controls on current international contracts (e.g., agricultural commodities). See 130 CONG. REC. S14,334 (daily ed. Oct. 11, 1984) (statement of Sen. Heinz); see also Gonzales, *How to Increase Technology Exports Without Risking National Security—An In-Depth Look at the Export Administration Amendments Act of 1985*, 8 LOY. L.A. INT'L & COMP. L.J. 399, 412 (1986).

288. 131 CONG. REC. H5062 (daily ed. June 27, 1985) (statement of Rep. Bereuter); see Zschau, *supra* note 145, at 14. The Senate bill contained many recommendations from Defense. See *id.* The House was so adamant in its opposition to extending Defense's authority over export controls that Zschau, a key Congressman in the debate, believes that the House would have forgone renewal of the EAA rather than pass a bill extending Defense's authority. See *id.* at 17.

cle to the Act's renewal was removed when the President issued a classified order increasing Defense's export control authority to include review of licenses for non-communist countries in addition to communist countries.²⁸⁹ Defense had sought the authority so that Commerce could no longer restrict its implementation of the EAA.²⁹⁰

Hearings and debates on the EAA's renewal centered on the effects on commerce of export controls. In the face of growing concern over the United States' competitiveness in high technology trade,²⁹¹ the controls' effects on science became secondary once again.²⁹² A move to statutorily adopt the *Corson Report's* criteria for determining militarily critical technology failed.²⁹³ The 1984 conference committee agreed, however, that "scientists and other scholars [should be able] freely to communicate their research findings . . ." ²⁹⁴ House conference members insisted on a policy statement that "an overly broad interpretation of the Export Administration Act may seriously limit, on grounds of national security, the legitimate scientific communication process on which scientific productivity in the United States depends."²⁹⁵ The House conferees were convinced that classification powers and contract and visa controls were "adequate to meet virtually all of our *reasonable*

289. See Zschau, *supra* note 145, at 19 & n.98; see also *Pressure Builds to Renew Export Controls Law*, 43 CONG. Q. WEEKLY REP. 320, 321 (1985); Gonzalez, *supra* note 287, at 412-13.

290. See *supra* note 245 and accompanying text.

291. See Zschau, *supra* note 145, at 12-16; see also FINAN, QUICK & SANBERG, THE U.S. TRADE POSITION IN HIGH TECHNOLOGY: 1980-1986, at 35-40 (prepared for the Joint Economic Committee of Congress 1986) (discussing the increasingly deleterious effects of export controls on United States competitiveness in high-technology trade).

In December 1986, the National Academy of Sciences published a report concluding that export controls had severely damaged American competitiveness in high-technology exports, and had damaged relations with allied nations. See Norman, *Academy Panel Blasts U.S. Export Controls*, 235 SCI. 424, 424 (1987). Defense, which had originally agreed to partially sponsor the report, refused to pay the second half of its commitment and disavowed the report. See *id.*

292. See *supra* text accompanying notes 127-30 (discussing primacy of concern over export controls' effect on high-technology trade during 1979 renewal of EAA).

293. Representative Roth had offered the amendment which would have required the Secretary of Defense to consider removing technology from the MCTL if it met one or more of the following tests:

- (i) The transfer of goods and technology which would not lead to a significant near-term improvement in the defense capability of a country to which exports are controlled under this section.
- (ii) Technology that is evolving slowly.
- (iii) Technology that is not process-oriented.
- (iv) Components used in militarily sensitive devices that in themselves are not sensitive.

Extension Hearings, *supra* note 29, at 1017; see *id.* at 1075-76 (statement of Rep. Roth).

294. Statement of the managers on proposed conference report on renewal of the Export Administration Act, § 103—Policy, *reprinted in* 130 CONG. REC. H12,150 (daily ed. Oct. 11, 1984).

295. *Id.*

security needs. *Any application of the provisions of the Export Administration Act to traditional scientific communication that deviates from the views stated here bears a heavy burden of justification to the Congress.*"²⁹⁶

Placing the strong language in the conference report rather than in the Act diluted its value, however. The original policy statement drafted for inclusion in the 1984 bill was not nearly as forthright. That statement read: "It is the policy of the United States to sustain vigorous scientific enterprise. To do so requires protecting the ability of scientists and other scholars freely to communicate their research findings by means of publications, teaching, conferences, and other forms of scholarly exchange."²⁹⁷ In mid-1985, when the EAA was finally renewed, the policy statement was greatly weakened. "Requires protection" was replaced with "involves sustaining," and it was stated that research findings could only be communicated "in accordance with applicable provisions of law."²⁹⁸

The EAA's half-hearted support of the freedom of American scientists to communicate guaranteed nothing. The 1985 conference report did not mention the reasons for the policy statement because the conferees limited the report to issues which divided the two Houses in 1985.²⁹⁹ The strong statements against using export controls to restrict scientific communications were repeated in Congress during considera-

296. *Id.* (emphasis added).

297. See *Extension Hearings*, *supra* note 29, at 1259. Laurence Brady, Assistant Secretary of Commerce for Trade Administration, indicated that the administration would oppose the amendment if it "would impede our ability to control the flow of know-how, at the conference or any other mechanism of that kind." *Id.* at 1263.

298. Export Administration Amendments Act of 1985, Pub. L. No. 99-64, § 103(5), 99 Stat. 120, 121 (codified at 50 U.S.C. app. § 2402(12) (Supp. V 1987)).

The President signed the Act on July 12, 1985. *Trade Policy: Reagan Signs Compromise Bill Reauthorizing Export Administration Act*, Daily Rep. Executives (BNA) No. 135, at L-3 (July 15, 1985). The Senate and House passed the Act agreed upon by the conference committee on June 27, 1985. 131 CONG. REC. S8927 (daily ed. June 27, 1985); *id.* at H5063.

The EAA of 1979 had expired on September 30, 1983. Congress extended the Act several times until March 30, 1984. The President then invoked the International Emergency Economic Powers Act, 50 U.S.C. § 1702 (1982), to continue the EAA in force (current version at 50 U.S.C.A. § 1702 (West Supp. 1990)). See Exec. Order 12,470, 49 Fed. Reg. 13,099 (1984). The emergency controls were revoked by the President on the same day he signed the Act's renewal. See Exec. Order 12,525, 50 Fed. Reg. 28,757 (1985).

299. See H.R. CONF. REP. 180, 99th Cong., 1st Sess. 54 (1985), reprinted in 1986 U.S. CODE CONG. & ADMIN. NEWS 108, 116; see also 131 CONG. REC. S8923 (daily ed. June 27, 1985) (statement of Sen. Garn) (stressing that legislative history of Act's renewal spans two Congresses); *id.* at H5059 (statement of Rep. Bonker) (1985 Act is result of deliberations over two Congresses). One commentator blames the lack of a strong statement against the use of export controls on scientific communication on inadequate support of the statement by the scientific and academic communities. See *Action on Export Controls*, 128 SCI. NEWS 5, 5 (July 6, 1985).

tion of the 1985 Act.³⁰⁰ Their effect and the effect of the Act's weak policy statement were even further diluted, however, by the 1985 conferees' reiteration of the prior committee's statement "not[ing] and emphasize[ing] that educational institutions remain subject to the same controls and license requirements for technology transfers as all other exporters."³⁰¹ This statement implies that export controls are appropriate on university campuses. Although the statement is contained in a section of the report discussing universities' exemptions from reporting agreements involving technical cooperation with foreign governments,³⁰² the language is broad enough to apply to all scientific communication. More significantly, it appears to contradict the 1984 conference committee's statement that export controls should not be applied to academic science.

The Act requires the Secretary of Defense to review the MCTL annually to remove technologies that are no longer militarily critical³⁰³ and to integrate items on the MCTL into the Control List "with all deliberate speed."³⁰⁴ It also requires the Secretary of Defense to report to Congress within a year on the integration and to *remove* controls on goods and products as their respective technologies were controlled.³⁰⁵ Discretion for determining which technologies were militarily critical remained in Defense.³⁰⁶

Defense complied with the EAA by reviewing the MCTL to add "newly developing technologies" with military significance, and to remove technologies that were no longer militarily critical.³⁰⁷ Publication of an unclassified version of the revised list was planned.³⁰⁸

300. 131 CONG. REC. H2005 (daily ed. Apr. 16, 1985) (statement of Rep. Bonker).

301. H.R. REP. NO. 180, 99th Cong., 1st Sess. 56 (1985), *reprinted in* 1986 U.S. CODE CONG. & ADMIN. NEWS 108, 118; *see* 131 CONG. REC. H2007 (daily ed. Apr. 16, 1985) (statement of Rep. Bonker).

302. *See* H.R. CONF. REP. 180, 99th Cong., 1st Sess. 56, *reprinted in* 1986 U.S. CODE CONG. & ADMIN. NEWS 108, 118. The committee recognized that requiring universities to report technical cooperation agreements could amount to prior restraint but reiterated its determination that "colleges, universities, and other educational institutions . . . must nevertheless obtain appropriate licenses before exporting any controlled technology, technical data, or goods." *Id.*

303. 50 U.S.C. app. § 2404(d)(5) (Supp. V 1987) (current version at 50 U.S.C.A. app. § 2404(d)(5) (West Supp. 1990)).

304. *Id.* § 2404(d)(4).

305. *Id.* § 2404(d)(6).

306. *See id.* § 2404(d)(5) (current version at 50 U.S.C.A. app. § 2404(d)(5) (West Supp. 1990)). The Secretary of Defense was required to report to Congress within a year on the impact of controlled countries receiving technology or goods on the MCTL. *Id.* § 2404(d)(7).

307. DEPARTMENT OF DEFENSE, THE FY 1987 DEPARTMENT OF DEFENSE PROGRAM FOR RESEARCH AND DEVELOPMENT VI-19 (1986), *reprinted in* *Defense Department Authorization and Oversight: Hearings on H.R. 4428 Before the House Comm. on Armed Services*, 99th Cong., 2d Sess. 12, 134 (1986) [hereinafter *Defense 1987 Authorization Hearings*].

308. *Id.* at VI-20, *Defense 1987 Authorization Hearings*, at 135.

Integration of the MCTL and the Control List proved to be difficult because of the different natures of the two lists. The Control List is a document compiled and used by Commerce to control, for national-security and foreign-policy reasons, the export of certain dual use products and technology. The MCTL, meanwhile, is a document containing products and technology that Defense considers to be militarily critical. Some, however, consider the MCTL to be "an exhaustive list of all technologies with military utility" ³⁰⁹

The MCTL was not intended to be a control document. Commerce's attempts to translate the MCTL into technical data regulations, therefore, have been difficult to accomplish. Commerce first formulated an intermediate Critical Technical Data List ³¹⁰ composed of "MCTL arrays of know-how" that were defined "with sufficient specificity" to be included in the Control List. ³¹¹ Controls were then to be applied to the completed unclassified list "pursuant to the Bucy Report." ³¹² One Commerce official suggested that the end result could be regulations with nonexistent benefits. ³¹³

It is not merely that integration of the MCTL and the Control List is impractical—total integration was never possible. Defense often requests State to place "volatile" technologies listed on the MCTL on the Munitions List. This practice insures that the MCTL cannot be integrated with the Control List because the Control List and the Munitions List are mutually exclusive. ³¹⁴

309. NATIONAL ACADEMY OF SCIENCES PANEL REPORT ON THE IMPACT OF NATIONAL SECURITY CONTROLS ON INTERNATIONAL TECHNOLOGY TRANSFER 27 (1987) [hereinafter PANEL REPORT] (executive summary), reprinted in *National Academy of Sciences Report on International Technology Transfer; Hearing Before the House Comm. on Science, Space, and Technology*, 100th Cong., 1st Sess. 7, 33 (1987).

310. See *Hearings on H.R. 5167*, supra note 3, at 1218 (statement of Edith Martin, Deputy Under Secretary of Defense for Research and Advanced Technology); see also *Scientific Communications Hearing*, supra note 274, at 167 (statement of William Archey, Acting Assistant Secretary of Commerce for Trade Administration).

311. See *Scientific Communications Hearing*, supra note 274, at 167 (statement of William Archey, Acting Assistant Secretary of Commerce for Trade Administration).

312. AMETAC Meeting of 25 July 1984, Memorandum for the Record 3 (July 26, 1984) (statement of Monty Baltas, Office of Export Administration, Commerce).

313. See *U.S. and Multilateral Export Controls: Hearing Before the Subcomm. on International Economic Policy and Trade of the House Comm. on Foreign Affairs*, 99th Cong., 1st Sess. 29 (1985) (statement of William Archey, Acting Assistant Secretary of Commerce for Trade Administration).

314. See *Export Controls: Restrictions on the Export of Critical Technologies*, 22 HARV. INT'L L.J. 411, 416 (1981). The commentator noted that placing MCTL items on the Munitions List circumvented Congress's mandate to integrate the MCTL into the Control List. Congress contradicted itself at least once by ordering Defense-sponsored VHSIC technology research to be placed on the Munitions List. Technology relating to VHSIC devices is listed in the MCTL. See DEPARTMENT OF DEFENSE, supra note 11, at 2-2.

While Congress was endorsing Defense's critical technologies approach, Defense had begun applying the approach to a new type of information. As a corollary to prohibiting the export of sophisticated computers to Soviet bloc nations, Defense and State attempted to restrict foreign access to certain supercomputers in the United States. The efforts were aimed at preventing researchers from Soviet bloc nations and China from learning the architectural structure of the supercomputers and using the computers as tools to break American codes or to conduct defense-related research.³¹⁵

The supercomputers at issue were the first four supercomputers to be placed on university campuses under an NSF program designed to upgrade American scientific research.³¹⁶ Ironically, one reason for the program was the discovery that American scientists often had to complete research on supercomputers overseas because of the limited academic access to supercomputers in the United States.³¹⁷ Thus, the barring of access to the NSF supercomputers did not prevent foreign nationals from using the same technology in other locations because Soviet bloc nations and China could purchase time on supercomputers located overseas³¹⁸ or owned by private industry in the United States.³¹⁹

When the NSF proposed insertion into the universities' contracts of a clause denying both Soviet-bloc and Chinese citizens access to the supercomputers, the universities refused to acquiesce.³²⁰ Not only

315. See Goodwin, *APS Opposes Proposed Restrictions on NSF Supercomputers*, 38 PHYSICS TODAY 53, 53 (Dec. 1985); cf. Park, *Supercomputers and Supersecrecy*, 38 PHYSICS TODAY 144, 144 (Dec. 1985) (questioning whether Soviets would jeopardize their secret weapons research by entering information on American supercomputers).

The issue of whether the supercomputers could be used to solve an adversary's defense problems began changing in 1986 to whether an adversary's scientists and engineers should be educated in the use of supercomputers. See Willenbrock, *Information Control and Technological Progress*, 3 ISSUES IN SCI. & TECH. 88, 94 (Fall 1986).

316. *Federal Supercomputer Programs and Policies: Hearing Before the Subcomm. on Energy Development and Applications and the Subcomm. on Science, Research, and Technology of the House Comm. on Science and Technology*, 99th Cong., 1st Sess. 39 (1985) [hereinafter *Supercomputer Hearings*] (statement of Mary Good, Chairperson, Programs and Plans Committee, STET). The STET program included plans for supercomputers on other university campuses as well as for a national network to access the supercomputers. See Goodwin, *supra* note 315, at 54.

317. *Supercomputer Hearings*, *supra* note 316, at 3 (statement of Rep. Boehlert); *id.* at 40 (statement of Mary Good, Chairperson, Programs and Plans Committee, NSF).

318. See Goodwin, *supra* note 315, at 54.

319. See *Supercomputer Centers: Use Faces National Security Controls*, 63 CHEM. & ENG'G NEWS 4, 4 (July 1, 1985). About 135 supercomputers were in use in the mid-1980s, mostly in the United States, Western Europe, and Japan. See *Academic Freedom*, Washington Times, Sept. 6, 1985, at 3.

320. See Norman, *Supercomputer Restrictions Pose Problems for NSF, Universities*, 229 SCI. 148, 148 (1985). The University of California at San Diego and Princeton University signed the contracts agreeing to accept forthcoming federal policy on access to the supercomputers. Cor-

would acquiescence have required the universities to police the activities of some of their students and academicians, but it also would have set a precedent of accepting federal controls on access to their research facilities and tools.³²¹ After months of negotiations, the NSF and the universities reached a compromise: controls over access were to be exercised through visa restrictions, with access to the supercomputers closely monitored.³²²

In the meantime, however, the dispute spread overseas. Commerce insisted that the University of London agree to bar the access of Soviet bloc and Chinese nationals to an American-manufactured supercomputer that the university was purchasing. The supercomputer at issue was a secondhand model already located in Great Britain at the time of its purchase by the University of London.³²³ The controls on supercomputers introduced a new dimension to the critical technologies approach: the denial of access to foreign nationals of specified academic facilities and tools.

In late 1986, the Executive Branch attempted yet another information control. Knowledge of the control's existence did not become public, however, until a Defense official revealed that post-publication controls had been imposed on automated databases by an order of the President's National Security Advisor.³²⁴ The order controlled the ac-

nell University and the University of Illinois signed the contracts on condition that an agreement on the controversial provision could be reached. Norman, *Illinois, Cornell Sign Supercomputer Contracts*, 229 *SCI.* 538, 538 (1985).

321. See Goodwin, *supra* note 315, at 54; Knight & Park, *Who Will Control the Supercomputers*, *Washington Post*, Aug. 17, 1985, at A19, col. 1.

322. Turner, *Universities Seek Exceptions to Rule Barring Soviets from Supercomputers*, *CHRONICLE OF HIGHER EDUC.*, Feb. 19, 1986, at 25, col. 1.

323. See Anderson, *Anger over Supercomputer Veto*, 322 *NATURE* 401, 401 (1986). In 1988, Congress ordered Commerce to amend the EAR to provide a definition of the term "supercomputer" for national security controls. Omnibus Trade and Competitiveness Act of 1988, § 2414, 50 U.S.C.A. app. § 2404(a)(6) (West Supp. 1990). Commerce proposed a definition in 1988, Fed. Reg. 48,932 (1988), and after receiving comments, proposed a revised definition in 1990. 55 Fed. Reg. 3019 (1990). According to the proposed revised definition, various levels of security safeguards may be imposed on the export of a supercomputer as a condition of export authorization. The level would depend on the country of destination. *Id.* at 3020 (proposed rule at 15 C.F.R. § 776.10(d)(3)).

324. Goodwin, *Making Waves: Poindexter Sails into Scientific Databases*, 40 *PHYSICS TODAY* 51, 51-52 (Jan. 1987). The order was issued without publication on October 29, 1986; its existence was acknowledged on November 11, 1986, during an Information Industry Association convention. *Id.*

In January 1985, a report by the Interagency Technology Transfer Intelligence Committee recommended that the National Security Council direct agencies to stop the public release of potentially damaging scientific and technical data. See Gould, *NTIS "Give-Away" of Scientific and Technical Information*, 5 *AAAS BULL. SCI. FREEDOM & NAT'L SECURITY* 1, 1 (Mar. 1985). In addition, the Secretary of Commerce criticized the National Technical Information Service (NTIS) for operating a give-away program for the Soviets of American scientific and technical

cess of foreign nationals to "sensitive information" in the databases. Sensitive information was defined broadly to include unclassified data involving national security and foreign affairs, as well as government-derived information involving such subjects as economics and agriculture.³²⁵

This national security order had a long history. In 1981, Defense and the NSA had been concerned that adversaries were gaining easy access to "the flood of unprotected telecommunications and automated data processing information afloat in [the United States]."³²⁶ A policy was therefore formulated to control the processing and communication of "sensitive information" in computer and automated databases.³²⁷ In 1984, the policy survived the opposition of other federal agencies to become National Security Decision Directive 145.³²⁸ The directive subdivided sensitive information into two categories: (1) "classified national security information" and (2) "other sensitive, but unclassified, Government or Government-derived information, the loss of which could adversely affect the national security interest."³²⁹ The Directive provided Defense with authority "to encourage, advise, and, where appropriate, to assist" private industry in identifying "sensitive non-government information."³³⁰ The vulnerability of private systems was to be evaluated, and measures for their protection were to be suggested.³³¹

In late 1985, Defense aided in the publication of a report identify-

data. Some private automated databases purchase reports directly from the NTIS. *See id.*

325. *See Computer Security Policies: Hearing Before the Subcomm. on Transportation, Aviation, and Materials of the House Comm. on Science and Technology, 99th Cong., 1st Sess. 51 (1985) [hereinafter Computer Security Hearing]* (statement of Donald Latham, Assistant Secretary of Defense for Command, Control, Communications, and Intelligence). Sensitive data is defined by the order as

information the disclosure, loss, misuse, alteration or destruction of which could adversely affect national security or other Federal government interests. National security interests are those unclassified matters that relate to national defense or foreign relations Other government interests are those related but not limited to the wide range of government or government-derived economic, human, financial, industrial, agricultural, technological and law enforcement information as well as the privacy or confidentiality of personal or commercial proprietary information provided to the U.S. government by its citizens.

See Goodwin, supra note 315, at 51.

326. *Computer Security Hearing, supra note 325, at 71.*

327. *Id.* The Secretary based the policy on Presidential Directive 24, issued in 1977 by President Carter. He broadened the policy's goal of protected telecommunications to include computer security and automated information systems security. *Id.* at 71-72.

328. *Id.* at 72; *see id.* at 31 (observing that "[i]t was a very difficult job pushing this [Directive] through the Government").

329. *Id.* at 72.

330. *See id.*

331. *Id.*

ing private automated databases as a target of Soviet acquisition.³³² According to the report, the Soviets were able to attain sensitive information by aggregating information accessible through the various databases.³³³ A little over a year later, the National Security Decision Directive was issued controlling access to the databases. Alerted by rumors that the controls would be imposed,³³⁴ scientific societies, industries, and academia reacted angrily. As a result, the directive was withdrawn for further study,³³⁵ and defense officials assured scientists that access would not be restricted to existing public databases.³³⁶

In 1987, Congress reacted to Defense's (and NSA's) attempt to control unclassified information in computer databases. The Computer Security Act of 1987 provides that nothing in the Act or any amendments to it "shall be construed . . . to authorize any Federal agency to limit, restrict, regulate, or control the collection, maintenance, disclosure, use, transfer, or sale of any information" in any form if the information is privately-owned, disclosable under the Freedom of Information Act or any other law that requires or authorizes public disclosure, or is in the public domain.³³⁷ The House Report accompanying the Act clearly expressed distrust of Defense's and NSA's intentions in asserting control over civilian databases.³³⁸ The Report noted that "[t]he apparently insatiable desire of the military for controlling information—whether classified or unclassified, whether government or private—is the most convincing argument for [the Act]."³³⁹

While the Computer Security Act was passing through Congress, the Executive Branch introduced a new rationale for controlling infor-

332. TECHNOLOGY TRANSFER INTELLIGENCE COMMITTEE, SOVIET ACQUISITION OF MILITARILY SIGNIFICANT WESTERN TECHNOLOGY: AN UPDATE (Sept. 1985); see Smith, *Soviets Target Campuses for Intelligence Operations*, 230 SCI. 49, 49 (1985). The Technology Transfer Intelligence Committee is an interagency committee chaired by the CIA. See Memorandum to AAAS Committee, *supra* note 280.

