

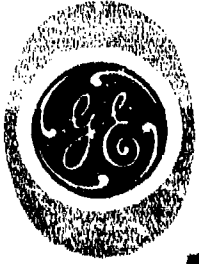
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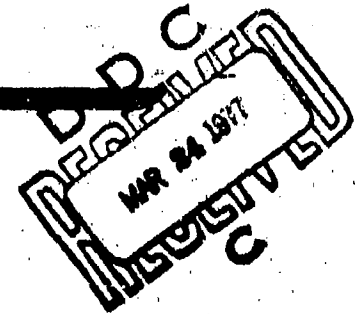


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ECONOMIC CONFLICT AND NATIONAL SECURITY RESEARCH

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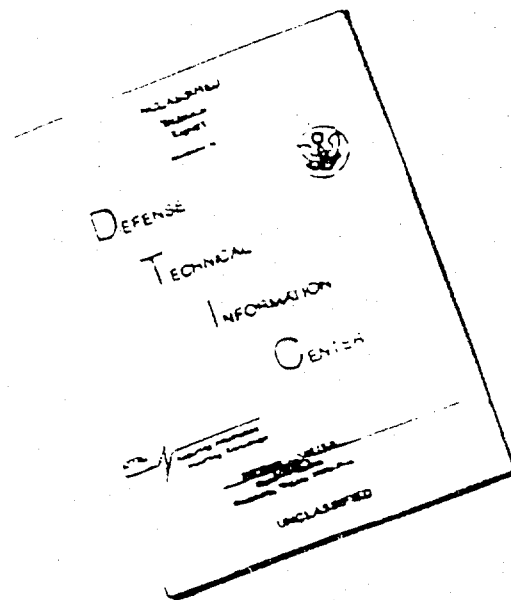
*A Report on the Proceedings
And Results of a Workshop for*

THE OFFICE OF NAVAL RESEARCH
Naval Analysis Program

February 22, 1977
GE 77 TMP-5

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EXECUTIVE SUMMARY

Introduction

As a result of recent trends and events in world affairs, the potential for economic conflict appears to have emerged as a prime national security issue for the 1970s. Various international developments have contributed to the growing concern over economic conflict, but none has been more striking or important than recent events with respect to the international trade of oil. Both the Arab oil embargo of late 1973 and the success of the Organization of Petroleum Exporting Countries (OPEC) in achieving and maintaining a quadrupling of international oil prices have been central events in shaping the trends and perceptions with regard to international economic conflict and its potential impact upon national security.

Within the Department of Defense (DoD), there has been an increasing awareness of the foregoing trends and the possible implications for national security. In this context, the Office of Naval Research (ONR), in its somewhat independent position directly under the Secretary of the Navy, took the initiative in formulating plans for a workshop which would bring together key individuals from Government, the academic community, and the private research sector to explore and exchange views with regard to:

- The definition of, and potential for, international economic conflict;
- Possible implications of international economic conflict for national security; and
- The need for research on this subject.

A workshop was subsequently organized and conducted to achieve three primary objectives, which may be briefly summarized as follows:

- To promote communications throughout the professional Government, academic, and private research communities on the subject of economic conflict;
- To develop a deeper understanding of the critical methodological issues involved in the quantitative analysis of policy questions related to economic conflict; and
- To provide ONR with professional points of view on the major problems and related research goals and priorities which ONR should consider in planning any future programs in this field.

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Highlights of the Proceedings

This unique and timely report provides a detailed insight into the highlights and results of the Workshop on Economic Conflict and National Security Research which was conducted at Airlie House near Warrenton, Virginia, in September 1976. Inasmuch as edited versions of the formal presentations, comments, and floor discussions are provided in Appendices C-I of the report, the main body of the report simply provides a concise, point-by-point synthesis of what are perceived to be consensus, as well as divergent, views of the participants with respect to the major issues and problems of economic conflict, the potential implications of these problems for U.S. national security, and possible areas for additional research. These views have been organized according to the following general categories:

- Concepts, Definitions, and Current Methods of Analysis;
- A Profile of Economic Trends in the Soviet Union;
- Current U.S. Government Forecasting and Policy Formulation Capabilities; and
- Suggested Areas for Research.

Concepts, Definitions, and Current Methods of Analysis

Recognizing that this Workshop "broke new ground" by initiating exploratory discussion of the very broad issue of economic conflict and its implications within DoD, it was quite appropriate and necessary that much discussion was actually devoted to defining the problem. Many participants posed the question "What are we talking about?" and then provided their contributions toward a better conceptualization of this issue.

A Profile of Economic Trends in the U.S.S.R.

In addition to discussing conceptual problems, attention was also devoted to the consideration of a second category of issues; namely, providing a description of the present and likely future domestic economic situation of the principal adversary of the United States -- the Soviet Union. Considerable interest was generated in this discussion because many facts about Soviet economic and demographic pressures, constraints, and weaknesses are not widely known and because these facts do have significant implications for U.S. policy: first, with respect to U.S. economic policies vis-à-vis the Soviet Union (which are presently in transition and subject to criticism within the U.S.) and second, with respect to the types of Soviet economic conflict initiatives which the U.S. might encounter in the coming decades. The general thrust of the discussion was directed towards assessing the overall status of the Soviet economy, identifying specific constraints and burdens on this economy, and developing some explanations of the implications of the trends.

Current U.S. Government Forecasting and Policy Formulation Capabilities

The next general category of discussion during the Workshop involved an assessment of the capabilities of the U.S. Government to devise and implement policies involving economic conflict and to predict and to respond to economic conflict initiatives by other countries. Various case studies were considered, and particular attention was directed towards the U.S./ NATO offset negotiations; the U.S. Government prediction of, and response to, the Arab oil embargo; and the general U.S. experience in the past with policies of economic warfare.

Suggested Areas for Research

In light of the stated aim of the Workshop, the participants made special efforts to suggest guidelines, as well as to identify substantive areas and specific analytical techniques, for a research program which will address economic conflict as it relates to national security. In identifying areas wherein research funds might be profitably spent, the participants not only outlined general principles with respect to the character and scope of a potential research program, but also proposed specific research projects to be considered.

Results

Bearing in mind the fundamental exploratory nature of this Workshop, it is nonetheless apparent that the Workshop was generally successful in achieving the stated objectives: i.e., to promote communications throughout the professional Government, academic, and private research communities on this subject; to develop a clearer understanding of economic conflict; and to help ONR identify appropriate research.

The presentations and discussions of the Workshop participants did serve to outline the broad complex spectrum of the problem, to confirm the need for a suitable research program in this area, and to identify numerous areas which appear to warrant research. However, with the publication and dissemination of this report, it is clear that additional actions must now be taken in order that a coherent research program can be formulated, presented to prospective research groups, and justified to prospective users and funding authorities. In this context, the following actions are recommended:

- Define the overall framework of the research program in terms of its goals, scope, and level of effort;
- Identify specific research projects among those suggested within the overall framework of the program which
 - Appear to be the most important and relevant to the Navy and the Department of Defense, and
 - Will not duplicate other recent or on-going research; and

- Initiate a suitable research program as soon as possible in order to maintain the impetus gained as a result of this Workshop.

It is therefore recommended that ONR, with the assistance of the Workshop Planning (now Advisory) Committee and such other individuals/agencies as may be desirable, proceed to develop a specific research program.

FOREWORD

This unique and timely report on Economic Conflict and National Security Research provides a detailed insight into the highlights and results of a three-day workshop conducted at Airlie House near Warrenton, Virginia, on September 13-15, 1976. Although this report does not define a specific research program (which was not an objective of the Workshop), it does:

- Provide an outline of the broad complex spectrum of the problem;
- Confirm the need for a suitable research program in this area; and
- Identify numerous areas which appear to warrant research.

In this context, the report recommends the following actions for consideration by the Office of Naval Research:

- Define the overall framework of a suitable research program in terms of its goals, scope, and level of effort;
- Identify specific research projects among those suggested within the overall framework of the program which
 - Appear to be the most important and relevant to the Navy and the Department of Defense, and
 - Will not duplicate other recent or on-going research; and
- Initiate the resultant research program as soon as possible in order to maintain the impetus attained by this Workshop.

In planning and conducting this Workshop, the innovative conceptual guidance provided by the Planning Committee, which consisted of the following individuals, was indeed invaluable and most appreciated:

- Professor Kenneth Arrow, Harvard University,
- Mr. Andrew Marshall, Office of the Secretary of Defense,
- Professor Oskar Morgenstern, New York University,
- Dr. George G.S. Murphy, GE-TEMPO and subsequently the University of California, Los Angeles,
- Professor Martin Shubik, Yale University,
- Mr. J. Randolph Simpson, Office of Naval Research, and
- Dr. Thomas C. Varley, Office of Naval Research.

The GE-TEMPO Center for Advanced Studies gratefully acknowledges, in particular, the devoted efforts of Mr. J. Randolph Simpson and Dr. George G.S. Murphy, who were responsible for the day-by-day implementation of the overall guidance and plan for the Workshop. The congenial facilities and efficient assistance provided by the staff of Airlie House were also greatly appreciated.

TABLE OF CONTENTS

	<u>Page</u>
Executive Summary	i
Foreword	v
1.0 Introduction	1
2.0 Workshop Objectives and Participants	2
3.0 Highlights of the Proceedings	3
3.1 Concepts, Definitions, and Current Methods of Analysis	4
3.1.1 Assessments of the State of the Art in Analyzing Problems of Economic Conflict	4
3.1.2 Suggestions for the Development of an Analytic Framework to Describe Economic Conflict	5
3.1.3 Examples of Behaviors Considered to be Acts of Economic Conflict	8
3.2 A Profile of Economic Trends in the U.S.S.R.	9
3.3 Current U.S. Government Forecasting and Policy Formulation Capabilities	12
3.3.1 Predictive and Responsive Capabilities	12
3.3.2 Food as a Weapon	14
3.3.3 Economic Warfare	15
3.4 Suggested Areas for Research	15
3.4.1 Assumptions Pertaining to a Potential Research Program	15
3.4.2 Suggested Definitional Analyses	19
3.4.3 Suggested Empirical and Historical Research	19
3.4.4 Suggested Theoretical and Methodological Research	23
3.4.5 Suggested Research Pertaining to Decision- Making Analysis	25
4.0 Conclusions and Recommendations	27

APPENDICES

	<u>Page</u>
A. A List of the Participants in the Workshop	A-1
B. Agenda for the Workshop	B-1
C. The Morning Session, September 13, 1976	
● <u>Official Welcome and Introductory Remarks</u> by Dr. William Raney and Dr. Robert Lundegard	C-1
● <u>Policy and Prediction: Perspective I</u> by Mr. Roger Shields	C-6
● <u>Economic Conflict in the Next Decade</u> by Dr. Thomas C. Schelling	C-20
● <u>Formal Comments on the Presentations of</u> <u>Mr. Shields and Professor Schelling</u> by Dr. Martin C. McGuire	C-28
● <u>Formal Comments on the Presentations of</u> <u>Mr. Shields and Professor Schelling</u> by Dr. Hans Heymann	C-31
● General Discussion	C-34
D. The Afternoon Session, September 13, 1976	
● <u>Opening Remarks</u> by Dr. Abram Bergson	D-1
● <u>Soviet National Security Estimates</u> <u>from Published Soviet Statistics</u> by Mr. William T. Lee	D-2
● <u>Soviet National Security Expenditures: A Perspective</u> by Mr. John A. Paisley	D-15
● <u>Formal Comments on the Presentations of</u> <u>Messrs. Lee and Paisley</u> by Mr. Kurt Kruger	D-22
● <u>Formal Comments on the Presentations of</u> <u>Messrs. Lee and Paisley</u> by Dr. Steven Rosefielde	D-24
● <u>Comments on the Presentations of</u> <u>Messrs. Lee and Paisley</u> by Dr. Martin Weitzman and Other Participants	D-30
● <u>Comments on the Presentations of</u> <u>Messrs. Lee and Paisley</u> by Dr. Michael Montias and Other Participants	D-36

	<u>Page</u>
E. The Morning Session, September 14, 1976	
● <u>Policy and Prediction: Perspective II</u> by Dr. Gus Weiss	E-1
● <u>Formulation of a National Security Policy</u> by Dr. Oskar Morgenstern	E-12
● <u>Formal Comments on the Presentations of</u> <u>Dr. Weiss and Professor Morgenstern</u> by Dr. Steven J. Brams	E-22
● <u>Formal Comments on the Presentations of</u> <u>Dr. Weiss and Professor Morgenstern</u> by Dr. Bernard Brodie	E-26
● <u>Formal Comments on the Presentations of</u> <u>Dr. Weiss and Professor Morgenstern</u> by Dr. Charles Wolf	E-29
● General Discussion	E-33
F. The Afternoon Session, September 14, 1976	
● <u>Unconventional Methods of Economic Warfare</u> by Dr. Martin Shubik	F-1
● <u>Formal Comments on the Presentation of</u> <u>Professor Shubik</u> by Dr. Jack Hirshleifer	F-15
● <u>Formal Comments on the Presentation of</u> <u>Professor Shubik</u> by Dr. Earl Thompson	F-20
● General Discussion	F-25
G. The Evening Session, September 14, 1976	
● <u>Highlights of a Policy-Level Perspective on</u> <u>Economic Conflict and International Relations</u> by The Honorable Robert Ellsworth	G-1
H. The Morning Session, September 15, 1976	
● <u>Internal Competition for Soviet Resources</u> <u>in the Decade to Come</u> by Mr. Patrick J. Parker	H-1
● <u>Dealing with Raw Material Supply Interruption:</u> <u>A Role for U.S. Agricultural Exports</u> by Dr. William Schneider	H-13
● <u>Formal Comments on the Presentations of</u> <u>Mr. Parker and Dr. Schneider</u> by Mr. David Kassing	H-22
● <u>Formal Comments on the Presentations of</u> <u>Mr. Parker and Dr. Schneider</u> by Dr. Dermot Gately	H-26
● General Discussion	H-30
● <u>An Informal Discussion of Soviet Demographic Trends</u> by Dr. Murray Feshbach	H-35

	<u>Page</u>
I. The Afternoon Session, September 15, 1976	
● <u>Bureaucratic Processes and Economic Warfare</u> by Dr. Graham Allison	I-1
● <u>Formal Comments on the Presentation of</u> <u>Professor Allison</u> by Mr. Andrew Marshall	I-15
● <u>Formal Comments on the Presentation of</u> <u>Professor Allison</u> by Dr. Davis Bobrow	I-18
● <u>Concluding Observations</u> by Dr. Kenneth Arrow	I-24
J. Some Subsequent Comments on:	
● <u>Economic Conflict and National Security</u> by Major General Robert N. Ginsburgh (USAF, Retired)	J-1
● <u>Economic Conflict</u> by Commander Rolf H. Clark	J-4
● <u>The Use of the Morgenstern-Thompson World Model</u> <u>for the Study of Problems in Economic Warfare</u> by Dr. Gerald L. Thompson	J-7
K. A Selected Bibliography	K-1
L. A Selection of Relevant Extracts	L-1
M. Distribution List	M-1
N. Report Documentation Page, Department of Defense Form DD 1473	N-1

ECONOMIC CONFLICT AND NATIONAL SECURITY RESEARCH

1.0 INTRODUCTION

As a result of recent trends and events in world affairs, the potential for economic conflict appears to have emerged as a prime national security issue for the 1970s. Various international developments have contributed to the growing concern over economic conflict, but none has been more striking or important than recent events with respect to the international trade of oil. Both the Arab oil embargo of late 1973 and the success of the Organization of Petroleum Exporting Countries (OPEC) in achieving and maintaining a quadrupling of international oil prices have been central events in shaping the trends and perceptions with regard to international economic conflict and its potential impact upon national security. Highlighting the world's current and growing economic interdependence, the oil embargo and OPEC's drastic increases in the price of oil not only reemphasized the critical national security importance to industrialized countries of maintaining access to raw material resources (especially energy resources), but also made these countries aware of the Third World's demands for a redistribution of global wealth. According to Professor Graham Allison of Harvard University, this fundamental economic issue with regard to the global distribution of income and wealth may well be the "central problem of international politics during the final quarter of this century."¹

Other international developments have also served to heighten concern over, and interest in, the issue of economic conflict. Of particular significance have been the new climate of detente between the United States and the Soviet Union and the currently popular perception of the difficulties involved in utilizing military power to achieve national objectives. Both of these developments tend to focus attention upon inter-state economic relations as a central arena for the interaction of competitive national ambitions and possible inter-state conflicts which may result therefrom.

Within the Department of Defense (DoD), there has been an increasing awareness of the foregoing trends and the possible implications for national security. In this context, the Office of Naval Research (ONR), in its somewhat independent position directly under the Secretary of the Navy, took the initiative in formulating plans for a workshop which would bring together key individuals from Government, the academic community,

¹ A Selection of Relevant Extracts, Appendix L, Page 11.

and the private research sector to explore and exchange views with regard to:

- The definition of, and potential for, international economic conflict;
- Possible implications of international economic conflict for national security; and
- The need for research on this subject.

The actual planning for the Workshop on Economic Conflict and National Security Research was performed by a Planning Committee consisting of the following individuals:

- Professor Kenneth Arrow of Harvard University,
- Mr. Andrew Marshall in the Office of the Secretary of Defense,
- Professor Oskar Morgenstern of New York University,
- Dr. George G.S. Murphy of the GE-TEMPO Center for Advanced Studies (now a Professor at the University of California at Los Angeles),
- Professor Martin Shubik of Yale University,
- Mr. J. Randolph Simpson from the Office of Naval Research (ONR), and
- Dr. Thomas C. Varley, also from ONR.

2.0 WORKSHOP OBJECTIVES AND PARTICIPANTS

As outlined by Dr. Robert J. Lundegard of ONR,² the Workshop was conceived and organized to achieve three primary objectives, which may be briefly summarized as follows:

- To promote communications throughout the professional Government, academic, and private research communities on the subject of economic conflict;
- To develop a deeper understanding of the critical methodological issues involved in the quantitative analysis of policy questions related to economic conflict; and

² For additional insight, refer to Appendix C, Pages 4-5.

- To provide ONR with professional points of view on the major problems and related research goals and priorities which ONR should consider in planning any future programs in this field.

As indicated in Table 1, the Planning Committee did succeed in bringing together individuals from a wide range of professions, who "in their regular walks of life would not have an opportunity to cross paths."³

TABLE 1. A SUMMARY OF WORKSHOP PARTICIPANTS

General Categories of Participants by Agency, Institution, or other Organizational Affiliation	Number
● Universities	22
● Department of Defense	
-- Military	9
-- Civilian	18
● Other Government Agencies	10
● Private Research Organizations and Consultants	18
● Other Institutions, Associations, and Individuals	2
TOTAL	79

A complete list of all individuals who participated in the Workshop, along with their organizational affiliation and titles, is provided in Appendix A.

3.0 HIGHLIGHTS OF THE PROCEEDINGS

As indicated in the agenda for the Workshop which appears in Appendix B, the proceedings consisted of:

- A series of formal presentations by key individuals from the Government, academic, and private research communities;
- Formal comments on the foregoing presentations by other participants; and
- A general floor discussion among the participants in the Workshop.

Inasmuch as edited versions of the formal presentations, comments, and floor discussions are provided in Appendices C-I of this report, the

³ For additional details, see Appendix C, Page 5.

highlights of the proceedings in this section of the report will simply synthesize what are perceived to be consensus, as well as divergent, views of the participants with respect to the major issues and problems of economic conflict, the potential implications of these problems for U.S. national security, and possible areas for additional research. These views have been organized according to the following general categories:

- Concepts, Definitions, and Current Methods of Analysis;
- A Profile of Economic Trends in the Soviet Union;
- Current U.S. Government Forecasting and Policy Formulation Capabilities; and
- Suggested Areas for Research.

3.1 Concepts, Definitions, and Current Methods of Analysis

Recognizing that this Workshop "broke new ground" by initiating exploratory discussion of the very broad issue of economic conflict and its implications within DoD, it was quite appropriate and necessary that much discussion was actually devoted to defining the problem. Many participants posed the question "What are we talking about?" and then provided their contributions toward a better conceptualization of this issue. The views which were presented may be synthesized as follows:

3.1.1 Assessments of the State of the Art in Analyzing Problems of Economic Conflict

- Although the subject of economic conflict is fundamental to studies in international relations, the actual literature which analyzes issues of economic conflict and economic warfare is "genuinely small."⁴ Moreover, there are few studies which address possible analytic methodologies related to this subject.
- A divergence of opinion existed with respect to the usefulness of international economic theory as a conceptual framework and basis for the discussion and resolution of problems of economic conflict. While some participants argued persuasively that international economic theory provided clear and simple answers to problems of economic conflict⁵, others contended that international economic

⁴ See Appendix F, Page 1.

⁵ For additional details, see Appendix F, Pages 21-23, and Appendix I, Pages 4-5.

theory is an inadequate basis on which to resolve these issues because it fails to include considerations of the political aspects of international economic relations. In other words, it is impaired by a lack of relevance to the "real world."⁶

- The current state of political and sociological power theory and game theory was viewed to be inadequate to deal with the questions pertaining to economic conflict.

3.1.2 Suggestions for the Development of an Analytic Framework to Describe Economic Conflict

The Workshop participants attempted to simplify the broad subject of economic conflict by delineating conceptual categories on the basis of which important facets of economic conflict could be brought into focus. Suggestions relevant to the development of this analytic framework included:

- The specification of necessary steps for the analysis of acts of economic conflict, of which the following six were proposed:
 - Identify the actors involved. Identify not only the actor(s) implementing a policy of economic conflict and the actor(s) receiving the direct consequences of the policy, but also the actor(s) experiencing the indirect consequences of the policy. Situations involving economic conflict can and do exist between and among allies, adversaries, and non-aligned nations. When situations involving economic conflict result in a shift in the rules of the game of international affairs, such as a change in rules governing international financial practices (i.e., repayment of debts, free movement of assets, etc.), then all nations are affected.
 - Specify the objective or the aim of a policy involving economic conflict. For example, a country might be motivated to engage in economic conflict in order to improve its own position (power), to injure an adversary (either directly or indirectly),⁷ and/or to control an adversary's behavior (either through threats or a fait accompli).⁸ In this context and more specifically, the general subject of economic conflict was also considered to include the

⁶ For further insight, refer to Appendix I, Pages 15-16.

⁷ For additional details, see Appendix F, Page 14.

⁸ For further insight, refer to Appendix I, Page 28.

pursuit of an economic objective (e.g., access to energy resources) through the application of economic, military, and/or political tools and the pursuit of political, military, and/or other objectives through the application of an economic tool (e.g., securing the release of Soviet Jews in exchange for U.S. trade).

-- Describe the international climate. For example, acts of economic conflict vis-à-vis an adversary during a hot war are generally considered to reflect economic warfare policies. However, economic conflict can and does exist between nations waging a cold war and between nations at peace with each other (for instance, U.S. economic conflict with NATO nations with respect to offset payments).

-- Specify the acts of economic conflict, to include both conventional and unconventional acts. The category of conventional acts includes such traditional tools and policies of economic conflict as:

- o Competition over vital resources;
- o The embargo of strategic goods vis-à-vis adversaries;
- o The use of high import tariffs to protect domestic industries; and
- o The attachment of political conditions to trade treaties.

Unconventional economic conflict refers to implements and policies of economic conflict which, although not presently significant in inter-state relations, might possibly be employed in the coming decades, due to the nature of the world situation. The characteristics of our age which tend to stimulate various modes of unconventional economic conflict include:

- o The development of a global consciousness among peoples and nations which is leading to international politicization of the domestic acts of nations (e.g., what a country does domestically is judged internationally);
- o The high degree of inter-linkage or inter-dependence in the international trade of goods;
- o The advent of highly complex, centralized credit systems; and
- o The nature and quality of some research which, potentially, can endanger the well-being of the world society.

The category of unconventional economic conflict consists of both "offensive"⁹ and "offending"¹⁰ acts, of which

- o "Offensive" acts include "dirty tricks"¹¹ attuned to a hot war which are expressly perpetrated vis-à-vis an adversary for the purpose of causing injury, and
 - o "Offending" acts include economically-motivated behaviors and/or conflict-motivated behaviors that take an economic form which other peoples and nations may consider to be "offending."
- Examine the consequences of economic conflict. This step subsumes such questions as whether or not an act of economic conflict will result in a hot war, the collapse of international financial arrangements, general ill-will, etc., or simply the desired end.
- Consider the manner in which policies of economic conflict serve as a complement to, or as a substitute for, other means of achieving national objectives. The exploitation of economic strengths may serve as an alternative to political "jawboning" and/or heavy-handed military action in order to achieve a desired end. Such action may reinforce initiatives in other sectors of competition or conflict.
- Consideration of the strength/weakness paradox of economic conflict -- An illustration of the strength/weakness paradox of economic conflict is a situation wherein assets under the political jurisdiction of one nation are owned by another nation. To the owner nation, these assets represent power and strength but they also entail a fundamental weakness for they can become hostages. This paradox creates both opportunities and vulnerabilities to nations involved in economic conflict.¹²
 - Recognition of constraints on the scope of economic conflict -- Realizing that states are naturally concerned with their own self-interests, the question was raised as to why "total" economic conflicts between states are rare, aside from wartime situations. Although international affairs is in a

⁹ For additional insight, refer to Appendix F, Pages 1-14.

¹⁰ For additional insight, refer to Appendix C, Pages 20-28.

¹¹ See again Appendix F, Page 1.

¹² Ibid., Page 11.

Hobbesian state of nature, several factors limit conflict between nations and encourage mutual restraint. Enlightened self-interest tends to lead states to accommodate each other for mutual benefits and thereby minimizes the scope of, but does not eliminate, conflict. Self-enforcing agreements also provide clear regulations on actions to confine conflicts, as do codes of ethics, laws, and altruism -- although the latter can be little relied upon in the international state of affairs. A possible exception may be noted in U.S. relationships with countries with which the United States has strong cultural and historical ties (e.g., Great Britain).¹³

- The definition of power --- Economic conflict must be viewed in the context of power relations. The literature of political science includes a variety of definitions of power. During the Workshop, it was convenient to view power as the ability to control outcomes.¹⁴

3.1.3 Examples of Behaviors Considered To be Acts of Economic Conflict

In addition to discussing the state of the analytic art with respect to economic conflict and attempting to develop an analytic framework for discussing this issue, some specific situations and policies involving economic conflict in the world today, or which might emerge in the decades ahead, were introduced and examined.

Among the examples of conventional economic conflict, the following cases were discussed:

- Debt rescheduling by the Soviet Union and Eastern European countries;
- Third World demands for redistribution of global wealth;
- The economic effects of the purchase of military hardware upon recipient countries;
- Economic issues involved in negotiations with regard to the Law of the Sea;
- U.S. use of food as a weapon;
- U.S. technology transfers to Communist nations; and
- Burden-sharing negotiations between the U.S. and its NATO allies with respect to the economic burden of NATO's military forces.

¹³ For additional details, see Appendix F, Pages 16-17.

¹⁴ For further insight, refer to Appendix E, Pages 22-25.

Examples of unconventional conflict involving both "offending" and "offensive" behaviors which were discussed included:

- Intrusive communications;
- Environmental externalities of dangerous research or weather modification;
- Discontinuance of exports in order to disrupt an adversary's economy;
- Wrecking a nation's financial institutions by flooding the country with counterfeit money and/or duplicate credit cards;
- Dumping pollutants in rivers and oceans;
- Destruction of national/international shrines or natural endowments (e.g., the plowing of Olduvai Gorge in order to plant peanuts);
- Instigating a panic; and
- Promoting dangerous or illicit commerce.