333. TECHNOLOGY TRANSFER INTELLIGENCE COMMITTEE, *supra* note 332, at 17; see Wilenbrock, *supra* note 315, at 93-94; *Regulating Access to Computer Databases*, AAAS BULL. ON ACCESS TO SCI. & TECH. INFO. 4, 4 (Summer 1986).

334. See Turner, *Pentagon Planning to Restrict Access to Public Databases*, CHRONICLE OF HIGHER EDUC., Jan. 21, 1987, at 1, col. 2.

335. See Engelberg, *Administration Rescinds Plan to Restrict Computer Data Flow*, The Oregonian, Mar. 18, 1987, at A10, col. 1. The FBI had begun implementing the order by inquiring into the use of automated databases at the State University of New York at Buffalo by an Iraqi student. See *id.*; Turner, *Effort to Limit Access to Unclassified Databases Draws Criticism*, CHRONICLE OF HIGHER EDUC., Mar. 4, 1987, at 12, col. 1.

336. See *The Saga of NSDD 145, The Poindexter Memorandum, and HR 145 (and a Classified Air Force Study)*, 10 AAAS BULL. ACCESS TO SCI. & TECH. INFO. 5, 7 (Spring 1987).

337. Pub. L. No. 100-235 § 8, 101 Stat. 1724, 1725.

338. H.R. REP. NO. 153(II), 100th Cong., 1st Sess. 7, reprinted in 1987 U.S. CODE CONG. & ADMIN. NEWS 3157, 3159, 3165-66.

339. *Id.* at 18, reprinted in 1987 U.S. CODE CONG. & ADMIN. NEWS at 3170.

mation. In opening the Federal Conference on Commercial Applications of Superconductors, President Reagan proposed an amendment to the Freedom of Information Act which would have permitted the withholding of "commercially valuable scientific and technical information" by laboratories owned and operated by the federal government.³⁴⁰ Thus, information would be subject to restriction for purely economic reasons with no requirement of a national security justification.

Pursuant to the President's proposal, the Justice Department began drafting a legislative proposal to amend the Freedom of Information Act.³⁴¹ Enactment of such a proposal could jeopardize the success of American research in superconductivity because many scientists involved in the research are foreign graduate students and researchers.³⁴² Their forced withdrawal from research would thus be detrimental to America's interest rather than advantageous.³⁴³

In 1988, Congress amended the EAA under pressure from the business community. Under the amendments, the Secretary of Defense reviews goods and technologies on the MCTL on an ongoing basis, instead of annually, to determine which goods and technologies may be removed from the list.³⁴⁴

The 1988 amendments also altered the procedure for referrals to the President by the Secretary of Defense. If the Secretary of Defense disagrees with the Secretary of Commerce on an item on the Control List, the Secretary of Defense has twenty days after receiving notification from the Secretary of Commerce to refer the matter to the President for resolution.³⁴⁵ Similarly, if the Secretary of Defense disagrees with the proposed export of "any goods or technology to any country to which exports are controlled for national security purposes," the Secretary has twenty days to recommend to the President and the Secretary of Commerce that the export be approved, conditionally approved, or disapproved.³⁴⁶ The President need no longer report to Congress if he

340. See *Relax Controls on Scientific Communication*, 4 ISSUES IN SCI. & TECH. 9, 10 (Winter 1988) (letter of Robert Park, Executive Director, American Physical Society).

341. See *id.* Private parties who have submitted "confidential commercial information" to the United States Government may object to disclosure of that information before an agency discloses it pursuant to a Freedom of Information Act request. "Confidential commercial information" is material that arguably contains information exempt from the Freedom of Information Act because "its disclosure could reasonably be expected to cause substantial competitive harm." Exec. Order No. 12,600, 52 Fed. Reg. 23,781 (1987), reprinted in 5 U.S.C. § 552 note (Supp. V 1987).

342. See McDonald, *Scientists Oppose Reagan's Plan to Limit Foreigners' Access to Data Opposed by Scientists*, CHRONICLE OF HIGHER EDUC., Sept. 9, 1987, at 1, col. 2.

343. See generally PANEL REPORT, *supra* note 309, at 17 (noting that foreign scientists in American laboratories help rather than hinder the national interest).

344. 50 U.S.C.A. app. § 2404(d)(5) (West Supp. 1990).

345. *Id.* at § 2404(c)(2).

346. *Id.* at § 2409(g)(2).

modifies or overrules the Secretary of Defense's recommendation.³⁴⁷ In other provisions of the EAA amendments, Congress emphasized that export controls must be effective by stressing multilateral controls over unilateral controls and by providing authority for the President to negotiate with fellow governments in Cocom to achieve more effective controls.³⁴⁸

Controls over scientific information tend to draw less public attention today than they did during the early and mid-1980s. However, as noted in a 1988 report by the Association of American Universities, the controls continue to expand.³⁴⁹ Despite regulations defining the power to control scientific information more narrowly than in the early 1980s, there is no indication that Defense and other agencies intend to halt the continued expansion of information controls enforced by them. Indeed, the list of agencies involved continues to grow.³⁵⁰ Congress demonstrated its resolve to restrict the use of export controls that were ineffective in preserving the United States' national security when those controls hurt the United States' competitiveness as an exporter. Congress should similarly restrict the use of ineffective and destructive controls on scientific communication.

347. Omnibus Trade and Competitiveness Act of 1988, Pub. L. No. 100-418, § 2425(a)(4), 102 Stat. 1107, 1360.

348. See 50 U.S.C.A. app. § 2404(l) (West Supp. 1990); see also 55 Fed. Reg. 25,083 (1990) (interim rule amending EAR to reduce licensing requirements on trade with cocom countries); *id.* at 12,635 (removing validated export licensing requirements for east-west export of certain low capacity hard disc drives).

349. S. & M. Spence, *Government Information Controls: Implications for Scholarship, Sci. & Tech.* (1988); see Walsh, *Growth of Information Management by Government Pilloried in Report*, 240 Sci. 595, 595 (1988).

350. See 32 C.F.R. § 249.4(h) (1989) ("[r]efrain from interfering with the planning and organizing of meetings sponsored and conducted by nongovernment organizations"); 15 C.F.R. pt. 779 & Supp. 5 (1990) (requiring validated licenses for scientific information only in specified instances, but establishing the applicability of export controls on university campuses).

The National Security Advisor aided an attempt to control unclassified data in private databases. See, e.g., *supra* note 324 and accompanying text. The FBI then attempted to enforce the National Security Advisor's directive by subpoenaing an employee at the State University of New York at Buffalo to provide information on searches of databases by a foreign student. See H.R. REP. NO. 153(II), 100th Cong., 1st Sess. 15, reprinted in 1987 U.S. CODE CONG. & ADMIN. NEWS 3157, 3167. Even though the directive was subsequently withdrawn after strong opposition, the FBI continued to play a role. In 1988, the FBI published a report to persuade librarians to report on foreign nationals who checked out technical books. Federal Bureau of Investigation, Library Awareness Program Report (1988); see *Spying in the Stacks*, Time, May 30, 1988, at 23.

Before Defense and its NSA had been prevented by Congress from controlling unclassified information in private databases, the National Security Advisor and the FBI had not played such a prominent role in controlling scientific information.

III. LEGALITY OF THE CRITICAL TECHNOLOGIES APPROACH

A. *Defense's Authority to Control Scientific Communications*

Evolution of the critical technologies approach has resulted in a synergistic concentration of massive power in Defense.³⁵¹ The MCTL has become the basis of both the Cocom export control list and the Control List (the MCTL has a ninety-five percent correlation with the Control List).³⁵² There seem to be no limitations upon Defense's authority over export of Munitions List items (such as the VHSIC program) or its advisory authority over dual-use items. When items are removed from the ITAR, their control is transferred to the EAR.³⁵³ Similarly, civilian technology that approximates military technology is subject to the EAR.³⁵⁴

Scientific information from any Defense-sponsored research falling under any export control law can be suppressed by Defense,³⁵⁵ and any information that may potentially be subject to classification can be "safeguarded" for thirty days, even if the information is not subsequently classified.³⁵⁶ Similarly, scientific information developed in private research is subject to export control laws.³⁵⁷ Defense's power over exports is not limited to exports to communist countries, but extends to America's allies as well.³⁵⁸ The penalties of imprisonment and heavy

351. See Department of Defense Directive No. 2040.2(A)(1) (Jan. 17, 1984).

352. *Transfer of Technology Hearings*, *supra* note 1, at 195-96 (attachment to letter from Richard Perle, Assistant Secretary of Defense for International Security Policy, to Senator Sam Nunn (July 16, 1984)).

353. See *High Technology Hearings*, *supra* note 25, at 163 (statement of Ernest Johnston, Deputy Assistant Secretary of State for Economic and Business Affairs). Mr. Johnston stated, "If an item is taken off the munitions list, and occasionally there are bills in Congress which do this, we pick them up on the list that is administered by the Department of Commerce." *Id.*

354. See 48 Fed. Reg. 28,633 (1983) (providing that VHSIC and related technical data not meeting ITAR criteria are subject to EAR).

355. See 32 C.F.R. §§ 250.1 to .9 (1989). The directive states:

[T]he Secretary of Defense may withhold from public disclosure, notwithstanding any other provision of law, any technical data with military or space application in the possession of, or under the control of, the Department of Defense, if such data may not be exported lawfully without an approval, authorization, or license under E.O. 12470 or the Arms Export Control Act. However, technical data may not be withheld under this section if regulations promulgated under either the Order or Act authorize the export of such data

Id. at § 250.4(a).

356. See Department of Defense Directive No. 5200.1, DOD 5200.1-R, DOD Information Security Program, Regulation, 32 C.F.R. § 159a.10(a)(2) (1989). Security classifications pursuant to Defense Directive 5200.1-R do not preclude use of distribution statements under Defense Directive 5230.24. See Department of Defense Directive No. 5230.24 (Encl. 2)(4) (Nov. 20, 1984).

357. The EAR and the ITAR do not differentiate between government-sponsored and private technical data.

358. See Announcement Concerning Licensing and Enforcement Procedures, 20 WEEKLY

finances contained in the ITAR³⁵⁹ and EAR³⁶⁰ appear to be superimposed over all controls exercised by Defense.³⁶¹ The MCTL, which is only a guide, has been used on at least one occasion as a control³⁶² and the MCTL's integration with the Control List assures its use as a control.

Controls beginning in Defense have a tendency to extend to all other federal agencies.³⁶³ Once established, controls may be reduced in the face of a hostile reaction from scientific societies and academia, but they do not generally disappear.³⁶⁴ They are thus cumulative as well as pervasive.

The controls expand by various means. Sometimes a control focuses on a specific means of scientific communication, such as foreign graduate students³⁶⁵ or supercomputers.³⁶⁶ Other controls focus on a process by which science is communicated such as symposia³⁶⁷ or the

COMP. PRES. DOC. 420, 420 (Mar. 23, 1984).

359. See 22 U.S.C. § 2778(c) (Supp. IV 1986); 22 C.F.R. § 127.3 (1990).

360. See 50 U.S.C. app. § 2410(b) (1982 & Supp. V 1987); 15 C.F.R. §§ 787.1 to .14 (1990); 55 Fed. Reg. 25,086 (1990) (interim rule amending 15 C.F.R. § 787.13).

361. See 32 C.F.R. § 250.9(b) (1989). The notice to be attached to controlled data states in pertinent part:

(a) Export of information contained herein, which includes, in some circumstances, release to foreign nationals within the United States, without first obtaining approval or license from the Department of State for items controlled by the International Traffic In Arms Regulations (ITAR), or the Department of Commerce for items controlled by the Export Administration Regulations (EAR), may constitute a violation of law.

(b) Under 22 U.S.C. 2778 the penalty for unlawful export of items or information controlled under the ITAR is up to 2 years imprisonment, or a fine of \$100,000, or both. Under 50 U.S.C., Appendix 2410, the penalty for unlawful export of items or information controlled under the EAR is a fine of up to \$1,000,000, or five times the value of the exports, whichever is greater; or for an individual, imprisonment of up to 10 years, or a fine of up to \$250,000, or both.

Id. at § 250.9(a)-(b). See generally Chalk, *Security and Scientific Communication*, 39 BULL. ATOM. SCI. 19, 20 (Aug.-Sept. 1983) (describing individual scientists being advised of possibility of violating the ITAR).

362. See generally *Restrictions on Technical Papers Raise Concerns*, 118 AVIATION WEEK & SPACE TECH. 22, 22 (1983) (describing reference to MCTL on summary of proceedings of conference held by National Bureau of Standards Center for Materials Science).

363. See *supra* notes 322-34 and accompanying text (sensitive data on automated databases).

364. See *supra* notes 282-84 (establishing the existence of export-controlled sessions at scientific meetings). Compare *supra* note 277 and accompanying text (noting that classification of ongoing research would be "a very, very remote possibility") with S. SPENCE & M. SPENCE, *GOVERNMENT INFORMATION CONTROLS: IMPLICATIONS FOR SCHOLARSHIP, SCIENCE, AND TECHNOLOGY* (1988) (noting the growing tendency by federal agencies to classify ongoing research).

365. See *supra* note 195 and accompanying text.

366. See *supra* note 322 (controls on access to supercomputers); see also Norman, *Soviets Disinvited to Join Drilling Program*, 236 SCI. 659, 660 (1987) (reporting that Defense disinvited Soviet participation in oceanographic research program because of technologies aboard research vessel).

367. See *supra* notes 268, 283-86 and accompanying text.

publication of research in scientific journals.³⁶⁸ Other controls expand the scope of controlled information, for example, an expansion of controlled research to include "sensitive" technical data³⁶⁹ or creation of a new rationale for controlling scientific information.³⁷⁰ The result is that the controls that first affected only a small percentage of scientists have become broad enough to affect almost the entire scientific community.³⁷¹

Throughout the history of Defense's critical technologies approach to suppressing scientific information, Congress has encouraged rather than stemmed the controls. Defense and other agencies have been allowed to infer from the statutes creating the ITAR and the EAR authority to control transfer of what they determine to be critical scientific information and technology. Congress has statutorily adopted the critical technologies approach³⁷² and has granted Defense additional powers to control scientific information.³⁷³ Although Congress has at times expressed concern over the extent of controls asserted by Defense, it has never reduced the power of Defense to control scientific communication. Defense's influence and power have continued to expand.

As a result of both congressional action and inaction, Defense has gained the authority to control scientific communications whenever it perceives a threat to the national security. Having been severely criticized by Congress in 1978 for its narrow definition of "national security,"³⁷⁴ Defense has responded by broadening the definition infinitely.³⁷⁵

368. See *supra* note 272 and accompanying text.

369. See *supra* notes 335-36 (treatment of sensitive data on automated databases).

370. See *supra* note 230 and accompanying text (permitting agencies to "safeguard" information pending a decision to classify); *supra* note 340 and accompanying text (proposing control of information for economic reasons).

371. See Long, *Scientific Freedom: Focus of National Security Controls Shifting*, 63 CHEM. & ENG'G NEWS 7, 10 (July 1, 1985).

372. See 50 U.S.C. app. § 2404(d) (1982 & West Supp. 1990).

373. See *supra* notes 281-82 and accompanying text (§ 1217(a)); notes 192-93 and accompanying text (VHSIC program).

374. See *supra* notes 103-07 (Dresser export licenses).

375. See 130 CONG. REC. H7716 (daily ed. Sept. 29, 1983) (statement of Rep. Courter) (recommending adoption of definition of "detrimental to national security" for EAA). Emerson, *Comment on "Access to Classified Information: Constitutional and Statutory Dimensions,"* 26 WM. & MARY L. REV. 845, 846 (1985) (arguing that the "term 'national security' is virtually without limitation"). See generally Relyea, *Increased National Security Controls on Scientific Communications*, 1 GOV'T INFO. Q. 177, 181-82 (1984) (describing national security as phrase of convenience for federal lawmakers that is subject to broad interpretation by executive officials). Cf. Relyea, *Shrouding the Endless Frontier—Scientific Communication and National Security: Considerations for a Policy Balance Sheet*, 1 GOV'T INFO. Q. 1, 7 (1984) (suggesting that the "underlying principle of any policy permitting the government to apply national security restrictions to the communication of scientific research findings or knowledge should be to maintain the security

B. Constitutional Analysis

The critical technologies approach and the EAA's regulation of scientific speech must be analyzed in the context of their constitutionality.³⁷⁶ In order to make a proper assessment of the constitutionality of government action, a general theory of the constitutional clause at issue must be established. This, of course, will be especially difficult in the area of free speech and free press; because these notions have been subjected to such divergent centrifugal forces, an architecturally coherent and principled approach to first amendment litigation is commonly thought impossible. Some scholars, for example, maintain that it is impossible to discern, much less to reconstruct or create, a general principle that will integrate and harmonize the myriad of disparate Supreme Court opinions on free speech during the past fifty years.³⁷⁷ But this does not preclude a working definition of the political free speech principle. One of these scholars who despairs of finding an overarching principle of free speech recognizes that political speech constitutes the

of scientific progress").

376. To review the statutory and administrative structure that can lead to restrictions on scientific speech, see *supra* text accompanying notes 8-9, 12-13, 22-24, 28, 41-70, 135-149, 169-70, 176-77, 189-92, 196, 203, 227-30, 263-71, 275, 281-82, 285-86, 298, 303-306, 354-61, 372.

377. See Magee, Book Review, 4 CONST. COMMENTARY 422, 423 (1987) (reviewing L. BOLLINGER, *THE TOLERANT SOCIETY: FREEDOM OF SPEECH AND EXTREMIST SPEECH IN AMERICA* (1986)) (concluding that "[t]he highs and lows of the Court's roller coaster adjudication of free speech claims of the last five decades would seem to foreclose any possibility of theoretical integrity in that realm. . . ."); BeVier, *The First Amendment and Political Speech: An Inquiry into the Substance and Limits of Principle*, 30 STAN. L. REV. 299, 300 (1978) (stating that "[a] carefully articulated conception of the basic purposes of the amendment is essential to first amendment adjudication and commentary" and that the various "tests" fashioned by the Supreme Court need to be informed by normative speech principles or they will not be capable of effectively guiding judicial decisionmaking); Freund, *The Great Disorder of Speech*, 44 AM. SCHOLAR 541 (1975); Schauer, *Categories and the First Amendment: A Play in Three Acts*, 34 VAND. L. REV. 265, 266 n.5 (1981) (stating that we should be concerned with the normative content of the first amendment, for without an appreciation of its "substantive underpinnings," it is difficult to structure a coherent body of free speech jurisprudence); Sunstein, *Pornography and the First Amendment*, 1986 DUKE L.J. 589, 605-06 (1986) (stating that "it would be difficult to imagine a sensible system of free expression that did not distinguish among categories of speech in accordance with their importance to the underlying purposes of the free speech guarantee" and that "any attempt to distinguish among categories of speech must start with an effort to isolate what is uniquely important about speech in the first place").

Justice Antonin Scalia has indicated that the new multiplicity of categories of speech protected by the first amendment has played havoc with the "prediction theory" of law. Scalia, *A House with Many Mansions: Categories of Speech Under the First Amendment*, in *THE CONSTITUTION, THE LAW, AND FREEDOM OF EXPRESSION 1787-1987*, at 9, 18 (J. Stewart ed. 1987). Moreover, the difficulty of prediction (or the unlikelihood of any regularity of analytical result) is compounded because "the degree of 'heightened' or 'reduced' protection that the various categories entail is entirely unspecified and inherently unspecifiable. . . . The calculation is indeed so inflexible that it may seem more to resemble a jury determination on a matter such as whether negligence was proven than a court determination of what the Constitution requires." *Id.*

original defense of freedom of speech.³⁷⁸ If the political speech principle cannot unify the disparate decisions, it can at least provide a compass for adjudication and aid the categorization approach used by the modern Court to address novel free speech claims.³⁷⁹ This approach categorizes different varieties of speech and assigns a requisite level of protection based on the importance of that variety of speech to the purposes promoted by the first amendment.³⁸⁰

The analysis of this article is based upon the premise that has for many American scholars been the touchstone of constitutional construction, viz., that an expositor of a constitutional document should, first and foremost, attempt to discover and apply the original intent of its framers and adopters.³⁸¹ The authors subscribe to the theory of

378. Magee, *supra* note 377, at 424. Briefly, the "political speech principle" rubric expresses the historical attachment to public debate on political topics as the special, if not exclusive, object of first amendment protection. For a discussion of the political speech principle, see *infra* notes 391-97 and accompanying text.

379. For a discussion of the taxonomization or categorization approach to first amendment analysis, see generally Scalia, *supra* note 377.

380. See generally Schauer, *supra* note 377.

381. The authors of this article adhere to the traditional touchstones of constitutional interpretation: "the intent of those who framed and ratified the instrument and the meaning attached to the constitutional language at the time the instrument was adopted." Peebles, *A Call to High Debate: The Organic Constitution in Its Formative Era, 1890-1920*, 52 U. COLO. L. REV. 49, 49 n.1 (1980); see Farber, *Legal Pragmatism and the Constitution*, 72 MINN. L. REV. 1331, 1357 (1988) ("In analyzing [a] constitutional issue, the starting point is . . . the language and history of the Constitution."). To employ the currently accepted, but somewhat confusing, rubric, this article proceeds from the theory of interpretivism, which is essentially the academician's phrase for the approach to constitutional decisionmaking commonly known as "strict construction" or "original understanding." See Brest, *The Misconceived Quest for the Original Understanding*, 60 B.U.L. REV. 204, 204 & n.1 (1980) (maintaining that interpretivism "describe[s] essentially the same concept" as originalism, viz., "the familiar approach to constitutional adjudication that accords binding authority to the text of the Constitution or the intention of the adopters"). For a deft evisceration of the confusing interpretivist-noninterpretivist terminology, see L. LEVY, ORIGINAL INTENT AND THE FRAMERS' CONSTITUTION xv (1988).

We reject the recent theory of constitutional interpretation known as "noninterpretivism." This theory is usually advanced as a necessary departure from text and history in order to safeguard some implicit or underlying constitutional right or value. See generally Grey, *Do We Have an Unwritten Constitution?*, 27 STAN. L. REV. 703 (1975).

Of course, this approach entirely ignores the necessity of linking judicial decisionmaking to grants of authority from "We the People." See Easterbrook, *Legal Interpretation and the Power of the Judiciary*, 7 HARV. J.L. & PUB. POL'Y 87 (1984).

One problem hardly ever addressed, much less resolved, by noninterpretivists is why and on what grounds the citizenry should respect and follow a modern judge's language and constitutional meanings more than the formulations and meanings left by our Founding-Era forerunners embraced within the Preamble's "We the People." See Anastaplo, *On Speech and Law in a Free Society*, 3 WINDSOR Y.B. OF ACCESS TO JUST. 436, 449 (1983) (reviewing F. HAIMAN, SPEECH AND LAW IN A FREE SOCIETY (1981)). In short, why should a modern judge's understanding be preferred to the original understanding? One of the few noninterpretivists to address this problem is John Hart Ely, who contends that a judge's adherence to tradition is undemocratic because it allows "yesterday's majority . . . [to] control today's." J. ELY, DEMOCRACY AND DISTRUST: A

“originalism;”³⁸² thereby, we satisfy the requirement that any argument about the meaning of a particular constitutional provision “must be both guided and confined . . . by an overarching general theory about the criteria for legitimate constitutional decisionmaking.”³⁸³ Pur-

THEORY OF JUDICIAL REVIEW 62 (1980). But the legitimacy of judicial review in a democracy hinges on the judge’s application of the highest expression of the people’s will in a written constitution. Alexander Hamilton’s early defense of judicial review, see THE FEDERALIST NO. 78, at 524 (A. Hamilton) (J. Cooke ed. 1961), and Chief Justice John Marshall’s similar defense in *Marbury v. Madison*, 5 U.S. (1 Cranch) 137, 176-78 (1803), implicitly assume that the ratifying citizens of 1787-1788 formed a super-majority that established an *Urtext*, namely, our national Constitution.

Moreover, as William E. Nelson has demonstrated, the original understanding of judicial review based on a written constitution was not an anti-democratic notion. Although judicial review has been regarded as essentially a countermajoritarian device since the Civil War, during the early years of the Republic it was not so regarded. Prior to 1820,

[t]he concern of judges in . . . constitutional cases was with the potentiality of conflict between legislators and their constituents—with the possibility that faithless legislators might betray the trust placed in them by the people. The perceived purpose of judicial review was to protect the people from such possible betrayals, not to interpose obstacles in the path of decisions made by the people’s agents in due execution of their trust.

Nelson, *Changing Conceptions of Judicial Review: The Evolution of Constitutional Theory in the States 1790-1860*, 120 U. PA. L. REV. 1166, 1177 (1972). Thus, prior to the Civil War, the citizens regarded courts as an institution necessary for striking down legislative acts when the legislature had failed to represent the true interests of the people or when it had acted contrary to the principles of civic virtue by succumbing to powerful special interests rather than to the people’s requests that it advance the general good of the polity. *Id.* at 1177-81. Pursuant to this “original understanding,” judicial review can be seen as an entirely democratic process; therefore, Professor Nelson’s findings recall to us a lost heritage whereby the actions of courts, even in striking down the acts of popular legislatures, can be seen as a proper part of the democratic process.

Likewise, Alexander M. Bickel’s rubric of judicial review as a “countermajoritarian” device and his call for judges “to immerse themselves in the tradition of our society and of kindred societies that have gone before,” A. BICKEL, THE LEAST DANGEROUS BRANCH: THE SUPREME COURT AT THE BAR OF POLITICS 236 (1962), have been commonly regarded as anti-democratic; but this characterization is accurate only if, *pace* Professor Ely, one regards our society as consisting only of those presently living. On the other hand, if one follows G.K. Chesterton’s “social compact” argument for an intergenerational republic, a “democracy of the dead,” whereby the relevant community is expanded to include those who have come before as well as those presently living, then judicial review based on text and history should be regarded as democratic in the sense of a society’s fullest participation, across time, in its own governance.

Moreover, those who protest against the rule of men long dead never level their protests against such basic decisions of the Founders as the idea that we should be governed by a tripartite government of separated and balanced powers. Instead, the protest is almost exclusively leveled against the Bill of Rights as an exclusive list of rights that can be protected by the federal judiciary. But the “mortmain” protesters only want the Bill of Rights to be applied expansively; they do not at all want federal judges or other officials to ignore or “cut back” on the liberties and protections contained in the Bill of Rights. On that point, even the protesters are quite content to be bound by the intent of the long-dead Framers. See Bork, *The Constitution, Original Intent, and Economic Rights*, 23 SAN DIEGO L. REV. 823, 827 (1986). See also *infra* note 390.

382. See *supra* note 381 (discussing interpretivism and originalism).

383. BeVier, *An Informed Public, an Informing Press: The Search for a Constitutional Principle*, 68 CALIF. L. REV. 482, 499 (1980) (footnote omitted). See *id.* at 499-500; BeVier,

suant to the "originalist" theory of constitutional adjudication, constitutional rules are legitimate only if they are anchored to principles that are derived from the text or history of the document or from the structure of government it prescribes.³⁸⁴ Since the turn of this century the Supreme Court has increasingly used history and original intent in its constitutional decisionmaking,³⁸⁵ often recognizing that an understanding of Colonial and Revolutionary-Era history are relevant and important to a proper elucidation of the Constitution,³⁸⁶ including the first

supra note 377, at 304-05 (concluding that confining the premises of constitutional adjudication to history, text, and structure is mandated by the quest for constitutional legitimacy in view of the Court's countermajoritarian power of judicial review); Bork, *Neutral Principles and Some First Amendment Problems*, 47 IND. L.J. 1 (1971) (basing constitutional principles on text and original intent out of a concern for constitutional legitimacy, which concern must inform all constitutional decisionmaking). For other commentators who advocate an "original understanding" approach to constitutional adjudication and analysis, see Grano, *Judicial Review and a Written Constitution in a Democratic Society* 28 WAYNE L. REV. 1 (1981); Kay, *Adherence to the Original Intentions in Constitutional Adjudication: Three Objections and Responses* 82 NW. U.L. REV. 226 (1988); Maltz, *Foreword: The Appeal of Originalism* 1987 UTAH L. REV. 773, 774 (maintaining that the case against original intent as a theory of constitutional meaning is "weaker" than its proponents allow and that originalism is itself "a perfectly plausible approach to constitutional adjudication"); Maltz, *The Failure of Attacks on Constitutional Originalism*, 4 CONST. COMMENTARY 43 (1987); Maltz, *Some New Thoughts on an Old Problem—The Role of the Intent of the Framers in Constitutional Theory*, 63 B.U.L. REV. 811 (1983); Monaghan, *Our Perfect Constitution*, 56 N.Y.U. L. REV. 353, 374-87 (1981) (arguing that the nature of the Constitution, as our highest organic law, itself mandates adherence to the text and the intent of its Framers and Ratifiers); Nelson, *History and Neutrality in Constitutional Adjudication*, 72 VA. L. REV. 1237 (1986); Rehnquist, *The Notion of a Living Constitution*, 54 TEX. L. REV. 693, 694-706 (1976); Van Alstyne, *Congressional Power and Free Speech: Levy's Legacy Revisited* (Book Review), 99 HARV. L. REV. 1089 (1986).

Professor Van Alstyne rebuts the *Realpolitik* views of noninterpretivists—i.e., the arguments that judges are not bound by history and that the first amendment means what the judges say it means—by making several common-sense observations about human nature once it dons the robe: "judges are human and will generally prefer to think that what they say is not a falsification of the document they are called upon to apply, but is at least in reasonably close keeping with its spirit. On this basis alone, history is scarcely avoidable. Unless one takes an interest in what the first amendment was meant to do, . . . one cannot know whether the interpretation . . . comes reasonably close to the spirit of the thing." *Id.* at 1099.

384. See *supra* note 381. We endorse a theory of constitutional interpretation grounded in the popular sovereignty and legislative supremacy accepted by the entire political spectrum in our Founding Era. See R. BERGER, *FEDERALISM: THE FOUNDERS' DESIGN* 14 (1987) (describing the legislative branch as the "darling of the Founders"); G. WOOD, *THE CREATION OF THE AMERICAN REPUBLIC, 1776-1787*, at 18-19, 24-26, 139, 162-63, 446-68, 453, 598-600 (1969); Presser, *A Tale of Two Judges: Richard Peters, Samuel Chase, and the Broken Promise of Federalist Jurisprudence*, 73 NW. U.L. REV. 26, 27-30 (1978) (remarking on the virtually universal adherence to popular sovereignty in the early national period); Scheiber, *Federalism and the Constitution: The Original Understanding*, in *AMERICAN LAW AND THE CONSTITUTIONAL ORDER: HISTORICAL PERSPECTIVES* 85, 98 (L. Friedman & H. Scheiber eds. 1978) (stating that in the late 1780s there existed an "ideological consensus in favor of self-government on libertarian, republican principles that marked Federalist and Antifederalist thought alike").

385. Note, *Of History and Due Process*, 63 IND. L.J. 369, 386 (1987).

386. See, e.g., *United States v. Brown*, 381 U.S. 437, 441-46 (1965) (using English and

amendment.³⁸⁷

The final, and perhaps the most important, reason for adhering to the interpretive theory of originalism is the attachment of the American people to this view of the Constitution. Even a leading advocate of the orthodoxly expansive reading of the speech and press clauses of the First Amendment appeals to the original intent and understanding of the Framers and Ratifiers,³⁸⁸ for otherwise "his position will be dismissed by the 'sober majority' as an irresponsible shift of meaning and authority."³⁸⁹ It is one thing to argue that scholars and judges should ignore the deep cultural sentiments of the American people when these are clearly out of step with republican principles, or when their beliefs stand athwart a clear command of the Constitution; it is quite another thing, however, to ignore the sober sentiment of the American people when it is dedicated to a fundamental "social contract" belief like the idea of "original understanding." Indeed, a good case can be made that the "contractarian" sentiments of the vast majority of Americans are more keenly attuned to the original justifications for judicial review contained in *The Federalist* No. 78 and in *Marbury v. Madison*³⁹⁰

American constitutional history to aid in the interpretation of article 1, section 9, clause 3 of the Constitution, the bill of attainder clause); see also J. STORY, COMMENTARIES ON THE CONSTITUTION OF THE UNITED STATES § 181, at 135 (abridged ed. 1833) ("The first and fundamental rule in the interpretation of all instruments is, to construe them according to the sense of the terms, and the intention of the parties.").

387. See, e.g., *New York Times Co. v. Sullivan*, 376 U.S. 254, 273 (1964) (relying on L. LEVY, LEGACY OF SUPPRESSION: FREEDOM OF SPEECH AND PRESS IN EARLY AMERICAN HISTORY 258 (1960)).

388. See F. HAIMAN, SPEECH AND LAW IN A FREE SOCIETY 176 (1981) (referring to how the first amendment "was intended to be treated" (emphasis added)); *id.* at 234 (describing "the public dialogue the First Amendment was designed to secure" (emphasis added)).

389. Anastaplo, *supra* note 381, at 448.

390. 5 U.S. (1 Cranch) 137 (1803). For a discussion of Alexander Hamilton's justification of judicial review in a constitutional republic, see Barber, *Judicial Review and the Federalist*, 55 U. CHI. L. REV. 836 (1988). The orthodox approach to constitutional judicial review, at least since *Federalist* No. 78, has been that the legislative branch should make law and policy, while the judiciary should only stand athwart that popular process "when the Constitution fairly can be interpreted (in light of its text, structure, history, and purposes) as foreclosing the course of action adopted by representative institutions." McConnell, *Federalism: Evaluating the Founders' Design* (Book Review), 54 U. CHI. L. REV. 1484, 1487 (1987).

This traditional understanding of the purpose and legitimacy of judicial review can be justified by the same argument that supplies the best answer to the rhetorical question beloved of noninterpretivists: "How can a constitution that was written over 200 years ago properly be said to govern our different world today?" See Dry, *Federalism and the Constitution: The Founders' Design and Contemporary Constitutional Law*, 4 CONST. COMMENTARY 233, 233 (1987). The justification and solution of both problems are exactly the same. The Constitution should be enforced by the courts as the supreme legal command of an *Urvoik*, "a past extraordinary majority" that has made certain basal judgments for their nation and their posterity. Morgan, *Symposium—Constitutional Scholarship: What Next?*, 5 CONST. COMMENTARY 64, 66 (1988). This is precisely Hamilton's justification for judicial review where there are clear conflicts between Acts

than are the noninterpretivist notions of some modern constitutional scholars.³⁹¹

of Congress and the commands of the Constitution, first proffered in the New York ratification controversy. See THE FEDERALIST No. 78, at 524 (A. Hamilton) (J. Cooke ed. 1961) ("Limitations [of the Constitution on legislative power] can be preserved in practice no other way than through the medium of the courts of justice; whose duty it must be to declare all acts contrary to the *manifest* tenor of the constitution void." (emphasis added)) and later adopted by Marshall in *Marbury v. Madison*, 5 U.S. (1 Cranch) at 176-78; see also Morgan, *supra*, at 66 (stating that "no other justification [of judicial review] can be reconciled to the primary commitment to self-government on which our constitutional edifice rests"); see also *supra* note 381.

391. As historians have often noted, the motifs of popular entertainment and mass communications are designed to perfectly track, and therefore are to that extent a reliable index of, the sentiments and beliefs of the majority, although such motifs may not at all describe what obtains in practice. See, e.g., Griffen, *The Progressive Ethos*, in THE DEVELOPMENT OF AN AMERICAN CULTURE 144, 157-58 (S. Coben & L. Ratner 2d ed. 1983); Welter, *On Studying the National Mind*, in NEW DIRECTIONS IN AMERICAN INTELLECTUAL HISTORY 64 (J. Higham & P. Conkin eds. 1979). For exemplars of the historiographical technique that uses popular entertainment and culture in order to capture the mentality of the nation, a state, or a region during a particular era, see D. DAGAVARIAN, SAYING IT AIN'T SO: AMERICAN VALUES AS REVEALED IN CHILDREN'S BASEBALL STORIES 1880-1950 (1988); S. DAVIS, PARADES AND POWER: STREET THEATRE IN NINETEENTH-CENTURY PHILADELPHIA (1986); B. WYATT-BROWN, SOUTHERN HONOR: ETHICS AND BEHAVIOR IN THE OLD SOUTH (1982).

An instance of how this analysis of popular beliefs can edify about public attachment to original understanding is provided by a popular NBC News Special hosted by Ms. Connie Chung, *Guns, Guns, Guns*, which was broadcast nationwide on NBC affiliates on the evening of July 5, 1988. In the peroration of this program, Ms. Chung observed that thousands of Americans insist on their right to keep and bear arms as guaranteed to them in the second amendment. "It is unclear," she concluded, "if our Founding Fathers meant this to apply to handguns. The Supreme Court has never made a definitive ruling on this." This sentiment, stated as the conclusion to a news program on a topic of vital interest to many Americans, manifests the strong effect "originalism" has on the American mind as the proper way for the Supreme Court to analyze difficult constitutional questions.

Further evidence of the importance of "originalism" to our *volk* constitutionalism is provided by a letter to the editors of the *Florida Bar Journal*, written by a nonlawyer:

Although I am not an attorney, I do occasionally read the *Bar Journal*. I would like to take issue with Judge Hatchett's article, "The 'Living' Constitution." There is nothing "elastic" or "living" in the United States Constitution. It is an agreement between people that was carved in granite

For a judge to rule on the law of the land on the basis of his individuality should be an impeachable offense

Letter of Richard S. Levy to the Editors, 63 FLA. B.J. 7 (Jan. 1989). See also *A Newsweek Poll: Bork, the Court and the Issues*, NEWSWEEK, Sept. 14, 1987, at 26 (describing a September 1987 Gallup Poll which concluded that 52% of Americans believe that Supreme Court justices should "apply the intentions of the original authors of the Constitution," while only 40% thought that the justices should "apply their own values as well" as the original intentions of the authors).

Trained lawyers, high and low, manifest attachment to this same *volk* constitutionalism. For example, retired Justice Lewis F. Powell presented the following originalist interpretation of the second amendment during an interview broadcast on *The MacNeil/Lehrer News Hour*:

Lehrer: So . . . the Constitution does not guarantee the right to bear arms? Explain that.

Powell: Have you read the second amendment?

Lehrer: Well, I think I have, but . . . be my guest.

.....

What exactly, then, does the history of the first amendment tell us about its purposes? An initial observation is that history must provide guidance, because the text itself, despite its brevity, provides only Delphic instruction.³⁹² Nevertheless, Leonard W. Levy, the dean of first amendment historians, insisted that the first-amendment language establishes an abstract “principle” of free speech.³⁹³ Among the several commentators who have questioned any presumption of a self-defining “principle” contained in the terse phraseology of the first amendment, none has stated the criticism more cogently than William W. Van Alstyne. The bare words “Congress shall make no law . . . abridging the freedom of speech”³⁹⁴ say nothing about any free speech principle. Indeed, “[t]he amendment does not speak to the issue at all.”³⁹⁵

Thus, the language of the first amendment speaks only of protecting from abridgement the *freedom* of speech and not *all* speech; Congress may abridge, regulate, or ban altogether any variety of speech not comprehended within *the freedom of speech*. Moreover, the language does not speak about free speech in “unqualified” terms, as Dr. Levy alleges.³⁹⁶ Rather, as he himself recognizes elsewhere in his book, “abridging” is hardly a word like “respecting” in the religion clause of the first amendment, which connotes no ability to legislate on the topic

Powell: This Court decided a case . . . —I think it is *United States against Miller*—decided back in the late '30s, in which the question involved a sawed-off shotgun. I won't go into the details of the opinion, but in essence the language in that [opinion] suggests what I believe, and that is that the second amendment was never intended to apply to handguns or indeed to sporting rifles and shotguns.

The MacNeil/Lehrer News Hour: Interview of Justice Lewis F. Powell (retired) (P.B.S. Television Broadcast, Jan. 2, 1989) (Transcript on file at the B.Y.U. Journal of Public Law office.).

Much the same sentiments were expressed recently by an attorney from the Bronx. After congratulating the editors for running an article on Alexander Hamilton's views of the Constitution, Michael Gask concluded that:

Mr. Hamilton would today be a “moderate constructionist” and favor court interpretations that would follow the express and implied principles and the purposes of the document, but not go beyond its words and meaning. To want to follow original intent, you don't have to be narrow or strict. But I'm sure that Mr. Hamilton and the other founders would want the intent of the constitution honored, and brought forward to the present, rather than for the Justices to make the constitution to be what they please.

Letter of Michael Gask to the Editors, 60 N.Y. ST. B.J. 8 (July 1988).

392. BeVier, *supra* note 377, at 306; *see also* A. BICKEL, *supra* note 381, at 88-89 (observing that the plain language of the first amendment does not provide the solution to constitutional analysis since the amendment describes neither what varieties of speech cannot be abridged nor what constitutes an abridgement).

393. L. LEVY, *EMERGENCE OF A FREE PRESS* 349 (1985) (concluding that the Framers “gave constitutional recognition to the principle of freedom of speech and press in unqualified and undefined terms”).

394. U.S. CONST. amend. I.

395. Van Alstyne, *supra* note 383, at 1095 n.18.

396. L. LEVY, *supra* note 393, at 349, *quoted in supra* note 393.

of religion whatsoever.³⁹⁷ Rather, abridging means something like restraining “the freedom of speech” (itself a limited category of speech, as explained above), and thus suggests that “Congress may regulate without abridging, whereas ‘no law respecting’ would have barred any laws on the subject.”³⁹⁸ Hence, the traditional touchstone of textual analysis according to canons of interpretation will provide but scant guidance for assessing the constitutionality of government regulations of speech,³⁹⁹ other than the insight that Congress may “regulate” or “control” many classes of speech not contained within “the freedom of speech” (e.g., obscenity) and that even as to the “covered” class, it may legislate concerning it without necessarily abridging it. The present inquiry must, therefore, turn for clarifying guidance to the history and the values expressed in the movement that culminated in the adoption of the first amendment. In this task, every first amendment scholar must begin with the work of Dr. Levy.

In his recent revision and enlargement of his own pathbreaking history of freedom of speech and press first published in 1960,⁴⁰⁰ Dr. Levy makes it clear that he has not changed his original revisionist target, viz., the thesis of Zechariah Chafee that the Framers and Ratifiers intended to eradicate the common law of seditious libel and thereby to render impossible any prosecution for criticism of the government or public officials.⁴⁰¹ Dr. Levy explained that the principal revisionist thesis of his original work remained unchanged: “I still aim to demolish the proposition . . . that it was the intent of . . . the Framers of the First Amendment to abolish the common law of seditious libel.”⁴⁰²

397. *Id.* at 270-71.

398. *Id.* at 270.

399. For a brief discussion of the antipodal results that have been reached in American history by applying the standard canons of construction to the constitutional text, see L. LEVY, *supra* note 381, at 9-11.

400. L. LEVY, *LEGACY OF SUPPRESSION: FREEDOM OF SPEECH AND PRESS IN EARLY AMERICAN HISTORY* (1960).

401. See Z. CHAFFEE, *FREE SPEECH IN THE UNITED STATES* 21 (1941); Chafee, *Freedom of Speech in War Time*, 32 *HARV. L. REV.* 932, 947 (1919); see also generally D. SMITH, *ZECHARIAH CHAFFEE, JR.: DEFENDER OF LIBERTY AND LAW* (1986); Prude, *Portrait of a Civil Libertarian: The Faith and Fear of Zechariah Chafee, Jr.*, 60 *J. AM. HIST.* 633 (1971); Rabban, *The Emergence of Modern First Amendment Doctrine*, 50 *U. CHI. L. REV.* 1205 (1983) (discussing views of Holmes, Brandeis, and Chafee).

402. L. LEVY, *supra* note 393, at xii; see *id.* at viii (remarking that the first version of his study of the original understanding of the first amendment had, like the 1985 revision, also contradicted the liberal opinion of Professor Chafee); L. LEVY, *supra* note 400, at 3 n.7; *id.* at 237 (“What is clear is that there exists no evidence to suggest an understanding that a constitutional guarantee of free speech or press meant the impossibility of future prosecutions of seditious utterances.”); see also L. LEVY, *supra* note 393, at 269 (repeating *verbatim* the same conclusion).

Years before Dr. Levy first published the results of his research, Edward S. Corwin had

Historians continue to disagree with Levy's premise regarding the intent of the drafters of the first amendment.⁴⁰³ There is little doubt, however, that not all forms of expression were "speech" within the meaning and intent of the first amendment. Libel, slander, obscenity, perjury, and other sorts of speech were almost universally "abridged" or restrained by state laws in the late eighteenth century.⁴⁰⁴ This naturally leads to the following question: What sort of speech *was* intended to be protected by the first amendment? Many modern commentators recognize that Supreme Court jurisprudence has regarded political speech as the most protected category of discourse.⁴⁰⁵ One recent study has called attention to the overlooked importance of the petition-of-government clause of the first amendment as further corroboration of the centrality of political speech to the historical meaning of the speech and press clauses.⁴⁰⁶

similarly concluded that the speech and press clauses of the first amendment had extremely limited purposes and did not intend the complete banishment of seditious libel but instead reflected the contemporary Blackstonean understanding of what freedom of the press meant. See THE CONSTITUTION OF THE UNITED STATES OF AMERICA, S. DOC. NO. 170, 82d Cong., 2d Sess. 769 (E. Corwin ed. 1953) (concluding that "it was no intention of the framers of Amendment I to change the [Blackstonean common] law" of no prior restraints but plenty of posterior prosecutions for seditious libel); Corwin, *Freedom of Speech and Press Under the First Amendment: A Resume*, 30 YALE L.J. 48 (1920) (arguing that the first amendment was a states' rights, not a civil rights, measure, for it was *not* intended to obliterate seditious libel but to reserve such prosecutions to the states).