3.2 A Profile of Economic Trends in the U.S.S.R.

In addition to discussing conceptual problems, attention was also devoted to the consideration of a second category of issues; namely, providing a description of the present and likely future domestic economic situation of the principal adversary of the United States -- the Soviet Union. Considerable interest was generated in this discussion because many facts about Soviet economic and demographic pressures, constraints, and weaknesses are not widely known and because these facts do have significant implications for U.S. policy: first, with respect to U.S. economic policies vis-à-vis the Soviet Union (which are presently in transition and subject to criticism within the U.S.)¹⁵ and second, with respect to the types of Soviet economic conflict initiatives which the U.S. might encounter in the coming decades. The general thrust of the discussion was directed towards assessing the overall status of the Soviet economy, identifying specific constraints and burdens on this economy, and developing some explanations of the implications of the trends. Some of the major points were as follows:

- Despite quite impressive growth rates in the post-World War II period, there is an emerging consensus among both

¹⁵ That is, U.S. grain sales and technology transfers to the U.S.S.R.

the (U.S.) people who look at the Soviet Union and the Soviets themselves that the U.S.S.R. is experiencing declining economic growth rates...which will continue into the future.¹⁶ ..."For the next ten years, a 3½ to 4 percent rate of GNP growth is in the right 'ballpark'" -- a respectable rate of growth, but modest in terms of Russian aspirations of the past..."and by no means distinguished for a country at the Soviets' stage of development."¹⁷

- The following factors were identified as the principal causes of this decline in the rate of Soviet economic growth:
 - "Retardation in the rate of technological progress,"¹⁸ and
 - Demographic changes which are causing serious problems in the composition of the new entries to the labor force.¹⁹

With respect to the first factor, it appears that Soviets have not been particularly good at either developing or absorbing technology and have had great difficulty moving into the areas of high technology which are needed to expand economic growth.²⁰

The demographic changes which the U.S.S.R. is experiencing involve a shift in the ethnic character of the majority of new additions to the labor force and an attendant decline in individual productivity. The principal growth of the Soviet population will be in the Soviet minority groups, "rather than the great Russians. From an economic point of view, this latter development can be described as a problem requiring greater investment in human capital in order to bring the minorities to the same level of productivity as the great Russians." ...This imposes a greater burden on the State in terms of its capital investment in education.²¹

- There was some divergence of opinion among the participants of the Workshop with regard to the relative importance of these factors in the decline of Soviet GNP. On the one hand, the demographic changes were highlighted as being particularly

16 For additional details, see Appendix H, Page 2.

17 Ibid., Page 10.

18 Ibid.

19 Ibid., Pages 2-3.

20 Ibid., Page 3.

21 Ibid., Pages 2-3.

important because increases in the labor supply have (traditionally) played an important role in Soviet economic growth (more significant than in the U.S.).²² On the other hand, the problem of developing and absorbing technology was considered to be more significant.²³ Although both factors were considered to be critical elements, there was some divergence with respect to emphasis.

- Constraints on the Soviet economy stemming from labor considerations are broader than solely the issue of labor productivity. Projections of future Soviet military manpower requirements and of the manpower needs of the Soviet economy indicate a labor crisis in 1983, because there will not be sufficient new additions to the labor force to meet the combined military and economic demand. This crisis reflects the demographic effects of World War II casualties on the U.S.S.R. Soviet leaders will have to choose among the possible tradeoffs in this situation, unless the problem can be circumvented through the substitution of capital for labor -- which is why the U.S.S.R. is avidly seeking U.S. technology.²⁴ However, the Soviet people are still deeply influenced by the World War II experience and are very willing to sacrifice for the national well-being in times of crisis.²⁵
- On the average, the rate of growth of the Soviet agricultural output is quite respectable. In recent years, however, Soviet agricultural production has reflected enormous fluctuations because "the system has been very vulnerable to weather changes."²⁶ "They have had two poor harvests in the last five years, one more than they usually have for a Five-Year Plan."²⁷ Approximately one-quarter of the Soviet capital investment is directed toward limiting this agricultural vulnerability to weather fluctuations. Much of the grain imported by the U.S.S.R. is not for minimal subsistence, but for raising the Soviet standard of living. The bulk of the grain has been allocated to livestock production so that Soviet citizens may enjoy meat occasionally. Currently, the Soviet Union has a livestock herd of 2 million animals, while the U.S., a country of comparable population, has a herd of 40 million animals.

²² See Appendix H, Page 3.

²³ Ibid., Page 10.

²⁴ Ibid., Page 3.

²⁵ Ibid., Page 30.

²⁶ Ibid., Page 11.

²⁷ Ibid., Page 9.

- In an effort to determine just how "tight the defense shoe pinches"²⁸ in the U.S.S.R. and to speculate what this might mean for Soviet priorities and objectives, estimates of the level, the rate of growth, and the share of GNP of Soviet defense expenditures were discussed. Although the details of this discussion appear to be somewhat peripheral to the main theme of the Workshop, it will suffice to state that Soviet defense expenditures seem to be growing at a higher rate than previously estimated. To some, this trend suggests the possibility that, at a future date, the Soviet Union might resort to "gunboat diplomacy" or military adventurism in order to alleviate its domestic pressures.²⁹ Others felt that such scenarios are farfetched and argued that:

- Soviet economic difficulties are not so severe, and
- The perception of an aggressive Soviet military build-up could apply equally, though incorrectly, to the U.S. in light of U.S. defense expenditures.³⁰

Additionally, some participants expressed surprise that significant methodological differences with respect to the various methods of estimating Soviet defense expenditures do exist and have not yet been resolved.

3.3 Current U.S. Government Forecasting and Policy Formulation Capabilities

The next general category of discussion during the Workshop involved an assessment of the capabilities of the U.S. Government to devise and implement policies involving economic conflict and to predict and to respond to economic conflict initiatives by other countries. Various case studies were considered, and particular attention was directed towards the U.S./NATO offset negotiations;³¹ the U.S. Government prediction of, and response to, the Arab oil embargo; and the general U.S. experience in the past with policies of economic warfare. In this context, the following principal themes emerged from the discussions.

3.3.1 Predictive and Responsive Capabilities

- The current capabilities of the U.S. Government to react to economic conflict initiatives of other countries is poor.

²⁸ See Appendix H, Pages 4-5.

²⁹ See Appendix G, Pages 6-7, and Appendix H, Pages 6-7.

³⁰ For additional details, refer to Appendix H, Pages 30-32.

³¹ In these negotiations, the U.S. has sought to apportion the financial burden of maintaining U.S. troops in Europe among its NATO allies, in particular, with the Federal Republic of Germany.

The performance of the Government has been deficient both in making correct predictions and in devising successful counter-policies. Factors which were identified as reasons for this perceived weakness of the U.S. Government with respect to economic conflict were as follows:

- Authority with respect to economic issues is diffused very broadly throughout the U.S. Government. As one individual observed, "A polymorphous society reflects itself in a polymorphous government. It is very difficult and very slow for us to achieve any kind of consensus, even on straightforward policy. It is even more difficult for us to package policy elements into a coherent whole to be implemented imaginatively and consistently over a period of time."³²
- Furthermore, "There is no focus in the U.S. Government for identifying contingencies, assessing threats and opportunities, developing capabilities, or designing initiatives in the area of predictions about economic events."³³
- The Executive Office of the President faces an intellectual and an organizational disjunction in its approach for dealing with this issue. The current procedure appears to separate domestic policy from foreign policy and to give insufficient attention to the substantial interlinkage between these two policy areas. Hence, the U.S. has relied primarily on diplomatic initiatives as its response to the OPEC cartel, rather than coupling these initiatives with a determined policy of energy conservation domestically.
- The U.S. Government has inadequately handled the dilemma of "go it alone" or "cooperate with allies" in situations of economic conflict. After dallying with Project Independence, the U.S. finally realized that, as long as our European allies were vulnerable, the U.S. was still vulnerable to oil embargos, and only then did we begin seriously to cooperate with our allies on oil stockpiling and related issues.³⁴
- The use of "a unitary maximizing model for thinking about a foreign government's behavior doesn't lead to very strong inferences about what that government is likely to do in future situations."³⁵ For example, general statements with

³² For additional insight, refer to Appendix C, Page 30.

³³ For additional details, see Appendix I, Pages 11-12.

³⁴ For further insight, refer to Appendix C, Page 8.

³⁵ See again Appendix I, Page 12.

regard to France's objectives, sometimes used as the basis of policy inferences, are really not very useful. This has been an error in U.S. Government thinking and prediction. The U.S. Government should try to disaggregate its unitary view of foreign governments (e.g., what foreign governments are like and what they might do) with the help of models. In this context, causal mapping provides a useful model. The U.S. Government's knowledge of macro-factors of other economies is also considered to be inadequate.³⁶

3.3.2 Food as a Weapon

- Use of U.S. agricultural exports as an economic tool to be implemented vis-à-vis the Soviet and Arab nations (should such policy be warranted) was proposed in the following terms:
 - The U.S. is the world's principal exporter of food and feedgrains, including 90% of the world soybean market. This dominance is tending to grow because of declining agricultural productivity (at least in some parts of the world), high birth rates, and climatic changes in some parts of the world.³⁷
 - This dominance provides the U.S. with a resource tool which can made an important contribution to achieving long-term foreign policy objectives and may be highly effective in the short-run.³⁸
- Other participants in the Workshop disagreed with this view and argued that:
 - U.S. dominance of international trade in food does not imply a U.S. dominance of world food production -- which, in fact, is not the case. Importantly, however, it is dominance in the latter category which would signify the possession of food as a resource weapon.³⁹
 - Without the use of military forces as policemen, a food embargo could not cope with the problem of transshipment. Therefore, the efficacy of the use of food as a weapon is questionable.⁴⁰

³⁶ For further insight, refer to Appendix I, Pages 11-12.

³⁷ For additional details, see Appendix H, Pages 16-19.

³⁸ Ibid., Pages 19-21.

³⁹ Ibid., Page 26.

⁴⁰ Ibid., Page 28.

- Use of food as a weapon is not in the long-term foreign policy interests of the U.S. because it would reverse the worldwide perspective of the U.S. as a humanitarian country concerned with helping other countries meet their food needs and would "severely damage our international reputation as a responsible trading partner."

3.3.3 Economic Warfare

U.S. policies of economic warfare (e.g., economic conflict policies vis-à-vis an adversary during a time of war) have generally been perceived to be ineffective. These policies have focused upon completely denying war resources to an adversary in hopes of causing his war-making potential to grind to a halt. Such hopes have not been realized (not in World War II, nor in Vietnam) and as a consequence, the efficacy of economic warfare has been criticized. The problem, however, is not that economic warfare is ineffective, but rather than unrealistic expectations have been ascribed to this policy. A realistic view of the goals of economic warfare would conceive them more modestly -- such as domestic disruption and confusion. In this way, the actual value of economic warfare could be perceived more clearly.⁴²

3.4 Suggested Areas for Research

In light of the stated aim of the Workshop, the participants made special efforts to suggest guidelines, as well as to identify substantive areas and specific analytical techniques, for a research program which will address economic conflict as it relates to national security. In identifying areas wherein research funds might be profitably spent, the participants not only outlined general principles with respect to the character and scope of a potential research program, but also proposed specific research projects to be considered.

Although the efforts of the Workshop participants to outline the general character and scope of a potential research program dealing with economic conflict vis-à-vis national security did result in a broad range of suggestions, their efforts reflected a number of proposed, as well as implied, assumptions -- some of which were not universally accepted. These assumptions may be summarized as indicated in the following sub-section.

3.4.1 Assumptions Pertaining to a Potential Research Program

Major assumptions emerging from the Workshop discussions as the apparent consensus of the participants with respect to principles which should guide potential research may be synthesized as follows:

⁴¹ See Appendix H, Page 27.

⁴² Ibid., Pages 13-16.

- Recognize that the world is very heterogeneous and forget symmetry.

The nations of the world have emerged as the result of divergent cultural, political and historical experiences. Hence, it is understandable that, in situations involving economic conflict, states "have highly different goals, highly different capabilities, and even different tactical and, to some extent, strategic positions from which they start."⁴³ Viewing interactions among states to be analogous to a chess game in which opponents agree on the basic rules of the game and wherein opponents field similar capabilities in the pursuit of similar objectives "can be a very dangerous first step."⁴⁴ Hence, the error of assuming that U.S. values, perceptions, and goals are universal should be avoided by "forgetting symmetry"⁴⁵ -- and recognizing the world's heterogeneity.

Related to this assumption is the idea that, in researching possible countermeasures to a potentially threatening initiative by some other country, the U.S. Government should avoid reacting in an unthinking "me-too"⁴⁶ fashion. "Me-tooism" is a mode of response which is based upon an assumption that what's good for the other party to do must also be good for me to do. Instead of responding in a "me-too" manner (e.g., if your opponent is developing an ABM system, then you should develop one too), one should consider the possibility of other forms of response in what may be totally unrelated areas and which might achieve the desired goals more efficaciously. In short, the world is heterogeneous and U.S. policies should be based upon the consideration of U.S. strengths, comparative advantages, and unique conditions of individual states.

- Think creatively, because actions which today seem unlikely may happen tomorrow.

The simple fact that a particular course of action has not been previously employed, or seems unlikely in the present world situation, does not preclude the possibility that such a course could, or might be quite likely to, be implemented in the future. Acts involving economic conflict which may now be considered to be remote possibilities may, in fact, be the

⁴³ For further insight, refer to Appendix F, Page 3.

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ Ibid.

principal threats to be faced in the days ahead. Recognizing that it is impossible to generate and examine all "offbeat"⁴⁷ (presumably unlikely) scenarios, a research program should nevertheless explore a variety of "unlikely" possibilities which, under certain circumstances, may become likely events in the decades ahead.⁴⁸

- Recognize the necessity for grounding abstract research of issues involving economic theory upon good descriptions of the realities of the world in order for this research to have practical utility.

"There has to be a certain amount of tailoring of economic dynamics to certain subsets of problems,"⁴⁹ if theoretical research is to be of value in designing policy. Static theoretical work is not enough;⁵⁰ the research must be "plugged into the real world." For this to be true, the concept of abstraction (i.e., with respect to performing an abstract study) must be made viable again. In this context, abstraction refers to the extracting of the cogent features of a real-world entity for a particular study. If abstract studies conform to this guideline, they can be worthwhile.⁵¹

The importance of empirical descriptions as the necessary basis of theoretical research was further emphasized in the following words: "Hence, I think that we don't want to engage in basic theoretical research proceeding from assumptions that are not grounded on good, empirical observations."⁵²

- Do not overlook the value of negative results.

In the assessment of policy options, research which provides positive results (e.g., a recommended course of action) is, of course, highly valued. Yet, the importance of negative results (e.g., determining that not enough information is available for a decision to be made with respect to the policy options under consideration or showing that a particular policy option is not feasible) should not be overlooked. Negative results allow one to dispute assertions which might otherwise remain unchallenged.⁵³

47 Appendix F, Page 1.

48 For further insight, refer to Appendix C, Page 38.

49 See Appendix E, Page 9.

50 Ibid., Pages 9-10.

51 Ibid.

52 Ibid., Page 32.

53 Ibid., Page 30.

- Do not underestimate the difficulties and complexities of research pertaining to economic conflict vis-à-vis national security.

Sponsors of research programs pertaining to issues of economic conflict "should not underestimate the difficulties with respect to the costs, time, and resources needed to illuminate some of the big issues."⁵⁴ The research work which needs to be done in this area transcends a series of one-shot research tasks and is likely to require several years to complete.

Some other assumptions, which were discussed to a lesser degree and which do not necessarily reflect a consensus among the participants in the Workshop with respect to principles that should guide potential research, may be briefly identified as follows for the purpose of possible further discussions which could result in a general consensus:

- "It would be most useful to establish broad areas of research within an overall framework, rather than sponsoring a myriad of individual, small, unrelated projects."⁵⁵
- Research with respect to the theory of power should be emphasized, and less attention should be devoted to empirical questions in which standard economic analysis provides definitive answers.⁵⁶
- Any research program sponsored by the Department of Defense (DoD) in the general area of economic conflict should focus upon economic issues which could conceivably lead to armed action involving the DoD. To a lesser degree, the research program should examine the use of economic tools as alternatives or complements to the application of military force in exercising leverage vis-à-vis other nations. Above all, however, "the problem is not international economic competition...or how the United States should wage economic warfare in peacetime."⁵⁷

A divergent opinion was to the effect that "the past emphasis on economic warfare in the peacetime situation is an appropriate one...(research into the use of) economic tools in a hot war should get zero priority."⁵⁸

⁵⁴ For additional details, see Appendix E, Page 32.

⁵⁵ See Appendix J, Page 3.

⁵⁶ See Appendix F, Pages 21.

⁵⁷ See Appendix J, Page 1.

⁵⁸ See Appendix H, Page 22.

- Research should be focused upon defensive policies to be implemented as countermeasures to possible economic conflict initiatives of other countries; it should not deal with offensive tools which the U.S. might employ because:
 - Inevitably, adverse domestic publicity will overtake such research, and
 - Assuming that ONR will sponsor research in this area, offensive tools which might be developed would be of little assistance to the Navy in performing its basic missions (protecting trade routes, etc.).⁵⁹

There was no consensus with regard to any assumption to the effect that international economy theory can provide a relevant framework for consideration of questions relating to economic conflict.⁶⁰

3.4.2 Suggested Definitional Analyses

Although significant progress was made, the exploratory discussions during the course of the Workshop did not provide a full and complete conceptualization of the issue of economic conflict. Questions which remained unresolved and which would appear to warrant new and/or additional research include:

- Is it a useful distinction to consider economic conflict to be different from economic competition? If so, on what should the distinction be based (e.g., conscious hostile intent, departure from classical free trade, or aggression)?
- What is the relation between economic conflict and international economic theory? and,
- What new concept for the classification of relationships among allies would be appropriate for the present world situation in which, for example, strict East/West bloc politics has given way to multipolarity and to the possibilities of freely-elected Communist governments in Western Europe?

3.4.3 Suggested Empirical and Historical Research

Discussions during the Workshop indicated that gaps and uncertainties in information currently hinder and impair both policy analysis and methodological research pertaining to economic conflict. Unfortunately, this lack of a strong, empirical data base results in the formulation of policies which tend to be based purely on political considerations and intuition and in methodological work which is

⁵⁹ For additional details, see Appendix J, Page 4.

⁶⁰ As previously reflected in Highlights of the Proceedings, Section 3.1.1, Pages 4-5.

sometimes less specific and relevant than it could be. In light of these problems, it was strongly suggested that research be conducted to get the facts straight. In this context, the following empirical and historical research was proposed:

- Analyze previous U.S. policies involving economic conflict to determine what lessons might be deduced from these cases; i.e.,
 - "Perform a set of historical performance analyses (of the U.S.) which can be coded by a panel of judges and then treated statistically so as to establish an informed taxonomy,"⁶¹
 - Identify and examine two sets of cases -- cases wherein the U.S. was the defensive party in the conflict and cases wherein the U.S. was the offensive party, and
 - Examine the perceptions of leaders both at the time the events were transpiring and at the present time to determine what changes have occurred as the years have passed.⁶²

One specific case study which was suggested is to examine the U.S. soybean embargo of Japan.

- Investigate why the OPEC cartel has remained stable and, in this context:
 - How petrodollar recycling has been successfully achieved, and
 - Why predictions with respect to both of these situations were incorrect.
- Analyze the interlinkage between the failures of financial institutions and the creation of economic and financial confusion. "The classical example is the failure of the parts of the U.S. banking system during the beginning part of the Depression, which raises the question: Was that a symptom of, or was that a major contributing cause to, the Depression?"⁶³
- Investigate the vulnerabilities of the U.S. currency and credit systems to sabotage. In this context, how can we deal with the dilemma that increased sophistication entails increased vulnerability?⁶⁴

⁶¹ See Appendix I, Page 22.

⁶² Ibid.

⁶³ See Appendix F, Page 13.

⁶⁴ Ibid.

- Identify and assess the role(s) which U.S. multinational corporations could play in economic conflict. Given that certain roles are identified, examine the ways in which the U.S. Government could compel a multinational corporation to play a specific role.
- Continue empirical research on the status of the Soviet economy. In particular, attempt to develop answers to such questions as:
 - What are the economic vulnerabilities of the U.S.S.R.?
 - What is the composition, size, and growth rate of the second economy in the U.S.S.R.? (The term second economy refers to economic activities within the U.S.S.R. in which private enterprise and mechanisms of the market place are observed to be at work -- such as the cultivation and marketing of produce grown on individual farm plots.) In this context,
 - o What would be the likely effects if this second economy were to thrive?
 - o Could the U.S. implement policies which would cause this economy to thrive?
 - What are the areas of competition for resources in the Soviet economy?
 - What are Soviet perceptions of the U.S. defense budget and what are the critical variables that influence these perceptions?
- Improve macro-factor analysis of other economies; in particular, the mini-sectoral analysis of these economies.⁶⁵
- Develop some systematic projections of trends in the world economy.
- Investigate the whole problem of transfer of computer technology and miniaturization techniques. In this context,
 - What is the state of the art of computer development in selected countries?

⁶⁵ For further insight, refer to Appendix I, Pages 12-14.

- What effects will the transfer of U.S. technology to the Soviet Union have upon the ability of the Soviet Union to generate higher technologies?
- Examine the issue of redundancy vis-à-vis economic development more completely in terms of such questions as:
 - Does redundancy (economic protection) develop "naturally" as an economy becomes more highly developed?
 - If not, how can redundancy be "artificially" built into the economy?⁶⁶
- Study the international debt situation in terms of such questions as:
 - What are the magnitude and implications of foreign debts for which the U.S. is the creditor?
 - These debts may provide leverage, but for which party is this true -- the creditor or the debtor?
- Examine possible adaptive responses of other smart and reasonably motivated nations in light of possible U.S. initiatives in this field of economic conflict. What would the likely net outcome be of such an exchange?
- Analyze the international trade-offs between state secrecy and multi-state cooperation in terms of what is to be gained or lost by pursuing either alternative.
- Conduct a series of threat analyses with reference to the U.S., to include:
 - The economic vulnerabilities of the U.S.;
 - Theory, concepts and doctrine behind the foreign economic policies of other nations or blocs, with priority given to the U.S.S.R., China, and the Arab and "non-aligned" countries;
 - Historical evaluation of the operational economic policies of these nations; and
 - Projections of their possible and probable future economic policies.⁶⁷

⁶⁶ For additional details, see Appendix E, Page 20, and Appendix F, Pages 3-4, 19.

⁶⁷ For further insight, refer to Appendix J, Page 2.

- Initiate some exploratory research on such subjects as:
 - Panics. Little is known about the forces which generate panics; for instance, can a panic be instigated?⁶⁸
 - Data bank and computer communication sabotage. As previously indicated, sophistication entails vulnerability, so the U.S. should know how to protect itself against such sabotage.⁶⁹
 - Discontinuous purchases and sales as a tactic to disrupt an adversary's economy.⁷⁰
 - U.S. energy policy. The U.S. seems to be pursuing a policy which will exhaust America first in contrast with the Dutch solution of maintaining standby reserves for use should oil imports be disrupted -- which might be a better policy for the U.S. to follow.⁷¹

Another possible research subject, but one on which there was strong disagreement, is that of the potential U.S. use of food exports as a weapon. Some participants, on the one hand, urged an in-depth study of the international food market in terms of national stock-piles and purchases so as to provide a better understanding of the potential effectiveness of food as a weapon. Others, however, were adamant that further research on this subject would be unwise because, in their opinion, a policy involving the use of food as a weapon is something that the U.S. could not, should not, and must not implement. As one individual stated, "I think that it's unrealistic to think that the U.S. political system and the U.S. Government would have either the desire or the capability to implement such a proposal."⁷²

3.4.4 Suggested Theoretical and Methodological Research

In addition to the need for research to get the facts straight, certain theoretical and methodological areas which also appear to warrant research efforts were suggested as follows:

- Develop a more basic model for understanding unwarranted assumptions of symmetry ("me-tooism").⁷³
- Develop a simulation model of an anti-social organization which might perpetuate various "offending" acts of economic

⁶⁸ For additional details, see Appendix F, Pages 11-12.

⁶⁹ Ibid., Pages 12-13.

⁷⁰ Ibid., Pages 20-21.

⁷¹ For further insight, refer to Appendix H, Page 29.

⁷² Ibid., Page 27.

⁷³ For further insight, refer to Appendix F, Pages 5 and 20.

conflict vis-à-vis particular countries or the world in general. Utilizing such a model, it might be possible to design countermeasures to these acts of economic conflict.

- Formulate finer categories and models by means of which factors that influence the policies of foreign governments can be better understood. This would be an effort aimed at "disaggregation of the 'g'"⁷⁴ (i.e., to gain a clearer insight into the government) for the purpose of improving one's capabilities to predict what another government would do in a particular situation.
- Investigate the subject of political economy in terms of game theory so as to improve assessment and predictive capabilities. Existing methodological and conceptual tools for the comparison of political/economic systems need to be improved. "In particular, we need to improve our ability to assess the 'management capacity' of nations."⁷⁵
- Investigate the use of new theories for the analysis of international order and stability.
- Develop new and more fruitful approaches to the analysis of Soviet political/economic developments in relation to civil and military developments."⁷⁶
- Explore catastrophe theory as a means of addressing the problem of unexpected occurrences which tends to be a thorn to reliable predictions.⁷⁷
- Conduct more research in "those technical areas dealing with dynamic systems -- such as State-Variable Analysis and Optimal Control Theory -- in order to make such techniques more useful."⁷⁸
- Assess current assumptions with regard to international economic activity. Subscribing to free trade theory assumes stability in the trading behavior of other nations. If trading behaviors are, in fact, not stable, then the entire free trade argument collapses.⁷⁹
- Perform research on theories of power (e.g., balance of power) with respect to economic conflict.

⁷⁴ See Appendix I, Page 12.

⁷⁵ Ibid., Page 22.

⁷⁶ See Appendix H, Page 33.

⁷⁷ For additional details, see Appendix J, Page 5.

⁷⁸ Ibid.

⁷⁹ For further insight, refer to Appendix E, Page 17.

- Review recent research on the compressibilities of economies with the objective of determining the implications of this research for the solution of problems involving potential economic conflict.
- Adapt the Morgenstern-Thompson world model by incorporating game theory concepts in the model for use in the study of potential economic conflict problems.
- Consider the development of a large-scale, econometric input-output model of major international economic relationships.

Several proposed areas of research in which there was considerable divergence of opinion involved oligopoly theory and the development of "models of optimal government, optimal political institutions, and optimal organizations for society in general."⁸⁰ With reference to economic conflict, the question of the capabilities of democracies to actually fight economic wars was debated, with considerable attention devoted to the need for an export control czar. With reference to additional research on oligopoly theory, some viewed "the theory of cartel behavior and the general theory of oligopoly to be very fruitful areas for both applied as well as basic research,"⁸¹ while others argued that what is needed is not more theory, but rather work to "convert what is now known into something that is persuasive."⁸²

3.4.5 Suggested Research Pertaining to Decision-Making Analysis

The last general category of suggested research that emerged from discussions during the Workshop pertains to the analysis of governmental decision-making processes with respect to possible economic conflict policies. Suggested areas of research within this general category may be briefly summarized as follows:

- Analyze "the strengths and weaknesses of selected Federal agencies and processes for dealing with international and domestic economic issues."⁸³ In this context, is there a more optimal organization of the U.S. Government which would ensure better management of actual/potential economic conflict in the sense of:
 - Better identification of possible threats and opportunities in the arena of economic conflict, and

⁸⁰ See Appendix F, Pages 23-24.

⁸¹ See Appendix H, Page 28.

⁸² See Appendix E, Page 7.

⁸³ See Appendix I, Page 8.

-- Better design of U.S. policies?

- Investigate the question of whether we should expand the stature, authority, and substructure of the Council on International Economic Policy (CIEP) so that it is equal to the National Security Council (NSC), and whether the NSC should be reorganized so that it is equipped to cope with these issues -- or are some other organizational arrangements warranted?
- Initiate basic work in the area of predicting decisions by foreign governments or organizations (such as OPEC) in the area of economic conflict. "Track records" of various prediction methods must be established so that the critical variables in the decision-making process can be identified and assessed.
- Explore a range of "conceivable characteristics of problem-solving behavior"⁸⁴ of selected nation-states, devoting special attention to an analysis of the bureaucratic structure of foreign governments and how this structure influences decision-making processes with regard to foreign economic policies.
- Initiate research on the political constituency that a Soviet Commissar must appease and please. "He may well have a constituency which causes him to 'fudge' figures and shape perceptions and policies in a certain way"⁸⁵ which, in turn, could provide an insight into Soviet decision-making processes.
- Perform organizational analyses in the following areas:
 - Indicators of likely action (i.e., how predictions can be made),
 - Implementation analysis (i.e., how policies are formulated and implemented), and
 - Internal bureaucratic dynamics.
- Conduct research on decision making in multi-person (or multi-organization) contexts wherein the various agents involved have different degrees of information about the underlying structure and other relevant facts and wherein

⁸⁴ See Appendix H, Page 32.