Surprisingly, Professor Chafee, in opposition to his own libertarian view of the first amendment, proleptically adopted the Levy thesis in 1949:

Especially significant is the contemporaneous evidence that the phrase "freedom of the press" was viewed against a background of familiar legal limitations which men of 1791 did not regard as objectionable, such as damage suits for libel. . . . Not only were private libel suits allowed, but also punishments for criminal libel and for contempt of court.

The truth is . . . that the framers had no very clear idea as to what they meant by "the freedom of speech or the press," but we can say [several] things with reasonable assurance In thinking about it, they took for granted the limitations which had been customarily applied in the day-to-day work of colonial courts.

Chafee, *Book Review*, 62 HARV. L. REV. 891, 897-98 (1949).

403. See, e.g., J. SMITH, *PRINTERS AND PRESS FREEDOM: THE IDEOLOGY OF EARLY AMERICAN JOURNALISM* (1988) (challenging the Levy thesis by arguing that late-18th-century Americans repudiated the idea of seditious libel); Anderson, *The Origins of the Press Clause*, 30 UCLA L. REV. 455 (1983); Mayton, *Seditious Libel and the Lost Guarantee of a Freedom of Expression*, 84 COLUM. L. REV. 91 (1984).

404. See G. GUNTER, *CONSTITUTIONAL LAW* 975 n.3 (11th ed. 1985).

405. See, e.g., W. VAN ALSTYNE, *INTERPRETATIONS OF THE FIRST AMENDMENT* 40-42 (1984); BeVier, *supra* note 377, at 302 (observing that although no wide-spread agreement exists on the proposition that the first amendment's protection is limited to political speech, most first amendment scholars freely concede the overwhelming importance of political speech as a first amendment value); Blasi, *The Checking Value in First Amendment Theory*, 1977 AM. B. FOUND. RES. J. 521, 554-57.

406. See Gottlieb, *The Speech Clause and the Limits of Neutrality*, 51 ALB. L. REV. 19, 43

An even more important and overlooked clause in the Constitution of 1787 suggests the actual original purpose of the speech and press clauses of the first amendment, namely, the Congressional "free" speech and debate clause of article I.⁴⁰⁷ As George Anastaplo⁴⁰⁸ and David A. Bogen⁴⁰⁹ have both observed, the first amendment is intimately related to the bundle of rights known as parliamentary privilege. In the eighteenth century, the most important right in this bundle was the cherished privilege of legislators to debate freely upon public affairs and suffer no interference from king or royal governors.⁴¹⁰ This privilege enhances the functional value of the speech and press clauses for the citizen, and it also delimits the scope of the first amendment's protection, at least as originally conceived.

Professor Anastaplo ably demonstrated that the historical prototype for the people's constitutional guarantee of free speech was the legislature's parliamentary privilege. This prototype indicates the political nature of the speech described and protected by the first amendment.⁴¹¹ Furthermore, Professor Bogen concurs in Dr. Anastaplo's

(1986); see also Higginson, *A Short History of the Right to Petition Government for the Redress of Grievances*, 96 YALE L.J. 142 (1986).

407. U.S. CONST. art. I, § 6, cl. 1 (providing that "for any Speech or Debate in either House, [the Senators and Representatives] shall not be questioned in any other Place").

408. See generally G. ANASTAPLO, *THE CONSTITUTIONALIST: NOTES ON THE FIRST AMENDMENT* (1971).

409. See generally D. BOGEN, *BULWARK OF LIBERTY: THE COURT AND THE FIRST AMENDMENT* (1984).

410. See Levy, *Parliamentary Privilege*, in 3 *ENCYCLOPEDIA OF THE AMERICAN CONSTITUTION* 1365 (L. Levy, K. Karst & D. Mahoney eds. 1986). On the development of parliamentary privilege in England, see Hulme, *The Winning of Freedom of Speech by the House of Commons*, 61 AM. HIST. REV. 825 (1956); on its development and meaning in America, see M. CLARKE, *PARLIAMENTARY PRIVILEGE IN THE AMERICAN COLONIES* (1943).

411. See G. ANASTAPLO, *supra* note 408, at 15-16, 115-18; Anastaplo, *supra* note 381, at 449 (arguing that "a salutary way to approach the freedom of speech and press provisions of the First Amendment is by recalling the risks, purpose, and effects of the freedom of speech provided in the Constitution for members of Congress while transacting the public business" and that "the First Amendment [is] best understood as primarily an assurance that the people at large would be able to discuss, virtually without limitation, the doings of their government and of their community and would thereby be equipped truly to govern themselves"); see also Berns, *Free Speech and Free Government* (Book Review), 2 POL. SCI. REVIEWER 217, 236 (1972) (reviewing L. LEVY, *LEGACY OF SUPPRESSION* (1960)) ("To protect freedom of expression, after all, [the Framers] added an amendment to the Constitution What is [the first amendment] for? The Founders regarded it as an essential institution of free government, because only with freedom of expression could there take place the necessary deliberation, without as well as within the legislative chambers, upon public policy.")

Two juxtaposed sections in the Declaration of Rights of the Vermont Constitution of 1786 indicate the intellectual connexity of parliamentary privilege and the "freedom of speech" necessary to a self-governing citizenry:

XV. That the people have a right of freedom of speech and of writing and publishing their sentiments, concerning the transactions of government — and therefore the freedom of the press ought not to be restrained.

judgment on the importance of parliamentary privilege to our understanding of the purposes and scope of the first amendment:

The major contribution of parliamentary privilege to the concept of freedom of speech is a recognition that the protection of speech is mandatory for the successful operation of the political process and for the preservation of self-government. The relationship between free speech and self-government . . . was embedded in an understanding that arose about the parliamentary privilege of debate.⁴¹²

Hence, the freedom of speech described in the first amendment was the public's version of parliamentary privilege and was just as crucial for the proper working of representative government. And this "self-governance" purpose prescribes the content of the speech intended for protection by the first amendment.

Dr. Levy now implicitly supports the view of Anastaplo and Bogen. In his latest work, Dr. Levy concludes that "freedom of the press had come to mean that the system of popular government could not effectively operate unless the press discharged its obligations to the electorate by judging officeholders and candidates for office."⁴¹³ In short, popular government would not function properly or successfully unless the press were free to criticize candidates and officeholders with the same immunity afforded representatives and senators when they spoke on the floor of Congress.

It is beyond the scope of this article to fully address, much less to resolve, the debate over the primary purpose of the first amendment; but we believe this article presents enough evidence and argument to justify casting our ballot with the numerous defenders of "political speech" as the central value of the first amendment's speech and press clauses. This form of expression⁴¹⁴ generally concerns the public debate

XVI. The freedom of deliberation, speech, and debate, in the legislature, is so essential to the rights of the people, that it cannot be the foundation of any accusation or prosecution, action or complaint, in any other court or place whatsoever.

VT. CONST. (1786), chap. 1, §§ 15-16, *reprinted in* 9 SOURCES AND DOCUMENTS OF UNITED STATES CONSTITUTIONS 499 (W. Swindler ed. 1979).

412. D. BOGEN, *supra* note 409, at 10. *See* F. HAIMAN, *supra* note 388, at 418-19 (explaining that the congressional immunity of speech and debate established by the Constitution was designed "to insure that government policymakers could engage in frank and uninhibited discussion of the public's business").

413. L. LEVY, *supra* note 393, at xii. *See id.* at xiv (referring to several works of Dr. Anastaplo's as among those that influenced his decision to rethink and revise LEGACY OF SUPPRESSION).

414. It is appropriate at this point to mention briefly some of the leading definitions of the speech comprehended by the political speech principle. Lillian R. BeVier defines political speech as speech that participates in "the process of forming and expressing the will of the majority according to which our representatives must govern." BeVier, *supra* note 377, at 309; *see also id.* at 300 (defining political speech as expression that "participates in the processes of representative

of those important social and political issues that are to be handled by public institutions. One of the first objections to the political speech principle is that there is no clear way to separate political from other forms of speech and, therefore, that it would be a vain task to place only political speech within the protective ambit of the first amendment.⁴¹⁵ Aside from the "slippery slope" fears, which seem to be the "mark of an excited or of a stupid head,"⁴¹⁶ most people find it relatively easy to distinguish between "political" and "nonpolitical" speech.⁴¹⁷ Professor Anastaplo correctly observed, "The distinction between 'political' and 'nonpolitical' is, in everyday terms, fairly easy to make. We use it, for instance, with respect to employees of the general government regulated by the Hatch Act and with respect to income tax exemptions and deductions."⁴¹⁸

Another common objection to the political-speech reading of the first amendment is that the amendment, on its face, encompasses many sorts of speech. Many scholars and historians, in addition to those already cited,⁴¹⁹ have argued, however, that the protection of political

democracy"); BeVier, *supra* note 383, at 502 (stating that political speech involves the debate and discussion of political issues and the dissemination of information about the affairs of government). Robert Bork defines political speech as "speech concerned with governmental behavior, policy or personnel Explicitly political speech is speech about how we are governed, . . . includ[ing] a wide range of evaluation, criticism, electioneering and propaganda. It does not cover scientific, educational, commercial or literary expressions as such." Bork, *supra* note 383, at 27-28. Antonin Scalia defines political speech as "the advocacy of particular courses of action with regard to the government." Scalia, *supra* note 377, at 12. The Supreme Court's own discussions suggest that political speech can be fairly defined as public discourse and debate on matters of public affairs, representative self-government, and community definition. See *Buckley v. Valeo*, 424 U.S. 1, 14-15, 48-49 (1976) (per curiam).

415. See, e.g., Posner, *Free Speech in an Economic Perspective*, 20 SUFFOLK U.L. REV. 1, 10 (1986) (contending that "there is no clear demarcation between political speech and other speech, once the purpose of protecting political speech is understood to be preservation of political competition," and then, astonishingly, classifying "the public advocacy of a right of abortion" as nonpolitical speech).

416. For Lord Cockburn's insistence upon reason's ability to make a distinction between the political and the nonpolitical, see 1 H. COCKBURN, EXAMINATION OF THE TRIALS FOR SEDITION WHICH HAVE HITHERTO OCCURRED IN SCOTLAND 68 (1888) (stating that to "see no difference between political and other offenses is the sure mark of an excited or of a stupid head"); cf. also Ely, *The Enigma of Political Crime* (Book Review), 21 LAW & SOC'Y REV. 875, 876-77 (1988) (arguing that it is possible and, moreover, necessary to distinguish between common crime and political crime).

417. G. ANASTAPLO, *supra* note 408, at 126.

418. *Id.* at 561 n.149; see Bork, *supra* note 383, at 27 (maintaining that there is no great difficulty in "drawing a line between political and non-political speech").

419. See *supra* notes 405-14 and accompanying text; see also A. SUTHERLAND, CONSTITUTIONALISM IN AMERICA: ORIGIN AND EVOLUTION OF ITS FUNDAMENTAL IDEAS (1965):

Popular self-government is intimately connected with the capability of political expression, individual or organized; with the right to petition for the redress of grievances; with an opportunity to persuade otherwise indifferent neighbors that grievances exist Free expression thus becomes an integral part of popular government. In mod-

speech was the leading purpose of the free speech and press clauses of the first amendment. Of course, it is far from clear that the first amendment's purpose, as of 1791, went very far beyond preventing the sort of English licensing system criticized by Blackstone.⁴²⁰ Nevertheless, what might be called the Madisonian view of the first amendment's purposes, "in its emphasis on political speech, has history on its side."⁴²¹ As Gordon S. Wood correctly noted, the Revolutionary Era's dominant assumption in favor of popular rule was premised on the conviction that the people, through political discourse, could perceive the common good and act upon that perception.⁴²² Thus, the primacy of political speech on the scale of first amendment values goes back further than 1791 or even 1787; rather, it is intertwined from the first with our dedication to republican and representative government as the best guarantor of the commonwealth.

Even Dr. Leonard Levy offers argumentation in support of the political speech thesis of the first amendment. He now concedes, tem-

ern states aspiration to liberty of expression about politics tends to be mingled with the claim to liberty of expression on all subjects. Freedom from moral and religious censorship is discussed in the same terms as freedom from censorship from political dissent, although the latter has an extra claim for it includes the means to all freedoms.

Id. at 116-17.

420. See *supra* notes 402-04 and accompanying text.

421. Sunstein, *Government Control of Information*, 74 CALIF. L. REV. 889, 910 (1986) (footnote omitted). Madison and other leaders of the Early National Period emphasized the political function and purpose of free speech in a republican form of government. See, e.g., Madison, *Report on the Virginia Resolutions*, in *THE MIND OF THE FOUNDER: SOURCES OF THE POLITICAL THOUGHT OF JAMES MADISON* 231, at 244, 258 (M. Meyers rev. ed. 1981) (maintaining that the Sedition Act unconstitutionally abridged "that right of freely examining public characters and measures, and of free communication thereon, which has ever been justly deemed the only effectual guardian of every other right" and that the "nature of governments elective, limited, and responsible . . . may well be supposed to require a greater freedom of animadversion, than might be tolerated" by other, less republican forms of government); "X," *On Freedom of Speech and the Press*, reprinted in 2 *THE WORKS OF DR. BENJAMIN FRANKLIN* 285, 285 (J. Sparks ed. 1834) ("Freedom of speech is a principal pillar of a free government; when this support is taken away, the constitution of a free society is dissolved, and tyranny is erected on its ruins." (anonymous essay attributed, probably incorrectly, to Franklin; see 2 *THE PAPERS OF BENJAMIN FRANKLIN* 184 (L. Labaree & W. Bell eds. 1960))); Letter from Thomas Jefferson to Charles Yancey (Jan. 6, 1816), reprinted in *THE POLITICAL WRITINGS OF THOMAS JEFFERSON* 93 (E. Dumbauld ed. 1955) ("There is no safe deposit for [the citizenry's liberty and property] but with the people themselves, nor can they be safe with them without information. Where the press is free and every man able to read, all is safe."); Letter of Thomas Jefferson to Edward Carrington (Jan. 16, 1787), reprinted in *id.* at 94 ("The basis of our governments being the opinion of the people, the very first object should be to keep that right; and were it left to me to decide whether we should have a government without newspapers or newspapers without a government, I should not hesitate a moment to prefer the latter.").

422. G. WOOD, *supra* note 384, at 52-58; see Schmitt & Webking, *Revolutionaries, Antifederalists, and Federalists: Comments on Gordon Wood's Understanding of the American Founding*, 9 POL. SCI. REVIEWER 195, 203 (1979).

pering somewhat the harshness of his original work,⁴²³ that in late eighteenth-century America, a general belief had emerged that a free press was essential to the definition and the continued existence of a republic.

[Freedom of the press] meant . . . that the press enjoyed a preferred position in the American constitutional scheme because of its special relationship to popular government. The electoral process would have been a sham if voters did not have the assistance of the press in learning what candidates stood for and what their records showed about past performance and qualifications. A free press was becoming indispensable to the existence of a free and responsible government.⁴²⁴

Dr. Levy then observes that the Founders' belief in this "essentiality"⁴²⁵ of free speech to popular government meant that their understanding of what speech is most essential in view of first amendment protection closely parallels the view of modern court doctrine; that is, the Founders believed that public debate on public affairs defined the "freedom of speech" protected by the first amendment:

It does not necessarily follow [from the belief that a free press was essential to a republican government] that the Framers decided to give the utmost latitude to expression. The First Amendment did not embody an absolute because not all speech is free speech, or, to put it another way, there are several classes of speech or of publication, some of which were not intended to be categorized under the rubric, "the freedom of speech" or freedom of the press.⁴²⁶

Furthermore, the view that speech should be protected because, and to the extent that, it is related to the formation of community identity and opinion has been supported by important political theorists and historians in works not directly concerned with the history of the first amendment.⁴²⁷

423. L. LEVY, *supra* note 400.

424. L. LEVY, *supra* note 393, at 273.

425. *Id.*

426. *Id.* Although Dr. Levy then went on to say that the Framers "did not provide answers" to the question of exactly what sorts of speech were protected and which were not, *id.* at 274, the tenor of his entire work is that political speech was virtually the exclusive concern of the speech and press clauses, no matter how broadly or narrowly those clauses were regarded. Moreover, the arguments of Dr. Anastaplo and Professor Bogen, *see supra* notes 411-12 and accompanying text, persuasively establish that freedom to discuss political matters was the central, and perhaps the exclusive, variety of speech originally covered by the first amendment.

427. *See, e.g.*, H. ARENDT, ON REVOLUTION 115-40, 227-28 (Pelican ed. 1977); J. POCOCK, THE MACHIAVELLIAN MOMENT: FLORENTINE POLITICAL THOUGHT AND THE ATLANTIC REPUBLICAN TRADITION 516-26 (1975); R. FAULKNER, RICHARD HOOKER AND THE POLITICS OF A CHRISTIAN ENGLAND 101 (1981); G. WOOD, *supra* note 384, at 46-90.

Frederick Schauer, arguing philosophically rather than historically, has also derived the pri-

By far the most famous political theorist to argue for the "protection of political speech" meaning of the first amendment was Alexander Meiklejohn.⁴²⁸ His original thesis was that the first amendment applies "only to speech which bears, directly or indirectly, upon issues with which voters have to deal."⁴²⁹ According to Harry Kalven, the *Sullivan* defamation decision⁴³⁰ placed Supreme Court jurisprudence back on the correct free speech track, largely because of Dr. Meiklejohn's path-breaking studies. The Court's opinion proposed that "analysis of free-speech issues should hereafter begin with the significant issue of seditious libel and defamation of government by its critics rather than with

macy of political speech under the Constitution:

The argument from democracy views freedom of speech as a necessary component of a society premised on the assumption that the population at large is sovereign. This *political* basis for a principle of freedom of speech leads to a position of prominence . . . for speech relating to public affairs, and even more prominence for criticism of governmental officials and policies. Such freedom is held to be necessary for two purposes. First, freedom of speech is crucial in providing the sovereign electorate with the information it needs to exercise its sovereign power, and to engage in the deliberative process requisite to the intelligent use of that power. Second, freedom to criticize makes possible holding governmental officials, as public servants, properly accountable to their masters, the population at large.

F. SCHAUER, *FREE SPEECH: A PHILOSOPHICAL INQUIRY* 35-36 (1982). *See also* Schauer, *Codifying the First Amendment*: New York v. Ferber, 1982 Sup. Ct. Rev. 285, 285 (footnotes omitted):

Words and pictures may be the instruments with which a political pamphlet wages a change in government policy, but they may also enable the child pornographer to display . . . photographs of children engaged in sexual activity. The former is unquestionably at the core of the First Amendment's protection of freedom of speech and press. The latter is equally clearly some distance from that core.

Id.

Some legal scholars have also extolled the "checking value" of the first amendment and have observed that this value essentially concerns political speech, for it involves speaking about and to public officials in regard to their handling of political duties and public affairs. Thus, Vincent Blasi has demonstrated that eighteenth-century political thinkers thought that a free press was essential as a means of checking "the inherent tendency of government officials to abuse the power entrusted to them." *See* Blasi, *supra* note 405, at 538; *see also* L. LEVY, *supra* note 393, at xii (arguing that in the late 18th century "the press had achieved a special status as an unofficial fourth branch of government, 'the Fourth Estate,' whose function was to check the three official branches by exposing misdeeds and policies contrary to the public interest").

428. Frank, *Hugo L. Black: Free Speech and the Declaration of Independence*, 1977 U. ILL. L.F. 577, 577 (footnote omitted) (stating that "[b]y 1960, Black was the foremost judicial and Meiklejohn the foremost philosophic exponent of free speech").

429. A. MEIKLEJOHN, *FREE SPEECH AND ITS RELATION TO SELF-GOVERNMENT* 94 (1948). Dr. Meiklejohn eventually modified his theory of coverage in response to the criticism that his narrow definition of political speech would leave much ancillary speech totally unprotected from government restriction. *See* Bollinger, *Free Speech and Intellectual Values*, 92 YALE L.J. 438, 444 (1983). By 1961, Meiklejohn had expanded his definition of political speech to include education, philosophy, science, and literature because the content of such speech elps voters to gain the intelligence necessary for the sane and objective judgment necessary to the proper use of the franchise. *See* Meiklejohn, *The First Amendment Is an Absolute*, 1961 SUP. CT. REV. 245, 256-57.

430. *New York Times Co. v. Sullivan*, 376 U.S. 254 (1964).

the sterile example of a man falsely yelling fire in a crowded theater."⁴³¹ In other words, the Court had rediscovered the fundamental proposition that "the central meaning of the First Amendment,"⁴³² is the protection of political speech.⁴³³

With the *Sullivan* opinion, therefore, the Court effectively adopted the Meiklejohn theory of free speech,⁴³⁴ significantly altering subsequent first amendment jurisprudence.⁴³⁵ The Meiklejohn view and name have been invoked frequently enough in Burger Court speech cases to establish that political speech is still considered to warrant special constitutional solicitude.⁴³⁶ In sum, then, the view that political speech enjoys primacy of position in the first amendment scale of values has been incorporated within "the vocabulary and analytical framework of both Supreme Court justices and constitutional commentators."⁴³⁷

431. Kalven, *The New York Times Case: A Note on "The Central Meaning of the First Amendment"*, 1964 SUP. CT. REV. 191, 205.

432. *Sullivan*, 376 U.S. at 273.

433. Heck & Ringelstein, *The Burger Court and the Primacy of Political Expression*, 40 W. POL. Q. 413, 413 (1987).

434. *See id.*; *see also* S. KRISLOV, *THE SUPREME COURT AND POLITICAL FREEDOM* 33-36 (1968).

435. Heck & Ringelstein, *supra* note 433, at 414. One crucial way the Meiklejohn theory has influenced free speech analysis in the Court has been through the increasingly-employed categorization approach to first amendment analysis, *see generally* Schauer, *supra* note 377; for the value-oriented theories of the first amendment—which all start from the premise that the level of constitutional protection varies with the kind of speech at issue—invariably assign the maximum degree of protection to political speech. *See* Heck & Ringelstein, *supra* note 433, at 414; *see also* F. CANAVAN, *FREEDOM OF EXPRESSION: PURPOSE AS LIMIT* 30 (1984) (stating that "[t]he primary purpose [of free speech and press] is to serve the political needs of a representative democracy which depends on free discussion of public affairs"); J. ELY, *supra* note 381, at 93-94; W. VAN ALSTYNE, *supra* note 405, at 40-42.

436. Heck & Ringelstein, *supra* note 433, at 415; *see* NAACP v. Claiborne Hardware Co., 458 U.S. 886, 911 (1982) (relying upon the political speech principle to protect a boycott by which the NAACP "sought to bring about political, social, and economic change" in a small Mississippi town and describing the boycott as protected "political activity"); *Carey v. Brown*, 447 U.S. 455, 466-67 (1980) (citing Meiklejohn in support of the postulate that "public issue picketing . . . has always rested on the highest rung of the hierarchy of First Amendment values"); *First Nat'l Bank v. Bellotti*, 435 U.S. 765, 776 (1978) (citing Meiklejohn for the proposition that political speech on a public referendum measure "is at the heart of the First Amendment's protections"); *Young v. American Mini Theatres, Inc.*, 427 U.S. 50, 70 (1976) (plurality opinion) (stating that the social interest in adult movies "is of a wholly different, and lesser, magnitude than the interest in untrammelled political debate"); *Buckley v. Valeo*, 424 U.S. 1, 14-15, 19, 39, 48-49 (1976) (*per curiam*).

437. Heck & Ringelstein, *supra* note 433, at 416; *see* Anastaplo, *William H. Rehnquist and the First Amendment*, 22 INTERCOLLEGIATE REV. 31 (Spring 1987); Bollinger, *supra* note 429, at 439; Schauer, *The Role of the People in First Amendment Theory*, 74 CALIF. L. REV. 761, 773-74 (1986) (footnote omitted) (pointing out that modern first amendment jurisprudence treats speech not equally but hierarchically and that "time and again in recent cases, speech that relates to matters of public concern is granted special protection"). Nevertheless, some have expressed

Of course, since first amendment scholars agree on little except their favorite topic of study, it is not surprising that although there is almost universal recognition of the importance of political speech, no such widespread agreement exists on the thesis that the amendment's protective ambit extends *only* to political debate and discourse.⁴³⁸ Some first amendment scholars have embraced "self-fulfillment," "personal growth," and "self-realization" as purposes of the first amendment.⁴³⁹ The self-realization or self-fulfillment theory of the first amendment maintains that a person "should be free to express himself or herself on all matters in order to develop all of his or her intellectual faculties."⁴⁴⁰ This theory has received scant attention, however, in Supreme Court first amendment jurisprudence. The Supreme Court has been wise to largely ignore, except in scattered *dicta*, the self-realization argument, for it proves too much.⁴⁴¹ Other human activities besides personal speech or writing can also develop personal potential or confer self-fulfillment. In other words, speech is indistinguishable from other forms of human activity when viewed from the vantage of self-realization.⁴⁴² Because many other human activities besides personal speech can develop a person's potential or confer self-fulfillment, the speech and press clauses of the first amendment must have had some

doubt over just how dedicated the Burger Court has been to the "primacy of political speech" principle, beyond the rhetorical level. For example, Lee Bollinger observed in 1980 that the Burger Court's free speech decisions manifested great ambivalence about the primacy of political speech. Bollinger, *Elitism, the Masses, and the Idea of Self-Government: Ambivalence About the "Central Meaning of the First Amendment,"* in CONSTITUTIONAL GOVERNMENT IN AMERICA 99, 100 (R. Collins ed. 1980).

More recently, two political scientists, after conducting a survey of Burger Court free speech cases, concluded, "Neither the Court as a whole, nor any justice, exhibited a pattern of supporting freedom of expression claims in an *extremely* high percentage of political expression cases, while supporting claims for protection of nonpolitical expression at a *significantly* lower rate." Heck & Ringelstein, *supra* note 433, at 422 (emphasis added). The italicized adverbs are the operative words in this conclusion, for the survey data indicate a higher level of protection in political speech cases than in non-political speech cases, and that is all that is required to establish the primacy—not exclusiveness—of political speech as a first amendment value and purpose. *See id.* at 421 (stating that the survey offers "limited support" for the "primacy of political speech" hypothesis in that the data show that the Burger Court decided in favor of the rights of litigants in 50.0% of the political speech cases, compared to a favorable disposition in only 37.8% of the nonpolitical speech cases).

438. *See* BeVier, *supra* note 377, at 302; Sunstein, *supra* note 421, at 909.

439. *See, e.g.*, T. EMERSON, *THE SYSTEM OF FREEDOM OF EXPRESSION* 6 (1970); M. REDISH, *FREEDOM OF EXPRESSION: A CRITICAL ANALYSIS* 30-58 (1984); L. TRIBE, *AMERICAN CONSTITUTIONAL LAW* § 12-1, at 788 (2d ed. 1988); Redish, *Self-Realization, Democracy, and Freedom of Expression: A Reply to Professor Baker*, 130 U. PA. L. REV. 678 (1982).

440. Nahmod, *Artistic Expression and Aesthetic Theory: The Beautiful, the Sublime, and the First Amendment*, 1987 WIS. L. REV. 221, 235.

441. For more detailed criticism of the self-realization theory of the First Amendment, see BeVier, *supra* note 377, at 320-22.

442. *See id.* at 315-16 & n.62.

other central purpose in mind:

[Theories of free speech based on self-fulfillment or self-realization] founder because they do not distinguish speaking from a wide range of other self-expressive activities that fall outside the purview of the first amendment. A satisfactory theory of free speech must explain why speech is distinguishable from other distinctly . . . self-expressive activities, such as riding a motorcycle or appearing naked in public⁴⁴³

Moreover, self-realization theories cannot be reconciled with modern first amendment jurisprudence, which treats speech not equally but hierarchically.⁴⁴⁴

Thus, the following question remains: If self-realization and self-fulfillment can be achieved equally well or better through Godivaesque parading, street-corner mime, or motorcycle-riding, why were *speaking* and *writing* singled out for constitutional protection?⁴⁴⁵

The answer is provided by history and Supreme Court jurisprudence, both of which demonstrate that political speech and writing serve a goal not served by such other forms of self-expressive activity as mime, motorcycle-riding, or even by other forms of speech. That constitutional end is self-government. Free speech is singled out for constitutional protection because it fosters the robust discussion of public affairs necessary for the people to decide how to vote and to assess how their

443. Schauer, *supra* note 437, at 772.

444. *Id.* at 773.

445. *Id.* at 772; see BeVier, *Liberty Fund, Inc.: Symposium on the First Amendment and Securities Regulation*, 20 CONN. L. REV. 383, 413 (1988) (Transcript of Symposium):

[T]he notion that the amendment was intended to guarantee self-fulfillment . . . is unsound. It's also a notion that goes too far, because the first amendment protects freedom of speech, not freedom of action Speech is self-expression and so is action. It's hard to differentiate speech from actions in their ability to contribute to self-fulfillment. But the first amendment doesn't cover action; it's not a basic charter of liberty.

The attachment of some commentators to the purpose of self-fulfillment as the core purpose served by the first amendment reflects what historian Eugene Genovese identified almost two decades ago as the characteristic trait of modern American liberalism, viz., "the extreme egotism of the pretension that self-expression is life's highest value." Genovese, *The Fortunes of the Left*, 22 NAT'L REV. 1266, 1267 (1970).

Even its staunchest defenders have recognized that the self-fulfillment theory is unconfined and even undifferentiated; that is, even liberal free speech theorists like Thomas Emerson have recognized that the self-fulfillment value is not confined merely to speech activity but could just as well justify any sort of conduct that a person could regard as self-fulfilling and that, therefore, it is difficult to discern a self-fulfillment value as a peculiar concern of the "speech and press" clauses of the first amendment. See Emerson, *First Amendment Doctrine and the Burger Court*, 68 CALIF. L. REV. 422, 425 (1980). Therefore, to the extent that "self-fulfillment" is protected at all in first amendment jurisprudence, it is as an unintended benefit from the protection afforded the "collective" political and social values of the political speech and marketplace of ideas theories. For a discussion of the "search for truth/marketplace of ideas" theory, see *infra* text accompanying notes 447-50.

representatives have voted and performed on important public issues.⁴⁴⁶

Another oft-cited purpose of the first amendment is the “marketplace of ideas/search for truth” rationale.⁴⁴⁷ This phrase resonates with attractiveness as an explanation for the first amendment’s protection of free speech and, perhaps for that reason, the Supreme Court has often supported this rationale in its opinions.⁴⁴⁸ There are, however, several problems with a broad endorsement of the “marketplace” theory, not the least of which is that most of these statements appear in *dicta*.

More importantly, however, the “marketplace” theory originally arose in the context of political speech,⁴⁴⁹ and is most persuasive in the context of a search for truth on topics of public concern. Its connection to debate on topics of public concern reveals the fundamental flaw of the theory, however. Even Justice Brandeis’s original presentation of the “search for political truth” rationale actually bears little relation to the self-government purposes of the first amendment since popular sovereignty, not truth, is the basis of representative democracy. In other words, popular sovereignty necessarily entails the authority of the people to make mistakes in their self-governance: its end is the Lockean, not the Platonic, polity.⁴⁵⁰

446. See Anastaplo, *Human Nature and the First Amendment*, 40 U. PITT. L. REV. 661, 684 (1979); Posner, *supra* note 415, at 50.

447. The “marketplace” trope derives from Justice Holmes’s famous *Abrams* dissent. See *Abrams v. United States*, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting) (“the best test of truth is the power of the thought to get itself accepted in the competition of the market”). The exact phrase “marketplace of ideas” was coined by Justice Brennan. See *Lamont v. Postmaster General*, 381 U.S. 301, 308 (1965) (Brennan, J., concurring); see also H. ABRAHAM, *THE JUDICIAL PROCESS* 302 (5th ed. 1986) (identifying *Lamont* as the “first [Supreme Court] decision voiding an Act of Congress on the ground that it violated the freedom of speech guarantee of the First Amendment”).

448. See, e.g., *Bose Corp. v. Consumers Union of United States, Inc.*, 466 U.S. 485, 503 (1984) (stating that “the freedom to speak one’s mind . . . is essential to the common quest for truth”); *Consolidated Edison Co. v. Public Serv. Comm’n*, 447 U.S. 530, 534, 537-38 (1980); *Linmark Assoc. v. Township of Willingboro*, 431 U.S. 85, 95-98 (1977); *Gertz v. Robert Welch, Inc.*, 418 U.S. 323, 339-40 (1974); *Red Lion Broadcasting Co. v. FCC*, 395 U.S. 367, 390 (1969) (stating that “the purpose of the First Amendment [is] to preserve an uninhibited marketplace of ideas in which truth will ultimately prevail”).

449. Holmes’s “marketplace of ideas” purpose of the first amendment is closely related to the Brandeisian “discovery of political truth” theory of free speech. *Whitney v. California*, 274 U.S. 357, 375 (1927) (Brandeis, J., concurring) (maintaining that the leaders of our revolutionary generation “believed that freedom to think as you will and to speak as you think are means indispensable to the discovery and spread of political truth”).

450. For a discussion of the true nature of political speech as a means to guarantee rule by the people, not rule by accurate information or truth, see A. BICKEL, *THE MORALITY OF CONSENT*, 62-63 (1975). As Professor Bickel cogently observed, the Constitution allows the votes of the majority to govern “whether or not [they are] wise or [are] founded in truth.” *Id.* at 62; see BeVier, *supra* note 377, at 318 n.70; Schneider, *Free Speech and Corporate Freedom: A Comment on First Nat’l Bank of Boston v. Bellotti*, 59 S. CAL. L. REV. 1227, 1270 (1986) (“in a democracy people have a right to participate in governing the country however useless their ideas

Perhaps the best reason for adhering to the "political speech" understanding and application of the first amendment is provided by the Supreme Court's own jurisprudence. As Frederick Schauer, one of the leading scholars of modern first amendment law, concluded, "time and again in recent cases, speech that relates to matters of public concern is granted special protection."⁴⁵¹ Even a quick review of Supreme Court case law will confirm Professor Schauer's observation, for the Court has often declared that a core purpose of the first amendment is to protect the discussion of public and political affairs.⁴⁵²

This long train of support by the Supreme Court for the political speech principle should not be surprising, for despite continual reiteration that the first amendment protects other forms of speech besides the political, "the Court has in fact delineated relatively few other categories of protected speech. . . ."⁴⁵³ Indeed, from a survey of press-clause cases involving governmental regulations that restrict publication, Lillian R. BeVier concluded that "[t]he first amendment doctrine that emerges from the cases rests on a broad consensus that political speech is at the core of the amendment's concern."⁴⁵⁴ As Justice Antonin

are").

451. Schauer, *supra* note 437, at 774 (footnote omitted).

452. See *Mills v. Alabama*, 384 U.S. 214, 218 (1966); see also *Boos v. Barry*, 485 U.S. 312, 317 (1988); *Dun & Bradstreet, Inc. v. Greenmoss Builders, Inc.*, 472 U.S. 749, 761-63 (1985) (plurality opinion) (declaring that public speech on matters of public concern will be afforded the greatest first amendment protection); *Connick v. Meyers*, 461 U.S. 138, 145-47 (1983); *NAACP v. Claiborne Hardware Co.*, 458 U.S. 886, 913 (1982); *Brown v. Hartlage*, 456 U.S. 45, 53-54 (1982); *Citizens Against Rent Control v. City of Berkeley*, 454 U.S. 290, 295-300 (1981); *Consolidated Edison Co. v. Public Serv. Comm'n*, 447 U.S. 530, 534 (1980); *Carey v. Brown*, 447 U.S. 455, 467 (1980); *Landmark Communications, Inc. v. Virginia*, 435 U.S. 829, 838-39 (1978); *First Nat'l Bank v. Bellotti*, 435 U.S. 765, 771, 776-77 (1978); *Virginia State Bd. of Pharmacy*, 425 U.S. 748, 765(1976); *Buckley v. Valeo*, 424 U.S. 1, 14 (1976) (per curiam); *Gertz v. Robert Welch, Inc.*, 418 U.S. 323, 339-41 (1974); *Cohen v. California*, 403 U.S. 15, 24 (1971); *Monitor Patriot Co. v. Roy*, 401 U.S. 265, 272 (1971); *Tinker v. Des Moines Indep. School Dist.*, 393 U.S. 503, 512 (1969); *New York Times Co. v. Sullivan*, 376 U.S. 254, 266, 270 (1964); *Garrison v. Louisiana*, 379 U.S. 64, 74-75 (1964); *DeJonge v. Oregon*, 299 U.S. 353, 365 (1937) (declaring that free speech supports and encourages public debate "to the end that government may be responsive to the will of the people"); *Grosjean v. American Press Co.*, 297 U.S. 233, 250 (1936).

453. BeVier, *supra* note 377, at 346 (footnotes omitted); see also *id.* at 346 n.210 ("Indeed, with the notable . . . exception of commercial speech, the Court's first amendment rules . . . —if not its rhetoric—are surprisingly congruent with [the political speech thesis].").

454. BeVier, *supra* note 383, at 485 (footnote omitted). Despite the beliefs of contemporary theorists such as Kent Greenawalt and Thomas I. Emerson that a "central purpose/political speech" approach slights the multitude of values comprehended by "free speech," see T. EMERSON, *supra* note 439, at 6-9 (proffering several values and purposes of free speech); Greenawalt, *Speech and Crime*, 1980 AM. B. FOND. RES. J. 645, 785 (contending that "[a]nyone who supposes that the protection of the First Amendment can be reduced to one justification is either deluded or willing to sacrifice a great deal in the interests of theoretical neatness and actual or apparent simplicity of administration"). Professor Emerson has himself recently acknowledged that the "central purpose-political speech" approach to first amendment analysis has become increasingly

Scalia observed, "It is generally agreed . . . that . . . 'political speech' . . . is entitled to the highest degree of protection from official interference" because "its protection is utterly central to the [self-government] purposes of the First Amendment. . . ." ⁴⁵⁵

If scientific speech serves the same purposes as "political speech," it must receive the heightened first amendment protection afforded political speech. Thus, the threshold question for purposes of this paper is whether to categorize scientific speech as "political speech." Before answering that question, however, we must first define the political system supported and succored by the political speech principle. The Supreme Court itself committed a common error when, in the *Bellotti* case, ⁴⁵⁶ it confused direct or plebiscitary democracy with the Constitution's republican or representative democracy. The *Bellotti* Court remarked that in a democracy the people, not the government, "are entrusted with the responsibility for judging and evaluating the relative merits of conflicting arguments." ⁴⁵⁷ More correctly, however, in a *representative* democracy, the *agents* of the people (i.e., elected officials) assess the merits of particular issues and arguments, act on those assessments, and then the people, through the franchise, "grade" their representatives' performance. ⁴⁵⁸ Unfortunately, the mistaken view of the *Bellotti* Court is rather widespread. And this view's concomitant, flawed version of the political speech principle is based on a "Jeffersonian" model of free speech, a model whose fundamental (and inaccurate) postulate is that "the purpose of free expression is to ensure . . . that the citizenry will make informed decisions on public issues. . . . The Jeffersonian model thus views [citizen] deliberation as a critical

potent and pervasive in the work of both judges and scholars. Anastaplo, *Notes Toward an Apologia pro vita sua*, 10 *INTERPRETATION* 319, 345 (1982) (recording the recent admission of Professor Emerson to Dr. Anastaplo that the Anastaplo-Meiklejohn thesis that the first amendment is limited to protection of political speech had garnered far more support by the early 1980s than Emerson would have thought possible twenty years earlier).

455. Scalia, *supra* note 377, at 12. See Bloustein, *The First Amendment and Privacy: The Supreme Court Justice and the Philosopher*, 28 *RUTGERS L. REV.* 41, 51 (1974) (stating that the first amendment's structural connection with representative democracy was correctly advanced by Dr. Meiklejohn as warrant for his proposition that constitutional protection should be extended almost exclusively to speech that is relevant to the processes and purposes of self-government); Converse, *Power and the Monopoly of Information*, 79 *AM. POL. SCI. REV.* 1 (1985) (observing that political speech has wisely and widely been regarded as the central concern and highest valued speech under the first amendment because of the logical and historical connexity between free government and free speech).

456. *First Nat'l Bank v. Bellotti*, 435 U.S. 765 (1978).

457. *Id.* at 791 (footnote omitted).

458. See BeVier, *supra* note 377, at 309 (concluding from the Constitution's establishment of representative democracy that "the [first] amendment protects the process of forming and expressing the will of the majority according to which our representatives must govern").

element in the system of self-government.”⁴⁵⁹

This attachment to deliberation by the citizenry is not, of course, the view that prevailed in our Founding Era. The Framers of the Constitution saw to it that political deliberation and decisionmaking, as opposed to ultimate responsibility and control, would inhere in the people’s elected representatives rather than in the people themselves.⁴⁶⁰ According to Madison’s and other Federalists’ conception of governance, the people’s representatives, not the people, should be responsible for daily deliberation and decisionmaking. This insistence on representative government marked the Federalists’ departure from classical theories of government and also describes the difference between a representative and a plebiscitary democracy.⁴⁶¹ Hence, our Madisonian Constitution fundamentally rejects the plebiscitarian view that a democratic government must precisely and accurately embody “the people’s will” in every jot and tittle of the law. To the contrary, representative democracy “consists of holding regular elections and hence providing a popular veto on recent legislative action.”⁴⁶²

The many imagined difficulties for governmental regulation of scientific speech dissolve once it is recognized that our Madisonian democracy and its concomitant reliance on political speech for its proper functioning are *toto caelo* different from Dr. Meiklejohn’s understanding of self-government and political speech. The Meiklejohn view is fundamentally flawed as a description of our constitutionally-structured system, for his observations are more suited to a direct than a representative democracy:

The First Amendment’s purpose is to give every voting member of the

459. Sunstein, *supra* note 421, at 890-91. One can see this Jeffersonian model in the work of Meiklejohn. *See supra* note 429.

460. *See* Sunstein, *supra* note 421 at 890 n.7; BeVier, *supra* note 383, at 505-06 (maintaining that the Constitution actually prescribes “a considerably more attenuated role for citizens in the actual decision of public issues” than is commonly understood today, for the Constitution mandates that public issues shall be decided by our representatives and that the Constitution was intentionally designed to cure the excesses of the plebiscitarian model of democracy that existed in the States during the Confederation Period).

461. *See* E. MORGAN, *INVENTING THE PEOPLE: THE RISE OF POPULAR SOVEREIGNTY IN ENGLAND AND AMERICA* (1988); G. WOOD, *supra* note 384, at 162-96, 344-89, 483-506, 532-36, 593-600; Sunstein, *supra* note 421, at 893-94 (observing that the Madisonian, unlike the Jeffersonian, view of free speech recognizes that we have not a plebiscitary but a representative democracy); Sunstein, *Interest Groups in American Public Law*, 38 *STAN. L. REV.* 29, 38-43 (1985) (explaining that Madison and other important Federalists of the Confederation and Early National Periods contended for and established systems of deliberation and legislation by representatives rather than by the entire citizenry).

462. Riker & Weingast, *Constitutional Regulation of Legislative Choice: The Political Consequences of Judicial Deference to Legislatures*, 74 *VA. L. REV.* 373, 397 (1988) (footnote omitted).

body politic the fullest possible participation in the understanding of those problems with which the citizens of a self-governing society must deal. When a free man is voting, it is not enough that the truth is known by someone else, by some scholar or administrator or legislator. The voters must have it, all of them.⁴⁶³

The Meiklejohn-Jeffersonian understanding of our constitutional democracy calls for direct, particularistic information and expertise-rich decisionmaking by each citizen. The problem with this understanding is that it does not accurately describe our system of self-government under which the representatives of the people, not the people themselves, gather the expertise and information necessary for making the daily, specific decisions concerning the business of the polity, the *res publica*.⁴⁶⁴

Furthermore, Dr. Meiklejohn is simply wrong to say that the basic American agreement on self-government is that "public issues shall be decided by universal suffrage."⁴⁶⁵ Our most basic agreement, as expressed in the government structured by the Constitution, is that public issues shall be decided by elected representatives.⁴⁶⁶ In short, the Constitution establishes a national system of self-government in which the citizenry does not directly make or implement the daily decisions about public affairs but instead holds the ultimate authority to establish the general direction of public policy through the election of representatives.