⁸⁵ See Appendix E, Page 35.

all of the parties involved are aware of this differentiation of information. Two special cases of this research include:

- Conflict situations (i.e., games) in which there is secrecy about capabilities, economic and military, and possibly privacy about values; and
 - Coordination of a large bureaucratic or other organization (e.g., the United States or the Soviet Government) in which there is specialization of information gathering and difficulties with internal communication.
- Investigate the possibilities of exploiting the employment of misinformation signals for influencing the behavior of an adversary. Examination of this issue should lead to the broader question of how a democratic government can correctly inform its own public about the facts of a current situation, while attempting to deliberately misinform (mislead) an adversary.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Bearing in mind the fundamental exploratory nature of this Workshop, it is nonetheless apparent that the Workshop was generally successful in achieving the stated objectives: i.e., to promote communications throughout the professional Government, academic, and private research communities on this subject; to develop a clearer understanding of economic conflict; and to help ONR identify appropriate research.

As is evident in the Highlights of the Proceedings, the presentations and discussions of the Workshop participants did serve to outline the broad complex spectrum of the problem, to confirm the need for a suitable research program in this area, and to identify numerous areas which appear to warrant research. However, with the publication and dissemination of this report on the proceedings and results of the Workshop, it is clear that additional actions must now be taken in order that a coherent research program can be formulated, presented to prospective research groups, and justified to prospective users and funding authorities. In this context, the following actions are recommended:

- Define the overall framework of the research program in terms of its goals, scope, and level of effort;
- Identify specific research projects among those suggested within the overall framework of the program which
 - Appear to be the most important and relevant to the Navy and the Department of Defense, and
 - Will not duplicate other recent or on-going research; and

- Initiate a suitable research program as soon as possible in order to maintain the impetus gained as a result of this Workshop.

It is therefore recommended that ONR, with the assistance of the Workshop Planning (now Advisory) Committee and such other individuals/agencies as may be desirable, proceed to develop a specific research program.

A LIST OF THE PARTICIPANTS IN THE WORKSHOP

A LIST OF THE PARTICIPANTS IN THE WORKSHOP ON
ECONOMIC CONFLICT AND NATIONAL SECURITY RESEARCH

September 13-15, 1976

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● Dr. Kenneth Arrow	James Bryant Conant University Professor, Harvard University
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● The Honorable Robert Ellsworth	Deputy Secretary of Defense

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AGENDA FOR THE WORKSHOP

AGENDA FOR THE WORKSHOP ON
ECONOMIC CONFLICT AND NATIONAL SECURITY RESEARCH
September 13-15, 1976

September 13, 1976 -- The Morning Session

- Convening the Workshop
Dr. Kenneth Arrow, James Bryant Conant University
Professor, Harvard University
- Official Welcome to the Workshop
Dr. William P. Raney, Deputy Chief of Naval
Research and Chief Scientist, Office of Naval
Research (ONR)
- Aims of the Workshop
Dr. Robert J. Lundegard, Director, Mathematical
and Information Sciences Division, ONR
- Policy and Prediction: Perspective I
Mr. Roger E. Shields, Deputy Assistant Secretary
of Defense (International Economic Affairs and
Prisoner of War/Missing in Action Affairs)
- Economic Conflict in the Next Decade
Dr. Thomas C. Schelling, Professor of Political
Economy, J. F. Kennedy School of Government
Harvard University
- Formal Comments on the Presentations by Mr. Shields
And Dr. Schelling
 - Dr. Martin C. McGuire, Professor of Economics,
University of Maryland
 - Dr. Hans Heymann, National Intelligence Officer
for Economics, Central Intelligence Agency (CIA)

September 13, 1976 -- The Afternoon Session

- Convening the Workshop
Dr. Abram Bergson, George F. Baker Professor of
Economics, Harvard University

- Soviet National Security Estimates from Soviet Published Statistics

Mr. William T. Lee, Consultant

- Soviet National Security Estimates: A Perspective

Mr. John A. Paisley, former Deputy Director, Office of Strategic Research, CIA

- Formal Comments on the Presentations by Messrs. Lee and Paisley

-- Mr. Kurt Kruger, Office of Economic Research, CIA

-- Dr. Steven Rosefielde, Professor of Economics University of North Carolina

-- Dr. Martin Weitzman, Professor of Economics, Massachusetts Institute of Technology

-- Dr. Michael Montias, Professor of Economics and the Institution for Social and Policy Studies, Yale University

September 14, 1976 -- The Morning Session

- Convening the Workshop

Dr. William P. Raney, Deputy Chief of Naval Research and Chief Scientist, ONR

- Policy and Prediction: Perspective II

Dr. Gus Weiss, Council on International Economic Policy, Executive Office of the President

- Formulation of a National Security Policy

Dr. Oskar Morgenstern, Professor of Economics, New York University

- Formal Comments on the Presentations by Drs. Weiss and Morgenstern

-- Dr. Steven Brams, Professor of Politics, New York University

-- Dr. Bernard Brodie, Professor of Political Science, University of California, Los Angeles

-- Dr. Charles Wolf, Chairman, Economics Department,
the Rand Corporation

September 14, 1976 -- The Afternoon Session

- Convening the Workshop
Mr. Patrick J. Parker, Research Professor of Systems
Analysis, Naval Post Graduate School
- Unconventional Methods of Economic Warfare
Dr. Martin Shubik, Professor, School of
Organization and Management, Yale University
- Formal Comments on the Presentation by Dr. Shubik
 - Dr. Jack Hirshleifer, Professor of Economics,
University of California, Los Angeles
 - Dr. Earl Thompson, Professor of Economics,
University of California, Los Angeles

September 14, 1976 -- The Banquet Session

- Keynote Address
The Honorable Robert Ellsworth, Deputy Secretary
of Defense

September 15, 1976 -- The Morning Session

- Convening the Workshop
Dr. Oskar Morgenstern, Professor of Economics,
New York University
- Internal Competition for Soviet Resources in the Decade
to Come
Mr. Patrick J. Parker, Research Professor of Systems
Analysis, Naval Post Graduate School
- Dealing with Raw Material Supply Interruption: A Hole for
U.S. Agricultural Exports
Dr. William Schneider, Jr., Hudson Institute and
Congressional Staff

- Formal Comments on the Presentations by Mr. Parker and Dr. Schneider
 - Mr. David Kassing, Director of the Center for Naval Analyses
 - Dr. Dermot Gately, Professor of Economics, New York University
- An Informal Discussion of Soviet Demographic Trends

Dr. Murray Feshbach, Foreign Demographic Analysis Division, Department of Commerce

September 15, 1976 -- The Afternoon Session

- Convening the Workshop

Mr. J. Randolph Simpson, Naval Analysis Program, ONR
- Bureaucratic Processes and Economic Warfare

Dr. Graham Allison, Professor of Government, J.F. Kennedy School of Government, Harvard University
- Formal Comments on the Presentation by Dr. Allison
 - Mr. Andrew Marshall, Director of Net Assessment, Office of the Secretary of Defense
 - Dr. Davis Bobrow, Professor of Political Theory, University of Maryland
- Concluding Observations

Dr. Kenneth Arrow, James Bryant Conant University Professor, Harvard University

THE MORNING SESSION, SEPTEMBER 13, 1975

TABLE OF CONTENTS

	Page
<u>Official Welcome and Introductory Remarks</u> by Dr. William Raney and Dr. Robert Lundegard	C-1
<u>Policy and Prediction: Perspective I</u> by Mr. Roger Shields	C-6
<u>Economic Conflict in the Next Decade</u> by Dr. Thomas C. Schelling	C-20
<u>Formal Comments on the Presentations of</u> <u>Mr. Shields and Professor Schelling</u> by Dr. Hans Heymann	C-28
<u>Formal Comments on the Presentations of</u> <u>Mr. Shields and Professor Schelling</u> by Dr. Martin C. McGuire	C-31
General Discussion	C-34

OFFICIAL WELCOME AND INTRODUCTORY REMARKS

by

Dr. William Raney and Dr. Robert Lundegard

Dr. Arrow: I would like to convene this Workshop, which is sponsored by the Office of Naval Research (ONR) for the purpose of exploring the subject of Economic Conflict and National Security Research. Let me introduce Dr. William Raney, who will officially welcome you on behalf of ONR.

Dr. Raney:

Welcome to Airlie House and to this Workshop. I thought that I might seize the opportunity, as long as I have a captive audience, to say a few words about what the Office of Naval Research is and why we should be interested in economics.

First of all, there's the budget. ONR was established by an Act of Congress thirty years ago because the Congress, in its wisdom at the end of World War II, saw a profound benefit to be realized from useful contact between the academic sciences community and the community of military affairs. So the Office of Naval Affairs was charged with promoting, stimulating, following and coordinating basic research that should be of importance to the Navy. Over those years, we have consistently sponsored a program of contracts for research with the academic community and industry -- in fact, wherever we think research is going on. That program has traditionally been a small fraction of the Navy's Research and Development (R&D) budget. But, recently, we've had an amount in the nature of 60-70 million dollars to spend annually on contracts for basic research. Most of these funds have been going to universities.

The areas we have to cover in our basic research in support of the Navy are numerous. We go all the way from medical and psychological sciences research to classical physics, nuclear physics, chemistry -- the "whole raft" of traditional disciplines. As you might expect, our program is very heavy in oceanography. But what many people find as a surprise is that, of the basic research program we support, only about a half of our research funds are allocated to the development of new military equipment. The other half of our basic research in support of the Navy covers the whole range of environmental matters and of other related fields that are important to the operation of the Navy. We look at meteorology and, as I've said, oceanography; we look at logistical problems, recruiting problems, training problems, and a great many

other things which have to do with the operation of a full-fledged Military Department. Importantly, it is far more than just the business of shooting wars in which we are interested. It's for this reason, then, that in looking around we began to worry as to whether or not:

- The Military Departments knew enough about the impact of economics, international economics in particular, on military operations, and
- There was enough going on in the country in terms of economists thinking about what the military problems were in the new relationships between the general economy and the ability of this country or any other country to wage military operations.

Waging military operations is an expensive business. It has detailed and intricate relationships with the will of any country to fight and the ability to foot the bill without absolutely ruining the rest of the country. It is for this reason, then, that we began thinking about whether or not we should try to support some research in the area of economics. I'll be very blunt and say that, whenever we stray out of the hardware field or perhaps the oceanography field, we generally find a certain amount of difficulty in explaining to our seniors, our critics, and our friends in Congress what it is we're doing and why we're doing it. But in this case, I think it is easy to explain that we wanted to look into the area so as to stimulate some interest, if interest is appropriate, and to see for ourselves whether or not there are things we could support on a systematic basis. Whether we will have a program in the future -- a systematic program looking at things economic and the relationship of the economy to the world of military operations and international relations -- is yet to be determined. That's one of the reasons we're having this Workshop, to find out a little bit more about the subject.

So, I should say no more on that score and let the question remain open until this Workshop is over. I would say, however, that after a period of declining support in the Congress and in the Military Departments for basic research -- a period in which we managed to keep the budget reasonably constant, but, of course, inflation cut our purchasing power -- things are beginning to look a little bit better for the next few years. As a matter of policy, the basic research budgets of all three Services are going up -- hopefully, at a rate which will allow a ten percent growth in real effort; that is, after a cost-of-living increase. Whether or not this policy will hold is yet to be seen. This budget development is coupled with an enunciated desire on the part of the Defense Department as a whole to work on the development of initiatives and new modes of interaction with the university community. The

details of this new method of working with the universities are yet to be announced, but I'm confident that we will be seeking still more money and still better ways in which we can interact in a style which fits well with the way that universities operate; that is, a certain amount of self-determination of the details of what's going on in a research program. I look forward to the chance to recapture some of our ability to carry out research in a whole variety of fields which contribute to the overall picture of military operations. Therefore, I repeat, we regard our business as much more than simply firing guns, dropping bombs, and steaming around in ships. There is a great deal more to it. We hope to be able to cover all of the fields of research in some sensible fashion, so that we can be educated and so the country can get the benefit of the research we are able to support. I'll repeat my welcome, then, and hope that the next three days, in fact, will provide a very fruitful chance to exchange views, clarify the issues, and then we'll see what comes of it.

Dr. Arrow: Having been welcomed and given these words of encouragement, I think that we are now ready to receive a few "marching orders". Dr. Lundegard of ONR will therefore talk about the aims of this Workshop.

Dr. Lundegard:

Let me begin by saying that this is a Workshop sponsored by the Office of Naval Research, which was founded by a Congressional Charter some 30 years ago this past August. Within ONR, I find myself also being the chairman of a committee to make and to carry out plans for the suitable celebration of our thirtieth anniversary. Therefore, I would like to begin by putting in a plug for ONR's thirtieth anniversary and say that we're going to be joined by the National Academy of Sciences in a symposium and banquet on the eighth of October in Washington. I extend an open invitation to all of those who are here to participate. The symposium will address matters of interest not only to those in the physical sciences, but also to those in the soft sciences. I hope to see many of you there.

Shortly after the Congress established the Office of Naval Research, the physicists took over, but not completely. I think that we have a long tradition at ONR of maintaining a very broad perspective with regard to matters of science. From the very beginning, the programs of ONR have addressed what one would expect: research in physics, chemistry, materials and the environment. But also, I think that our programs in the behavioral sciences, the social sciences, economics, and even anthropology -- though very small and often very defensive -- are significant. I am the Director of the Mathematical Information Sciences Division of ONR -- one of six or seven involved in this span of scientific activities. In this Division, our primary concern is with research on the tools of analysis. It is within this Division that we also span the physical

sciences having primary programs in ONR -- to include mechanics, aeromechanics, through the basic disciplines of applied mathematics and computer sciences to ONR's program of naval analysis. Within the Division, we also have ONR responsibility for economics, and as a result of this responsibility, we have developed the interests that have led to this particular Workshop.

In this context, I would like for you to know (that is, those of you who do not already know) some of the people from ONR who are here and who are directly responsible for our participation in planning this Workshop; namely, Mr. Randy Simpson, Dr. Tom Varley and Cdr. Ron James. These are the three people who are the most involved in the development of a research program.

I'm not sure that I'll have an additional opportunity during the coming three days to express our thanks to the other individuals who have been involved in the planning of this meeting. We've been very fortunate, indeed, to have had Professors Kenneth Arrow, Oskar Morgenstern and Martin Shubik, as well as Mr. Andrew Marshall, participating in developing the concept of this meeting and the agenda of papers and participants. We also extend our thanks to GE-TEMPO which has provided the supporting arrangements for conducting the Workshop.

We do look forward to initiating some research programs of a limited nature on the basis of the problems and issues that are identified during this Workshop. Moreover, we hope to receive the advice and inputs from the group that helped us with this Workshop. We are particularly pleased, of course, to be the sponsor of this Workshop. The subject matter, which includes economics, national security and economic conflict, is obviously something of very broad Federal interest. It is not a matter unique to the Navy. As a matter of fact, we've been asked by our superiors in the Office of the Chief of Naval Operations why the Office of Naval Research should be in the role of sponsoring this Workshop -- why not one of the more typical agencies of the Government? In answer to this question, we find that, on many occasions over the past years, we have been able to play a "wild card" role within the Government and particularly within the Department of Defense. That is to say, we use our somewhat independent position under the Secretary of the Navy to assemble people from academic and industrial institutions who indeed have a particular interest in a project such as this, which is emerging as one of more critical interest in the Department of Defense. We are pleased to pay that "wild card" role in initiating the planning for this particular workshop.

The objectives of the Workshop have been previously covered in some degree by Bill Raney, but, to recapitulate a bit, the objectives of the Workshop, as we see them, are first, to promote communications throughout the different communities and among the representatives present. Assembled among us today are numerous people from Government agencies, representatives of the academic institutions, and people from the private

research sector. By bringing together all of these people, who in their regular walks of life would not have an opportunity to cross paths, we are providing them with a chance to exchange views on an important subject. Secondly, of course, we (by "we", I mean the individuals involved within the Office of Naval Research) hope to deepen our understanding of the critical, methodological issues that we face in the quantitative analysis of international and national economic situations. We hope to obtain a better insight into what those issues are and what kinds of research approaches might be appropriate in dealing with them. Lastly, and perhaps most importantly, we wish to stimulate research within the community and to provide a point of view, based upon the proceedings of the Workshop, with respect to what directives and what priorities would be most appropriate in order to initiate additional research in this area. Of course, there are a number of agencies that have been interested in sponsoring research in economic analysis over the years. ONR is one of them, though our program is admittedly very small. The Defense Advanced Research Projects Agency (DARPA) is a much larger agency having an historical concern with research in this area. I understand that there are people from DARPA here at this Workshop, and we hope that the proceedings and results of the Workshop will be useful to that Agency in preparing plans for additional work in this area. With respect to the budget matters mentioned by Bill Raney, I think that we have emerged from the period of the "budget crunch" wherein defense research was very much on the defensive and was very much a set of activities that was shrinking in size and importance. In recent years, I think that the situation has been turned around within the Department of Defense and Congress and, hopefully, within the nation and the universities. We look forward to a period of increasing support and size of our budget. At this point in time, we are able to set aside funds within our own Division on a scale appropriate to our type of operation, and this area is one of several areas that we are looking at in terms of possible research initiatives. With that sort of "bottom line", let me complete my role in the opening of the Workshop and thank you all again for being here; I wish you the best of luck during the next three days.

Dr. Arrow: Thank you very much, Bob Lundegard. The morning sessions of the Workshop will tend to concentrate on the possible role of economics in predicting the development of economic conflicts. To begin with, we'll hear from Dr. Roger Shields, Deputy Assistant Secretary of Defense for International Economic Affairs and PW/MIA Affairs, who will present the first perspective with respect to policy and predictions.

POLICY AND PREDICTION: PERSPECTIVE I

by

Mr. Roger Shields, Deputy Assistant Secretary of Defense
(International Economic Affairs & PW/MIA Affairs)*

INTRODUCTION

I am particularly pleased that we are meeting here today to discuss some of the issues pertaining to economic conflict because I think this kind of dialogue is long overdue. Moreover, I think it's very unfortunate that, perhaps outside of this room and maybe even within this room, there still isn't a strong realization of the way economic activity in the world and trends in economic activity impact upon our national security. I wrestle with this problem everyday from the standpoint of policy from within the Defense Department, so I also have a very lively interest in related research. Research budgets are never what they ought to be. We are never able to carry out the research programs that we would like to carry out, partly because a lot of people don't appreciate this type of endeavor. We're wrestling with variables that sometimes defy quantification; it's much easier to respond to a threat delineated in terms of number of tanks, tactical aircraft, and surface combatants which your potential adversary may possess. It's not quite so easy to deal with the economic variables.

On the other hand, I think that there are some positive trends developing. Maybe some of them have been misinterpreted, but I think, nevertheless, that there is a greater realization that economic activities and conflict in the world may assume a greater role with respect to our security than they may have in the past. I think that some of this awareness has been driven by the events of the last few years -- oil embargoes and things of that nature. It has also been driven, I think, by the concept of detente. We may have a new word for it, but we're still talking about a general realization that the world is becoming an increasingly dangerous place in which to wage war because superpowers have an abundance of nuclear weapons. Therefore, the reasoning goes that we ought to outlaw, or at least implicitly outlaw, direct conflict, and we ought to turn our attention to other arenas. Presumably, as the argument continues, our potential adversaries have and are looking at the economic arena. So, the conflict that we see in the world in the future is going to be economic conflict in which nations strive for economic advantage and try to influence the Third World areas through economic devices.

*Now with the Treasury Department.

APPLICATION OF MILITARY FORCE

On the other hand, I think we have seen some other opposite trends. For example, we have seen some startling successes and failures in the last few years achieved through the use of military arms. I don't think anyone was able to overlook the impact of the employment of military force in the last Arab-Israeli conflict. Of course, it ended with the Israelis in a position of primacy, as the other earlier conflicts have, but the Arabs were able to bridge the Suez Canal and achieve some very startling successes -- successes which made them feel that, in fact, they had waged a successful conflict. India and Pakistan resorted to the use of military force and, in my opinion, the results were not lost on some of the smaller nations of the world. Similarly, North Vietnam's conquest of South Vietnam was won in the end through the use of military force, although I think that economic interactions were also very important.

So there appear to be some conflicting trends in the world. We see cases involving some smaller nations in which the use of military force has been very advantageous for those nations which had the military edge; that is, military superiority. Greek military weakness in the face of the Turkish invasion of Cyprus is an example of this situation. On the other hand, a "muscle-bound condition" exists among some of the larger nuclear nations by virtue of which their nuclear umbrellas are perhaps providing a shell which permits conflict to be carried on more briefly at a lower level. In any case, I think one salutary effect has been the increased recognition that economic events are important and may very well have a significant impact on our security. In other words, we have to look at our security in terms other than how many divisions or airwings we're able to put "on the line".

ECONOMIC CONFLICT vs. ECONOMIC COMPETITION

We talk about economic conflict, and that is good because I'm interested in economic conflict. I'm not sure just what the distinction is between economic conflict and economic competition; for instance:

- When does economic competition and striving for advantage become so fierce that it becomes economic conflict?
- Do we have economic conflict only with our potential adversaries or is economic conflict with our Allies equally important?

Economic Conflict

Let me cite some specific examples. First of all, the relationship with security can be very direct, as in the case of the oil embargo of 1973 and 1974. We saw our own military position threatened and had to implement the Defense Production Act to make sure that adequate supplies of petroleum, oil and lubricants (POL) were allocated to the military effort. We also saw a great deal of anxiety on the part of the people of this country at large. In fact, as time went on, people began to shed some of their inhibitions and we witnessed responsible individuals openly talking about the possibility of a direct military invasion of the Middle East oilfields in the event of another embargo. Here was an obvious case of military escalation and possible military conflict as a result of the threat to our economy.

Similarly, we saw some of our Allies in NATO turn away from us (more than arm's length) and refuse to refuel our aircraft so as to impede our efforts to move munitions from our depots to Israel. We perceived a crisis among our Allies in NATO which was probably the greatest crisis NATO has faced for some time -- if not in the entire history of NATO. The problem was not only with our potential adversaries, but also with our friends as well. I think that during this crisis there was a lot of concern about national security, but there were still a lot of points which had been missed. I think that it was very obvious that, when we talked about Project Independence as a means of achieving independence from (or moving away from) foreign sources of POL, we were talking in terms of United States interests; i.e., safeguarding our security and military posture by providing adequate sources of domestic energy.

There was not much comment at all about how vulnerable we were with "the Sword of Damocles" hanging over the heads of our Allies. I recall a cartoon in the New York Times during the embargo which showed a fellow in an Arab garb slipping a knife into the back of a fellow on the ground who was labeled NATO. The words coming from the Arab were, "Take that, America." Yet, we still missed the point. We talked about our own security in terms of our ability to provide domestically the sources of energy which we needed. We forgot completely that as long as our Allies were vulnerable, we were vulnerable; our Allies were vulnerable and our Project Independence didn't do anything about improving the situation. We saw this "wedge" driven between ourselves and our Allies on economic grounds. Hence, there was a possibility of economic conflict evolving directly into a situation which would have an adverse impact on NATO's ability to deter military conflict.

Economic Competition

We have already heard comments this morning with regard to how we ought to "gear up" for competition over the long haul -- competition which may very well be economic competition. How do we provide adequate military resources when we face shortages and scarcities and disruptions in our own domestic economy? Welfare budgets compete with military budgets; such fiscal constraints apply not only to the U.S., but also to our Allies. The U.K. has had tremendous economic problems. One candidate for budget-cutting in the U.K. is the military budget, along with all the other budgets. I think that it is important to note that the military budget in the U.K. has not been cut more severely than it might have been. In any case, we are talking about competition over the long haul, and we are concerned about the slope of our per capita income line as compared with that of our Allies and with that of some of our potential adversaries as an indication of our ability to sustain adequate defense expenditures into the future. So, I believe that the concept of international security is a very broad one.

Sharing the Military Burden

The Jackson-Nunn Amendment, which was passed by Congress a few years ago, related the economic variables of our balance of payments position directly to our ability to maintain military forces in NATO. Historically, we have had a series of agreements with the Federal Republic of Germany (FRG) which were aimed at providing economic benefits to the United States. These agreements resulted from an implicit recognition that there were burdens associated with maintaining overseas troop commitments -- particularly in the NATO area. We didn't always distinguish between the various types of burdens, and I think that is one of the possible errors that we ought to remedy.

There are a number of different types of burdens associated with the deployment of troops overseas. First, there is a balance of payments burden. The FRG offsets were usually directed at the balance of payments burden. There is also a budgetary burden with respect to the incremental costs of maintaining troops in Europe. Of course, there's also the real burden which reflects the real cost of maintaining those resources actually dedicated to NATO. In any case, the U.S. negotiated agreements with the Federal Republic of Germany through which the FRG provided assistance to the U.S. in terms of balance of payments support -- primarily by purchasing Treasury securities and military hardware items. As time went on, this became more of a financial burden and a balance of payments burden for the FRG. In the case of the Federal Republic of Germany, that country became increasingly reluctant to support this kind of burden. As a result of this increasing reluctance, an Amendment was passed in Congress which related U.S. troop levels in NATO to the willingness of our Allies to provide balance of payments relief equal to the balance of payments cost incurred in stationing U.S. troops with NATO in Europe, and

which called for a withdrawal of our troops in direct proportion to the failure of our Allies to offset that balance of payments burden. As a result, we appeared to be on the brink of economic conflict (or at least incipient economic conflict) with the Federal Republic of Germany -- one of our Allies. Fortunately, we were able to meet that challenge, but I think it was met only at a very heavy cost. We had to use a great deal of capital and goodwill not only with the Federal Republic of Germany, but also with our other Allies on this issue -- a subject that was not very well understood on the other side of the Atlantic. As a matter of fact, at the time that the Jackson-Nunn Amendment passed, we had established flexible exchange rates and our balance of payments position had already been turned around. Many of the reasons for pursuing this type of offset had become academic. In any case, we became aware of the potential economic conflict with the Federal Republic, and the two Allies have now agreed to do away with these kinds of offsets. On the other hand, there is still a real burden associated with our presence in Germany and in NATO which is becoming better understood. There are economists who are looking at this burden and who are talking about the sharing of burdens on an equitable basis within NATO. We are now concerned with burden-sharing in more traditional economic terms among our Allies in NATO, and this issue requires economic analysis and economic prediction.

There is the burden of maintaining troops and there are other general economic burdens. In this context,

- How do we relate the need to distribute military burdens in an equitable way with respect to the soundness of our Allies' economies?
- Do we demand that the United Kingdom provide its fair share, as determined by our economic burden-sharing formula, even at the expense of the well-being of its economy?
- How do we measure the contribution of a well and healthy economy of an ally to our own security?
- How can we predict the effect of general economic malaise on the ability of our Allies and ourselves to provide a competent and effective military defense?

These are very difficult questions to answer, and because they are so difficult, we tend to turn away from them. Yet, these issues are becoming increasingly important.

Offset Agreements

We now recognize that there is a problem with another type of offset among our Allies in general. Virtually every time we make a major sale of military equipment to our Allies, we are faced with a requirement of buying back a quantity of goods in some form or another from the purchasing country in order to reduce the strain on its balance of

payments and also because these countries want to realize economic benefits in addition to enhanced military capabilities.

In the case of the sale of the F-16 lightweight fighter aircraft to the Allies in NATO, there was, in the first instance, competition between a French aircraft and two American aircraft. Then, it was finally resolved within the United States which aircraft our Air Force would fly, and that airplane became the principal competitor of the French F-1. The U.S. aircraft is much more effective militarily; that was easily demonstrated. It also embodies much later state-of-the-art technology. It's just a much more militarily effective aircraft. It also had an absolute price advantage. Therefore, in general economic terms, that aircraft should have been the obvious choice of our Allies and that should have been the end of it, but it wasn't. Had the United States not been willing to enter into very complex and very difficult offset agreements which call for partial co-production of the allied aircraft in Europe, production of the United States aircraft, in part, in Europe, and production of a portion of the sales to third countries in Europe, the U.S. would not have sold that aircraft as it finally did. The Europeans who bought the airplane are NATO partners and are going to achieve more than a hundred percent offset -- if all goes well.