This accurate understanding of our constitutional system helps resolve a paradox suggested by the Meiklejohn view that popular sovereignty, in the plebiscitarian sense of that term, justifies the primacy of political speech and first amendment doctrine. The paradox entailed in the Meiklejohn view is that in a system where the people are sovereign, the agents of the people should not be able to decide what ideas and information the principal (i.e., the people) receive.⁴⁶⁷ But popular sovereignty and restraints on speech only present an anomaly when we confuse, as Dr. Meiklejohn did, our representative democracy with a plebiscitary or direct democracy. Those who shaped our republican form of government most certainly realized the impracticalities, in addition to the dangers, of direct or "Athenian" democracy.⁴⁶⁸

463. A. MEIKLEJOHN, *supra* note 429, at 75.

464. See BeVier, *supra* note 383, at 505.

465. A. MEIKLEJOHN, *supra* note 429, at 27.

466. See BeVier, *supra* note 383, at 505.

467. See A. MEIKLEJOHN, *supra* note 429, at 26-27.

468. See, e.g., THE FEDERALIST NO. 55, at 374 (J. Madison) (J. Cooke ed. 1961) ("In all very numerous assemblies, of whatever characters composed, passion never fails to wrest the sceptre from reason. Had every Athenian citizen been a Socrates; every Athenian assembly would still

In other words, in our representative democracy, the people are protected by the first amendment's political speech principle to the extent that they must receive the ideas and information necessary to control and choose those who represent them in the chambers of government.⁴⁶⁹ Hence, to define political speech as the fundamental concern of

have been a mob."'). The historical evidence indicates that the concerns of the Federalists centered more on the dangers of direct democracy than its impracticalities. The general theory of a constitutional polity advanced by the Federalists maintained that the quick and hasty decisions of a transient majority would often be unwise decisions and that the decisions made under a longer, more deliberate view of the topic, which the men of "continental vision" elected as national representatives would likely take, should more accurately reflect and implement the national good. Thus, the Founders envisioned and established a system of mediating representatives—Congressmen, indirectly-elected President and Senators—giving expression to the long, deliberate will of the people. See G. WOOD, *supra* note 384, at 471-518; Lutz, *Bernard Bailyn, Gordon S. Wood, and Whig Political Theory*, 7 POL. SCI. REVIEWER 111, 124-25 (1977) (concluding that for the Federalists, more than for the earlier Real Whigs and Commonwealthmen, the deliberate sense of the community is discovered not so much through direct decisionmaking and debate by the citizenry as through an indirect political process in which delay is important "because it takes time to produce mechanically the fair sense of the community, [and] also because in the short run many people will be slow to recognize what is a fair balancing of interests," and that therefore, although the Federalists adhered to the fundamental American political tenet that government should be based on the deliberate sense of the community, the Federalists became far more insistent that the process be slow and indirect in order that it might better reflect true deliberation and the true "deliberate sense of the community"); Schauer, *supra* note 437, at 775; Sunstein, *supra* note 461, at 32-43.

A consequence of this Federalist understanding of our constitutional system is that first-amendment protection of speech should be regarded as a constitutional decision of the Founders that the first amendment will not permit a current majority to decide to exclude certain voices or viewpoints from political debate; it is only through a delayed and complete debate—that is, one which includes all voices and interests—in the national forum that the national representatives can come to discern and implement the national good. See Lutz, *supra*, at 123-24. On the importance of the requirement of viewpoint neutrality to a determination that a government regulation is constitutional, see F. SCHAUER, *supra* note 427, at 38-39, 43-44 (justifying the special free-speech protections with reference to the chance that government will be acting for illegitimate, partisan reasons in its attempts to restrict speech).

Furthermore, Professor Schauer's philosophical conclusion is supported by numerous Supreme Court opinions providing that "the First Amendment forbids the government to regulate speech in ways that favor some viewpoints or ideas at the expense of others." *Members of City Council v. Taxpayers for Vincent*, 466 U.S. 789, 804 (1984). See *Pacific Gas & Elec. Co. v. Public Util. Comm'n*, 475 U.S. 1, 6-7 (1986) (striking down an order of the state commission because it penalized certain points of view expressed in political editorials inserted by PG&E in its monthly billing statements); *Cornelius v. NAACP Legal Defense & Educ. Fund*, 473 U.S. 788, 806 (1985) (holding that the government can validly restrict access to a nonpublic forum based on speaker identity and the subject matter of the speech as long as the restriction not only is reasonable in light of the forum's purpose but also is viewpoint-neutral). Thus, under the Court's modern approach, a more stringent scrutiny is applied to government regulations that appear to take political or ideological sides on public issues—a failure of viewpoint-neutrality—and a more important governmental interest is required to uphold viewpoint-based restrictions. See *Welkowitz, Smoke in the Air: Commercial Speech and Broadcasting*, 7 CARDOZO L. REV. 47, 53-54 (1985).

469. See Posner, *supra* note 415, at 50-51. In contrast to the Federalists of the founding generation, who viewed indirect democracy as the necessary means of controlling a piebald human nature and the natural factionalism of a heterogeneous American populace, see *supra* note 468,

constitutional protection provides the method for dissolving the paradox of popular sovereignty and governmental restrictions on nonpolitical speech; that is, once the nature of the "politics" served by political speech is correctly understood, it no longer appears "undemocratic" to recognize, as many commentators have, that government has a legitimate and necessary interest in regulating "scientific information with actual or potential military applications."⁴⁷⁰

Therefore, the argument that the EAA is unconstitutional under a first amendment theory derived from the Meiklejohn view of self-government is fundamentally flawed, for our republican form of government does not describe or arise from a view of popular sovereignty that contemplates direct, particularistic citizen involvement in the making or implementation of laws.⁴⁷¹ Because ours is a representative, not a direct, democracy, the constitutional system does not require full information disclosure to the citizenry in order for there to be a proper working of the political process. Citizen deliberation and electoral control of officials functions quite effectively without full disclosure of the

the representative democracy established by those Federalists is nowadays most often justified in terms of the impracticalities created by the structure of modern society; that is, the average individual in a complex and complicated modern world can seldom, if ever, conduct information-gathering expeditions, since most citizens are consumed by the daily cares of raising families and earning a living wage, and even if they could, there is no agora large enough to contain their assembly. This fact was remarked by political and legal commentators as early as the 19th century. See, e.g., F. LIEBER, ON CIVIL LIBERTY AND SELF-GOVERNMENT (1853), *reprinted in* FREEDOM OF THE PRESS FROM HAMILTON TO THE WARREN COURT 378 (H. Nelson ed. 1967) ("We do not assemble in the markets as the people of antiquity did. The millions depending upon public information, in our national states, could not meet in the market . . ."). Hence, it is now commonly recognized that the people cannot be expected to govern, but they do choose the governors; so "American government officials . . . are really our public servants: they may tell us what to do, but we decide *who* they are and, in the last analysis, what *they* are to do." Anastaplo, *supra* note 446, at 667; cf. Roche, Book Review, 40 CORNELL L.Q. 633 (1955), *reprinted in* J. ROCHE, SHADOW AND SUBSTANCE: ESSAYS ON THE THEORY AND STRUCTURE OF POLITICS 222, at 224 (1964) ("democratic government is founded upon a rigorous doctrine of responsibility: the elected official is held responsible and *must* be held responsible, if democratic political theory is to have any meaning").

470. Sunstein, *supra* note 421, at 894. See DuVal, *The Occasions of Secrecy*, 47 U. PITT. L. REV. 579, 591 (1986) ("There is little dissent from the notion that our society needs to protect the secrecy of at least some kinds of military information."). Indeed, even anti-secrecy zealots admit the existence of "essential secrets." See, e.g., A. COX, THE MYTHS OF NATIONAL SECURITY 193 (1975); M. HALPERIN & D. HOFFMAN, TOP SECRET: NATIONAL SECURITY AND THE RIGHT TO KNOW 65-67 (1977) (listing classes of national-security and foreign-policy information that should be treated as "presumptively secret"). And the authors of the *Corson Report* acknowledged that "some things must, by their very nature, be kept secret." *Corson Report*, *supra* note 210, at 48. For examples of the sorts of information that, if kept secret, would enhance our national security, see *id.* at 19 ("The Panel has no reason to doubt government assertions that . . . acquisitions [of technology] from the West have permitted the Soviet military to develop countermeasures to Western weapons, improve Soviet weapon performance, avoid hundreds of millions of dollars in R&D costs, and modernize critical sectors of Soviet military production.").

471. See BeVier, *supra* note 383, at 506.

sort of minutiae that the representatives themselves would need in order to write a statute. The electorate will only want and need to verify whether the statute has achieved its goals satisfactorily.⁴⁷²

Vincent Blasi,⁴⁷³ among others,⁴⁷⁴ has observed that it is fanciful to suppose that citizens deliberate, or much want to, on the quotidian and detailed issues of public policy.⁴⁷⁵ The important datum, as Professor Blasi points out, is that the people retain ultimate theoretical *and* practical authority through the franchise to check abuses of power by their agents and to score their performance in office.⁴⁷⁶ Under the proper republican understanding of the "political speech" principle, one can see that the "marketplace of ideas/search for truth" notion that truth will be discovered best by a free-for-all among contending ideas does not describe the American polity or political process. Judge Posner correctly observes that the "most important aspect of freedom of political speech is simply the right to criticize government officials and policies—that is, the right to disseminate information that may affect how people vote in the next election."⁴⁷⁷

Under this standard, it is clear that the EAA permits robust attempts to have the EAA repealed, as evidenced by the law review criticism⁴⁷⁸ and the hostile scientific-journal commentary cited throughout this article.⁴⁷⁹ No one can plausibly contend that the EAA regulations of scientific speech will suppress, much less that they aim to eliminate, the sort of scientific-policy debate that would necessarily be a prelude to the repeal, as it was to the enactment, of the EAA. Therefore, under

472. See Sunstein, *supra* note 421, at 894.

473. Blasi, *supra* note 405.

474. See, e.g., Posner, *supra* note 415, at 50 ("The evaluation of policies does not always, and perhaps does not typically, require access to the same information that the policymakers have. Most people are less interested in whether government policies are made in what appears to be a rational and well-informed manner than in whether the policies work, and the latter question is answered by observing the effects of the policies . . . [V]erification is a more persuasive test of truth than debate is."); Riker & Weingast, *supra* note 462, at 397.

475. See Blasi, *supra* note 405, at 539, 541-42.

476. *Id.* at 542; see Anastaplo, *How to Read the Constitution of the United States*, 17 *LOY. U. CHI. L.J.* 1, 41 (1985) ("We, the people, do make the vital political decisions here, both by the choice of officers of government and through the influence of public opinion. The power we require, therefore, is not only that of the ballot but also that which comes in the form of the right to discuss fully and freely the public business of the country."); Anastaplo, *supra* note 446, at 667, quoted *supra* note 469; Schauer, *supra* note 437, at 780.

477. Posner, *supra* note 415 at 11.

478. See, e.g., Alexander, *Preserving High Technology Secrets: National Security Controls on University Research and Teaching*, 15 *LAW & POL'Y IN INT'L BUS.* 173 (1983); Ferguson, *Scientific and Technological Expression: A Problem in First Amendment Theory*, 16 *HARV. C.R.-C.L. L. REV.* 519 (1981); Comment, *National Security Controls on the Dissemination of Privately Generated Scientific Information*, 30 *UCLA L. REV.* 405 (1982).

479. See, e.g., commentary cited *supra* notes 18, 28, 195, 315.

the political speech principle outlined herein, the EAA's regulation of pure scientific speech should not be regarded as a first amendment violation.⁴⁸⁰

480. On the "political speech" principle, see *supra* notes 413-19 and accompanying text. The characteristics of "pure" scientific speech make it more akin to "commercial speech" than to political speech. As explained in the text, see *infra* text accompanying notes 483-93, unlike political speech, scientific speech does not directly contribute to the self-governing and political-speech purposes underlying the first amendment. When it does, however, contribute to these self-governing functions, pure scientific speech should be afforded the same high level of protection as political speech. See *infra* notes 483-88 and accompanying text. Since 1976, the Court's opinions have emphasized that, on account of the mercantile and self-serving nature of commercial speech, its first amendment protection would be far more limited than that of political speech. See Wolfson, *The First Amendment and the SEC*, 20 CONN. L. REV. 265, 268 (1988). The Court has defined commercial speech as expression that proposes a commercial transaction, see *Central Hudson Gas & Elec. Corp. v. Public Serv. Comm'n.*, 447 U.S. 557, 561-62 (1980), which, in plain English, usually means an advertisement. The justification usually offered for the intermediate level of protection granted commercial opinion is that commercial claims are thought to be more easily verifiable than political opinion, less likely to be deterred by regulation, and less central to first amendment values than political speech. See Scalia, *supra* note 377, at 13; see also Emerson, *supra* note 445, at 460. Hence, the Court recognized that it was illegitimate, under the central meaning of the first amendment and its political speech principle, as well as impolitic in view of the government's historical function of regulating the economy, to extend full first amendment protection to commercial speech. Indeed, commercial speech is so far removed from the context of political debate and the social importance of the advertised transactions are so low as to make the speech virtually irrelevant to true first amendment values and concerns. See *BeVier*, *supra* note 377, at 353; see also Jackson & Jeffries, *Commercial Speech: Economic Due Process and the First Amendment*, 65 VA. L. REV. 1 (1979) (pointing out the misleading and incorrect nature of the Court's underlying rationale that informed commercial choice may be as important to society as informed political choice).

When the Court moved commercial speech from the "totally uncovered by the first amendment" category of speech, see *Valentine v. Chrestensen*, 316 U.S. 52 (1942), and brought it within first amendment coverage, see *Virginia State Bd. of Pharmacy v. Virginia Citizens Consumer Council, Inc.*, 425 U.S. 748 (1976), the general rationale for "some" but not "full" first amendment protection was that commercial speech, spurred by economic self-interest, is harder than noncommercial speech and hence is less likely to be significantly deterred by government regulation. See *id.* at 771 n.24; see also *Bates v. State Bar*, 433 U.S. 350, 381 (1977). This discrete categorization of commercial speech as a less-protected variety of speech suggests that the scientific, technical nature of the material in the category of scientific speech should affect the degree of its protection and the intensity and scope of permissible regulation. See Kamenshine, *Embargoes on Exports of Ideas and Information: First Amendment Issues*, 26 WM. & MARY L. REV. 863, 865 (1985); see also *Metromedia, Inc. v. San Diego*, 453 U.S. 490, 508-11 (1981) (plurality opinion) (indicating deferential review of restrictions of commercial speech).

The Supreme Court's modern trend toward categorizing speech as either covered or uncovered by the first amendment and of then assigning each category of speech its own particular degree of protection, see generally Schauer, *supra* note 377, is a question not just of balancing abstract costs against general "free expression" values, but of balancing the social costs against the individual and social benefits of the speech viewed in light of the first amendment's central purpose. Scientific speech, like commercial speech, is harder than political speech, due largely to its methodology, the dedication of its adepts, and its community environment of academic and institutional support. Hence, pure scientific speech should be afforded the same intermediate degree of protection that the court has extended to commercial speech. Under this level of protection, even more clearly than under the highest "political speech" level of protection, pure scientific speech is not unconstitutionally infringed by the EAA and its critical technologies regulations. See *infra*

Moreover, the American people can robustly evaluate the policies, purposes, and successes of the critical technologies approach and the EAA without having disclosed and divulged to them all the scientific details contained in the various scientific theories, presentations, and papers regulated under the EAA and other information control laws.⁴⁸¹ Because the citizenry does not need to have high scientific theory and data within its ken in order to evaluate the wisdom and effectiveness of the EAA, the restricted presentation of such theory and data at regulated scientific colloquia does not detract from the political purposes central to first amendment protections. The voter does not need to master the intricacies and details of scientific theories and axioms in order to evaluate and debate the effectiveness of the EAA regulations, or other national laws, as a guarantor of our national security and the national good.⁴⁸²

Some, of course, will continue to argue that without access to the technical and scientific details contained in the scientific speech restricted under the EAA, the citizenry will not be equipped to assess national defense and foreign affairs policies. But in a representative democracy, the electors do not need access to the particular details of the regulated scientific speech in order to evaluate the government's policies and performance on defense and diplomacy.⁴⁸³ The voters will have

notes 490-95 and accompanying text.

481. See Posner, *supra* note 415, at 50. This means, with regard to the regulation of scientific speech, that voters do not need to know every bit of theoretical detail and every scrap of sensitive scientific information in order to decide whether that general sort of scientific data, if known by our adversaries, would contribute to the weakening of our national security. Nor do citizens need to know every scintilla of conceivably relevant technological information in order to make effective use of the franchise. The efficacy of the EAA in achieving its goals will be assessed by the voters through an examination of our scientific progress and the vigor of our military defense *vis-a-vis* our adversaries. Cf. BeVier, *supra* note 383, at 507.

482. Cf. Posner, *supra* note 415, at 51. Robert Bork defines political speech narrowly, see Bork, *supra* note 383, at 27-28; but his definition makes taxonomical sense when one realizes that he is talking about *pure* forms of speech. Thus, when Bork concludes that scientific, literary, educational, and commercial expressions should not be defined as "protected" speech, see *id.*, quoted *supra* note 414, he does not exclude the possibility that, say, science or literature can be used in a public affairs context to make a political point and hence should there be categorized and protected as "political speech." Professor Sunstein explicitly recognizes the possibility of this categorical metamorphosis of scientific theory into political speech. See Sunstein, *supra* note 421, at 908 n.75. But "pure" scientific speech does not generally convey public policy or social opinion; it is ideologically value-free, perhaps even more so than commercial speech. For this reason, as for the others argued above, see *supra* notes 480-81 and accompanying text, the EAA restrictions should easily survive any constitutional challenge. See *supra* notes 478-81 and accompanying text; cf. also Atanasio, *Does The First Amendment Guarantee a Right to Conduct Scientific Experiments?*, 14 J.C. & U.L. 435, 453-56 (1987) (arguing that scientific experimentation warrants reduced constitutional protection because of its similarities to commercial speech).

483. See Fein, *Access to Classified Information: Constitutional and Statutory Dimensions*, 26 WM. & MARY L. REV. 805, 814 (1985); see also *supra* note 476.

access to massive amounts of information about the effectiveness and wisdom of the EAA and other national security acts and policies. Through such information and political commentary, the electors "can make an intelligent assessment of the . . . national security programs."⁴⁸⁴

Indeed, the primary concern of the citizenry is the effectiveness of the various acts and policies protecting the national security; and for this determination, the particular details of the scientific data and theories "are, at best, of secondary interest."⁴⁸⁵ Moreover, of course, in responding to the desires of the electorate that the effectiveness of the various national security policies and acts be evaluated from time to time, Congress, the actual policymaker in a representative democracy, can gain access to the restricted scientific theory and data in closed executive sessions, and debates on the floor of Congress can be held in secret.⁴⁸⁶

On the other hand, when scientific data or theories are necessary to make a public policy point, then the "politicized" scientific speech should be afforded the same high level of protection as any other political discourse.⁴⁸⁷ For example, newspaper advertisements or handbills promulgated by the Union of Concerned Scientists about the dangers of a "nuclear winter" would be protected like, and regarded as, political speech, even if they contained theoretical and technical data.⁴⁸⁸ Thus, political debate about the use of laser technology for national defense and the wisdom of the Strategic Defense Initiative would most certainly be protected as political speech even though formal academic papers on the scientific theories and know-how of laser science could be censored to protect the national security.⁴⁸⁹

484. Fein, *supra* note 483, at 814.

485. *Id.*

486. *See id.* at 816.

487. Kamenshine, *supra* note 480, at 874; *see supra* note 482. Just as with the prosecution of a war and emergency wartime measures, so too with national security measures: the political speech principle of the first amendment guarantees the freedom to discuss whether the measures were or are wise and whether they should be continued or repealed. After all, it is the people, and only the people, who can authorize public officials to pass such measures and to execute them; hence, the freedom to assess them must be commensurate with the power to authorize them. *See Anastaplo, The Occasions of Freedom of Speech*, 5 POL. SCI. REVIEWER 303, 398-401 (1975).

488. Kamenshine, *supra* note 480, at 874; *see supra* note 482; *see also* Sunstein, *supra* note 377, at 624-25 (suggesting a "whole document-general effect" approach to protection and categorization of speech).

489. *Cf.* BeVier, *supra* note 377, at 353 (arguing that even though the advertising of prescription drug or attorneys' prices should not be protected under the first amendment, "political debate about such topics would [nevertheless] unquestionably be protected"); *cf. also id.* at 354 (noting that "on [each protected commercial speech] topic a political commentator would have had no difficulty casting his speech in a form that would have avoided regulation").

Most scientific speech, however, bears little or no connection with political discourse or the discussion of public affairs by the citizenry.⁴⁹⁰ To extend the maximum level of "political speech" protection to scientific speech might result in the judicialization of foreign policy and national security policy.⁴⁹¹ Stringent categorical protection of the *Brandenburg*⁴⁹² or *Pentagon Papers*⁴⁹³ variety would force the courts to

490. Kamenshine, *supra* note 480, at 874; *see* United States v. Progressive, Inc., 467 F. Supp. 990, 994 (W.D. Wis. 1979) (there is "no plausible reason why the public needs to know the technical details about hydrogen bomb construction to carry on an informed debate on the issue"), *mandamus denied sub nom.* Morland v. Sprecher, 443 U.S. 709, *dismissed*, 610 F.2d 819 (7th Cir. 1979); *see also supra* notes 480-82.

491. *See generally* Banks & Strausman, Bowsler v. Synar: *The Emerging Judicialization of the Fisc*, 28 B.C.L. REV. 659 (1987). The transformation of constitutional adjudication into a form of legislative choice introduces certain disadvantages into the political system. The chief disadvantage is that fundamental questions about the proper functioning of the political system and its policy decisions are answered on an *ad hoc* basis in cases involving the accidental collisions of private persons in all-too-petty cases. Mahoney, *The First Monday in October*, 2 CLAREMONT REV. BKS. 15, 15 (Oct. 1983). As Richard Neely, Justice of the West Virginia Supreme Court of Appeals has observed, courts face a serious, often fatal, shortcoming when they attempt to reject legislative policy by rulings of unconstitutionality: viz., a characteristic ignorance of the wealth of data and argumentation presented to the legislature and its committees. *See* R. NEELY, JUDICIAL JEOPARDY 14-15, 147-48 (1986).

This wealth of legislative data and policy argument concerning the EAA and the critical technologies approach to the protection of national security is reflected in, roughly, the first 375 footnotes of this article. A judicial decision of invalidity, contrary to the legislative decision of necessity, might *appear* to be fair and proper in the particular case at bar, given the narrow record on appeal; but such a particularistic decision could cause untoward, or even tragic consequences, when applied generally within the field of scientific research, secrecy, and the national security. Thus, separation-of-powers *and* competency concerns argue against a judicialization of foreign policy and national defense. Such questions are for the legislature, not only because the Constitution grants the national legislature those duties and powers, not only because the first amendment does not prevent a latitudinarian maneuvering with those powers, but also because Congress and the administrative apparatus it creates are better equipped than courts to deal with the empirical and technical issues that defense and foreign affairs entail.

492. *Brandenburg v. Ohio*, 395 U.S. 444, 447 (1969) (per curiam) (holding that "the constitutional guarantees of free speech and free press do not permit a State to . . . proscribe advocacy of the use of force or of law violation except where such advocacy is directed to inciting . . . imminent lawless action and is likely to incite . . . such action"). The *Brandenburg* version of the clear-and-present-danger test has been described as applying the highest level of constitutional protection, an extremely stringent protection, for political speech, even subversive political speech. *See* Attanasio, *supra* note 482, at 440-41; *see also* Hess v. Indiana, 414 U.S. 105 (1973) (per curiam); L. TRIBE, *supra* note 439, § 12-9, at 848-49.