All may not go well. What is the capability of the economy of Belgium to support the kind of offset agreements into which we entered? There should have been a great deal more economic analysis, I think, before we became involved in that offset, but we didn't have time to do it. It's by no means sure that these offset arrangements are going to be successful. We have seen offset agreements entered into by U.S. companies selling military hardware to our Allies in which the offset commitments have not been met. The potential for economic conflict in these cases is high, has a direct impact on our ability to put first-class military equipment into Europe, and also impacts upon the ability of our Allies to sustain and support their military effort. It is a very important and critical area that impacts directly on our national security, and it has not received enough attention.

ECONOMIC ANALYSIS AND PREDICTION

To the extent that we have been considering this problem, we have been thinking more in terms of our potential adversaries and other areas of the world where we have neutrals who are willing to move politically in one direction or another -- depending on what we are able to do.

Lately, in another area which requires economic analysis, we've seen a great debate on the Soviet defense effort:

- What are they doing?
- What kind of relationship exists between the size of the Soviet defense budget and the U.S. defense budget?

- What does this mean with respect to our own budget?

Should the U.S. try to match the Soviet defense budget dollar for dollar? Obviously, there is no need for a one-to-one relationship, but to the extent that we measure aggregate defense capabilities in terms of financial magnitudes, there is a relationship between budget size and defense capabilities; there has to be one. We must do a good job of economic analysis and economic prediction to figure out what kind of disparity can or can't be tolerated, and we've been looking at that.

Turning now to other world resources, there is a potential problem with chromium because our principal supplier is Rhodesia, where we now see internal military conflict. To some extent, we need to be able to predict, first of all, politically what's going to happen in that country. Surely, the political events will be influenced by military events. In this context:

- What is our economic interest in maintaining our source of chromium supply from Rhodesia -- the alternatives being South Africa, to some extent, but primarily the Soviet Union?
- Can we assure ourselves of alternative sources of supply?
- Are there substitutes for chromium which will do the job adequately?
- What is the cost of developing those substitutes, if there are substitutes?
- Do we have room to maneuver and to exploit the possible competition between those few suppliers so as to assure an adequate supply for ourselves?

Cartels

We need to know something about cartel theory -- particularly with regard to oil. Returning to the oil problem again, we talked about military might and the possible need to use military force. Can we, as economists, analyze such cartels? Traditionally, we know that cartels have weaknesses, and we've analyzed them in economic terms, but how do we answer questions such as:

- Does a cartel which is motivated by a common political goal and has common ethnic and religious ties have the strength to overcome the traditional weaknesses of a cartel?
- Can we predict, through the use of economic analysis, that a cartel is going to collapse so that there will be no need for the use of military force?

Those are the important questions.

The Ability to Predict

What is our ability to predict future events? Interdisciplinary efforts are required to develop our predictive capabilities. We talk about economic prediction and our capability to perform economic analysis, and I think we are able to identify some of these potential trouble spots. However, we are not able to quantify them with precision, and we're not able to talk about what this means in terms of political and military action. As a political economist, I am concerned about the economic tools as they are applied to political questions -- questions such as how well economies run when they are managed by governments. I think that this is an important question with regard to the Soviet economy. Even if we are able to analyze what the Soviets are spending on their military establishment, through the use of economic methods and methodology, this only begins to present some of the more interesting questions, such as:

- What does this do to the Soviet economy in the long run?
- If we are talking about long-term competition, can the Soviets sustain this over a long haul?
- What is the burden of the Soviet defense effort on the Soviet economy?

If we could quantify that burden in terms of a percentage of the GNP or by some other method, we must then turn to some of our colleagues in other areas and say: "What does this mean to the Soviet system of government?" Does the Solzhenitsyn or Medvedev phenomenon mean anything in terms of the susceptibility of the Soviet economy to consumer pressure? Are we allowing, in fact, this Soviet buildup of military force to proceed because of our transfer of U.S. resources to the Soviet Union? On Capitol Hill, Senators whom I thought would have been of different persuasions, are questioning grain sales to the Soviet Union because of the possible utility of these grain sales to the Soviet military. They ask:

- "Are we releasing resources from the Soviet domestic economy to the military sector?"
- In effect, are we turning 'butter into guns?'
- Are we running a foreign aid program for the Soviets through the very generous credit provisions which the Western nations are providing the Soviet Union -- extremely low rates of interest, long-term loans, and very soft loans?
- Is it this program which is allowing the Soviet Union to continue its military buildup?"

These are all very crucial questions.

Influencing The Soviet Union

Now, what about the ability of the United States to influence the Soviet economy? If we can adequately assess the military burdens borne by the Soviet economy and if our political scientists and sociologists can tell us something about how the Soviet consumer might react to these burdens, what these burdens might eventually do to the Soviet form of government, and what they might do to the Soviet economy in terms of long-run international economic competition, then it would appear that we could assess to what extent the Soviet defense burdens provide the U.S. with a source of economic leverage. In this context,

- If we are providing the Soviets with a foreign aid program -- and economists must determine if there is one -- does this provide us with a source of leverage?
- Can we use economic weapons to influence Soviet behavior in other areas?
- Is there a trade-off between U.S. grain and a SALT agreement (those outside the economics profession are used to thinking in all-or-nothing terms)?
- Can you trade ten million tons of wheat for an MBFR agreement?

As economists, we think that these are the wrong kinds of questions to ask, for we think about marginal analysis and incremental changes. Can we "nudge that giant around" and what can it do for us?

We have really only begun to bring the tools of economic analysis and prediction to bear in this area, and I'm not sure exactly what we are going to achieve. I don't think we yet know ourselves, because we haven't really focused upon these difficult questions. Maybe we are only beginning to ask the right questions. What kind of answers are we going to find? Maybe they are going to be "soft" and maybe some of my colleagues in the Defense Department are going to turn away and say that they aren't sufficiently precise to tell them very much. They will say "You can tell me that we have problems with scarce resources -- so we have stockpile programs. You can tell me that our Allies are going to become increasingly concerned with their own economies and, to that extent, they may very well sacrifice military effectiveness for economic gain -- but you can't tell me how much and you can't tell me what this means. Moreover, you can't tell me what it means in terms of Soviet intentions when the Soviets devote fifteen or seventeen percent of their GNP to the military budget. You can give me some numbers; you can give me some trends; but you can't really relate them to anything."

In the final analysis, when we are talking about policy, we are talking about actions based on the best possible assessment of intentions as well as capabilities. Does what we consider to be a heavy transfer of resources from the civil sector to the military sector indicate anything about Soviet intentions? Maybe other decision makers are going to have to use the answers we provide -- to the extent we can quantify and provide them -- to make these assessments themselves. So far, we have not done very well with our purely economic predictions. We have not really assessed the importance of economic variables in terms of actions on the part of our Allies and potential adversaries -- and this is critical.

Flexible Exchange Rates

A few years ago, when we institutionalized flexible exchange rates, many economists were saying that we now had a more automatic mechanism to prevent extreme balance of payments crises. Certainly, central banks may intervene in the foreign exchange markets and can take action more rapidly. Some of the extreme consequences that we've seen in the past will not occur because we no longer have fixed exchange rates. But, in terms of economic conflict escalating into overt diplomatic and military conflict, are flexible rates really adequate to safeguard the economy from these extreme shocks, or are these countries now concerned, in fact, about even slight movements of exchange rates?

Maybe it is no longer the extreme balance of payments disequilibrium which is of importance to countries, but rather now the movement of the exchange rates themselves. A continually depreciating peso or franc could be the signal which triggers their action. What can we, as economists, say about that? Is there some correlation between economic variables and the kinds of things which governments do? From that standpoint, it may be too optimistic to say that we have done something, with the assistance of flexible rates, and have moved away from such crises.

When we look at something from an economist's point of view, our interpretation may well be that the situation is good and that the system is working because the exchange rates are moving in accordance with the adjustment mechanism. However, the non-economist decision-maker may not interpret the situation the same way. The prediction task of the economist is, first, to predict what exchange rates will do and, second, to provide some insight into how economists, central bankers and Government officials are going to react to them. It's in that sequence of reactions that we will find perhaps the most significant benefit of our economic predictions. We've got to know, first, what's happening, and then we have to know what it means. When we talk about what it means, we're moving outside of our professional area so we're going to have to educate a lot of other people and know what they're talking about. We have to be able to assess the impact of changes in economic variables on a wide range of non-economic variables.

Technology Transfer

Technology is something that economists perhaps don't really understand as well as they might, for it's a difficult and crucial subject to handle. In this context,

- What is the impact of technology transfer on our Allies' and our own economies and how do we translate that impact in terms of national security?
- What is the impact of technology transfer on our potential adversaries? Do our controls, which are aimed at controlling the transfer of technology from a security standpoint, really work?

When we talk about controls on technology transfer today, we are talking about controls which are really explicit regarding economic factors only with respect to items in short supply. The law states we must consider national security, foreign policy implications, and items that are in short supply. No other economic advantages or economic criteria are supposed to be considered. Shouldn't we be looking at the impact of technology transfer on our domestic economy in terms of national security?

In the past, when we looked at technology transfer in terms of security, we looked at it in terms of military advantage; i.e., what does this do to us militarily? If there is transfer of grain to the U.S.S.R., the Defense Department is not allowed to consider the grain transfer from the standpoint of turning "butter into guns" and the release of resources from the civil sector to the military sector in the Soviet economy. We are only responsible for looking at the military use of the exports in a very direct sense. Dual-usage items, such as computers, are subject to review because they have direct military, as well as other, uses. We can review a case involving a computer that's supposed to go to a biomedical research laboratory and indicate what it would contribute to the Soviet military posture if that computer were diverted -- but, we can't look at that computer and say the Soviets are now going to be able to divert some of their own domestically produced computers for military use. That's a little bit far afield. Similarly, with respect to foreign policy considerations, we might look at international economic implications, but only indirectly, such as in terms of short supply and the related impact on inflation.

Maybe this is not the way we ought to be analyzing the problem. Maybe we ought to do a better job of analyzing the interaction between economic variables and the impact on the defense establishment, both indirectly and directly, and recommend some changes in the law that would allow us to do this efficiently so that we would have better control of that technology transfer. On the other hand, with regard to our Allies, we may wish to relax our controls on technology transfer. Maybe it would

be worthwhile from the standpoint of security to provide the U.K. with some of our latest technology -- a move which we might not otherwise consider if the U.K. were "healthy" and prospering economically -- simply because it is to our advantage to be sure that our Allies have a good, sound economic base. But what are we doing to our own industrial base? That's another question which many people are concerned about today. Other relevant questions are:

- What is the impact of our trade and of our procurement regulations pertaining to foreign trade on our own domestic military industrial base?
- Can we predict what is going to happen?
- Can we predict that current trends will result in no U.S. firms voluntarily staying in the tank production area?
- How do we make these kinds of enterprises attractive economically to U.S. industry?
- Has the defense industry in the U.S. become an "off-again, on-again" kind of thing which in the long run will cause firms to seek other lines of business?
- What have we done economically to assure that we have the capability of waging a prolonged war, if we find ourselves in such a position?
- Is our domestic industrial production efficient enough to do that?

Foreign Military Sales

What about foreign military sales? What is the long-term impact of the foreign military sale of a sophisticated item on the economies of some of our Allies? We don't make that sale on economic grounds. A foreign military sale is only made because it is supposed to enhance the security of the United States. When we talk about the security of the United States, the issue is much broader than simply military security. Not enough people are used to thinking in terms of other than strictly military security. Our fundamental security is composed of a military dimension, a political dimension, and an economic dimension. How do we, as economists, relate these three dimensions to our overall national security? Have we been able to define adequately the relationship between economic health and well-being and our national security? Have we been able to point out that economic well-being decreases the possibility of conflict? I'm not so sure.

Historically, looking back at the United States, we see the period in the late 1800s as being one of unprecedented economic growth, but also one of economic unrest. Then, looking at the period of the Vietnam conflict, when we were most vocal in expressing our general dissatisfaction with conditions here in the United States, we see that it was a time when the economy was growing and everyone was becoming increasingly affluent. Then again, we see the diminution of such unrest at the same time that we've had tremendous economic problems. Are we, in fact, contributing to economic conflict when we provide the basis for sound economic growth, or is there an inverse correlation? Could the presence of serious global economic problems stabilize the world in terms of reducing adventurous military actions? This involves dimensions of an interdisciplinary nature, and we ought to examine the issues more closely to see what we can find. Then, we might be able to use our findings to improve our predictive abilities and provide some worthwhile inputs in the national security area. The relationship of economic growth to world stability is extremely important for us to ascertain. U.S. foreign military sales increased to a total of approximately nine billion dollars last year. A number of the newly affluent oil exporting countries are acquiring the latest in military weaponry and technology. What is the impact of these foreign military sales on the ability of those countries to sustain growth over the long term?

Can we predict that the present short-term gains of a country in terms of a greater economic or military capability are going to result, in the long run, in an increase in the overall capability of that country to support us? Are we, in fact, geared for the long haul? In other words, is it more in the interest of the United States to assess the impact of these transfers on the growth of the economies of these states over the long run? If it is, does this then mean that what we're doing is incorrect? We may have to sacrifice some enhancement of our immediate military security to do these kinds of things.

CONCLUSIONS

A look at the balance sheet tells us that economists have not done the job in the national security area that needs so much to be done. This is due in part to the inability of the economist to predict with any degree of accuracy why, how, or when normal economic competition will evolve into economic conflict and, in turn, when economic conflict will escalate into armed conflict. But, in this regard, the economist is no different than anyone else. The ability to predict the future is limited even in the so-called "hard" sciences. We still have very little ability to predict the timing and location of earthquakes and tornadoes. Most of the blame for the inactivity of economists in national security affairs

is simply due to the failure of economists and non-economists alike to recognize that, in addition to the military dimension of national security, there is also an economic dimension. In retrospect, it is easy to see that the U.S. and its NATO Allies were vulnerable to an oil embargo in 1973. Yet there were few warnings with regard to this vulnerability. The lesson learned in 1973 has even yet not been generalized and extended. In a world where the developing nations are no longer reticent about announcing their intention of sharing more fully in the world's wealth not only through their own increased production, but also through massive transfers of resources from developed nations, the potential for economic conflict should be apparent. In times past, such of these nations which had the military capability often went to war. If they lacked the military force to reinforce these claims, they had little recourse but to do nothing. Today, it is obvious that many of these countries feel that they have another option -- that of waging economic warfare. These ideas, in turn, may have given rise to the notion that, in the world economy of today, nations which are strong militarily may nevertheless have an Achilles heel in their economic structure. Thus, the use of an economic weapon in the future is likely to be extremely attractive as an alternative to armed conflict for nations with potent military forces, but who are reluctant to employ them, as well as for nations with no other way to press their international goals.

Are the U.S. and its NATO Allies vulnerable to the use of economic weapons? Does the West have economic weapons of its own which can be used to maintain world economic and military stability? Unfortunately, we have not done enough work to answer these questions, nor do we even know if these questions can be answered. Still, many of the right questions are being asked and some progress is being made. Law of the Sea negotiations, for example, have reflected a greater awareness of the influence of economic issues on national security by the U.S. and its Allies. Nevertheless, we have a long way to go. We must do a better job of integrating the economic aspects of security with the political and military facets.

ECONOMIC CONFLICT IN THE NEXT DECADE

by

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Assuming that East-West or Soviet-American conflict will receive attention in other papers, this one will speculate about other kinds of economic conflict that may be of concern to the United States over the next 15 or 20 years. Some of these will be economically motivated behaviors that give rise to conflict; some will be conflict-motivated behaviors that take an economic form. The distinction is not always clear: many kinds of innocent behavior that can cause harm can be used, not so innocently, to do just that, or can be threatened for deterrent or extortionate effect.

This paper will mainly be a list of "offending behaviors," behaviors that offend or do damage. These are organized under a dozen headings which are not meant to be a permanent taxonomy, but just a set of convenient clusters. The list is incomplete and is intended to help others think of additional examples that correspond to their own experience or their own fields of interest. Later in this paper, some classifying dimensions, relating mainly to the attitudes and abilities of governments rather than to the problems and conflicts themselves, are introduced.

THE GLOBAL "COMMONS"

With oil spills on everybody's mind, we can begin with the problems that arise when we spoil each other's environments or deplete our common property resources. Oil spills themselves are very local when they occur, but they may occur almost anywhere and the problem is worldwide. Fifteen years ago, there was a proposal to put millions of tiny strands of copper wire into orbit for some communications experiments; I believe they were going to be well up beyond the earth's atmosphere and would not come down for a long time, if ever. The capsule apparently didn't open, so it's all up there, much more like a copper ball than like the advertising leaflets that airplanes sometimes drop. If the Cubans had been about to do it, we might have considered sabotaging the installation from which they would have launched such an effrontery; but the incipient environmentalists in this country apparently had no counterpart in foreign governments to protest the attempted American cluttering of their overhead space.

A similar problem would arise if some governments were to decide that the cheapest and safest way to dispose of radioactive waste from nuclear power production was to float it out to sea and dump it overboard. Even if the arithmetic showed that it would almost certainly do nobody any harm, other governments might find such behavior offensive. Transporting nuclear wastes in tankships of Liberian registry may eventually, as with residual fuel oil, be recognized as an international concern.

A consequence of the increasing combustion of fossil fuel, especially coal, that has recently been receiving dramatic attention is the possible atmospheric effects of a doubling of the carbon dioxide in the atmosphere. If the greenhouse effect causes global temperatures which are a degree or two higher, and if that differential is not offset by a countervailing cooling trend, enormous but unpredictable changes in weather patterns may occur with the melting of the North Polar ice-cap, and inundation of coastal cities worldwide might result from the melting of the kilometer-thick glacial coverings of Antarctica and Greenland. Establishing national quotas on total combustion early in the 21st Century, especially among the countries that have or do not have their own fuel resources, that have or do not have other sources of power, or that have or have not achieved advanced levels of production, would be nasty.

Other familiar examples have recently been mercury, DDT, aerosol sprays, SSTs, and the possibility of a sea-level canal across Central America. Fishing resources have already led to "wars" in the literal sense, although only small ones, and the ocean floor bids to become a contested part of the globe before too long.

Hazards to health (smallpox) and to crops (bollworms and beetles) can also be considered under this heading; failure to keep sources of infection under control is a little like failing to dispose properly of poisonous wastes and other noxious substances that go up the smoke-stack or down the pipe and blow or flow into other people's air and water.

ENVIRONMENTAL EXTERNALITIES

In addition to exhausting or spoiling the global environment, there are other activities, often more localized or bilateral, that can give rise to conflict between and among particular sets of countries. Diversion of rivers and currents, lowering of the water table, generation of acid rain over other countries and pollution of rivers that flow through other countries, are familiar examples -- some of which have already provoked military responses in some parts of the world. Weather modification when it proves feasible -- engaged in by governments or

allowed by governments -- might inflame relations between neighboring countries. The damming of the Bering Straits has been described as an act that might substantially change the weather for more than one country -- the benefit not having the same algebraic sign for all affected. An almost unavoidable source of conflict can arise in the location of nuclear power reactors, especially just upwind of national boundaries, unless governments manage to collaborate in arriving at uniform criteria for siting and for safety.

INTRUSIVE COMMUNICATIONS

Recent newspaper photos of the elderly Tokyo Rose remind us for how long electronic intrusion has been part of hot and cold wars. Politically subversive broadcasts have been used not only by governments of all colors, but also by revolutionary organizations and governments in exile -- similarly with many kinds of propaganda and incitement. But there are additional possibilities in the communication of illicit technology -- techniques of violence and sabotage, weapon construction, targeting information for saboteurs and kidnappers, even the direction of crime. Then there is the possibility, actually with a rather long history, of pornography crossing national boundaries by radio or television, or advice and advertisements for contraception, abortion, or bloody spectator contests. Orson Welles demonstrated 40 years ago that confusion and panic can be generated at a distance by radio; and much mischief can be done by misinformation and counterfeit announcements. Specific individuals can be blackmailed, for profit or for politics, by the threat of slanderous broadcasts beyond the reach of court orders and libel suits.

OFFENDING INTERNAL ACTIVITIES

There are many things that nations do internally that have impact abroad because others care. Archaeology in Jerusalem, the treatment of political prisoners in Chile, Soviet persecution of distinguished scholars, and the use of residents as hostages to blackmail their relatives living abroad are familiar examples. Unique scientific sites, like the Olduvai Gorge; unique anthropological peoples, like some of the Indians in Brazil; and religious sites, like many in Jerusalem, have all been sources of conflict, even aside from any deliberate persecution of minority groups or people who are objects of concern abroad. Migratory birds are already the subject of treaties, as are some whales in the ocean; but the permanent destruction of some kinds of natural beauty, or the extinction of some endangered species through the action or inaction of particular countries, could similarly become objects not only of diplomacy, but also of boycotts and other private activities.

CREATION OF SCARCITIES

Crop destruction has been considered not only as strategic warfare, but also as a political tool in cold war. It could also, of course, be used to create scarcities abroad and the demand for exports. I have never heard any evidence that hoof and mouth disease was disseminated abroad by the cattlemen of any country that deprecated foreign competition, but it is evident that cattle growers, even a cattle-growing country in the aggregate, can benefit from reduced foreign competition. Similarly, discrediting the quality, reliability, and safety of foreign goods or foreign engineering firms, by methods that may well include sabotage, have commercial as well as political motives.

Stimulating demand for addictive drugs in occupied territories or foreign countries, if the nation doing so is a monopolist or main source of supply, could be a commercially attractive way of creating demand and thus enhancing the scarcity of one's own resources. Many of us remember when cigarette companies in the United States had representatives on college campuses who gave away cigarettes, in the interest of getting people hooked; and it is known that tobacco companies used motion pictures and other techniques to make smoking fashionable, especially among women. Now that the Surgeon General has determined that cigarette smoking is dangerous, one can get some notion of the scale of conflict that might occur if America were innocent of the tobacco habit and tobacco growers in Cuba, Turkey, or Communist China began to distribute free cigarettes to high school children. (My own belated proposal is that we should have used wartime lend-lease to cultivate a generation of Russians devoted to peanut butter.)

HURTFUL INCENTIVES

Here we have the "brain drain," the somewhat similar "doctor drain," and sometimes a deliberately organized "leadership drain." This is the category of incentives, working on private individuals or firms, that are harmful to the interests of other countries--incentives that may be innocent and incidental or deliberately contrived.

Blacklisting and boycotting are much publicized instances in connection with the Arab-Israeli enmity. Commercial bribery, with the possible connivance of some governments, has proved just within the past year what a source of conflict it can be.

Governmental or private rewards for illicit acts like assassination, sabotage, or commercial preference, are a continual danger. The food that was publicly distributed at the expense of the father of Patty Hearst is a reminder that not all forms of ransom and blackmail require a guilty perpetrator to identify and reveal himself in order to collect. The same is true with the release of prisoners in the face of blackmail.

COMMERCE IN OUTLAWED GOODS

Here we have that strange episode in which the United States provided Turkey with what one can construe either as financial assistance or as blackmail in order to compensate farmers for reducing their poppy crop. In this category also is the reported attempt of the President of Libya to buy an assembled nuclear weapon, or the plutonium with which to make one, a few years ago. Probably because the most powerful countries, like the United States, do a thriving business in the sale of weapons abroad, we are a long way from seeing much overt conflict as a result of traffic in weapons; but, if some country were known to be allowing the production for sale of chemical and biological anti-personnel weapons, or specially prepared and packaged crop disease agents, there might be a serious effort to stop the traffic in some of these non-nuclear, weapon-like substances.

It remains to be seen whether or not nuclear traffic by countries unbound by treaty obligations will be the object of strong diplomatic, economic, or even military pressure. President Ford in his October 28, 1976 statement on nuclear policy said that any misbehavior which violated any agreements regarding nuclear safeguards would not only subject the guilty nation to a nuclear boycott by the United States, but would also result in "further steps, not necessarily confined to the area of nuclear cooperation, against the violator nation," and that it wouldn't even matter whether or not the agreement which was violated was an agreement with the United States. The diplomatic basis for moving against countries that had no such agreements would of course be different; but though the President may not have felt it proper to mention sanctions against countries that, in misbehaving, violated no agreements, he may have had them in mind and hoped they were listening.

DANGEROUS RESEARCH

Nuclear testing is the prime example here, but sheep and cattle have died in the Western United States under circumstances suggesting an "incident" in connection with weapon research, an incident that may have gotten out of hand. If sheep were dying in Cuba as a result of slovenly controls on biological weapon development, the United States might become concerned. Even legitimate research on infectious diseases or cancer can have epidemiological consequences that go beyond national boundaries.

The recent attention to DNA research in America seemed to involve two quite different kinds of dangers, one being the danger that the research would succeed and that techniques of genetic manipulation would become available -- the other being that the research might have harmful side effects in the development of harmful and uncontrollable new strains of life. Whether or not the outcry would have been greater or smaller if it were another nation's government that was funding such research on a large scale is hard to guess, but the possibility of conflict is there.

Research in the development of new addictive drugs, in the development of new concealable weapons for non-military use, or for techniques of remote behavior control might often be judged improper because the very objectives are deemed inappropriate. Governments might come under sanction either for promoting such research or for merely allowing it or being unable to stop it.

PUBLIC NUISANCES

I have already referred to inadequate participation in public health programs, or refusals to participate, and the same might be true of cooperation with respect to crop and animal health where there are infectious or epidemiological consequences that extend beyond a country. (What kind of blackmail might have been feasible, even if unthinkable, for a very poor country that had the last few remaining cases of the most severe strain of smallpox, and was asked to allow teams from the World Health Organization to come in and stamp out this menace to all mankind?) Also under this heading are the "attractive nuisances," the gambling and the sex and the drugs and the blood sports and the illicit medical treatments -- in a recent era, abortions -- that are not allowed to consumers in some countries but are offered for the tourist trade in others.

HAVEN FOR ILLICIT NON-GOVERNMENTAL ACTIVITIES

There are countries that have offered safe haven to hijackers and countries that provide secure headquarters and rehabilitation areas for terrorists. Some of the intrusive communications mentioned earlier could be either governmental or private, and, if private, might have the connivance of the neutrality of the government or be simply beyond the government's power to suppress.

INTRUSIVE ACTIONS AND COUNTERACTIONS

Communication has been mentioned, but there are such possibilities as intrusive attacks on crops and animals -- whether to spray them against disease or to harm them; attacks on noxious agriculture-like poppies and marijuana; police or commando action against terrorists, counterfeiters, or dangerous research; even efforts at remote inoculation or contraception. Some of these might be offensive (not merely "offending") and some might be defensive, or retaliatory, or prophylactic.

SOME CLASSIFICATORY DIMENSIONS

Cutting across these several types of potentially offending behavior are several dimensions of motive, organization, and scope.

First, there is the distinction between government activity and private activity, a distinction that cannot always easily be made in royalist or socialist totalitarian countries.

Second, there is the distinction between licit and illicit activity. Some of the pornography and the blackmail and the bribery and the illegal research may be the offending behavior of another government; some may be the offending behavior of firms and individuals in other countries. During the past couple of years, we have learned that the licit-illicit distinction can also be applied to the activities of governments.

A third dimension relates to the "host" government's attitude toward the activity, assuming that it is not governmentally conducted. At one extreme, the government can promote and encourage, even assist; at the other extreme, it can deplore the activity and do its best to stamp it out; in between, it may merely permit the activity, as is the case with many kinds of industrial activity that cause environmental concern.

A fourth dimension is the attitude of a government toward the target or victim country. It may be hostile, as in the Arab boycott. It may be neutral, as in the brain drain. It may be retaliatory, as in the commando raid on Entebbe.

Another dimension is scope. The consequences of an offending activity may be global, as with carbon dioxide, or bilateral, as with river pollution, or something in-between, as, say, the regional effects of air pollution -- Scandinavia and the low countries being affected by British smokestacks. Many of the activities are of course selective, that is, done against chosen targets; some may have a limited number of victims or targets, but without any geographical influence. Some of the activities may be asymmetrical, depending on the way the wind blows, or the way rivers flow, or because some offending or dangerous activity in one country simply has no counterpart in the victim country.

Finally, the government or non-governmental perpetrator may be quite innocent, possibly not knowing of the harm that is done, but surely not intending it, as in the case of aerosol shaving foam. The attitude may be more strategic -- a government possibly wanting to be compensated somehow for imposing restrictions on some innocently-motivated, even if externally harmful, activity. Moreover, a government may be quite deliberately extortionate, recognizing that the power to do some harm abroad may be a source of influence, privilege, or plain compensation.

With many activities there will be the important question of what the baseline is, or where the property rights attach. For some of these activities, the legal tradition is that one is free to engage in them and anybody who is offended is free to offer compensation for cessation. Others, in contrast, are subject to a tradition that they may not be done unless victims are compensated. Among the things that one may do unless compensated for ceasing, for some the tradition is to charge what the traffic will bear, while for others it is indecent to ask for more than "just compensation" for stopping it.

Another important dimension is the government's excuse for permitting something that it may acknowledge as improper. It may simply lack the resources to stop it -- policing and patrolling a territory or a coastline or monitoring shops and laboratories may just be too costly. Or the government may lack the appropriate technology for monitoring the activity. It may lack legal authority; it may lack political power; it may lack administrative ability; it may even lack the intelligence capability. Many of the things that occur in the United States that may offend other countries could be things that are protected by the Constitution, and no government has jurisdiction.

In all of these potential conflicts, there will be some important traditions and precedents -- the raid on Entebbe was occasionally supported by reference to American naval action against the pirates of Tripoli. The alignments and alliances will matter -- opium poppies being raised in Denmark or Communist China would impose a different kind of conflict from those grown in Turkey. There will be internal traditions and precedents, and important cultural constraints and cultural differences. Many of the conflicts will be aggravated by the fact that legal and constitutional rights, cultural traditions, religious institutions, and attitudes toward personal freedom or free enterprise, differ widely among countries. There will be power relationships among countries, and "weakness relationships" to be exploited. There will be the usual dimensions, or even polarizations, between the rich and the poor, the white and the non-white, the new states and the old.

There will be the important dimension, in the event of an offending behavior, of what is proposed to be done with it: eliminate it, regulate it, or compensate it. There is a critical distinction between (i) the things that are mainly "distributive" or divisive -- things the cessation of which would benefit some and inflict harm or cost on others, but where adequate compensation ought to take care of the problem and the activity may well continue; (ii) the things that in the aggregate do more harm than they are worth and should be eliminated, compensation not being able to take care of it -- indeed, the victim potentially being able to compensate for the costs of abandoning the behavior; and (iii) the things that involve different notions of "right and wrong" in an uncompromisable way, like political refuge, freedom of immigration, religious doctrines, constitutional rights; and, finally (iv) the behaviors that are deliberately engaged in as part of some ongoing conflict and are not themselves the source of conflict.

FORMAL COMMENTS ON THE PRESENTATIONS OF
MR. SHIELDS AND PROFESSOR SCHELLING

by

Mr. Hans Heymann, Jr., National Intelligence Officer
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INTRODUCTION

I have only a very few comments to make about Tom Schelling's very entertaining and helpful catalogue of offending behaviors. Because his list is a bit of a "grab bag", commenting on it systematically is extraordinarily difficult. It seems to me, however, that we can select some relatively innocuous, innocent, and simply handled problems among the long list of issues which Tom described. I propose to eliminate those from my comments and focus instead on the rather wide diversity of potential problems and threats.

COMMON DEFENSES AGAINST THREATS

In thinking about these types of problems, I was first struck by a sense of widespread vulnerability and helplessness. The economic instruments are there, but how well can they be used? Then, I started thinking about the many events and contingencies that Tom Schelling described, and it occurred to me that many of these tactics would certainly not be targeted against the United States alone or against any single victim country. What he calls the global commons and the dangerous research and experimentations would fall into the category of having an impact upon the world at large and would be a threat to all countries; this, I think, is quite important. Some of them would be at least as threatening to our allies as to us. Others would be or could be, at least implicitly, threatening to our antagonists as well as to us; for example, threatening acts by outlaw governments or terrorist acts or threats by non-governmental groups. What I'm driving at is the importance of recognizing elements of commonality among governments in the perception of threats, of identifying those threats which could evoke a sense of common danger, and of thinking about ways of concerting the counteraction of the various threatened parties. It seems to me that for counteraction to be effective in a highly interdependent world, you really need international and multinational cooperation. The chances of developing such cooperation in this increasingly threatening world seems to me to be not altogether unfavorable. In a world in which

governmental authority appears to be weakening almost universally, there may be more inclination for governments to join forces against common threats. Thus, I'd argue that it is important for us to identify those threats or actions which offer opportunities for creating common defenses with allies, with adversaries, perhaps even with neutrals.

DIFFICULTIES IN IMPLEMENTING POLICY

On the other hand, when we look at our ability to develop policy in the international economics area. I am rather disheartened at our very bad "track record" in coping with vulnerabilities that we are able to see clearly right now. Take the threat of an oil embargo -- a rather improbable but extremely dangerous contingency that we would rather not think about. Our vulnerability, and that of our allies, to a cut-off of oil supplies is growing steadily and visibly. The willingness of the Government to face up to such difficult problems is not. That leads me to a general observation which I hope we will keep in mind in other deliberations during the next three days; namely, the difficulties we face in concerting governmental policy in the international economic sphere.

A polymorphous society reflects itself in a polymorphous government. It is very difficult and very slow for us to achieve any kind of consensus, even on a relatively straightforward policy. It is even more difficult for us to package policy elements into a coherent whole which is to be implemented imaginatively and consistently over a period of time. A friend of mine once said to me, "The only kind of policy recommendation that is worth making is one that can be implemented by Cretins." It was a little unkind, but not altogether wrong.

DOMESTIC CONSTRAINTS ON FOREIGN POLICY

Foreign economic policy, as we are all too frequently reminded, is severely constrained by divergent domestic political interests. As simple a protective device as a moratorium or embargo on grain sales to prevent severe price disruption created a political cause célèbre which is being fiercely debated in this Presidential campaign. Roger Shields mentioned leverages as a recurrent theme in U.S. policy deliberations. Are our economic strengths and our antagonists' economic weaknesses susceptible to exploitation by seeking or eliciting political concessions on other issues? Examples have been discussed extensively within the Government of the Soviet interest in U.S. technology on the positive side, the Soviet need to resort to U.S. grain periodically, and the Soviet and East European heavy indebtedness. Can we exploit these for beneficial political ends? It seems to me we need only think about it for a moment to realize that these issues are perhaps useful in that they give us a better bargaining position in negotiating on a particular issue, whether it be grain or technology or credit extensions. We do have a better bargaining position and perhaps some related financial concessions can be exacted, as was the case in the grain deal when we

were able to get the Russians to agree to our carrying grain in "U.S. bottoms" at somewhat higher rates. But combining these strengths into something that you can use as broad political leverage seems to me to be severely limited. Again, looking at the Soviet case, there is the extreme Soviet sensitivity to any implication that economic distress on their part translates into political weakness. In this context, any U.S. attempt at blatant "leverage" would evoke, and has evoked, an over-reaction in the opposite direction. Take the case of the trade agreement. U.S. policy instruments that we have available for exerting leverage are extremely crude and, as I said, are limited by domestic political constraints. The Russians have alternatives available that they can turn to, with the possible exception of grain, but, even there, their alternatives are to draw on their reserves and to cut back on domestic consumption. Finally and once again, cooperation with our OECD allies would be absolutely essential, and we've not done very well on that front.

U.S. SPECIAL FORCES

Finally, let me simply say that, since Tom Schelling brought up Entebbe, I have had the uncomfortable thought that we, the United States, may not be able to carry out an Entebbe operation today. At some point, economic responses may fail and forceful intervention at minimum levels of violence may be necessary, and I am asking the troublesome question: Do we still have the capability we once had to carry out these kinds of special operations? In the aftermath of Vietnam, our military forces turned away from special forces and things like guerrilla warfare and commandos, and concentrated on conventional warfare and the strategic nuclear threat. I recently attended a session in which this issue came up very concretely and I was given to understand that all of those resources that we once had in this area of response have been disseminated and diffused -- which I think is something to consider.

FORMAL COMMENTS ON THE PRESENTATIONS OF

MR. SHIELDS AND PROFESSOR SCHELLING

by

Dr. Martin C. McGuire, Professor of Economics,
University of Maryland

INTRODUCTION

I came here to say a word or two about economic conflict in the sense of classical trade warfare, but, I should like first to comment on this impressive list of possible disasters. To me, the importance of a list like this is that it makes us think how inadequate our conventional tools for analysis of economic conflict might be.

Many items on Tom Schelling's agenda are unworthy and would probably be counterproductive as tactics for the United States. However, the problem remains of how to counteract or cope with such offensive behavior on the part of others and, more specifically, in terms of the purposes of this Workshop, how to design a research program to enhance our ability to so cope. Here the contrast between Tom Schelling's list and the more traditional issues in economic warfare is striking.

THE ORGANIZATION QUESTION

The crucial difference concerns the organization of conflict. We implicitly tend to assume conflict is organized. To take the case of classical trade warfare, the instruments at hand include tariffs, quotas, export dumping, embargoes, and boycotts. The purposes of employing such tools are to harm an adversary by reducing his real income or limiting his military potential. These instruments are employed systematically -- possibly at great economic cost to the aggressor and his allies (as well as the victim) over a more or less extended period of time. The efficacy of such economic warfare depends crucially on an organized system of production (at home and abroad) and of trade. Within an organized structure, questions such as optimum economic attack and optimum defense, internal distributive consequences of economic war, cartel formation, stability, and vulnerability are all researchable problems with important policy payoffs.

Some of Tom Schelling's examples fit this model. For instance, faced with contingency planning for a natural (or man-made) disaster such as famine, researchable questions as to alternative, less vulnerable production or storage techniques come to mind. Moreover, if scarcities are created by an organized entity, such as a hostile government, the threat they pose can be handled in part by exploring the interests and motives of the adversary: Can he be appeased, threatened, punished or otherwise bargained with? As we progress through Tom Schelling's list, the problem of how such offensive behavior might be organized and by whom becomes crucial. Let me be more specific.

CAUSES

The first question that arises is: Why would certain sorts of groups undertake (for instance) to disseminate disease? Would this be a random occurrence, or, if it were not random, perpetrated by small and shifting groups? If activities such as these were perpetrated by small and shifting groups, it might be in our interests to see if we could stimulate organization of such anti-social behavior so that we can control or have some influence on it.

The second question is: Why would such things be done? One possibility is just to be malicious. A person or group which does things just for the pleasure of creating havoc is certainly much less easy to deal with than someone who has a specific purpose, a purpose which might be appeased, countered, or defeated at some cost. But, if malice is the motive, who would it be done to hurt? Or again, further down the list: Is this activity a byproduct of something useful to the persons perpetrating it (pollution) or is it a byproduct to something that is useful to both them and us? It strikes me that the key question for research here in such a list of grim possibilities for sheer destruction is whether or not one can anticipate their being perpetrated and organized in a systematic goal-seeking fashion so that we can come to grips with them analytically. (Do we have more leverage in combatting organized crime in contrast to disorganized crime? Many people think we do -- that some kind of organization of illegal acts helps to control them.) If these types of events are totally disorganized, the problems of dealing with the perpetrators are immensely more difficult. Thus our research should ask what incentives can be provided to restrict the availability of tactics such as these to identifiable groups with something to lose (or gain).

To the extent that one can successfully confine weapons of terror or malice to governments or quasi-governments, a major research problem is when and how to form offensive or defensive alliances to combat noxious behaviors. In this connection, the fact is that very little conceptual work exists on the structure or instruments of economic warfare, and what little does exist concentrates on unilateral economic aggression. Our knowledge of the sophisticated use of economic power in a resource-scarce, over-populated world for assertive or defensive purposes is almost nil. Although a certain amount is known with regard to the dynamics of military

alliances, very little exists on the formulation, stability, and defense of economic alliances. With such weak conceptual foundations, we are unable to anticipate the general characteristics of future crises and will be caught by surprise as they emerge.

Some crises, such as wide-spread famine, may be essentially economic in nature with grave national security repercussions. Some may be essentially military crises (wars in the Third World) wherein our best instrument is economic -- the sophisticated application of arms export controls. Others may be political (e.g., Union of South Africa apartheid explosion) and our only economic instrument (e.g., South African gold and diamonds). Still others may be a combination (e.g., Panamanian seizure of the Canal). In all of these cases, the economic feasibility and costs to the U.S. of exerting economic pressure to control or defuse and manage a situation will be crucially dependant upon the economic alliances we face and those we can form. (In this context, contemplate the Panama situation). Our state of knowledge is so primitive that the appropriate economic instruments for such crisis management are unknown. Thus, the effectiveness of boycotts, embargoes, dumping, quotas, tariffs, and other instruments of economic warfare will vary dramatically from one challenge to another depending upon the strength of individual countries, vulnerability to economic pressure, solidarity of alliances and numerous other factors. Moreover, not knowing the general defining parameters of likely crises, advance early warning signals will escape our notice, or, when such unexpected emergencies are thrust upon us, we will not have the requisite policy tools forged for effective use.

THINK CREATIVELY

Tom Schelling's presentation, however, seems to me to call into question the value of concentrating research exclusively on traditional methods of conceptualizing; i.e., thinking of trading blocs or economic measures, such as boycotts or embargoes or tariffs or quotas or formations of defensive or offensive economic alliances. Possibly the most threatening kinds of economic conflict are those for which this traditional framework doesn't help us very much at all. We have to think beyond that framework and think how we could cope with these outlaw activities, trying to increase the degree of leverage that other governments have over these kinds of things, even if those other governments are enemies.

GENERAL DISCUSSION

Dr. Schneider: I have just one footnote pertaining to the issue of grain sales. There is a certain amount of misunderstanding about the reaction of the U.S. agricultural community to the administration of the embargo. It is true that the agricultural community was upset, not because of the notion of the embargo per se, but because the community was advised in the previous year that it was in the national interest to grow as much as possible in order to accommodate potential sales to the Soviet Union. Hence, if an embargo were found to be desirable for other policy reasons, the reaction of the agricultural community does not necessarily preclude the establishment of a different set of institutional arrangements which would enable the U.S. Government to manipulate agricultural exports to the Soviet Union. The lesson to be learned is that we must not give conflicting signals to the agricultural interests in the U.S.

Dr. Burstein: I have two observations -- one of which is pertinent solely to economics. I was interested in the consequences of foreign reaction to the destruction of our forests in the context of formal welfare economics. We may sometimes neglect the spatial extension of tastes of being consulted, just as we have in the better-known temporal question on the role of the unborn. More pertinent to this Workshop, I've been disappointed with what I think is a rather "wooden notion" of allies. It seems to me that we are neglecting our main contribution to the examination of strategic interplay by not fully considering the ways in which our cooperative behavior with the Russians, for example -- could be at the expense of people we are calling our allies. The Taiwan case vis-à-vis the Chinese is a very straightforward example of my point. Still more interesting to me, though, is the need to reconsider the meaning of ally. In light of the ongoing situation in Italy and of the distinct possibility of a victory of the "Union de Gauche" in France, we have to define the meaning of an alliance (e.g., of the U.S. with a Socialist Republic of Italy or with a new government of France) in rather different terms from the those carried over from World War II, which has thus far dominated our discussion. I would hope that, as we go on, we will hear more about non-binary classification of countries. Hearing the discussion here today, I've pictured myself on a World War II battlefield with clearly identified persons being on my side and the opponents being over there. Rather, it is the very complexity of the notion of an alliance and the growing complexity in certain tangible circumstances of inter-state relations that interest me. I especially expected Professor Schelling to supply me with a greater sophistication on this particular point, since it is one which is extremely difficult and perhaps defies classification.

Professor Morgenstern: Mr. Shields has given us a long manual of open problems with which it is fairly difficult to come to grips. However, it struck me that no distinction is made between what are the primary issues and what are the secondary ones. Look at the Vietnam war. If you take a very calm look, what happened? We fought 10,000 miles away from our own people; we incurred great expenses and disturbance of our economy; we produced monetary disturbances leading to monetary inflation; and we produced an upheaval among our young people, especially in the academic world. From the Soviet point of view, what would be a more ideal situation than for the U.S. to fight this war and suffer all these attendant problems? The Soviets sat back in peace while we wasted our energies. The Vietnam war provides a classical example of military-political operations. If there is to be a conflict, force your opponent to fight at the most unfavorable location for him. That's exactly what we did. Where are we now? South Vietnam and North Vietnam are reunited. The new Vietnam is making a great effort to establish good relations with the United States. Yet, it is a communist country which is not under Russian domination. That is the situation. What good does it do then to solve problems which arise from foolish underlying policies which we may pursue? Nothing. We were totally lacking in the knowledge of what the basic situation was, and I wonder if we will repeat such mistakes again.

Mr. Waldman: I have one comment about Tom Schelling's list. I don't think we should ignore traditional economic acts, such as industrial takeovers, boycotts, cartel operations, exercising jurisdiction over resources which are not traditionally viewed as being within a particular country, or just increasing relative market shares. These are courses of economic conflict which I thought this Workshop would consider. Furthermore, some of the problems cited by Professor Schelling are often generated because countries are so totally wrapped up in these other questions -- more so than some of the things which are on Tom's list. These questions seem to me to provide a much greater potential for conflict between countries.

Dr. Wolfe: I have a question to raise on the subject of leverage. The Russians are accumulating very large debts to the West and to some of our allies. I do not know the precise size of present and prospective Soviet debts, but they are quite large. The leverage question is simply: Whom, in this instance, does the leverage favor? It seems to me that this is a subject to which the Workshop might care to devote some attention. The more conventional notion is that Soviet debts represent leverage that we can usefully exploit. On reflection, I think that perhaps some of the leverage works the other way.

Professor Shubik: There is an old financial saying that when you're in debt for \$20,000 to your bank, you have a cruel and implacable creditor. But, when you're in debt for a half a million dollars to your bank, you

have a partner. One clear case in which the hostage question was turned around is that of the Arab takeover of the oilfields. In a world of double-entry bookkeeping, who owns the hostages is never a completely clear question.

Professor Montias: I don't think Tom Schelling intended to provide an exhaustive list of offending behaviors. As a footnote to his discussion of scarcity creation, I would like to say that there is also glut creation as an instrument of economic warfare. In particular, I am thinking of gold sales to reduce the price of gold so as to put pressure on the Republic of South Africa. In this day and age, when many nations have large strategic stocks at their disposal, stocks can be manipulated, both to create scarcity and to depreciate the value of other peoples' stocks and thereby do harm.

Professor Bergson: I'm over-awed by the list of problems that has just been presented to us. These problems are not only numerous, but also they are very difficult and complex. To make matters worse, Hans Heymann has reminded us that, even after we've carried out a good deal of analysis, it's often very difficult to formulate a policy which might be feasible in the light of prevailing political constraints. Clearly, in grappling with problems of this sort, we will sooner or later become involved with research that is essentially judgmental. In other words, after a lot of empirical analysis, there will be, in the end, very important aspects that must be dealt with judgmentally. For example, we may do a lot of research on what the Russians are gaining from their trade with the West, from technological transfers made by the West to the U.S.S.R., and from credits. But, in the end, assessing what these economic transactions mean to them, how they might respond to different sorts of efforts, and what might be done to capitalize upon their reliance on such trade relations, will involve the exercise of judgment. This raises the problem of how one ought to go about assuring that, where issues of this sort have to be dealt with, a suitable range of possibilities is brought to the attention of policy makers. It's not just a matter of having one person do research so as to provide an answer. Where there are judgmental questions of this sort, much more is involved. I think that a group such as this might well consider the question: What sort of procedures would be appropriate in such circumstances? The analogous situation is where projections have to be made in the light of very limited information, in which case, a variety of ways is used to solicit informed opinion and a range of interesting impressions. This is something to which some serious thought might well be given. In any event, it is not a question that can be resolved by "farming out" research projects; much more is involved.

I would also like to direct your attention to some current research which is likely to have a significant impact upon studies involving future economic conflict. I am referring to the global projections that are being made of the world economy. This is, of course, an extraordinarily ambitious effort, and I'm sure that many questions will arise in regard to its execution. It is an effort to view the coming decades of the entire world at one time and, clearly, the question of the potential sources of economic conflict is likely to be illuminated by having some systematic projections of the world economy in general. This is something that might be borne in mind in considering the questions that confront us today.

Professor Arrow: As suggested by one of the commentators, Professor Schelling's list is really concerned with what might be called "technological externalities." Invariably, there are many things for which the market does not operate. Domestically, we are accustomed to the idea that even when the market is operating, demands for change are nevertheless present in the form of redistribution of income and, of course, in the international sphere, the redistribution of wealth has currently become a major topic in world conferences. The "new international economic order" is an often repeated phrase which raises the question of morality, ethics, and resource allocations. I'm not trying to arrive at a moral judgment; I'm simply asking the question of whether or not morality is a power in itself. I don't really know the answer to this question. However, when I hear these claims about a new international economic order, I assume that it is simply a matter of a small change in bargaining. But other people, who seem to be more knowledgeable, take these claims very seriously, especially with regard to the moral claim which, they feel, is persuasive and has a large power potential. They think that because the moral claim is persuasive, it is itself a source of power. The demand of the South for a larger share of the world's wealth is an appeal to the moral senses and, therefore, of course, has persuasive force -- which has value along with divisions and cruisers. So, this is a point of economic conflict that seems to be appearing, at least verbally, everywhere. It has apparently afforded one reason for Third World support of the oil cartel which, off-hand, might appear to be antagonistic to its interests. This point may repeat itself in one form or another in the future.

Mr. Shields: Beyond any question, part of this commentary on international morality and demand for income distribution is a result of changes in bargaining power. But, this fact doesn't make these issues any less real or any less important. This development can be seen not only in the developing areas, but also in OECD nations -- at least in an incipient form. Maybe the U.K. is becoming virtually a "have-not" nation, demanding income redistribution. But, in another respect, the U.K. now has North Sea oil and could behave in much the same way as

OPEC. These are matters which we must consider. If we focus exclusively on traditional military security, we are missing the point. Vietnam taught many lessons -- one of which was that traditional military superiority does not guarantee victory, the acquisition of territory, or success in achieving one's goal. When we talk about world blocs and the question of international morality (and this is an idea which may be far more important than anything else), we see traditional countries behaving in non-traditional ways. We have joined the bloc of nations favoring the extension of economic interests in continental waters to 200 miles. Our position is in common with nations that claim that this is something that has to do with more than economic factors; it has to do with economic morality. I don't know how to deal with this, except to point out that it challenges existing economic orders. Perhaps, it also challenges the role of the international market place. Maybe this challenge has always been there, but bargaining positions have changed.

Professor Schelling: I have a hunch that my presentation might have been more appropriate on the last day, rather than on the first day of this Workshop. I didn't mean to suggest that some of the more traditional and conventional problems, which I assumed were on everybody's minds, were not important. I viewed my task not to identify the likely conflicts of the coming decade, but rather to introduce the possibility of some new kinds of conflicts which might arise. For that reason, I thought the task was to be first imaginative and then critical -- develop the longest list that you can and then slowly pare it down. I think that it is premature to start deciding which of these potential conflicts are going to prove to be real situations in the future and which won't be. I think that I probably do differ with some people here on the relative importance of the possible types of conflict which I've described as compared with some of the more traditional kinds of conflict. That may be because I've been preoccupied for a couple of years with the spread of fissionable materials around the world, and I have come to think that a lot of economically motivated competition is going to get us into serious trouble. But, I also think that it is useful to speculate about the worst kinds of mischief which may possibly arise.

Ken Arrow is right that a lot of these things appear to be technological, but it seems to me that selling Jews for \$50,000 a head is not technological. Failing to prohibit American companies from covert activities that weren't being done by Lockheed is another major problem. And, when it is turned around and becomes Arab black-listing of companies that trade with companies that do business in Israel, we're in a very dirty kind of economic warfare that is reminiscent of what went on in World War II and apparently continues to go on. These cases, to me, are not technological.

I didn't quite understand the remark about allies. My impression is that this list is orthogonal to the East-West kind of conflict and substantially orthogonal to the question of alliance relationships. In particular, I didn't mean that these were practical activities which were part of warfare. For example, when I referred to creating scarcities, I did not have in mind creating scarcities in order to hurt an adversary. I meant creating scarcities in order to make money. Here is an example to clarify the point which I was emphasizing. American cattle farmers know that they benefit from hoof and mouth disease in Argentina, and I think it is well worth keeping in mind that one of the reasons why we like hoof and mouth disease in other countries is that it creates scarcities. Many years ago, I heard representatives of U.S. military forces propose that it would be perfectly feasible to spread crop diseases in mainland China, by aerial techniques, which would make the Chinese much more dependent on food supplies from the West. As far as I know, the proposals never got anywhere; we would probably have heard if they had. What I had in mind were the things that might be done, not as part of an ongoing warfare -- insidious devices to subjugate your enemies and so forth -- but the things that might be done whether we like it or not, that we may even find ourselves collectively doing, and may find it difficult keeping ourselves from doing. It may not be easy for the Federal Government to keep American firms from bribing government officials in other countries; this has proven to be a real problem. In any case, what I meant to do was to suggest that, in addition to the kinds of strategic East-West warfare that became an especially important part of American policy in about 1951, and in addition to the OPEC kind of problems which have been dramatized for us, and in addition to the enormous difficulties you get into when you use the words energy independence (U.S. independence rather than independence for our side, whichever our side is), there are even more problems and worse problems. I think Ken Arrow's characterizations of the technological aspect is right to this extent. It may be that technology has progressively made these problems more pervasive and more difficult to cope with. Before this Workshop began, Oskar Morgenstern was remarking that at least one of the advantages of living in these exciting and dangerous times is that we'll all be dead before the worst of these problems comes to fruition.

THE AFTERNOON SESSION, SEPTEMBER 13, 1976

APPENDIX D

TABLE OF CONTENTS

	<u>Page</u>
<u>Opening Remarks</u> by Dr. Abram Bergson	D-1
<u>Soviet National Security Estimates</u> <u>from Soviet Published Statistics</u> by Mr. William T. Lee	D-2
<u>Soviet National Security Expenditures:</u> <u>A Perspective</u> by Mr. John A. Paisley	D-15
<u>Formal Comments on the Presentations of</u> <u>Messrs. Lee and Paisley</u> by Mr. Kurt Kruger	D-22
<u>Formal Comments on the Presentations of</u> <u>Messrs. Lee and Paisley</u> by Dr. Steven Rosefielde	D-24
<u>Comments on the Presentations of</u> <u>Messrs. Lee and Paisley</u> by Dr. Martin Weitzman and Other Participants	D-30
<u>Comments on the Presentations of</u> <u>Messrs. Lee and Paisley</u> by Dr. Michael Montias and Other Participants	D-36

OPENING REMARKS

by

Dr. Abram Bergson, Professor of Economics
Harvard University

Analyzing Soviet national security expenditures, their level compared with ours and changes in this level over time, poses a problem with respect to the availability of information due to the extreme Soviet secrecy in this area. The resolution of this problem generally depends upon the availability of specialized expertise. By the same token, it's the kind of problem which doesn't always lend itself easily to fruitful exchanges in a large gathering such as this.

I think that there were two major reasons for placing this subject on our agenda. First, there must have been the feeling that it would be useful to provide persons not deeply involved in this subject with some general impression with regard to the state of the art. Beyond that, I think it was hoped that there might be some feedback which would permit an improvement in the state of the art. While we might not be able to make a contribution in terms of specific, specialized expertise, there must be many conceptual issues which also arise with respect to this subject wherein advice from a gathering of this nature could be valuable. Among other things, there is the question as to whether or not national security expenditures of the sort that we usually focus upon are the aggregate of prime interest in light of our more ultimate concerns in appraising the:

- Defense burden on the Soviet Union, and ●
- Soviet Union's military capabilities.

I hope we can have some interesting discussions today about these conceptual issues, even though the specialized expertise required to deal with some questions is not available to all of us.

Several approaches to the estimation of Soviet national security expenditures have been devised as means of countering the ever-present informational problem. On the one hand, there is the conventional approach, which underlies the estimates generated within the U.S. Government, especially by the Central Intelligence Agency (CIA). There are also various unconventional approaches. Today, we are going to hear presentations on both conventional and unconventional approaches.