493. *New York Times Co. v. United States*, 403 U.S. 713, 730 (1971) (Stewart, J., concurring) (declaring that the government can restrain the publication of information if disclosure "will surely result in direct, immediate, and irreparable damage to our Nation or its people"). *See* Sunstein, *supra* note 421, at 903 (pointing out that the *Pentagon Papers* standard of strict scrutiny of "secrecy" would likely "foreclose government regulation of the communication of technical data to foreign nations, notwithstanding the potential of such communication to enhance the military capability of perceived and actual enemies"). Perhaps more pertinent than the *Pentagon Papers* standard for the sorts of troublesome national security cases that might arise under the EAA is the "disclosure of troop movements" *dictum* in *Near v. Minnesota*, 283 U.S. 691, 716 (1931) (listing six exceptions to prior restraint protection, including the publication of troop trans-

ignore national security threats that do not satisfy those doctrinal standards, since many such threats cannot, because the threatened harm is somewhat uncertain or accumulates over time.⁴⁹⁴ It would therefore be unwise—based on the history of political speech and the first amendment (as outlined in this article) and also on grounds of the importance of national security and the lack of institutional competence of the courts to properly understand national security—to afford pure scientific speech the same high degree of protection as political speech.⁴⁹⁵

port sailing dates and the publication of locations and numbers of troops). This *dictum* strongly supports the constitutionality of the censorship of scientific papers which might otherwise divulge sensitive national security information through open seminars and colloquia.

494. Cf. Atanasio, *supra* note 482, at 442 (making essentially the same point in regard to extending stringent constitutional protection to scientific research activities).

495. See *supra* note 480. Another possible untoward consequence of affording full “political speech” protection to scientific speech is doctrinal dilution: like oil on water, the vigor of constitutional protection thins as it expands. There is a real possibility that first amendment doctrines will lose some of their strength because of the number of unacceptable consequences their application would generate when these rules (such as the *Brandenburg* clear-and-present-danger test or the prior-restraint doctrine) are extended beyond their political speech context to categories of newly-covered speech, such as commercial speech. See Schauer, *Commercial Speech and the Architecture of the First Amendment*, 56 *CIN. L. REV.* 1181, 1194 (1988). As the unacceptable applications begin to accumulate, courts will be faced with the choice of allowing the unpleasant results to multiply or of modifying and diluting the old rules to make them better accommodate social expectations in the new categories. See *id.* at 1195; see also Anastaplo, *supra* note 381, at 455 (observing that “we face the prospect of reducing the ‘absoluteness’ of First Amendment protection even as (and because?) we expand the coverage of that protection”); Anastaplo, *supra* note 476, at 39 (“Will political discussion come to be curtailed as, say, advertising can obviously be? The First Amendment does not distinguish among the things it does protect: if its absolute-sounding language can permit advertising to be regulated, why should it not permit political discussion to be regulated as well?”); Rubin, *Nazis, Skokie and the First Amendment as Virtue* (Book Review), 74 *CALIF. L. REV.* 233, 239 n.20 (1986); Schauer, *supra* note 377, at 271-72 (contending that if certain categories of speech are not given less than the maximum level of protection, there will be an inevitable dilution of the strong protection historically afforded political speech); Sunstein, *supra* note 377, at 605 (“Any system that recognizes the need for some regulation but does not draw lines could be driven to deny full protection to speech that merits it—because the burden of justification imposed on the government would have to be lightened in order to allow regulation of, for example, commercial speech, conspiracies, and private libel. By hypothesis, that lighter burden would have to be extended across-the-board. The alternative would be to apply the standards for political speech to all speech, and thus to require the government to meet a test so stringent as to preclude most forms of regulation that are currently accepted.”); Sunstein, *supra* note 421, at 909.

The Supreme Court has itself recognized the danger of doctrinal dilution, and this concern “led the . . . Court, first in footnote 24 of *Virginia Pharmacy* and then in the four-part test of *Central Hudson Gas & Elec. Corp. v. Public Serv. Comm’n*, to treat commercial speech in a strikingly different fashion from ‘core’ first amendment speech.” Schauer, *supra*, at 1197. And in recognizing the normative differences between political and commercial speech, the Court has made sound distinctions that also provide good “architectural” arguments for assigning intermediate-level status to scientific speech:

To require a parity of constitutional protection for commercial and noncommercial speech alike could invite dilution, simply by a levelling process, of the force of the Amendment’s guarantee with respect to the latter kind of speech. Rather than subject the First Amendment to such a devaluation, we instead have afforded commercial

Contemplation of Congress's authority to suspend the great writ of habeas corpus⁴⁹⁶ should awaken us to the constitutional legitimacy of a superintending power to be exercised, on behalf of the people, for the serving of the common good and the preserving of the national security.⁴⁹⁷ Furthermore, even a quick survey of the general fear of foreign domination during the 1780s, which contributed to the movement for a more energetic central government that would contain this sort of superintending power, should remind us of the government's duty, and its concomitant authority, to secure national sovereignty and security. The fear of foreign aggression and the desire to proudly join the ranks of strong and independent states in the community of nations contributed powerful motives for the establishment of a more vigorous and effective national government. That meant transferring more authority, and the leeway to maneuver with that authority, to public officials, so that they could safeguard our independence and sovereignty.⁴⁹⁸ Surely, then, our republican form of government would be better served if the energy and effort expended in criticizing the courts for not invalidating the EAA were directed to Congress for the EAA's reform *vis-a-vis* scientific progress and national security.⁴⁹⁹ Our criticisms and suggested statutory amendments therefore follow in the next section of this article.

speech a limited measure of protection, commensurate with its subordinate position in the scale of First Amendment values, while allowing modes of regulation that might be impermissible in the realm of noncommercial expression.

Ohralik v. Ohio State Bar Ass'n, 436 U.S. 447, 456 (1978). See Emerson, *supra* note 445, at 460 (concluding that the inclusion of formerly uncovered speech within the scope of first amendment protection "tends to dilute and devitalize first amendment doctrine").

Thus, if "pure" scientific speech is treated like political speech, there will be a natural tendency to dilute the stringency of maximum level protective standards in order to avert untoward national security consequences. Attanasio, *supra* note 482, at 442; see *id.* at 456; cf. *supra* note 493. This weakening of standards will undermine their capacity to safeguard the speech "central" to the constitutional system, political speech, in the times and situations when political speech would most need the maximum level of protection afforded by those undiluted standards. See Blasi, *The Pathological Perspective and the First Amendment*, 85 COLUM. L. REV. 449 (1985) (arguing the thesis that when adjudicating first amendment cases, the Court's overriding goal should be to fashion free speech standards that can best protect dissenting and unorthodox political viewpoints during periods of intolerance such as the post-World War I Red Scare and the McCarthy Era).

496. U.S. CONST. art. I, § 9, cl. 2.

497. See Anastaplo, *Freedom of Speech and the Silence of the Law* (Book Review), 64 TEX. L. REV. 443, 449 (1985).

498. See A. McLAUGHLIN, *THE CONFEDERATION AND THE CONSTITUTION 1783-1789*, at 70-81 (Collier ed. 1961); Burley, *The Alien Tort Statute and the Judiciary Act of 1789: A Badge of Honor*, 83 AM. J. INT'L L. 461 (1989); Marks, *Power, Pride, and Purse: Diplomatic Origins of the Constitution*, 11 DIPLOMATIC HIST. 303 (1987); see also generally C. FRIEDRICH, *CONSTITUTIONAL REASON OF STATE* (1957); Vagts, "Reason of State" in Amerika, 15 JAHRBUCH FUR AMERIKASTUDIEN 237 (1970).

499. See Mendelson, *Learned Hand: Patient Democrat*, 76 HARV. L. REV. 322, 333 (1962).

IV. EFFECT OF THE CRITICAL TECHNOLOGIES APPROACH

Scientists argue that national security is injured rather than enhanced by controlling the flow of scientific information.⁵⁰⁰ This argument has merit. Soviet scientists outnumber American scientists⁵⁰¹ and are equally as capable,⁵⁰² but the closed Soviet society retards the free flow of scientific ideas.⁵⁰³ By controlling the dissemination of scientific ideas, Defense is removing potentially broad areas of science from the positive control of peer review—a system on which American science depends for its vitality. The cost to the United States of this loss, however, is unassessed.

Scientific secrecy is self-defeating.⁵⁰⁴ It is both theoretically and practically impossible to restrict science. Defense accepts the theoretical impossibility of permanent restrictions, and seeks instead to restrict access to American scientific advances for a sufficiently long period to maintain the United States' technological lead. The flaw in this system is that practical controls do not exist outside of classification and contract provisions. Export controls may prevent foreign nationals from

500. See, e.g., Carey, *Science and the National Security*, 214 *SCI.* 609, 609 (1981) (arguing that restrictions on science are counterproductive); Unger, *A Proposal to Limit Government Imposed Secrecy*, 24 *IEEE TECH. & SOC'Y MAG.* 3, 3 (Dec. 1983) (maintaining that restricting Soviet access to American science necessarily restricts American science).

501. The Soviet Union graduates about 300,000 scientists and engineers annually, compared to about 80,000 scientific and engineering graduates annually in the United States. See *Hearings on H.R. 5167*, *supra* note 3, at 1202 (statement of Edith Martin, Deputy Under Secretary of Defense for Research and Advanced Technology). A significant proportion of graduates from American universities are foreign students who will not remain in the United States. See National Science Foundation, *Academic Science/Engineering: 1972-83, Final Report* at 30 (1984).

502. See generally Carey, *supra* note 500, at 609 ("It is a profoundly disturbing mistake to put out the notion that Soviet scientific capability is inferior to ours. We know better."); Toth, *Soviet Space Technology Advances Now Major Concern to U.S. Officials*, *The Oregonian*, Jan. 2, 1987, at A10, col. 1 (reporting that the "expert consensus is that the Soviets match or lead the United States in the basic technology of lasers and particle beams—and perhaps even in converting the technology into weapons").

Accounts of the capability of Soviet scientists, engineers, and technicians can be misleading. For example, accounts of Soviets copying Western computer technology are usually interpreted as a technologically-backward country copying more advanced technology. The internal layout of the Western computers has been found to have been relaid in the Soviet versions, however, to make it compatible with Soviet equipment. The skill involved in relaying the internal layout requires a level of sophistication not generally acknowledged by Western observers. See Snell, *Soviet Microprocessors and Microcomputers*, in *TECHNICAL PROGRESS AND SOVIET ECONOMIC DEVELOPMENT* 51, 60 (1986); see also *Defense 1987 Authorization Hearings*, *supra* note 307, at 711 (statement of Donald Latham, Assistant Secretary of Defense for Command, Control, Communications, and Intelligence) ("[E]verytime . . . you look in depth at what the Soviets are doing they surprise us technologically . . . I find they are a lot better than people want to give them credit for.").

503. See *Impact Hearings*, *supra* note 219, at 132 (statement of Edward Gerjuoy, American Physical Society).

504. See Long, *supra* note 371, at 8.

attending American conferences, but they also deter Americans from attending and/or presenting papers. Scientific data heard by Americans who attend conferences are restricted. The data will either stagnate (in which case no further control will be necessary), or they will be incorporated within new research (in which case the information to be controlled expands). A foreseeable result is that scientists who attend restricted conferences will avoid using controlled data because of the danger of attracting export controls to their own research.

If Defense sponsored only a small percentage of American scientific research, the effect of its information controls could be negligible. In reality, however, Defense-related research accounts for nearly one-fourth of the total research conducted in the United States.⁵⁰⁵ This percentage increased in the 1980s.⁵⁰⁶

Export controls can be enforced against scientific societies, universities, or individual scientists. All these mechanisms are fraught with difficulties. A scientific society has neither the resources nor the power to control all presentations and conversations made during conferences.⁵⁰⁷ Societies will either restrict attendance regardless of information discussed,⁵⁰⁸ or will cease organizing conferences.⁵⁰⁹ The inevitable effect will be to restrict the free discussion of new scientific ideas.⁵¹⁰

505. See DIALOG, *supra* note 48, at 91 n.1.

506. E.g., *Hearings on H.R. 5167*, *supra* note 3, at 1166 (statement of Edith Martin, Deputy Under Secretary of Defense for Research and Advanced Technology) (discussing research funding for Strategic Defense Initiative (SDI)). The entire SDI program is composed of Defense category 6.3 research (advanced technology development), to which controls may be applied. See Gollon, *SDI Funds Costly for Scientists*, 42 BULL. ATOM. SCI. 24, 25 (Jan. 1986).

507. *Impact Hearings*, *supra* note 219, at 138 (statement of Edward Gerjuoy, American Physical Society). Dr. Gerjuoy mentioned as reasons for the impossibility of organizers controlling conferences: copies of individual presentations not being available before conferences; digressions by speakers from planned topics; unforeseen responses to audience questions; and the inability of conference organizers to know whether speakers are disclosing prohibited information. *Id.*

508. See, e.g., McDonald, *Scientific Organizations Move to Limit Conference Attendance to U.S. Citizens*, CHRONICLE OF HIGHER EDUC., Mar. 6, 1985, at 5, col. 2 (describing ban imposed on foreign nationals in order to avoid last minute withdrawal of papers); Park, *Intimidation Leads to Self-Censorship in Science*, 41 BULL. ATOM. SCI. 22, 22 (Mar. 1985) (reporting that Society of Manufacturing Engineers limited one of its meetings to United States citizens on society's own initiative).

One conference organizer reported that speakers had requested that a conference be closed after being advised by Defense that information in their papers was restricted. McDonald, *supra*, at 7, col. 3. An organizer of a meeting of the Society of Manufacturing Engineers was told by Defense that if foreign nationals attended, security guards would have to be hired to check credentials or the meeting would have to be held at a federal facility. *Id.*

509. See Vossen, *Technology Export Curbs: "Unconstitutional"*, 8 OPTICS NEWS 6, 6 (Sept.-Oct. 1982).

510. The restrictions may already be stifling some scientific speech. See *Technology Transfer: Hearings Before the Subcomm. on Science Research and Technology of the House Comm. on Science and Technology*, 98th Cong., 1st Sess. 143 (1985) (statement of Russell Drew, on behalf of the IEEE); see also *Professional Society Meetings Restricted to "U.S. Citizens Only"*, 5 AAAS

Information control laws are antithetical to universities which are by nature places for the dissemination of knowledge. Universities will refuse restricted federal funds,⁵¹¹ discontinue research in high technology,⁵¹² or they will jeopardize their graduate programs by accepting contracts which restrict the access of a significant proportion of their students. Controls on access by foreign graduate students has already proven to be detrimental.⁵¹³ Foreign nationals account for twenty-two percent of all doctoral students in American universities. In 1982, foreign students received fifty percent of the doctorates in engineering, and thirty-two percent of the doctorates in mathematics and computer sciences. Most of these students would be covered by the export control laws; about seventy-five percent attend American universities on temporary student visas.⁵¹⁴ Rather than harming America's national security, these students aid America's interest by contributing their talents to American science and engineering.⁵¹⁵ If controls are applied extensively to foreign graduate students, the number of universities subject to controls could be substantial. Over sixty universities and institutes have been identified as the targets of Soviet attempts to gain American scientific knowledge.⁵¹⁶

Individual scientists will cease to invite foreign scientists to cooperate in their research from fear that the government will "disinvite" their guests.⁵¹⁷ Scientists from allied nations may refuse to accept offers to conduct research for American sponsors such as Defense.⁵¹⁸ American scientists will perhaps be restricted from attendance at foreign sci-

BULL. SCI. FREEDOM & NAT'L SECURITY 5, 5 (Mar. 1985) (describing self-censorship by scientific societies).

511. See, e.g., *Scientific Communications Hearing*, *supra* note 274, at 49-50 (statement of Dale Corson, President Emeritus, Cornell University) (recounting that Cornell refused Air Force funds when contract invoked the ITAR).

512. See, e.g., *id.* at 49 (statement of Dale Corson, President Emeritus, Cornell University) (maintaining that major research universities will probably cease research in areas where classifications are imposed); Gerjuoy, *Unwise Export Controls Can Hurt*, 34 PHYSICS TODAY 144, 144 (Oct. 1982) (stating that universities and laboratories will stop researching in areas that become inconvenient and divisive).

513. Barber & Morgan, *The Impact of Foreign Graduate Students on Engineering Education in the United States*, 236 SCI. 33, 36 (1987).

514. National Science Foundation, *supra* note 501, at 30.

515. PANEL REPORT, *supra* note 309, at 17.

516. See S. REP. NO. 522, 99th Cong., 2d Sess. 24 (1986).

517. See *Impact Hearings*, *supra* note 219, at 139 (statement of Edward Gerjuoy, American Physical Society).

518. See Walton, *SDI: UK Scientists Should Take Care*, 322 NATURE 300, 300-01 (1986) (expressing concern about possible prepublication controls on Star Wars basic research offered for contract to British scientists); Wright, "No Secrets" from British Scientists in Star Wars, *The Times* (London), Aug. 7, 1985, at 28, col. 1 (reporting problem with Defense excluding from meetings British scientists invited to conduct Star Wars research).

entific conferences and would thus be unable to freely discuss theories with American allies. Indeed, American scientists may also avoid attendance at export-controlled meetings because of the negative effect on their careers of signing a nondisclosure form.⁵¹⁹ As Admiral Inman feared, a backlash has occurred that is effectively blocking technology transfer in an area in which it is desired: between America and her allies.⁵²⁰ The general effect of information controls on the scientific community has been increasing unease about whether to publish in certain areas of science, and whether to interact with foreign nationals.⁵²¹ The United States is becoming isolationist at a time when its leadership in science is being successfully challenged by other nations,⁵²² including the Soviet Union.⁵²³ Isolationism in this context can only increase the scientific lead-times of foreign nations; lead-times which have already overtaken the United States.

Publication and recognition of achievements are impossible in a controlled scientific environment. Defense's policy of restricting participation by its contractors and employees in unclassified scientific and technical meetings is counterproductive. Not only does the policy prevent peer recognition of Defense contractors and employees, but it also jeopardizes Defense programs by restricting the access of Defense scientists to state-of-the-art presentations and discussions.⁵²⁴ In addition, the policy deters recruitment of scientists into Defense programs,

519. See Willenbrock, *Technology Transfer and National Security*, 4 IEEE TECH. & SOC'Y MAG. 13, 14 (Sept. 1985).

520. Inman, *Technology and Strategy*, Proceedings of the U.S. Naval Inst., Sea Link Supp. 45, 50-51 (Dec. Supp. 1984); Ritter, *The Critical Issue of the Transfer of Technology*, Nato's Sixteen Nations 40, 43 (July 1983) (noting that scientists from allied nations are increasingly denied access to American scientific conferences and research institutions).

521. SCIENTIFIC AND TECHNOLOGICAL COOPERATION BETWEEN INDUSTRIALIZED COUNTRIES: THE ROLE OF THE UNITED STATES 216, 219 (M. Wallerstein ed. 1984).

522. Hemily, *Graduate Students and Postdoctoral International Exchanges of U.S. Scientists in Scientific and Technological Cooperation Among Industrialized Countries: The Role of the United States* 189, 213 (M. Wallerstein ed. 1984).

523. For example, the Soviet Union leads the United States in important aspects of nuclear fusion, high energy physics, and agricultural technologies. *U.S.-Soviet Exchanges: A Conference Report* 14, 19, 27 (Kennan Institute for Advanced Russian Studies, The Wilson Center 1985). Defense estimates that the Soviet Union equals the United States in six of the twenty basic technologies judged to be the most important. The Soviet Union is also closing the gap between it and the United States in four other technologies. Department of Defense, The FY 1987 Department of Defense Program for Research and Development II-11 (1986), reprinted in *Defense 1987 Authorization Hearings*, *supra* note 307, at 40.

524. See Letter from Richard T. Gowen, IEEE President, to Caspar Weinberger, Secretary of Defense (Oct. 19, 1984), cited in 4 AAAS BULL. SCI. FREEDOM & NAT'L SECURITY 5, 5 (Dec. 1984). The letter read in pertinent part, "the Defense Department has embarked on a course that—as patriotic and well-intentioned as it may seem—may threaten the technological supremacy of the U.S." *Id.*

and causes those already hired to leave.⁵²⁵ Contractors who submit unclassified papers for prepublication review have been frequently denied permission to present their ideas at scientific meetings.⁵²⁶

The public will suffer if scientific information is too restrictively controlled. If military science is kept so completely secret that the public and their congressional representatives cannot discuss scientific weapons, no opportunity will exist for public reaction to limit those weapons.⁵²⁷ Controlling military science necessarily restricts civilian science. Such a movement is contrary to America's interest in having a scientifically literate populace.⁵²⁸

Defense cannot effectively control American science unless it monitors thousands of publications, conferences, exchanges, and meetings. If Defense is effective in implementing such an extensive control system, the acquisition of American science by its adversaries and potential adversaries will probably cease.⁵²⁹ However, the harm inflicted on the United States' national security by the controls will also be substantial.⁵³⁰ Instead of attempting to protect the national security by stifling creative American scientific ideas, America's national security is served better by promoting scientific research.⁵³¹

V. CONCLUSION AND RECOMMENDATIONS

Defense views the critical technologies approach as an appropriate way to control the access of the United States' adversaries and potential adversaries to American sciences and technology. Congress appears to endorse the approach by statutorily adopting the MCTL and by extending Defense's authority to control previously unrestricted informa-

525. See Smith, *Scientific Secrecy: An Unhealthy Trend*, 228 SCI. 1293, 1293 (1985). The chief scientist of the Air Force's Weapons Laboratory, located in New Mexico, criticized the MCTL's expansion, stating that: "[t]he list is unwieldy and the topics are not sufficiently defined Because it is subject to different interpretations, people are prone to err on the side of conservatism. It has to be fine-tuned." *Id.* (quoting Arthur H. Guenther, Chief Scientist at the Air Force Weapons Laboratory near Albuquerque, New Mexico).

526. See Wilson, *A Threat to Scientific Communication*, 38 PHYSICS TODAY 128, 128 (July 1985).

527. Teller, *Secrecy: The Road to Nowhere*, 84 TECH. REV. 12, 14 (Oct. 1981).

528. *Id.* at 12.

529. See generally Denning, *A Scientist's View of Government Control over Scientific Publication*, 1 IEEE TECH. & SOC'Y MAG. 17, 18 (Sept. 1982) (arguing that scientific secrets cannot be preserved, but can be undermined by excessive secrecy).

530. See, e.g., Memorandum to the AAAS Committee on Scientific Freedom and Responsibility, *supra* note 280 (noting observations of self-censorship by scientists).