SOVIET NATIONAL SECURITY ESTIMATES
FROM SOVIET PUBLISHED STATISTICS

by

Mr. William T. Lee

I want to concentrate today on some of the points mentioned by Professor Bergson; that is, the level, the rate of change, and the share of the Gross National Product (GNP) of Soviet defense expenditures as I view them -- taking into account the recent revisions of Soviet defense expenditures estimated by the Central Intelligence Agency (CIA). I wish to offer an hypothesis with regard to the opportunity cost of defense expenditures in the Soviet Union and to note some of the policy implications of these defense expenditures -- if, indeed, they are as large as they may be and if they are growing as fast as they may be growing. Then, I propose to go on to some other questions which I think are raised by the revised CIA estimates; questions such as the basic objectives which the Soviet Union is pursuing and some basic problems with respect to the nature of Soviet decision making. Finally, I will close on a note about some further problems of economic measurement that are involved, once you have changed the estimate of defense expenditures significantly.

THREE APPROACHES

By way of providing a little more background, I'll sketch three approaches that, historically, have been applied to the question of estimating Soviet national security expenditures. First, the conventional approach of the CIA is a direct costing approach in which that Agency seeks to cost out all observables in the Soviet military establishment; i.e., the cost of buying, operating, and maintaining it. The CIA attempts to do this directly from intelligence information costed in dollars and then translated into rubles. I'll leave the rest of that explanation to John Paisley, who follows me, with the observation that the research and development (R&D) portion has always been costed directly from published Soviet data, rather than by the CIA's direct costing method.

The second method that has been used is simply to accept the Soviet defense line item in the budget as being a measurement of everything, except R&D, and to assume that you can factor out the military R&D and space portions from another line item the Soviets publish not only in the budget, but also in other literature which states how much they spend for "science".

My approach has been different. Again, I start with Soviet data, but I argue that you can get the procurement portion of Soviet defense expenditures from published Soviet data on gross output and machinery and equipment -- after a number of operations which translate gross output into final demand and then remove the producer and consumer durables. Historically, I have argued that, since 1950, the published defense budget is pretty much an operating budget. I think that it's one of the casualties of the Korean War. The defense line item used to cover a lot more before the Korean War, perhaps everything except R&D -- but it changed substantially at that point. In the mid-1960s, I became convinced that the science expenditures did not contain a large portion of Soviet R&D expenditures. In this, I was anticipated by Professor Korol at the Massachusetts Institute of Technology (MIT) who, in 1965, published a book saying that the science expenditures did not include development costs. Incidentally, in presenting my paper, I'm talking only in rubles. I don't propose to talk in dollars, and I wish there were a 10-year moratorium on dollar estimates of Soviet defense costs. You can create such estimates, but let's not refer to them as Soviet defense expenditures, because they are not.

COMPARING ESTIMATES

Almost 20 years ago, when the conventional approach and my unconventional approach were simultaneously developed in the CIA, the original argument was over procurement. Since I have subsequently been identified as saying the CIA's estimates have been too low -- which, indeed, I think they have been -- I would like to point out that, when the argument originally began, I was saying the Agency was much too high -- that you could not possibly justify the amount of procurement that the CIA was estimating, based upon the Soviet output data. Another argument that goes back 20 years was the effect on Soviet defense expenditures of moving into areas of high technology. At that time, the CIA contended that the Soviets would be relatively efficient at technological innovation. I argued just the opposite.

In 1960, these two approaches "crossed" each other in terms of the aggregate figures. Both agreed that Soviet defense expenditures around 1960 were somewhere between 15 and 18 million rubles. In subsequent years, however, we started to have differences in our figures and by 1970, our differences were separated by a factor

of two. The CIA was saying about 24 billion, and I was saying 43 to 49 billion.1

So our differences were separated by a factor of two in 1970. The rate of growth I derived from the Soviet data was on the order of 8 to 10 percent per annum, and it's been pretty constant from 1958 on -- which, of course, means that the share of GNP has been rising substantially, if this rate of growth is indeed correct. The Agency starts with the share of defense expenditures for national security in 1955 at about 11 percent (we all agreed on that). This declines to about 8 or 9 percent in the late 1950s (and we're more or less agreed on that). Then, the earlier CIA figures continue to decline to just 6 percent by 1970 and 5 percent by 1975. My estimates went just the opposite way: up to 10-12 percent by 1970 and 14-15 percent at the present time.

Question: Bill, is this just procurement?

Mr. Lee: No, this is the total for national security.

Question: What do you do about manpower and consumables?

Mr. Lee: Until 1970, I took the published defense line item to be a reasonable approximation of those expenditures. This is not to say that I believe that all such expenditures are included in this defense line item. Importantly, though, as I interpret Soviet data, it does cover expenditures, to include military construction -- although there are other Soviet data from which one could reach a different conclusion with regard to military construction.

Question: Are there inflation factors which are responsible for this?

Mr. Lee: I think that there is very substantial inflation in the Soviet Union, but it is what I call technological inflation due to the high cost of innovation of new technology -- not from the kind of inflation with which we normally deal and which has been affecting us seriously. It is certainly not the kind involving rising manpower costs that we've been experiencing. This is one of the things I want to bring up at the conclusion of my presentation: What is the meaning of a constant ruble or a constant dollar in an era of rapid technological change? As a layman in this business, I have serious reservations about the meaning of such measures.

Question: You are saying that current and constant rubles reflect the same growth rate?

Mr. Lee: I'm saying that, by any Soviet deflator which I can find, the rate of growth in constant rubles and the growth in current rubles, as carried in the Soviet books, is not much different -- the constant ruble growth rate being slightly higher. Moreover, I don't think one can even talk about constant rubles in areas such as R&D.

Now the revised CIA figures are a good deal different. In terms of magnitude, we more or less agree on 45 to 50 billion in 1970, which is about 11 to 12 percent of the GNP. But, the CIA still estimates the rate of growth for the period 1970-1975 at about 4-5 percent overall, and the Agency has not yet published a revised rate of growth extending its estimates back from 1970 to 1960 or to 1955. That's one of the issues I will address.

THE HARVARD SEMINAR²

To provide some additional background, I would also like to very quickly summarize some of the points raised at a recent Harvard seminar which I think are very pertinent. At that seminar, Professor Cohn more or less agreed that the defense line item is an operating budget and does not include procurement. Procurement is financed in another portion of the Soviet budget: specifically, under the article for State reserves in "Financing the National Economy." I think it's generally agreed that the direct costing method, which is the conventional method of the CIA, has a difficult time picking up all operations and maintenance costs. It's simply the nature of such accounting procedures that makes it so difficult to see everything that goes into the operations and maintenance of a military establishment. If you were sitting on top of the Washington Monument, for example, you could probably figure out approximately how many missiles and tanks we had, but you'd have a devil of a time identifying all of our operating costs. The same thing applies to the USSR military establishment when you are using national means of verification to obtain your data. I think that it's also agreed among quite a few people now, but maybe not by all of us who work in this area, that the science expenditures do not finance all research, development, test, and evaluation (RDT&E).

Now, Douglas Diamond (of CIA) made some very important points at the Harvard seminar, the first of which, according to my notes, is that the revised CIA estimates must be checked against the data on machinery output -- Soviet data on machinery output was originally the core of the unconventional approach. Second, the revised CIA estimates must be checked against the budget, because one can identify most military expenditures in the Soviet budget. I didn't think that this was possible about a year ago, but a book by a Soviet author, Evdokimov, really provides some hope of doing so. This would give you a sort of check on all other kinds of estimates -- a ceiling, so to speak -- because you can't identify all of the civilian expenditures, which means that the residual you have in the budget is probably a bit on

²Seminar on Soviet Defense Spending at the Russian Research Center, Harvard University, August 21-22, 1976.

the high side, but probably quite consistently so -- at least from 1960 on. Douglas Diamond also made the point that the revised estimates can be reconciled with the CIA's estimate of the 1970 GNP (I wish to comment on this again a little bit later). Furthermore, when Douglas agreed that you have to reconcile these estimates with GNP and have to calibrate them against the Soviet data on machinery output and the budget, it seemed to me that this forced the CIA away from its historical position of a 3 percent rate of growth overall. If the Agency uses these Soviet data for calibration, it will end up with a much higher rate of growth -- in the ballpark of 8 to 10 percent. I believe there was also a consensus that a consistent historical series for revised defense and gross national product is required so that everything will fit together and we can therefore make some sense of it.

Now, I would like to make two points on issues raised at the Harvard seminar. One relates to the GNP reconciliation which Professor Bergson raised. I'm afraid the CIA is not in as good shape as Douglas Diamond indicated during the seminar. The Agency's published 1970 GNP, as it presently exists, cannot be reconciled with its revised estimates of 40 to 45 billion, excluding space activities, and 45 to 50 billion with space activities. However, I think the money can be found; it exists, but it's going to require some additional work to provide the documentation.³

A question worthy of comment raised by Professor Montias is whether or not you can see in some obvious, visible way the impact of rising defense expenditures? I think that you can. If you look at the history of the Soviet index of gross output of all machinery and equipment (which, of course, a lot of people do not accept, but you just start with that as one measure of the total output of all machinery and equipment) and then you chart producer durables (for which very good data are available in Soviet publications), you'll see that there are periods in which the two measures diverge in growth in such a manner that it's impossible to explain by means of biases in the Soviet gross output data. For example, during the Korean War period, producer durables were constant for about three years and grew very little during the next two years. So there's about a 3-4 year period in which all of the growth in the output of the machinery and equipment went to the military. This is very clear from the index numbers, unless you want to argue that, all of a sudden in 1951, there was a huge increase in the amount of "water" in Soviet statistics, due to a really accelerated growth in double-counting and overpricing, which I don't think can happen -- particularly when you observe the reverse trend as soon as the Korean War was over. In other words, producer

³Comment by Professor Bergson: Maybe the CIA could appropriate funds for this work.

durables grew faster than the gross output of the sector as a whole. This means, when you consider the biases argument, that the biases all of a sudden reversed themselves -- and so it goes historically. Therefore, I think there are places where, in the historical record of some of these gross measures, the shadow of the changing pattern of all allocations between the investment program, on the one hand, and the military, on the other hand, is very clear from the gross data.⁴

Hence, I would argue that, if you grant that Soviet defense spending in 1970 was somewhere around 45 to 50 billion, then, going back to 1960, I think that you can establish constraints of less than 20 billion. These constraints can be established in several ways. One is from the budget analysis. If you look at the Soviet budget and the other component of the budget wherein I think we now agree that the procurement is financed, you will find that defense expenditures could in no way exceed about 19-20 billion in 1960, and probably were a bit less, which again I will suggest means that 15-18 billion rubles is "in the ballpark" for 1960. So, if Soviet defense expenditures were less than 20 billion in 1960 and somewhere around 45-50 billion in 1970 (including space activities), then you've got an 8-10 percent rate of growth, and I don't think it makes much difference what reasonable deflator you apply to it. If you go beyond 1970, I think you'll find similar constraints in the budget for 1971 to 1975. Here, I rely very heavily on Evdokimov, who indicates that up to 320-330 billion was spent for defense in 1971 to 1975 (although there are some data that won't be complete until we receive the next budget handbook). The revised CIA estimates amount to only about 225-250 billion for that five-year period so, again, I think the rate of growth of 4-5 percent after 1970 is low. About 8 percent per annum is more realistic for the past five years.

The revised CIA estimates did not provide any information on the estimate of procurement but, again, if you go to the machinery

⁴ Question: What kind of data are available on producer durables?

Mr. Lee: Data on producer durables are obtained from investment data which indicate the output of the producer durables, with some minor and esoteric machinery and equipment reported independently. This crossover in the rates of growth can be explained by either a shifting pattern of allocation between investment and the military or a sudden and gross reversal in the biases -- which, I suggest, institutionally, is impossible. Consumer durables, in this case, are so small that it doesn't make much difference what you do with them.

Question: What about the growth in output of consumer durables?

Mr. Lee: I don't think consumer durables ever grow any faster than the gross output index. They are pretty small, and the corrections to the data which we do have on consumer durables would not change the picture.

and metal-working (M&MW) data (i.e., the machinery output data), you obtain something like an 80-100 percent increase in procurement during the period 1971-1975. However, when you estimate operations and maintenance from 1970 onward, I think we're all in trouble because the defense budget, the line item for defense, has been constant or declining since then. That is simply implausible. The question is what kind of a rate of growth you think is reasonable -- 3-5 percent per annum or something like that. Operating costs had to go up, but the question is how much? Again, I would submit that the trend in the defense line item since 1970 provides more evidence that you cannot fit all of the Soviet defense expenditures (except R&D) in it. Furthermore, it's being manipulated for political purposes.

SOVIET OPPORTUNITY COSTS

On the subject of opportunity costs, the hypothesis I would like to offer goes something like this: the opportunity cost of defense expenditures in the Soviet Union is very high because, first of all, there's a fairly direct trade-off between defense and investment. There's not much of a trade-off between defense and consumption, at least not directly and in the short run. In the longer run, there is a trade-off, but in the short run, it's very much defense versus investment.

I would also advance the hypothesis that the rising cost of weaponry is one of the primary causes for the very low proportion of durables in Soviet investment outlays. Durables are only about one-third of new investment outlays. In other words, for each new ruble of investment, only about 35 kopecks are allocated to durables; the rest goes into brick and mortar. If you deduct housing and some other things, the ratio is still only about 40 percent. I have seen Soviet explanations of this subject which allege that, in other Western countries, this ratio is much higher. I'll be willing to stand corrected if I'm wrong or they are wrong about this subject, but I have seen some Soviet data which indicate that, in the US, about two-thirds of the investment outlays are producer durables. I think that I've also seen some data with regard to Japan which runs about 80 percent. However, I do not know much about such shares in other countries, so perhaps I'm wrong. But, if this is the case and if the low ratio of producer durables in Soviet investment outlays has something to do with defense expenditures, then I would argue that, as a hypothesis, there is a relative shortage of producer durables which adds to the difficulty of substituting capital for labor in the Soviet economy. This situation is evidenced by the relatively modest contribution of technology to the growth of output in Western analyses of the production function of the Soviet economy.

The hypothesis which I would like to suggest, but which is beyond my technical capabilities to test (though I believe that it may be worthy of some examination), is that the opportunity cost of defense expenditures in the Soviet Union is high because:

- There is a direct trade-off between investment and defense and, when you increase defense, it inhibits the growth of investment, and
- The composition of investment is not conducive to a high growth rate or to the achievement of a high rate of substitution of capital for labor due to the extremely low ratio of producer durables in new investment as a result of the "drainoff" into defense.

If we could really measure the impact of technology, it would be even worse. The Soviets published some data on how many of their people still work with hand tools in the industrial sector and it's very significant.⁵

SOVIET OBJECTIVES

Now, I think that we need to look at some basic Soviet objectives across the board not only in light of the question of how much the Soviets are spending and the share of the GNP, but also in view of a lot of other things that are going on in the Soviet military establishment. I think that we need to ask ourselves some really basic questions at this time about the Soviet objectives in Europe and Eurasia and with respect to the intercontinental military sphere. I have in mind such questions as:

- Are the Soviets looking for some measure of superiority?
- Are they looking for a status quo; some sort of Finlandization of Europe; or some long-range plan aimed at incorporating Europe into the socialist camp?

In the continental military sphere, I think the same questions need to be addressed. They have been under debate in recent years, and I guess they are under very serious debate now -- but these are very fundamental questions; i.e.,

- Do the Soviets seek some degree of parity or some measure of superiority in terms of intercontinental strategic forces?
and

⁵For the extended series of questions and answers which ensued at this point, see the Addendum at the end of this presentation.

- Will some of our negotiations have anything whatsoever to do with whether or not the Soviets achieve these objectives?

Another more specific military question is: Will the USSR seek the complete damage limiting posture in the 1980s that they seem to have pursued throughout the 1960s when they further improve their offensive capabilities?

NEED FOR BASIC RESEARCH

In conclusion, I think that we need a lot more basic research on many aspects of the Soviet economy and Soviet decision-making processes. We need more applied and basic research within the Government. If you'll pardon me for saying something which I sometimes put a little too sarcastically, within the U.S. Government there is a bad tendency to deal only with highly classified material. So, if I could figure a way to stamp "Top Secret" on Pravda before it came into the country, I would do so. Furthermore, if I could find a way to photograph Soviet literature when it's still in manuscript form -- photograph it from space at a cost of a billion or two dollars -- it would carry a lot more credence within the U.S. Government than it does when published openly. Unclassified Soviet literature is often not exploited and even when it is exploited is not understood as well as it might be. I think that we need a:

- Periodic reexamination of assumptions in many of these areas, and
- Periodic and continual revalidation of many aspects of out "conventional wisdom" with regard to the operation of the Soviet economy which I think were true 20 years ago, but have not been true in the past 10 or 15 years.

We need a very serious review of many aspects of Soviet political and military objectives and of the decision-making process. Furthermore, getting down to the question of economic measurement in an era of rapid technological change, we need to ask: What is the meaning of constant prices? Can we put together any constant prices that have much meaning when technology is changing so rapidly. Take, for example, the Minuteman III missile. We could not have procured several hundred Minuteman III missiles in 1965 for the entire GNP of the United States, but five years later, we started buying them in quantity for a few million dollars each. Now what is the meaning of a constant price series going back 10 or 15 years? Maybe I'm not posing the question very well, but I would suggest that this is a serious problem and that those of you who understand economic theory much better than I do with

my poor knowledge should give some thought to the problem of constant price measurement of successive changes in the state of the art.⁶

⁶Comment: That problem's been solved.

Mr. Lee: Oh, then I wish the CIA would start using it and show some convincing growth rates.

ADDENDUM

(Footnote 5, Page D-9)

Professor Weitzman: I raise this question: Is someone being arbitrarily misleading? Blast furnaces are construction, even though they incorporate a tremendous amount of machinery. Transmission lines for electricity and petroleum or coal exploration and development are classified as construction, even though there's a tremendous amount of equipment involved. The Soviet Union is probably more intensive in those things relative to our economy, so I don't know how much weight can be placed on that.

Mr. Lee: I don't know either, but it would certainly be worthy of further investigation. The Soviets attempt to explain this, but I've seen no mention of this point. They have made the argument that they build a lot more of their new factories in areas where it's cold, so they have to build their walls more thickly. (Another reason for this might be that they are attempting to make their factories more blast-resistant than one might expect. There may be more civil defense activity going on than we realize.) The Soviets also have to build a lot of new housing when they build new factories, and this tends to keep this ratio down. So, there are things to be investigated, but I support the hypothesis that this is the explanation for a relatively small contribution by the technology residual and why the Soviets are running into increasing problems in substituting capital for labor.

Professor Bergson: Since this question has come up, there's one other aspect which should be considered; that is, the ruble price structure compared with the price structure of the dollar, the yen, and so on. Offhand, I would guess that it's possible that the ruble prices of machinery and equipment are quite low, compared with construction costs in Russia, and with respect to the comparable relationships in the U.S. or Japan. Something ought to be checked, because this difference could be a very decisive factor.

Mr. Lee: You're perfectly right; that is a very important consideration. My own suggestion is that this was true 20 years ago, but that it is much less true today. However, it is another factor to be investigated.

Dr. Wolfe: I don't understand your point on trade-offs, unless you're arguing that the opportunity costs in the defense sector are higher than the ruble value of the defense expenditures. In other words, you're saying something about relative prices in defense equipment and understating the civilian opportunity costs. Otherwise, if the prices are efficient prices, then the opportunity costs in the civilian sector would be reflected by the ruble value of the defense expenditures.

Mr. Lee: I'm not quite sure, but let's put it this way. If you have people working by hand and you don't give them better, more sophisticated tools, productivity growth will be inhibited. If you put less into the military, you can give these people tools with which to work. I think that there is also some problem in costing the high technology items. If we understood relative pricing a little better, there may be some slight break in the defense prices, or at least the military get more of the high technology output, even if they pay for it.

Comment: You've got to be saying that the ruble prices of the equipment, technology and capital which they are getting understate the efficient prices.

Mr. Lee: Perhaps.

Comment: I think that this is all you can say, otherwise the ruble value of defense expenditures would reflect their opportunity cost.

Mr. Lee: Again, that's part of the problem; but when you have people working by hand instead of with tools, this is what the Industrial Revolution was all about. You can give them more and better tools and productivity increases -- substituting capital for labor.

Comment: But then, that should be reflected in the ruble prices of the capital.

Mr. Lee: All right, maybe it is reflected in ruble prices, but if you reallocate from the defense to the civilian sector, you would then alleviate some of their problems significantly.

Dr. Burstein: Production is less roundabout in Russia than, say, here. Why should defense be taking more from consumption than from investment? Another point which has been made is that Russian defense is particularly sacrificial to investment. I have not understood why an investment dollar is worth more than a consumption dollar for the same reason that Dr. Wolfe raised. In any case, when production is less roundabout, it seems to me that the present value, proportionately, of the consumption output is going to be the result. The machines that are thus sacrificed would be higher than in a system which is more roundabout, relatively speaking. So, everything that's been said about the more or less primitive nature of Russian production suggests to me that, if you used the present value criterion, you would be sacrificing more consumption relative to investment. These machines don't make machines that make machines for each other.

Mr. Lee: Yes, they do.

Dr. Burstein: That's more roundabout, not less roundabout.

Mr. Lee: I agree with you that, in the long run, consumption suffers, but in the near term, when someone sits down to "divide up the pie" for this year or for the next five years, the consumer is going to get a very small portion of the "machinery pie." He gets around 10 percent and that's it. It may have gone up to 12 percent with the increase in the number of automobiles, but it's still a very small portion. So, the real division between who's going to get which durable occurs between producer durables and the military hardware -- the weapon systems.

Professor Bergson: I think what Bill is saying could be translated in terms of the relation of short and long-run marginal rates of transformation: the short-run marginal rate being given by the existing allocation of capital to the production of different kinds of goods and the long-run marginal rate involving a reallocation of capital as well as labor. Bill could be interpreted as saying that the short-run marginal rate of transformation between consumer goods and defense goods relative to the long-run rate is much lower than the short-run rate between investment goods and defense relative to the long-run rate.

Mr. Lee: Yes, that's exactly what I'm trying to suggest.

SOVIET NATIONAL SECURITY EXPENDITURES:
A PERSPECTIVE

by

Mr. John A. Paisley, formerly Deputy Director,
Office of Strategic Research,
Central Intelligence Agency

INTRODUCTION

On the agenda for this Workshop, I am identified as formerly of the Central Intelligence Agency, and I want to emphasize that point. I'm not here today to defend a CIA position or to represent the Agency in any way.

In my comments, I will depart somewhat from the subject matter that Bill Lee addressed. I'm not going to be dealing so much with substance -- that is, growth rates and levels of expenditures -- as with methodology and its implications for analysis and predictions. First, I will present a limited overview of the nature and origins of the direct costing approach to estimating Soviet military outlays, as opposed to the more traditional way of studying defense expenditures based on defense budgets and other national statistical data. I will also make some comparisons of the direct costing and financial data approaches; comment on the strengths and weaknesses of each; and conclude with some suggestions concerning possible gains to be realized, if the practitioners of the two methods worked more closely together.

The objectives of this Workshop posed the questions, "What is the state of analysis and prediction?" (in this case, economic analysis of defense activity) and "What can be done to improve it?" Bill Lee listed three approaches. I would collapse these into two. The first approach is the study of national security outlays through a combination of various forms of Soviet economic statistics and a knowledge of Soviet economic theory and practices. The second approach is the direct costing of known and estimated Soviet military forces, programs, and activities. To help in understanding the direct costing approach, let me digress a bit to review the origins of the second approach as it came to be developed by CIA.

ORIGINS OF THE DIRECT-COSTING APPROACH

Initially, CIA studies of the Soviet economy were concentrated on a branch of industry (or sector of origin) basis, and the organization of the effort resembled a Leontieff program. Military production per se was but a side-product of the work, and not much was done to try to accumulate the outputs of military products into an overall measure of the defense effort. The CIA role in analysis of the Soviet military establishment was not very great in the early post-World War II years, when economic analysis was focused upon the recovery of the Soviet economy. Basic information on the economy included:

- Published Soviet data,
- Materials assembled by the Germans during the war and captured by the US at the end of the war,
- What was known of industrial facilities being transferred to the USSR as reparations, and
- Such other information as became available from refugee and other sources.

By about the mid-1950s, time had run out with regard to this approach. For one thing, the economic recovery of the Soviet Union was well along and there was just not enough new information on Soviet capital formation and industrial production at the micro level to justify continuation of large-scale efforts in that area. So, a shift was begun toward a more aggregative analysis and, except in certain high priority areas, detailed industrial analysis was reduced. As a result, the work became even less relevant to the study of overall military-economic analysis and to the development of a comprehensive picture of Soviet resources devoted to military programs.

During this period, the military force estimates (that is, the estimates of the kind of forces the Soviets were building and deploying) were developed independently by the US Military Services, based often only on the views of US military planners with respect to the kinds and levels of forces they would want if they were "in Soviet shoes." However, there was some capability to relate force estimates to production capacity at the level of individual weapons (ships and bombers, for example), but this was not rigorously applied across-the-board, and it could not be used to develop an aggregate measure of resources being devoted to military programs. As a consequence, there was no way to relate total national security programs to the requirements such programs placed upon the national economy. Of course, it was well understood at that time that the announced Soviet defense budget was an imprecise and unreliable indicator of Soviet resources allocated to defense.

The end result of developing estimates of Soviet military forces, based heavily on US perceptions of Soviet goals and needs, led to a situation where, when all the forces were summed, the implications for the economy could be very high indeed. At the same time, there was no existing way to evaluate this situation in order to determine if there were any constraint or reasonable upper level of feasibility for these combinations of forces.

So, about that time, the CIA analysts turned the question around. Instead of trying to determine the resources being allocated to military forces from industrial data -- a method precluded by data deficiencies -- they began to calculate the resources that would be required to support the forces which were then being estimated and to consider what this would imply for the economy at the aggregate level. This was the direct costing method in embryo. Initially, it concentrated primarily on the procurement of the major hardware items and served quite limited purposes, but gradually, the method was expanded to include conceptually the bulk of Soviet military activities. However, the initial goal was to develop resource measures in ruble terms for comparison with other measures of Soviet economic activity, such as machinery production. In its original purpose (and in ruble terms), it provided an approximate aggregate measure of resources required to support the military forces believed to exist in the USSR. The detailed nature of the calculations also made it possible to sub-aggregate the data in various ways so as to highlight trends and inflection points in resource flows which, in turn, could be translated into presumptions with regard to Soviet military priorities. In all of this, however, paramount emphasis should be placed on the fact that economic data derived in this manner are a derivative of the force estimates. Such estimates were characterized as "resource implications of estimates of Soviet military forces" -- not as "estimates of Soviet military expenditures."

Over time, this technique was refined and developed into a full matrix of known and estimated cost-generating activities of the Soviet military establishment. It was articulated by means of a sizable computer program which, for any set of forces one wished to examine, would yield the cost implications of those forces both in rubles and in the dollar equivalent, if paid for in terms of US prices. Unfortunately, the level of specificity involved in the computations and provided in the output tended to give many users of the data a misplaced confidence in the precision of the results. Several sources of error were possible, such as errors in the:

- Physical size of the forces and their activities,
- Dollar costs associated with particular weapons or other economic inputs, and

- Ruble values estimated either directly or indirectly through dollar-to-ruble conversion equations.

Of course, varying degrees of confidence were attached to the various data elements inserted into the computer. Some elements were held with extremely high confidence. Others were less well known, but could be approximated with what was believed to be reasonable accuracy. Finally, there were numerous areas, such as the costs of heating barracks, ammunitions expended in training, and repairs, which had to be factored into the estimates on the basis of US experience modified by any available information on differences between US and Soviet practices. I would point out, however, that Soviet programs and activities of greatest interest to the US, because of the threat they posed, tended to be the most well known and best understood of all the data entering the program. The less well known inputs tended to be the support and maintenance costs, which do not change greatly from year to year and, while they are sizable in the aggregate, do not drain much from the pool of scarce or high quality resources available to the Soviet Union.

I've presented this historical digression because I think it is important to an understanding of the present status of this direct costing technique and will perhaps make my later comments somewhat clearer on how to improve analysis and prediction. I have a few comments now about the "budget" approach and its relationship to direct costing.

BUDGET ANALYSIS AND DIRECT COSTING

I will refer to the various combination of methods of analysis and the data derived from Soviet economic statistics by the shorthand term "budget analysis." In comparing the budget analysis approach and the direct costing approach, the main point I wish to stress is that there are positive aspects of each -- as well as limitations. The two techniques have too often been characterized as competing alternatives. That, I believe, is incorrect and shortsighted. I hope that further research and analysis sponsored by both the Government and private institutions (including universities, foundations, and private research centers) will bring the two approaches into a more harmonious relationship.

The strengths of the direct costing method are that the results are related directly to the known and estimated physical military programs and activities and, because the data are developed from the micro level, a wealth of definitional detail in virtually any desired format is possible. The data can be arrayed to portray procurement vs operating and maintenance costs over time, or manpower outlays, or to illuminate trends in individual missions or services. Some potential sources of error relate to the possible existence of an activity that is not

estimated in physical terms and to prices due to imperfect ruble-to-dollar conversion rates for the various inputs. Another disadvantage of the direct costing method, if ruble measures are used to estimate the burden of defense, is that it is constructed so as to conform with US Department of Defense accounting categories which, in all likelihood, is not the same way that the Soviets would view their defense accounts.

Turning now to the budget or statistical data approach, we see that the strengths and weaknesses are inverted. For example, to the extent that one can successfully derive a reasonably confident measure of military expenditures from internal Soviet statistical data, we would have to assume that it represented a fair approximation of how the Soviets view their own outlays for defense. Of course, there is no assurance that a Soviet set of accounts would be translatable directly into the US structure, but one would expect that all major activities would be accounted for. The weaknesses of the budget data approach are basically two-fold. First, virtually no definitional detail is possible with this approach. Depending upon the particular technique used, claims may be advanced (as Bill Lee does) that operating and maintenance (O&M) costs, and perhaps procurement, can be isolated. Beyond that, there is no way that one can even hope to further disaggregate to the military mission or force level. The second and most telling weakness of the budget or statistical data approach is that the community of reputable and experienced scholars who have worked on this problem do not agree among themselves on the results that it produces.

LOOKING FORWARD

Moving onward from the points that I have just made, I would argue that there is much to be gained from attempts to combine the two approaches in some way or, at the very least, to try to develop an approach that utilizes internal Soviet statistical data in an attempt to calibrate the direct costing method against the Soviet pricing structure. Why hasn't this been done before? One answer has already been given; it has been tried and there is disagreement on the results. But perhaps it has not been given a fair trial. Earlier, I made the point that support for basic economic research has been severely curtailed over the past fifteen or so years. This is equally true in Government as well as non-Government institutions. Because the direct costing method provided the level of detail that the user wanted (which the budget approach could not provide), direct costing tended to dominate the analysis. I'm not implying that Gresham's Law was working, but I do think that it is unfortunate that more serious and coordinated attempts have not been made to emphasize both paths of analysis equally and to try to synthesize the results.

I sense that there are some positive signs for the future. First, under Director of Central Intelligence William Colby, the CIA began to

be much more open with regard to the release of formerly classified data which did not jeopardize intelligence sources. This trend has applied particularly to economic data. Mr. George Bush appears to be continuing this policy. As a result, the public debate and press reporting has improved markedly both in the understanding and articulation of the arguments presented and in the level of responsibility shown in the debates over US defense spending. I also feel that there is increased pressure on the estimating personnel themselves because they have more people looking at them and examining their statements. Everyone is better informed, including the specialists on the Soviet economy in the academic world and research institutes -- many of whom were not really close to the direct costing estimates prior to this time. I also sense an interest both in and out of Government in terms of increasing the level of effort in basic research on the Soviet economy. If this occurs, it cannot help but benefit the study of the defense sector.

INTERPRETATION OF MILITARY-ECONOMIC DATA

Thus far, I have spoken only of techniques to develop economic data relating to military activities and to improve their accuracy and their relevance to military-economic analysis. Certainly, if higher confidence data could be developed and if the details developed by direct costing could be linked to Soviet planning data, the ability to evaluate both present and future economic behavior, performance, and decision making would be markedly improved. But even if detailed Soviet military budget data of unquestioned authenticity were available, there is still room for variance in interpretation -- as we are all well aware of as the result of the internal debates on US military-economic matters. Now, I would like to touch briefly on some persistent and sometimes pernicious misunderstandings of the estimates of military expenditure that keep cropping up in the press and, often, even in official documents as well. Here is a list of some of the more significant misunderstandings:

- The idea that there is a single-valued "true" cost of defense:

Concepts of defense costs vary from country to country and even within a country -- depending on the particular facet of the problem being examined. Defense budgets flow from accounting conventions and seldom from any rigorous attention to a "full cost" concept. In international comparisons, particular care must be exercised in order to ensure comparability. In my view, this will be one of the most difficult problems to solve in any attempt to calibrate the direct costing approach with Soviet budget data.

- The use of annual military expenditure data as a surrogate for military strength:

Military budgets represent annual money flows -- part of which involves maintaining present strength and part of which involves

increments of men and weapons. But, in no sense, does an annual budget represent a stock or inventory value. If it were possible to develop comparisons of the value of total military stocks, some interesting and useful analyses might be performed, but equating monetary cost to military utility would still be very tricky indeed.

- Confusion in the meaning of ruble and dollar measures:

This is a perennial problem. Life would be simpler if one could stick with one or the other. Bill Lee would like to deal only in rubles -- as would anyone who deals primarily with internal Soviet processes, decisions, and resources. But, the monetary language of US officials is "dollars", and the use of dollar values computed in the direct costing method often goes well beyond the limited meaning of the data -- which is only a monetary expression in familiar terms of what the same flow and mix of resources would cost if purchased in the US. If this is not a meaningful measure, as some people believe, it still seems more preferable to calculate it, exercising care to weight the results by the different purchasing power relationships that exist in the two economies, than by using only the artificial "official exchange rate" -- otherwise the latter method would be widely used anyway.

CONCLUSIONS

To sum up my views on the state of analysis and prediction in the military-economic area, I would characterize the patient as being in a stage of early maturity, somewhat undernourished and abused, but all-in-all in a condition where the prognosis is hopeful, providing:

- That direct costing analysis and the study of the broader Soviet economy are joined in more cooperative efforts and calibrated against each other;
- That there is a greater infusion of resources on the study of the USSR as a whole, and its economy in particular; and
- That this will lead to more theoretical and practical work so as to focus the analysis on the meaning of military-economic data for US policy planning.

FORMAL COMMENTS ON THE PRESENTATIONS OF MESSRS. LEE AND PAISLEY

by

Mr. Kurt Kruger, Office of Economic Research,
Central Intelligence Agency

INTRODUCTION

Over the years, I've been a critic of both what's called the unconventional approach and what's been called the conventional approach. Basically, I agree with the conclusions of both Mr. Lee and Mr. Paisley; namely,

- Mr. Lee said that we need more basic research and a periodic reexamination of our assumptions, and
- Mr. Paisley has said that the two approaches are not mutually exclusive alternatives.

Unfortunately, they have been viewed as alternatives, but it is now time to look and to use both approaches simultaneously. In the long run, neither approach can produce reliable estimates without the assistance of the other. Mr. Lee's approach, as currently formulated, is a viable first step; that is, using

- A residual from the machine-building gross value output (GVO);
- The published Soviet defense budget, as representative of operating costs; and
- An analysis of Soviet science expenditures.

However, at the present time, I do not believe that the machine-building residual technique can yield sufficiently accurate values for independent estimates of military hardware.

THE MACHINE-BUILDING RESIDUAL

The Central Intelligence Agency estimate of a machine-building residual for 1970 -- a military residual in the economy which would represent hardware -- ranges from about 13 to 27 billion rubles, with the best estimate around 20 billion. Bill Lee attained similar results and a similar margin of error around his estimate. You don't know enough until you combine these results with the direct costing approach or until you refine your residual from machine-building through an

analysis of the Soviet reporting methodologies. I think that the latter can be done.

The assumption that the published defense sector can be used as a surrogate for operating costs is a heroic assumption, because even Bill Lee, in using it, admits that:

- Prior to 1950, it represented something else,
- After 1970, it also represents something else, and
- Only in the intervening years does it represent operating costs.

We know that it's a political tool which can be very easily manipulated. We know that it reflects, if anything, Soviet pricing, which can change over time (i.e., relative subsidies can change) and, to use it unmodified as a reflector of operating costs, is something with which I just cannot agree. We do not have a sufficiently accurate definition of what is included in the published Soviet defense line item in the budget in order to be sure that it includes only operating costs. We have had reports that, conceptually, it includes everything, but not all of the expenditures for everything.

THE SCIENCE AND RESEARCH AND DEVELOPMENT FIGURES

Insofar as Soviet science is concerned, Bill Lee stood alone for a long time in saying that the figure for Soviet science was not inclusive of all science and excluded some military science. I think that the intelligence and academic communities which have examined this problem are now in general agreement that the science figure is not complete and that it cannot be used alone to derive estimates of Soviet expenditures on military R&D -- nor can it be assumed that its trend reflects that of all Soviet R&D expenditures.

CONCLUSION

I hope that both approaches, direct costing and examination of national economic data, will be used in the future to estimate Soviet defense expenditures. Furthermore, not just the approaches outlined by Mr. Lee, but also other ways of approaching this question from a variety of directions should be pursued. This includes the budgetary approach which Mr. Lee outlined in his forthcoming study as support for his findings. This approach has not been pursued independently, and studying available funds and trying to "residualize" these funds accurately should be considered. I have seen indications within the intelligence community that the multidirectional approach to estimating defense expenditures is gaining support. I am in favor of using a variety of estimating techniques in order to derive the best estimate of these expenditures.

FORMAL COMMENTS ON THE PRESENTATIONS OF MESSRS. LEE AND PAISLEY

by

Dr. Steven Rosefielde, Assistant Professor of
Economics, University of North Carolina

INTRODUCTION

I've set an ambitious task for myself, which is to try to tease from the recently revised CIA figures concerning Soviet ruble expenditures on defense what is and what is not consistent with regard to our estimates of Soviet defense expenditures. This task is difficult, not simply because it is complicated, but because we would need a complete conference to really get at this matter in sufficient detail. Therefore, let us proceed without perorations to the newly released CIA estimates of Soviet defense expenditures.

CIA'S REVISED ESTIMATES

I don't know how many of you have received the CIA publication entitled "Estimated Soviet Defense Spending in Rubles (not dollars), 1970-1975". This publication tells us a number of things -- first and foremost of which is that, on the basis of new information, Soviet defense expenditures for 1970 in rubles were suddenly revised upwards from 24 to 48 billion rubles. This is a startling revision. Statistical discrepancies of 3-4 percent are commonly encountered in quantitative work, but not 100%. What's the explanation?

THE HARDWARE ERROR

First, it should be noted that the hardware estimates are off much more than the overall estimates. This can be seen by looking at the structure of aggregate Soviet defense expenditures. Most of the additional expenses uncovered are not in payments to manpower, but are additional costs in weapons procurement. If the hardware component is isolated, the revised CIA figures imply a 200%, rather than a 100%, statistical error. We are dealing with a change of rather unprecedented magnitude. To be in error by 200 percent is, I think, really shocking. It raises the possibility that our perception of the Soviet postwar defense effort has been grossly erroneous.

IMPLICATIONS OF THE SOVIET DEFENSE BURDEN

What are the implications of this revision in the CIA estimates of Soviet military expenditures as the CIA itself assesses them?

First, we are told that the new information does alter our calculation of the national defense share of GNP from 6-8 percent to 11-13 percent. I totally agree with this change. Second, the new information alters our perception of the efficiency of the Soviet defense industry. This, too, is difficult to argue with. Presumably, we know or have some good estimates of what the Soviet stock of military weapons is. If you discover today that it costs you three times as much to produce the things which you produced yesterday, then obviously, the Soviets are less efficient in production than we had previously supposed. This is all I mean when I say that I'm impressed with the argument in the CIA document that the Soviets are less efficient in defense production than we previously thought.

Also, we are told that the revisions alter our perception of the military burden on Soviet economic growth. Again, this is reasonably clear. Although at first these conclusions might appear to be innocuous, they're not. As the CIA correctly notes, the burden of military expenditures on the Soviet national economy now seems to be substantially greater than we previously thought it was. If the Soviets could release 25 billion rubles from the military and put this amount into other investments, then they could have more consumption goods, both now and in the future. A massive military program appears to impose a huge opportunity cost on the Soviet civilian economy.

There's a more subtle implication here which I would also like to try to draw out. In the past, it had been assumed that the relatively low cost of Soviet military procurement implied that the military sector of the Soviet economy was relatively more efficient, as compared to non-military production of machinery and equipment. Furthermore, it was argued that the USSR was becoming more and more efficient in terms of production over time. In the long run, it would appear that the Soviets could increase the magnitude of their military hardware procurement at relatively low cost or social burden. They could subtract resources from one sector of the economy, add them to this very efficient military sector, and obtain a large output. This implied that the US might not be able to compete successfully with the Soviets in a sustained arms race. However, this inference is no longer tenable because the military machine-building sector appears to be no more efficient than any other sector of the Soviet economy.

EVALUATING ADDITIONAL ASSERTIONS

Thus far, the conclusions drawn by the CIA appear to be logically valid. Other assertions, however, are less defensible and pose serious questions of fact and interpretation. It is stated that the new estimates of Soviet defense expenditures do not imply the following things:

- First, they do not affect our appraisal of the size or the capabilities of Soviet military forces. That's a direct assertion on page 1 of the document.

- In addition, the CIA states that the new estimates do not have an important effect on dollar cost estimates of reproducing Soviet defense programs.

These are basic assertions which, I feel, shouldn't be taken at face value because internal evidence suggests that they are inconsistent.

INCONSISTENCIES

At a recent seminar in Cambridge, Massachusetts,⁷ Mr. Douglas Diamond and some other members of the CIA admitted that 25 billion rubles of Soviet GNP could not be accounted for in Soviet national income accounts due to revision of the estimates of Soviet defense expenditures. If this discrepancy is "backcast", unexplained Soviet defense expenditures during the 1960s could reach several hundreds of billions of rubles. An attempt was made to explain this discrepancy by suggesting that the additional 25 billion rubles could be covered by the statistical residual in the original CIA accounts for the year 1970. Bill Lee informs me that this is not true, but we need not quibble. The thrust of the CIA document is that the error in the estimates of Soviet defense expenditures in rubles can be explained by erroneous ruble/dollar ratios. I would like to suggest that this is not true.

Of course, if the ruble/dollar ratio were erroneous and our total estimates were off by a factor of two, all that one needs to do is to multiply our dollar estimates of Soviet defense expenditures by two, and then, the ruble cost of the Soviet defense effort will be doubled. That's very straightforward. Whether this procedure is valid, however, depends upon whether or not we can make the trends before and after 1970 consistent with known expenditures from the Soviet budget. I would therefore like to assert on the basis of my own calculations that, if the CIA can fit the missing 24 billion rubles into the 1970 budget, they can't do it for 1969 and they can't do it for 1968 because the 3 percent growth rate estimated by the CIA for the production of the military hardware in those years implies a continuously increasing statistical discrepancy. All that you have to do is "backcast" at 3 percent per annum to find out what the implied budgets are for 1969, 1968, and 1967. Then, you will discover

⁷ Seminar on Soviet Defense Spending at the Russian Research Center, Harvard University, August 21-22, 1976.

that the discrepancy explodes beyond all plausible explanation.⁸

I'd like to bring all of these inconsistencies out as we go on. I'm very tempted to stop now, having successfully provoked a heated discussion, but this is exactly how the implications appear to me. Let's not fight over the facts, because I'm not privy to the classified data upon which the revised CIA estimates are based. I don't know the covert facts, and it is easy to make me look silly on points of detail. But, I can say something, I think, about what looks to me to be the consistency of the material, as is presented in this document, and I can draw some implications from it.

Suppose that somebody who is knowledgeable with respect to the particulars of the Soviet defense budget defected to the West. He knows all the numbers, and he gives us a figure which is much higher than the CIA now estimates. What does this imply about our methodologies for understanding real Soviet defense expenditures? I'm not talking about opportunity costs. I'm just trying to get at what the orders of magnitude are. I suggest to you that this kind of a question leads to the kind of thinking which follows.

QUESTIONING THE CIA'S WEAPONS COUNTS

If we are correct that an error was made in 1970 -- that Soviet defense expenditures in rubles are much greater than we thought they were and that this can't be rationalized in terms of a ruble/dollar

⁸Mr. Parker: If you assume a very much higher growth rate.....

Dr. Rosefielde: Then you can make it consistent.

Mr. Parker: But, there's the assumption here that we have good deflators of the Soviet economy, and that's not at all clear. In fact, it may be that ruble costs have skyrocketed selectively with regard to defense.

Dr. Rosefielde: But, there are two hypotheses. Either there's a much more rapid inflation in defense than elsewhere in the economy, or real defense expenditures have grown much faster than previously supposed.

Dr. Heymann: I would submit that there is a substantial amount of evidence that there was, in fact, a considerable inflation in costs.

Dr. Rosefielde: But, if you look at the physical composition of the procurement, you can postulate very large increases in costs for the same things. An alternative explanation exists, which is that the equipment is getting much more sophisticated.

ratio -- then the question we have to ask is: Where is the error? If it's not in the ruble/dollar ratio as a mere monetary phenomenon, then where can it be? I would like to suggest that it can be in either of two places: in the weapons count or in the quality of the weapons. From my work in this area, I've discovered that there seems to be a "sacred cow" in this business which says that the weapons count can't be wrong. As an outsider, I can say that I distrust "sacred cows." What I know about the weapons count makes me somewhat suspicious. You send a satellite up; you see a factory; you measure the number of square feet in the factory; and you try to figure out how many weapons are produced inside that factory. I'm a little doubtful with regard to the accuracy of such estimates. But, regardless of that particular point, what about quality? Over time, as everyone knows, the quality of Soviet military hardware has improved so that, if defense goods are computed with base year equipment unadjusted for quality change, a mere physical inventory of Soviet weapons may seriously understate the real volume of effective Soviet weapons. At the same time, dollar and ruble costs are understated by failing to measure the true volume of primary inputs needed for their production.

What might this underestimation imply? Perhaps nothing. Presumably, if the people in the Department of Defense who conduct war games accurately understand the quality of the Soviet weapon systems, then they have taken the changes in quality into consideration. That may be one possible explanation. Another possibility, however, is that we have only a rough idea of the quality of Soviet weapon systems. If we initially accepted the dollar figures for Soviet weapons as a measure of the Soviet defense effort (which was obtained by counting the weapons and then utilizing direct costing in dollars to figure out what the weapon system cost) and now, because the quality of the weapons is vastly superior to what we thought it was before, increase the dollar value of those weapons from 140 billion dollars in the CIA document to 240 billion dollars, would it affect our military analysts' perceptions of Soviet military power? I just don't know, but this potential discrepancy in the magnitude of the Soviet defense effort is one of the implications that emerges from a careful look at this document.

QUALITATIVE ERRORS

On the basis of the foregoing discussion, it may not be too rash to suppose that our perception of the quality of Soviet weapons expressed in dollars or rubles is incorrect. I say dollars or rubles,

because all ruble and dollar figures are obtained from the very same estimate of physical outputs. It is important to understand this point. By constantly switching the frame of reference from rubles to dollars, to physical units, to current prices, to index number relativity, it is quite possible to hopelessly obfuscate the issue of Soviet defense expenditures. In fact, it sometimes appears as though people try to hedge their bets on Soviet military expenditures, depending on what they think will be the psychological effects of the level of defense expenditures on others. In the process, these individuals keep a "little piece of the game" to themselves, hidden away in their pockets, which makes analysis very difficult indeed. Therefore, it should be clearly understood that the discrepancy concerning the magnitude of Soviet defense expenditures is not an index number relativity problem, and is not caused by different currency numeraires, but is present in constant value, whether rubles or dollars, and reflects a fundamental inconsistency either in our physical estimates of Soviet weapons, their quality, or both.

CONCLUSION

In conclusion, I would like to suggest that it is not possible to formulate a rational appraisal of Soviet military intentions on the basis of inconsistent data. Since this is obviously a vital matter, a major effort should be undertaken to reconcile these inconsistencies and to ascertain the facts regarding weapons count and the handling of quality in the measurement of the Soviet defense effort.

COMMENTS ON THE PRESENTATIONS OF MESSRS. LEE AND PAISLEY

by

Dr. Martin Weitzman, Professor of Economics,
Massachusetts Institute of Technology,
and Other Participants

DR. WEITZMAN

For my part, I'd like to return to what Steve Rosefielde was saying and try to understand that a little better. Steve said that the CIA revised its ruble estimates of the Soviet budget, presumably by the following sort of process:

- First, it went through its direct counting of weapons output -- however this is done -- but didn't change these figures.
- The revisions occurred in the CIA's estimate of the ruble value of the output -- the ruble cost of producing the weapons.

My understanding of these computations is that the CIA studies a piece of Soviet military equipment and, through knowledge of U.S. manufacturing costs, determines a dollar value for the equipment which is then converted into rubles. Now, apparently, some information has surfaced which indicates that we should be converting to a much higher level of rubles per dollar. What is the inconsistency which that implies? That's the part that I didn't understand.

Dr. Rosefielde: When you recapitulate, you want to make sure that you can account for the total allocation of the gross national product in the Soviet Union. Previously, we said "X" share of GNP is investment; "Y" share is consumption; "Z" share is military expenditures; and there's a little residual. Now, we're saying that, in terms of our ruble values of the Soviet gross national product, more is being spent on the military than can be provided by the gross national product. We want to know where it is.

Dr. Weitzman: Is there any "quick and dirty" answer to this question?

Dr. Rosefielde: At the Harvard seminar on Soviet defense spending, Douglas Diamond said that there was just enough (25 billion) in the residual to cover it.

Professor Bergson: You mean free floating rubles? There's so much interest in this subject that I think we should ask Mr. Kruger to comment upon it a little further.

Mr. Kruger: Well, for one thing, we have a set of revised defense estimates, but we do not have a set of revised GNP estimates.

Professor Bergson: The revised defense estimates cover which years?

Mr. Kruger: Just 1970 to 1975; we do not have them revised for the entire stream of years for which we've analyzed the GNP.

Dr. Weitzman: Is the revision along the lines of which I spoke? Did the CIA just go back and redo it year by year with the new ruble/dollar ratio?

Mr. Kruger: For the defense expenditures, yes.

Dr. Rosefielde: No, the CIA couldn't have gone back because, as Kurt says, 1970 is where the inconsistency begins.

Professor Bergson: So far, what we have is a new series of ruble defense figures obtained from dollar defense estimates which are apparently not revised and based on a new translation of those old Soviet defense dollar figures into rubles for the period 1970 to 1975.

Mr. Kruger: That's correct, and we're in the process of deriving estimates for Soviet defense for years earlier than 1970. However, the GNP accounts have not been revised since the defense estimates were revised. So, there would be an apparent inconsistency if we had a set of GNP figures which were created around defense estimates that were on the order of one-half or 60 percent of what they are now. We are going to be revising our GNP estimates in the next year but, until we do that, any explanation of where the additional defense expenditures impact on the economy will remain unknown. We may have some preliminary guesses, but the research has just not been done. So, it would be premature for me to assume the impact of the revised expenditures on other sectors of the economy.

Mr. Parker: Using the more aggregative approaches, however, we can do more than just guess. There are some data which bear on the problem. I don't regard these data as definitive, but they're there, so it's not just a wild guess that we're making -- there is some basis for it.

Mr. Kruger: Yes, for one thing, there's sort of a non-argument here because you're relating current Soviet defense expenditures by means of available funds in their production data, their national

income statistics, or their budgetary data to a problem in which we have Soviet GNP and Soviet defense expenditures in constant rubles -- utilizing our definition of constant rubles.

Dr. Rosefielde: What is the base year for your constant rubles?

Mr. Kruger: 1970.

Dr. Rosefielde: Then, there's no problem; that's the year we're talking about.

Mr. Kruger: No, but you say there's a problem if we go to 1969, which is not necessarily true. The rapid growth rate that would be necessary in the data on current Soviet defense expenditures in order to reach a figure of 50 to 60 billion in 1975 does not necessarily have to be present in a constant ruble GNP or defense expenditure series. I don't know whether it will or will not be present because we have not redone the GNP accounts. But, what you say is not true a priori, because there's a high growth rate in current prices. We're going to encounter the same phenomenon in constant prices.

Mr. Parker: Look, there's a set of calculations that you may find consistent with the data which would lead you "out of that box." However, before these calculations are performed, there's some suggestion that, when you gather the data to do those calculations, you may find yourself still "in the box." At the moment, that seems to me to be more than just a guess -- but really the best guess that one could make based on the kinds of aggregative data that we have.

Professor Bergson: Could you explain what you mean by "being in the box?"

Mr. Parker: "The box" is essentially that the 3 percent annual increase in defense expenditures in real terms is not correct. Some substantially higher rate is necessary for all the figures to go together. This is what it looks like to a reasonable person who has to bet money, recognizing it as a gamble with still a fairly high variance.

Dr. Weitzman: Steve Rosefielde brought up the question of whether or not this is consistent with the previous Soviet accounts. Those Soviet accounts were developed by the CIA with the errors that are inherent in such a process. Are those errors of an order of magnitude to cover this kind of thing or aren't they?

Dr. Heymann: I can make one point here. It's all very well to talk about an inconsistency or a non-fit with residuals, but we have to bear in mind that the GNP figures are also subject to substantial uncertainty insofar as the definition of what goes into the categories of Soviet financial accounts. There is certainly not a very high degree of confidence that we fully understand just what is included in

the category of capital investments. Are they all, in fact, capital investments, or do the Soviets treat some kinds of military procurement or allocations to strategic reserve as a capital investment? We don't know. The residuals that have emerged from analysis of the national economy in the Soviet publication of national income accounts are also quite open to question. We have a number of imperfect instruments of assessment, all of which are open to question. No one of these instruments gives you a solid base from which to check your estimates. Therefore, I think it's a bit curious to be talking about the critical inconsistency between one and another of these instruments.

Mr. Parker: You need to say something stronger than that. There are numbers. Now, there are inconsistencies among these numbers and those inconsistencies need to be recognized. This suggests that the things which those numbers measure are, in one way or one place, inconsistently made. Those are two quite different statements, and I think it's very important to keep the two sorted out. At this moment, there is an internal inconsistency in the numbers, and you would therefore have to look for some bias or error in the things that those numbers purport to make. It's a perpetual problem of new discoveries of information, new insights, and calling to question old assumptions and old evidence. I have never been happy with any notion that any set of numbers published by anyone is sacrosanct. The one thing which I think is underestimated by everyone here is that there was indeed recovery of a substantial new amount of ruble costs and prices. Many of these costs had been around somewhere, but hadn't been assembled; some of these costs were newly acquired by dint of a strong collection effort; and some costs appeared in unclassified publications that have turned up. That information has dramatically changed our perception of the cost of Soviet weapons and, from the mid-1960s until today, there is also substantial evidence of the increasing complexity and sophistication of these weapons. In principle, I am not at all surprised at the revisions that have occurred. It's just a cumulative lag in the appreciation of these new phenomena. It's unfortunate that this all lunges on the scene at one moment in time. In fact, it reflects an ongoing process that's been at work for quite a number of years. We were just not aware of it. The research took a long time, and it's far from complete. Moreover, the research is not terribly good and requires an enormous number of people to do it. But, it's the best we've got. Certainly, we have the persistence to plow ahead and to plod away at improving our estimates, but the improvements will always be inadequate, marginal, and unsatisfying. It's a terribly tough problem.

Professor Shubik: I have two slightly different questions. The first major question is: How do Soviet experts estimate U.S. expenditures for defense? Spin-off questions to this question are: What do they believe the total expenditures are, and how does the Soviet estimate of the U.S. defense budget influence the Soviet analysis of Soviet defenses and how they make up their own defense budget? The

second major question is: When comparing Soviet and U.S. defenses, how do U.S. experts correct the facts so as to account for taxes and accounting fudge factors? It is quite clear to anyone who's ever had anything to do with military procurement that the structure of procurement includes taking care of "the boys", the conferences, the salesmen, the tax override, and the peculiarities of the unique U.S. institutional system. In the Soviet Union, there must also be some arrangement, but what is it and how are our facts corrected to account for it.