531. See, e.g., F. ROURKE, *supra* note 6, at 30 (stating that "[s]cientific achievement is itself regarded as the finest basis for national security"); New York State Bar Association, *Toward Legal Simplification: Report of the Association Task Force on Simplification of the Law* 20-21 (1987).

tion whenever development of the approach demands it. As the critical technologies approach broadened, Congress's criticism of Defense's export controls ceased. Periodic criticism leveled at Defense's expansive interpretation of national security is, in reality, confirmation that Defense is fulfilling its mission of protecting America's security.

If scientific data were static, Defense's critical technologies approach would be praiseworthy. Unfortunately, the approach only addresses the effect of the controls on the acquisition of American science and technology by adversaries and potential adversaries. It does not address the effect of the controls on the vitality of American science, and on scientific communications between American scientists and between those scientists and their counterparts in friendly nations. The scientists of friendly nations are included in the controls, resulting in a rift between America and her allies.⁵³² The harm already suffered by American science may never be known; progress not achieved because of self-censorship cannot be measured. The potential stigma of being suspected of divulging militarily critical information may persuade scientists to discontinue research in certain disciplines or to pursue other careers. In a 1986 congressional report, the acquisition of American scientific information by the Soviet Union was discussed in the same context as espionage and illegal exports.⁵³³

To halt the increasingly detrimental effect on American science by Defense, Congress should specify criteria for items in the MCTL. The criteria should be those derived from the *Corson Report*. That is, a good or technology should not be included in the MCTL unless it meets at least one of the following criteria: (1) its transfer will lead "to a significant near-term improvement in the defense capability of a country to which exports are controlled under [the EAR]"; (2) the technology is evolving rapidly; or (3) the technology is process-oriented.⁵³⁴ In addition, the EAA and the Arms Export Control Act should state that export controls promulgated under them should not be applied to university-based scientific research.

Congress should rescind its mandate to Commerce and Defense to

532. See, e.g., *A Delicate Balance: Scientific Communication vs. National Security* (Wallerstein & Gould eds.), 4 ISSUES IN SCI. & TECH. 42, 44, 48, 50, 51 (Fall 1987) (representatives from the United Kingdom, France, West Germany, and Japan expressing concern over American export controls on scientific communication).

533. See Senate Select Committee on Intelligence, *Meeting the Espionage Challenge: A Review of United States Counterintelligence and Security Programs*, S. REP. NO. 522, 99th Cong., 2d Sess. 29 (1986).

534. *Extension Hearings*, *supra* note 29, at 1017. An attempt to include the provisions in the EAA's renewal in 1985 failed. See *id.* at 1075-76; see also *supra* note 293 (discussing amendment).

integrate the MCTL and the Control List. The MCTL was never intended to be a control document. Attempts to transform it into one are impractical and ineffective. The tendency to continually add products and technologies to the Control List should be halted in favor of a more selective approach aimed at reducing the size of the list.⁵³⁵ The size of the Control List jeopardizes its effective administration.⁵³⁶

If the research to be sponsored under a government contract is unclassified but falls within the criteria set by the *Corson Report*, a prepublication review clause could be agreed to in advance. Breach of the contract should not trigger export controls, nor should post-publication review be applied to the research. If restrictions other than a prepublication review clause are considered necessary, the contract should specify that the research will be classified. By notifying universities in advance of controls on research, the universities can decide whether to permit it on their campuses.

Finally, universities or scientific societies should not be expected to police campuses or meetings for violations of information control laws, regulations, and directives. A presumption should exist that basic scientific research should be made widely available by encouraging the publication of research results, permitting access to scientific conferences, and supporting academic visits.⁵³⁷ If Defense, State, or Commerce are concerned that specified foreign nationals may attempt to acquire militarily critical science and technology at a meeting or during a university visit or course of study, State should use visa controls to control the individuals involved.

535. See PANEL REPORT, *supra* note 309, at 19.

536. See *id.* at 15-16.

537. The general principles on open scientific communication, published by the Organization for Economic Cooperation and Development at the urging of the United States Office of Science and Technology Policy, present guidelines for encouraging open communications between scientists of member nations. However, the two-page document does not discuss export controls, however. See Dickson, *OECD Sets Guidelines for Cooperation*, 240 SCI. 716, 716-17 (1988).

APPENDIX

Examples of Scientific Information Affected by Information Controls
1987

One week before a major conference on commercial applications of super-conductivity sponsored by the White House and the Department of Energy, the President's science advisor closed the conference to all non-Americans. In his speech to the conference, the President proposed amending the Freedom of Information Act to permit federal government laboratories to "withhold commercially valuable scientific and technical information."⁵³⁸

1986

In December 1986, the FBI initiated a subpoena that was served on the Associate Director of the State University of New York at Buffalo. The subpoena ordered the Associate Director to provide information on searches conducted on the library's databases by a foreign student.⁵³⁹

1985

Two weeks before a meeting of the Society of Photo-Optical Engineers, Defense informed scientists that their Defense-sponsored papers had been rejected on the basis of a provision in the Department of Defense Authorization Act of 1984 that permitted Defense to withhold technical information from the public. A compromise was reached under which the twenty-six rejected papers were presented in export-controlled sessions restricted to United States, Canadian, and certain English and French citizens.⁵⁴⁰

In a conference on advanced technology in materials processing sponsored by the Society for the Advancement of Material and Process Engineering, four out of thirty-nine sessions were closed to foreign nationals.⁵⁴¹

A team of high energy physicists conducting publishable research on the free electron laser for the civil fusion reactor program of the Department of Energy discovered the possibility of gigawatt power out-

538. *Forum*, ISSUES IN SCI. & TECH., Winter 1988, at 10 (letter from Robert Park, Executive Director, American Physical Society); *U.S. Bars Foreigners from Superconductivity Session*, L.A. Times, July 25, 1987, at 22, col. 1.

539. H.R. REP. NO. 153(II), 100th Cong., 1st Sess. 15, reprinted in 1987 U.S. CODE CONG. & ADMIN. NEWS 3157, 3167.

540. Borrelle, *supra* note 283, at 10.

541. Long, *supra* note 371, at 9.

puts. The Strategic Defense Initiative Organization which had sponsored a small part of the research, classified the research. The scientists were threatened with jail if details were released. In April 1986, results of the research were declassified, but the experimental details remained classified.⁵⁴²

The Society of Manufacturing Engineers held a conference on "Composites in Manufacturing 4," in Anaheim, California. Part of the conference's announcement read: "This conference is open to U.S. citizens only." The announcement was printed at the society's instigation "to avoid horror stories such as the 1982 SPIE meeting." Sessions were restricted at the request of speakers who had been informed by Defense that their papers could not be revealed to foreign nationals.⁵⁴³

1984

The Society for the Advancement of Material and Process Engineering held a meeting entitled "High Tech Review—1984." Entry to certain sessions was restricted to holders of American birth certificates or passports.⁵⁴⁴

The American Astronautical Society's meeting entitled "Space Propulsion for the 1990s" included a "secret" session on research on the Strategic Defense Initiative.⁵⁴⁵

A course on metal matrix composites offered by UCLA's extension school was restricted to American citizens.⁵⁴⁶

The Twenty-Fifth Structural Dynamics and Materials Conference was held by the American Institute of Aeronautics and Astronautics in Palm Springs, California. Entry to some sessions required presentation of an American birth certificate, passport, naturalization papers, or voter registration card. The ITAR were cited as authority for controlling information at the sessions.⁵⁴⁷

Defense and NASA held a Symposium on Composite Materials in conjunction with the American Ceramics Society's Eighth Annual Conference on Composite and Advanced Materials. Entrance was restricted to American citizens.⁵⁴⁸

542. Walton, *supra* note 518, at 300.

543. McDonald, *supra* note 508, at 5, col. 2; Park, *supra* note 508, at 22.

544. Park, *supra* note 508, at 22.

545. Goodwin, *Incident over SPIE Papers Muddies Scientific Secrecy Issue*, 38 PHYSICS TODAY 55, 55-57 (June 1985).

546. Park, *supra* note 508, at 22.

547. *Id.*

548. *Id.* at 22-23.

1983

After 900 copies of the proceedings of the National Telesystems Conference were printed, three words had to be deleted from a paper based on unclassified research sponsored by the Air Force. The contract under which the research had been conducted did not contain a prepublication review clause. The researcher who had received local approval for the paper's release was asked to delete the words "for example, manpacks" (referring to a receiver's ability to locate the position of a missile) from each copy of the proceedings.⁵⁴⁹

A contract for biotechnology research involving the microbial degradation of organophosphates was entered into between the United States Army and the University of Maryland. The unclassified contract contained a provision stating: "No foreign nationals may be employed in this contract without approval of the Contracting Officer. When requesting approval, furnish full names, date and port of entry, and position in which employee will be utilized."⁵⁵⁰

FBI agents conspicuously arrested an East German physicist for espionage at the Thirtieth Annual Symposium of the American Vacuum Society in Boston, Massachusetts. No classified information had been discussed at the meeting, attended by about 2,600 scientists and engineers. The FBI threatened to subpoena a list of conferees if its request for the list was denied. Although the society refused to comply with the request, no subpoena was issued.⁵⁵¹

Six out of twenty-four papers scheduled for presentation by members of the United States Army Cold Regions Research and Engineering Laboratory were withdrawn from the Fourth International Conference on Permafrost in Fairbanks, Alaska.⁵⁵²

Three unclassified papers were withdrawn from a joint meeting of the Optical Society of America & IEEE in New Orleans, Louisiana, after the Army determined that one of the papers was subject to export controls. The scientists, experts in military applications of optical fibers, had expected their papers to be withdrawn, even though exhibits at the conference portrayed military uses of optical fibers.⁵⁵³

A paper sponsored by NASA's Langley Research Center and

549. Ramirez, *The Balance of Interests Between National Security Controls and First Amendment Interests in Academic Freedom*, 13 J.C.U.L. 179, 217-18 (1986) (citing 8 THE INSTITUTE 1 (Mar. 1984)).

550. 5 AAAS BULL. SCI. FREEDOM & NAT'L SECURITY 7, 7 (Mar. 1985).

551. Norman, *To Catch a Spy*, 222 SCI. 904-05 (1983); *FBI Upsets AVS by Arresting East German at Meeting*, 37 PHYSICS TODAY 53, 53-54 (Jan. 1984).

552. *Clamdowns on Scientific Meetings Listed in Study*, 14 SCI. & GOV'T REP. 3, 3 (Mar. 1, 1984).

553. *Stifling Scientific Communications to Protect US Technology*, *supra* note 240 at 41.

presented at the American Institute of Aeronautics and Astronautics' Aerospace Sciences Meetings in Reno, Nevada, was restricted from the date of its submission to NASA in February 1982 until its presentation. The paper carried a warning stating:

Subject to Export Control Laws.

This document contains information for manufacturing or using munitions of war. Export of the information contained herein, or release to foreign nationals within the United States, without first obtaining an export license, is a violation of the International Traffic-in-Arms Regulations. Such violation is subject to a penalty of up to 2 years imprisonment and a fine of \$100,000 under 22 U.S.C. 2778. Include this notice with any reproduced portion of this document.

The unclassified NASA-sponsored paper reported that up to \$1 billion annually could be saved in fuel costs by attaching flatplate airfoils to commercial aircraft fuselage in order to break up large eddies occurring in boundary layer turbulence. The Assistant Head of Langley Research Center's Viscous Flow Branch imposed the restriction on the paper partly to permit American industry to gain a headstart in developing new technology.⁵⁵⁴

A summary of the Proceedings of the Washington Conference on Rapid Solidification Processing, held by the National Bureau for Standards Center for Materials Science, contained the following warning:

This document contains information which is subject to special export controls. It should not be transferred to foreign nationals in the U.S. (Reference Export Administration Regulations, Section 287.1, Oct. 1, 1980, and Federal Register, Oct. 1, 1980, Vol. 45 No. 192, page 65014).⁵⁵⁵

A course on metal matrix composites offered by the University of Maryland in College Park was restricted to United States citizens.⁵⁵⁶

A graduate student in computer science at Stanford University requested unclassified information from Defense. The information had been located by the student on Defense Technical Information Center files, available through a computer link from the engineering library at Stanford. Defense refused the request and classified the information.⁵⁵⁷

Cornell University rejected a \$450,000 Air Force contract that invoked the ITAR to control all technical data generated by research.

554. *Restrictions on Technical Papers Raise Concerns*, *supra* note 362, at 22; *NASA Limits Research Paper Distribution*, 118 AVIATION WEEK & SPACE TECH. 23, 23 (Jan. 17, 1983).

555. *Restrictions on Technical Papers Raise Concerns*, *supra* note 362, at 22.

556. Park, *supra* note 508, at 22-23.

557. Chalk, *supra* note 361, at 19-21.

Cornell explained that the research could not be restricted to access by American nationals—as requested by the Air Force—because of foreign nationals already conducting research in the department at Cornell.⁵⁵⁸

1982

An official of Texas Instruments, acting at the Air Force's request, asked three Texas Instruments employees to withdraw their papers from the IEEE's International Test Conference in Philadelphia, Pennsylvania. The request was received five days prior to the conference after the conference abstracts (including the three previously cleared papers) had been printed. The Air Force reviewed and cleared the papers after criticism of its actions.⁵⁵⁹

Defense ordered six scientists to withdraw their papers from a conference on blue-green laser communication sponsored by the Optical Society of America.⁵⁶⁰

Several presentations were withdrawn from a conference on technology for space astrophysics because of confusion over potential problems with Defense. The conference was sponsored by the American Institute of Aeronautics and Astronautics, the Optical Society of America, and the Society of Photo-Optical Instrumentation.⁵⁶¹

Before the IEEE Electrical and Aerospace Systems' Electrical Aerospace Conference in Washington, D.C., began, the chairman of the group was requested by an Air Force representative to destroy all abstracts, papers, and records, and to cancel specific presentations that were said to compromise national security. The chairman stated that IEEE would comply with the request if the Air Force paid the expenses involved, which were estimated to be between \$25,000 and \$50,000. The Air Force representative withdrew the request the following day.⁵⁶²

One week before a meeting of the Society of Photo-optical Instrumentation Engineers, the Navy ordered the withdrawal of all papers dealing with airborne reconnaissance. The Navy had cleared the papers for publication but the Department of Defense had not. One hundred

558. *Scientific Communications and National Security, Hearing Before the Subcomm. on Science, Research and Technology and the Subcomm. on Science, Research and Technology and the Subcomm. on Investigations and Oversight of the House Comm. on Science and Technology*, 98th Cong., 2d Sess. 49-50 (1984) (statement of Dale Corson, President Emeritus, Cornell University).

559. *Clampdowns on Scientific Meetings Listed in Study*, 14 SCI. & GOV'T REP. 3, 3 (Mar. 1, 1984).

560. Long, *supra* note 371, at 7-8.

561. *Id.*

562. *Clampdown on Scientific Meetings Listed in Study*, *supra* note 559, at 3.

and thirty papers were withdrawn.⁵⁶³

Two papers on VHSIC research were withdrawn from a meeting of the Electrochemical Society in Toronto, Canada, because they contained information that was reportedly too sensitive to be exported to foreign nationals.⁵⁶⁴

Customs officials seized computer science books being shipped to Japan by a professional society.⁵⁶⁵

State advised the National Academy of Sciences to place restrictions on the visit of a Soviet nutritional scientist to the Massachusetts Institute of Technology. The Soviet scientist was not to view research in nutrition or biotechnology or to have access to research and activities sponsored by the Department of Defense.⁵⁶⁶

Chemical Abstracts' export license to mail magnetic tapes to Warsaw Technical University was not renewed by Commerce. The renewal was denied to the bibliographic information service which had been mailing information to Warsaw since 1974 because export of the magnetic tape technology to Soviet bloc nations was not in the interest of national security.⁵⁶⁷

An article entitled *Out-Numbered and Out-Weaponed by Soviets, the U.S. Army Shoots for High Technology* was submitted to the IEEE SPECTRUM. During the expert review process, a copy of the article was sent by the SPECTRUM to the Secretary of the Army because the article contained quotations by him. Six weeks later the Army Office of the Chief of Public Affairs telephoned the SPECTRUM and ordered the article shredded because it contained classified information. The SPECTRUM traced the origins of the three statements objected to by the Army and found that two statements were from an unclassified Army publication and one was from public testimony given to Congress by the Army Chief of Staff. The Army subsequently agreed that two of the statements were not classified, but stated that the speech given by the Army Chief of Staff had been reclassified.⁵⁶⁸

563. Greenberg, "Remote Censoring," *DOD Blocks Symposium Papers*, 122 SCI. NEWS 148 (1982); *I Left My Paper in San Diego*, 8 OPTICS NEWS 3 (Nov.-Dec. 1982).

564. Panel on Scientific Communication and National Security, Committee on Science, Engineering and Public Policy of the National Academy of Sciences, National Academy of Engineering and Institute of Medicine, *Scientific Communication and National Security* 106 (1982) [hereinafter *Scientific Communication*].

565. Relyea, *supra* note 375, at 193.

566. *Scientific Communication*, *supra* note 564, at 184.

567. Chalk, *supra* note 361, at 19-21.

568. Willenbrock, *supra* note 207, at 8.

1981

Commerce informed foreign subscribers to the MEDLINE service of the National Library of Medicine that nationals from communist countries were not to be allowed on-line computer access unless Commerce granted prior approval. (MEDLINE is a computerized index to articles from about 300 medical and biomedical journals.) Commerce was concerned about the possibility of operators switching from MEDLINE to computer files on national finance, etc.⁵⁶⁹

1980

Commerce, Defense, and State persuaded the American Vacuum Society to disinvite Russians, Poles, Chinese, and Hungarian scientists from a conference on magnetic bubble memories. All foreign nationals attending the conference were required to sign a pledge that they would not divulge unpublished information obtained at the conference to Eastern bloc nationals.⁵⁷⁰

State denied visas to Soviet scientists planning to attend a conference on laser fusion sponsored by the IEEE and the American Optical Society. One of the Soviet scientists, who was a post-doctoral student at the University of Texas, had co-authored a paper to be presented at the conference.⁵⁷¹

The Massachusetts Institute of Technology declined a \$250,000 contract for research on computer-aided design because of conditions prohibiting release of research results for two years in order that foreign nations could not gain access.⁵⁷²

The firm of Rohm and Hass applied for a patent for an improved electro-chemical battery, a product of research sponsored by the company. The invention was placed under a secrecy order at the request of the Army. Six months later, government officials rescinded the order.⁵⁷³

NSF forwarded to the NSA a scientist's request for refunding a cryptology grant. The scientist's research was unclassified. When the NSA proposed partial funding of the grant in lieu of the NSF, the scientist protested because of the likelihood of his research being classified. The ensuing dispute resulted in a voluntary system of prepublica-

569. Marshall, *Medical Data Bank: A Security Risk*, 216 SCI. 831, 831 (1982).

570. Wade, *Science Meetings Catch the U.S.-Soviet Chill*, 207 SCI. 1056 (1980); *Government Bars Soviets from AVS and OSA Meetings*, 33 PHYSICS TODAY 81 (Apr. 1980).

571. *Government Bars Soviets from AVS and OSA Meetings*, 33 PHYSICS TODAY 81 (Apr. 1980).

572. Kolata, *supra* note 195, at 524.

573. *Of Bubbles, Bombs, and Batteries: Secrecy Snafus*, 85 TECH. REV. 36, 37 (Feb.-Mar. 1982).

tion review of cryptology by the NSA.⁵⁷⁴

State informed Cornell University that a Hungarian scientist could not receive prepublication copies of research papers during a proposed visit to the university to study electronic circuitry. In addition, State limited the scientist's receipt of information to classroom situations, prohibiting private discussions and seminars. The visit was cancelled.⁵⁷⁵

Funding for an unclassified research program on Very High Speed Integrated Circuits sponsored by Defense had been authorized by Congress and was being conducted in several universities. When new funding was authorized, Congress conditioned it on the program being subject to the ITAR. Defense subsequently issued guidelines applying export controls to the disclosure of applied research and recommended that noncitizens who had not declared their intent to be citizens be excluded from basic research.⁵⁷⁶

1978

NSA requested that a secrecy order be issued under the Patent and Invention Secrecy Act, 35 U.S.C. § 181 (1988), for a patent application for an advanced communication privacy device. The patent had been applied for by a group of inventors led by a university scientist. No explanation for the secrecy order was provided.⁵⁷⁷

The NSA requested Commerce to issue a secrecy order under the Patent and Invention Secrecy Act, 35 U.S.C. § 181 (1988), to a University of Milwaukee professor. The professor had requested a patent for computer data safeguards invented by him pursuant to an NSF grant. He had received no indication that his unclassified research, which had been published, would be restrained. After the university's president protested, the order was lifted.⁵⁷⁸

574. Kolata, *Prior Restraints Recommended*, 211 SCI. 797 (1981); Kolata, *Study Group Agrees to Voluntary Restraints*, 210 SCI. 511 (1980); Kolata, *Cryptography: A New Clash Between Academic Freedom and National Security*, 209 SCI. 995 (1980).

575. Kolata, *supra*, note 195.

576. Dickson, *Campus Chiefs Protest DOD Security Rules*, 11 SCI. & GOV'T REP. 5 (May 1981); Dickson, *Academe Ponders Defense Curbs on Research*, 11 SCI. & GOV'T REP. 5 (Mar. 1981); Kolata, *supra* note 195.

577. Shapley, *NSA Slaps Secrecy Order on Inventors' Communications Patent*, 201 SCI. 891 (1978).

578. *Impact of National Security Considerations on Science and Technology: Hearings Before the Subcomm. on Science, Research and Technology and the Subcomm. on Investigations and Oversight of the House Comm. on Science and Technology*, 97th Cong., 2d Sess. 192 (1982) (statement of Mary Cheh, Professor of Law, National Law Center, George Washington University); *University Will Fight Research Secrecy Order*, 113 SCI. NEWS 373 (1978); *Secrecy Order Lifted*, 114 SCI. NEWS 7 (1978).

1977

An official of the NSA, acting as a private citizen, suggested that scientists planning to present papers at a cryptology symposium sponsored by the IEEE review their plans. According to the official, the presentations could violate the ITAR. The symposium was held as planned but some graduate students' papers were presented by faculty to ensure legal support from universities. The government took no action.⁵⁷⁹

1976

A Soviet theoretical physicist was stopped by officials of the Energy and Research Development Administration from delivering a speech he was presenting to American scientists on thermonuclear fusion.⁵⁸⁰

579. Unger, *The Growing Threat of Government Secrecy*, 85 *TECH. REV.* 30 (Feb.-Mar. 1982); Shapley & Kolata, *Cryptology: Scientists Puzzle Over Threat to Open Research*, *Publication*, 195 *SCI.* 1345 (1977).

580. Metz, *Thermonuclear Fusion: U.S. Puts Wraps on Latest Soviet Work*, 194 *SCI.* 166 (1976).