Professor Morgenstern: Among my books which have been translated into Russian is one entitled On the Accuracy of Economic Observations. The introduction was written by the Russian editor who translated it for me. He wrote, "It's interesting that Morgenstern, a capitalist and orthodox economist, finds statistics to be total errors." Then, he continues, "He also makes some observations about statistics in communistic and socialistic economies, but since these are observations coming from a capitalist bourgeois economist and obviously have no value, the editor in his wisdom has omitted those passages." I found that very peculiar.

I had visits separately by two Russians. I won't identify them, but one is an academician in the U.S. During the conversation, I said, "How is it possible that you publish something like this in Russia?" (Incidentally, 14,500 copies of the translation were printed, which is a substantial number for a book of this kind.) He said, "You don't understand what the remark means. The meaning is to put the nose of the people who read this onto the fact that our statistics, for the major part, are lousy." That is what the academician told me. When there are certain ideological differences between two countries, it is important to keep in mind how difficult it is to interpret correctly the meaning of words and statements.

Undoubtedly, we know what payments are being made one way or the other. Work of this kind is being done. For example, I can well imagine an increase in costs occurring as follows:

- First you have your army marching on foot, and then you put them in trucks, which costs much more money, but represents great technological progress.
- On the other hand, you could use a plane like the one that landed in Japan a few days ago without being discovered by the most sophisticated radar systems we have.

What does it all mean? It forces the United States to completely revise all our radar technology and expenditures because, clearly, something has happened which requires a new analysis. This is the pressure of one technology on a related technology. To my mind, what that means in dollars or rubles is of less importance.

Dr. Weitzman: Let me ask one additional question: Am I correct in presuming that the CIA's basic information is predicated on inventories of large Soviet weapons and that figures on production flows are deduced from shifts in the basic inventory data? I pose this question because John Paisley surprised me when he said that we don't have good information on inventories.

Mr. Paisley: What I meant was that we have not systematically computed comparative values of inventories in the U.S. and U.S.S.R. There are some problems in comparing an aircraft or ship produced 20 years ago and an aircraft or ship produced 10 years ago. How do you carry that value through to today? You can look at its original purchase price or you can depreciate it over time. These sorts of problems have not been fully solved. The point I was making is that, if you're going to use monetary measures as some kind of surrogate for military power, don't do it on the budgetary measures -- do it on an inventory basis, and it has not been done. I think that there are attempts being made, but there are some fairly serious methodological issues that need to be resolved with regard to how to go about it. These issues relate not to the actual existence of military stocks, but rather to how their value is computed and aggregated.

COMMENTS ON THE PRESENTATIONS OF MESSRS. LEE AND PAISLEY

by

Dr. Michael Montias, Professor of Economics,
Yale University,
and Other Participants

PROFESSOR MONTIAS

Since I'm not a specialist in budgetary matters, I'll simply confine my comments to several questions. We've all been tantalized by the missing 20 to 30 billion rubles in the 1970 estimates of the Soviet defense budget and by the hints that have been dropped by Hans Heymann and others with regard to new evidence on costs. In this connection, I'd like to press on a bit further.

Suppose, as I suspect is true, that our estimates of the ruble costs of the procurement items in the CIA estimates were based upon price handbooks. These handbooks reflect the prices of a given year -- the last year when prices were revised. In the meantime, if costs have risen, then the industries producing these items will receive subsidies. One possible explanation of an underestimation of 25 billion is that certain large amounts of subsidies were received by these industries, but were not registered in our estimates of the so-called procurement costs which were based upon the actual delivery prices.

Other things might also have happened. The technique of basing prices on the handbooks depends upon the choice of certain key items in the handbooks (the handbooks contain thousands of different quality items) and then comparing them with American items of the same type. If the sampling of these items is wrong, if we've underestimated the average quality of items, if we've selected low-cost items rather than what are really average-cost items, then we will underestimate costs. If there's a systematic bias in this direction, it may, in the long run, account for large ruble costs.

Finally, of course, there may be a number of items produced in the Soviet Union on a contractual, cost-plus basis; I would think that many R&D intensive items would be of that sort. These would not be reflected in the price handbooks. Therefore, by basing estimates on price handbooks, we may be systematically underestimating the rising costs of those weapons which tend to be of the cost-plus type.

Mr. Kruger: The price handbooks have not really been fully exploited. I don't believe that the ruble prices reflected in them at the present time are used to derive ruble/dollar ratios for either the civilian or military sector. In the civilian sector, we have relied heavily, until recently, on ruble/dollar studies based on the 1955 price handbooks. There's a new study under way to derive new ruble/dollar ratios from the new price handbooks. Then, we will have a set of new ruble/dollar ratios to compare with the old ones. The price handbooks, however, are not the basis on which the ruble/dollar ratio used in the defense sector is derived.

Dr. Heymann: Can you tell us generally what was the basis of the old estimates before the revision was made?

Mr. Kruger: The basis was a collection of prices for various items of Soviet military equipment.

Dr. Heymann: Which you've pieced together, but you don't have even a reasonably random sample of these items.

Mr. Kruger: There is a very limited sample.

Dr. Heymann: The most useful kind of information that we have on the quasi-military sector is not preiskuranti, stravochniki, optovokh, or tsen, but studies that are aids to the builder of major equipments, such as: merchant vessels; heavy complex, off the road, construction equipment; and things which contain construction cost elements.

Dr. Montias: Yes, but these are contained in estimators' handbooks. I have used these handbooks in studies of East European countries and have found that their prices may deviate systematically from actual costs and prices.

Dr. Heymann: I'm quite sure that they do deviate. Have you discovered in what direction and for what reasons they do deviate systematically?

Dr. Montias: When I studied Poland in the mid-1950s, there was an underestimation in the order of 10 to 15 percent. But, as I mentioned earlier, I would think that the cost estimators' handbooks would tend to overemphasize the costs of typical construction items and underestimate the atypical R&D intensive items. The latter items may result in a systematic bias toward underestimation.

Professor Bergson: You're saying that this type of information is used to derive the new, higher defense figures. Mike Montias' implication is that, perhaps, the figures should be still higher.

Professor Arrow: I'm surprised; I was hoping that you'd tell us about some method which would give one even greater credits.

Professor Bergson: If I may, I'd like to intervene in this interesting question which we have been discussing. The question is: What are the implications for persons concerned with appraising Soviet defense expenditures and the Soviet economy in light of this dramatic revision of the CIA's figures? I assume that, in due course, the CIA, if it's persistent, will be able to reconcile the new figure with a variety of other data that are available. Hans Heymann suggests that there is a certain amount of "give" in the data -- that is, by pushing some of the figures here and nudging some of the other figures there, we can hopefully fit them in with the other data and make some plausible adjustments. With the information we now have, the moral seems to be that there is a very sizable margin of error in our estimates of Soviet defense expenditures in rubles. This error carries over to certain larger categories and to their allocation of GNP, though not to the same degree; i.e., what is 100 or 200 percent for defense may only be 5 to 6 percent for the GNP.

Moreover, I think that this margin of error will be associated with the new figures as well as the old figures. Until we have more information on how our estimates were wrong, on where we are able to improve the estimates, and on what have we to work on now, we are simply in a situation where any of our figures may be subject to an appreciable margin of error. This applies to the new ones as well as the old ones. Maybe there is some sense in the hypothesis that the new ones are somewhat better than the old ones, but we don't have very much information upon which to make this choice. All we know is that you have reason to believe that the figure for the ruble/dollar ratio has to be increased by 100 or 200 percent. Anyone who doesn't have access to your classified material is in the dark on this question. Until now, in-depth information is released as to what motivated you to make this change, this big margin of error has to be associated with the new figures as well as the old ones. That's the moral which I read into this situation.

Professor Arrow: Is it true that the revision of Soviet defense expenditure figures is simply a question of the ruble amount? My understanding is that the real state of Soviet military capabilities is not at issue here. We apparently have other evidence in this regard.

Professor Bergson: Do you mean capability in terms of physical items?

Professor Arrow: No, presumably in terms of quality too. Let me rephrase my point. Suppose that we agree that the actual Soviet military capability is known from other evidence and that our only uncertainty is with regard to these ruble figures. Would this tell you anything? Presumably, the significance of the ruble figure would be as an exchange ratio between civilian and military goods. If it's quite arbitrary with

respect to how they choose to price goods (and they might charge the military very different prices from those that they charge the civilians), then this discussion may be valueless. Is it possible that these rubles which you've discovered would be a measure of the trade-off between civilian and military goods?

Professor Bergson: Ken, you're raising a very major question which can't be answered in a minute. I think that there is a feeling that there's some relation between ruble prices -- after some adjustments for taxes, to which Professor Shubik referred, and for subsidies -- and rates of transformation. Ruble figures are important. A lot of analysis by Western economists of what's going on in the Soviet Union makes use of ruble figures on the basis of this assumption.

Dr. Wolf: Let's return to Ken's question. If you accept the premise that we know the size and capability of Soviet forces (both the human and physical systems), of what national security import is the "true" ruble magnitude of Soviet defense expenditures?

Professor Bergson: My immediate reaction is that we could analyze Soviet capabilities without reference to ruble figures. We have the physical data. If we wanted to aggregate, we could do so in terms of dollars and make comparisons. But when you get into questions like defense burden, competing uses of resources in the Soviet Union from the standpoint of the Soviet government, you have to introduce rubles.

Mr. Parker: I think that a very important point was brought up earlier; namely, if you have a rough approximation of opportunity costs and if you can estimate the trends over time (and I will talk more about what I think these trends look like later), you may obtain some evidence which will give you clues to Soviet intentions. This is particularly true if, for example, the trends in general economic growth and in defense expenditures are diverging in one way or another.

Furthermore, with regard to the issue of measuring opportunity costs, I understand that some people here have looked at these data and think that the accounting numbers (the ruble/dollar ratios) don't reflect the phenomenon of the priority treatment of the Soviet defense industry; for example, its input waiting lines may be shorter; the quality of the materials, which are accounted for in the same way, may be higher; and the components shipped to defense may be selected for special quality. As a result, you may feel that the opportunity cost which, as presently measured, does not capture any of these statistics, should be higher. Therefore, the burden of defense on the economy is even higher still. But, that observation is complicated by the fact that, if these things were instead transferred to the civilian economy, they might, in part, be treated in a more wasteful way. The subtleties of measurement are very great. In many cases, these measurements do not require access to specially privileged information and can be studied very productively by outside institutions.

I have one other point. Four years ago, if you received an estimate of Soviet defense expenditures through official channels and asked what the uncertainty was, your response would be plus or minus 15 percent. When you read the new numbers and ask what the uncertainty is, it's again plus or minus about 15 percent. They may have some reason to say that, with a 100 percent revision, the error may be something excessively small. After all, they do have new knowledge. I think that taking the range of these two estimates is excessively large.

Professor Bergson: The only reason that I said what I did is that we have no information on what underlies the revision. We have no independent basis upon which to judge. All we know is that there are some intelligent people in the CIA.

Mr. Parker: You do have some information in some sense that the current estimates are at least more consistent with these dreadful national income estimates that we've been producing for some time.

Professor Bergson: That hasn't been worked out yet by the CIA.

Mr. Parker: No, but it has been worked out by other people. The point, however, is that, when dealing with an area where there are important policy debates, if there is this large amount of uncertainty when you describe the trends, then it's enormously important that the policymakers be exposed to alternative sets of calculations -- not just to an official number that rises up through some bureaucratic organization. One of several important concerns which this Workshop can focus upon is the necessity for some promise of advocacy being generated in an area such as this. This is the best way to expose the range and character of our focus to people who have to make decisions based on imperfect analysis. Bringing outsiders into work in a more systematic way is a very important matter to consider.

THE MORNING SESSION, SEPTEMBER 14, 1976

APPENDIX E

TABLE OF CONTENTS

	<u>Page</u>
<u>Policy and Prediction: Perspective II</u> by Dr. Gus Weiss	E-1
<u>Formulation of a National Security Policy</u> by Dr. Oskar Morgenstern	E-12
<u>Formal Comments on the Presentations of</u> <u>Dr. Weiss and Professor Morgenstern</u> by Dr. Steven J. Brams	E-22
<u>Formal Comments on the Presentations of</u> <u>Dr. Weiss and Professor Morgenstern</u> by Dr. Bernard Brodie	E-26
<u>Formal Comments on the Presentations of</u> <u>Dr. Weiss and Professor Morgenstern</u> by Dr. Charles Wolf	E-29
General Discussion	E-33

POLICY AND PREDICTION: PERSPECTIVE II

by

Dr. Gus Weiss, Council on International Economic Policy,
Executive Office of the President

CONCEPTUALIZING ECONOMIC WARFARE

Let's assume that you were placed in the role of the commander-in-chief of conducting economic warfare. We don't have such a post right now, at least at the Executive level of the Government. But, if there were such a post, you would like to have both offensive and defensive capabilities. Of course, the defensive capabilities are what you would put in place first. To do that, you would need to charge somebody with designing tactics and strategies. Then, being in a reflective mood, you might sit back and ask yourself the fundamental questions:

- What is economic warfare and economic conflict?
- What is it that's going on here, or is anything going on here at all?

For many of us, I think that the latter is still an open question. In a sense, it's clear to me that there isn't anything new about economic warfare and economic conflict. It was invented at least by the mercantilists and probably before that. If you do a little time-distribution analysis of the dates of publication of the literature listed in the bibliography, the median is about 1950 or 1952, so I repeat: Is anything unique going on here or not?

THE NEED FOR DEFINITIONAL ANALYSIS

First of all, if I were in the Office of Naval Research (ONR) and you asked what I think possible research projects on economic conflict and national security might be, I would strongly recommend something called "spade work", which involves a good deal of definitional analysis; i.e., trying to define what it is you're talking about when you talk about competition, oligopoly, multi-national corporations, cartels, economic conflict, and economic warfare. Some kind of central analysis of all of these terms is needed. I don't think there is an accepted vocabulary on this subject, so these terms are very difficult to "come to grips with." I obtained the impression yesterday -- at least in listening to the morning session -- that people wanted to avoid talking about this, because it was very difficult to figure out just what it

was that was being talked about. When we turned to the Soviet budget, everybody knew all about that, and there was a tremendous enthusiasm for the plus or minus 11 percent and the 12 to 14 percent. There we had an issue that we could argue over quantitatively.

But the subject of economic conflict doesn't provoke such discussions. People tend to want to run away from it. Certainly in the Executive Branch, we do not understand it. I thought that the Arab oil embargo of 1973 would be the "Styx missile of cartel analysis." My impression is that the people performing the analytic portion of the response to the cartel didn't understand n-person game theory of responses to economic conflict or warfare. Moreover, the attention of the Executive Branch was distracted by Watergate. By the way, it occurs to me that there are always enormous distractions. Decision-making people are always busy with their queue of activities which gets in the way of all other activities until you prove that another activity is indeed something you ought to be really working upon very hard.

In short, I think that a lot of "spade work" needs to be done to figure out just exactly what economic conflict is and what it isn't -- assuming that there is something there, which is still an open question.

But why is there so much interest in this subject? I was very impressed with the list of people who are participating in this Workshop -- a very good group, indeed. Obviously, there's a lingering problem of potential resource scarcities around the world. People are worried about a long-term agricultural problem and perhaps a climatic change. There's a good deal of intuition and judgment that goes into the analysis of such problems. It's a judgment of the moment premised upon what economists would call people's utility functions which, by the way, I've never found to be transitive; they also tend to switch around from day to day, thus making the whole procedure rather puzzling. However, you're not dealing with an audience that has been totally trained. That's not to say they're unintelligent; they're very bright indeed. But you have to avoid making analytic presentations which lapse into jargon. You've got to translate into English, and it seems to me, that's a very humbling procedure. More often than not, you find that what you're attempting to translate isn't worth translating or doesn't hold up when you reduce it to words. Anyhow, there was the calculated risk of the grain sale of 1972. Now, we have a problem emerging with regard to the Soviets and the Eastern European countries who, because of their external burden of debts, are beginning to side with the Third World that wants to reschedule. I wouldn't be at all surprised if the Eastern European countries get into the debt scheduling queue as well. What do you do about that, if anything? I think that this issue raises a good problem for theories with regard to economic conflict. How would you alert the policy people that this is "coming down the road?" If indeed it is, but we can't really be sure, then what do we do about it?

LAW OF THE SEA NEGOTIATIONS

There's the Law of the Sea Conference that's going on which I have followed peripherally. The stakes are enormous, and the conflict is very large. Moreover, misreporting on the subject has been somewhat astonishing. However, I think it is a very good example of the kinds of things we're talking about. The consequences for the U.S. are very significant, and the consequences for other individual countries are also large. The resources in the sea are essentially inexhaustible, and in theory, you can just take what's needed. So, the benefits for the U.S. would be substantial. We have some of the essentials of the technology to do this, but how do you navigate the situation?

TECHNOLOGY TRANSFER

A whole set of issues border between cooperation and conflict (warfare) concerning technology transfer around the world. The Soviets, for instance, have an enormous campaign underway to get what they can from the West. Then, there's always the issue of technology transfer through multi-national corporations to the developed non-communist world. This subject never dies. It's like Phoenix; it's always re-appearing from the ashes. We think that we have put it away and it pops up again. I think that it's a problem of too much money chasing too few analysts. People constantly want to recycle and reinvent the problem. I have some questions about the marginal benefit from that sort of activity for I think it's rather small, but nonetheless, it is there.

INTERNATIONAL MONETARY SHOCKS

On the macro scale, I would be interested in knowing how this group would characterize 1971 when we formally abandoned gold convertibility, devalued our currency, established a 10 percent import tax, and altered exchange rates. In a sense, it worked, but I don't think that we could have negotiated the energy problem on fixed exchange rates. How would you fit that into your category system for economic conflicts? So, there is a lot of definitional work which needs to be done.

INFORMATION SYSTEMS

Again, let's assume that you're the Commander-in-Chief of Economic Conflict. How do you know if you're being attacked? What is your early warning system? To my mind, this is, to begin with, an issue involving economic intelligence, which is in itself an arcane subject about which other conferences have been and should be held. You have to define what an attack is, what is legal, what is illegal, and, in fact, as Roger Shields was discussing, what is the difference among acceptable competition, conflict, and something more extreme.

Next, I would ask: When do you know that an attack is going on? It has been my impression that the information-handling apparatus of the United States Government is not supersonic. Information has to be assembled; somebody has to read it; and then an array of people have to indicate that they think it's alright. This is a sort of decay function. When a number of people have to read and authorize something, you can count upon a 10 percent reduction in the quality of the information and a 20 percent addition in time. So, you really just don't have a very good real time system for this; if you were Commander-in-Chief of Economic Conflict, you would certainly want to do better.

Besides knowing whether or not you are being attacked by means of your warning system, and knowing when this is going on, there is a structural difference between, say, the U.S. and the Bloc countries and, indeed, some of your other developed countries with regard to information. There's an information disparity. To my mind, the U.S. would register 10 on a scale of zero to 10 with respect to the "openness" of information, and the Soviets, of course, would register much lower. The Japanese are careful in making their plans available; it's a little harder to get information about Japan than it is, for instance, about Western Europe. But, there's a lot of information about the U.S., its economy, and its plans. We are an open society -- not a state trading company. It seems to me that we don't have decision making in our system that is at all like anybody else's. That is to say, it's not very well defined, so the information is diffused quite a bit. Does this put you at a disadvantage or not in operating in the area of economic conflict. The null hypothesis is that it puts you at some disadvantage.¹

¹ Professor Arrow: I have a comment relating to the secrecy of decision making and confidentiality. In connection with the grain sale, weren't there allegations that the United States Government did not, in fact, know of the decision with regard to the grain sale? This suggests that companies of the United States are by no means extremely open sources of information. In fact, it's very difficult to get information on matters connected with oil, for example. I know that many Congressional Committees have been trying to obtain data about the decisions, which were made in conditions of extreme secrecy. It may be that this is a more effective means of security than having a large bureaucratic organization.

Dr. Weiss: Right. In the case of the grain sales, the Soviets arrived with their game plan and proceeded to execute it with great secrecy in an essentially monopsony fashion by going to the grain companies after having studied the hysteresis loop, if you will, in the United States information apparatus. Distinctions like the one you have just made ought to be explored. Some information that the Soviets collect with regard to the United States economy, the United States Government doesn't have access to. But, if you were to sit where I sit, you would have the opportunity to see what's going on.

RESPONSES

I am a cynic with regard to our responses. Most of our responses are late, and, because they are late, we generally pay more than we would otherwise.

So, I would say that, if you were attempting to look into the future and anticipate what is likely to happen, you'd have to do some hard work to determine which areas are the most important, which ones can analytically be made tractable (where, in fact, you can do some good thinking, not necessarily operations research, mathematics, or economics, but just hard thinking with a pencil and a piece of paper), and where there is the opportunity for the Government to make a response. I enjoyed Professor Schelling's discussion yesterday because, to my mind, the most probable scenarios that are going to happen in the future are generally the least likely. I know that this is a rather perverse law of probability for the real world, but the strangest things do happen, often randomly, which make them very difficult to anticipate. You've got to be "fast on your feet," which we are. The subject of economic conflict can be arcane too quickly, and all of us can lapse into the jargon that I've talked about. It doesn't do anybody any good to be arcane, because the political people have to make decisions, and they're not going to make decisions based upon the tools that professionals - or technicians, as Dr. Kissinger would say - are used to working with. You have to be more persuasive than that but, of course, you can imbed arguments with the outputs of those things.

LEVERAGE

The subject of leverage was brought up yesterday. It's very similar to power, but to my mind, it's also the same thing as being clever. It's been my experience that being clever in the interagency framework of the United States Government is a little difficult to do. There has been, for instance, a good deal of thinking about games. It's very difficult for us to figure out who all of the players are. You would say: "Your trading partner (which is the euphemism for your competition) might be the set of players in Western Europe." But, there are the other players who don't get their fair share of the analysis, such as all of the Departments in the United States Government that have a competitive and cooperative relationship with each other at the same time. To develop a common denominator of that procedure within some expeditious period of time is taxing. You have your ostensible competition, and you have all of the Departments and all the interests within the United States Government that wish to be heard. The Council on International Economic Policy (CIEP) is presumed to coordinate these activities. Coordination is another euphemistic phrase which, I think, in its most accurate form would mean ultimately "hitting somebody over the head with a baseball bat" when you've finally argued everything that could be argued and you've got to take something to the President. This is a very expensive procedure, and it's not conducive to being imaginative or clever. If you're going to be clever, use leverage and exert power; I think that that's probably necessary if

you're going to be Commander-in-Chief of Economic Conflict. It cannot be spread all over the interagency structure.

I mentioned that the U.S. is a market economy and not involved in state trading. We are deliberately a disaggregated economic power and certainly disaggregated in the control of economic affairs within the Government. There is the well-known dominance of economic policy by political goals and quite a bit of schizophrenia that goes on in that regard. Just witness the debates on whether or not grain should be sold to the Soviets in view of what the Soviets had the Cubans do in Angola. At the same time, there is a different argument out in the Midwest.

CONCLUSION

How much analysis is applicable to all this? It's an open question. Let's use anything that can help, but let's not, of course, over-sell it. When analysis isn't performed properly or isn't presented properly, people will rely upon their intuitions or simply use straight forward political considerations for decision making. I think that this is a very powerful argument for getting the numbers straight. I was going to say that we just have to keep on muddling through, but that's a conclusion and it's not really clear to me that we're through anything. I would say that we're muddling along in a very ad hoc situation wherein glimmers of problems pop up and are perceived. We then shuffle them off to an appropriate agency and try to find out what's going on and to get something done. But, this is not a national scheme. I think that another question that you might want to address is: Should there be such a plan and how would you imbed it?

QUESTIONS AND COMMENTS

Dr. Wolf: You referred to the debate going on in the Midwest. Is anyone arguing that grain should be used for leverage -- aside from Hans Heymann's statement yesterday that you can't use grain for leverage in any field outside of grain transactions? Aren't both of the Presidential candidates vying with one another and saying, "We'll never do that?" Aren't the constraints in terms of the U.S. players -- not the Government, but the economy -- so strong that it's almost infeasible to consider how you can "turn off grain," even if you thought it would be effective?

Dr. Weiss: That's right, but when Angola came along, there was such a debate.

Professor Arrow: Angola reflected political constraints on economic policy. But, isn't it also true that there are very large economic constraints on political policy? Doesn't the grain case exemplify that situation? Thus, what might possibly be a useful political weapon might inhibit the economic interests involved. These are two different objectives, and

there is no particular reason one should be sacrificed for the other. But, it's really true that particular economic interests -- oil or grain -- may possibly stand in the way of achieving political goals.

Dr. Weiss: That's true, and that's my argument for performing the analysis carefully. As an example, there is the classic case of uranium enrichment in which the Administration wants to have the next increment of increase in uranium enrichment capacity passed to the private sector. This was a problem wherein economics dominated political judgment, because such a plan is enormously expensive and the Administration wants to get it out of the Federal budget. For an assortment of reasons, this proposal has been very, very complicated to get through Congress. There has also been considerable delay in getting the plant approved and in "opening the contractual window." While this delay has been going on, the Russians and some of the European producers of enriched uranium have been taking orders which the U.S. should have obtained. I think that this is a good example of what you are talking about. There was a terrific split in the Administration over this subject; people became so wedded to the notion that uranium enrichment should be put into the private sector that you could not reverse this "great ocean liner of policy." It's still "steaming along," and we're still in the middle of a great delay with respect to a decision.

Professor Shubik: You commented on the study of OPEC and the problems involved. Do you feel that it would be worthwhile spending some serious money in trying to devise a more operational oligopoly theory? In addition, do you feel that there is an interest either in the academic community or in Washington to do so?

Dr. Weiss: I think that we have enough oligopoly theory now. It isn't the theory that's the problem. It's converting what is known now into something that is persuasive. What struck me was that, were I the President in 1973, I would have had as "Mission One" an exploration of what we could do about oligopolies and cartels in petroleum; let's have a menu of ten things right now that we can do. That did not happen. With regard to the point of view of the academic community, I really don't know because I haven't had much recent contact with the people who do this research. My premise would be that we know enough already; it just has to be converted and translated into action. Thus far, we have missed the big opportunity, which was the recession and decline in demand for oil. Now that everything has picked up again in the world economy, we can look forward to an increase in the price of oil.

Professor Shubik: I think that you do the academic economists almost too much honor. My own personal belief is that most academic oligopoly theory serves one operational purpose: to get articles published in academic journals which get assistant professors promoted to associate professors. Presumably, the whole idea of scientific inquiry has been (and Merton makes this point very well) that it is precisely this competition and desire for promotion which serves to actually prove knowledge. As

a by-product of this competition, we actually do learn something. I don't think it's quite accurate to say that nothing has been learned from all oligopoly theory. Like all scientific work, about 90% of it is beside the point when it comes to application, but there's no way of getting to the useful 10 percent without getting the rest of it. In fact, some academics, such as Professor Adelman, have proposed techniques for using oligopoly arguments for countering OPEC. But, I've never seen any attempt to discuss their ideas with regard to secret bidding or other forms of anti-cartel action. We have a stockpiling policy and a law that was signed about six months ago, but these are not anti-cartel. They're a protection against the interruption of supply which, indeed, may be very valuable. Anti-cartel acts are different. Sealed bidding -- sometimes the adoptions by companies do not receive footnoted acknowledgment.

Dr. Weiss: Do you have any ideas of things that ONR might usefully do to push the theory of oligopoly in useful directions?

Professor Shubik: That's like asking a cat what should be done with cream.

Dr. Weiss: I'm sure the United States Government would give you ten options for that.

Dr. Raney: In your discussion of leverage, I think that I overheard you say something like "surely we should do everything we can." My impression is that the favorable results of trade manipulation for strategic advantage may be very seriously exaggerated and, furthermore, the manipulation eventually has to be performed in such detail that responsible people can't keep track of what is happening. Strong bureaucratic interests might develop and live a life of their own. While this may be harmless, it could be quite harmful. Most of these things, I think, are very expensive in terms of the diplomatic price that you pay in order to get the cooperation which you often need. I wonder whether or not some historical research on U.S. experience in this area, starting with 1945 or 1946, might lead to some useful, cautionary results with these policies, which, in principle, look as though they could be effective -- but could turn out to be a lot more trouble than they are worth.

Dr. Weiss: Studying the soybean problem with Japan would be a very good example of the suggestion you are making. The Japanese still have not forgotten our soybean embargo, and it isn't clear to me that our information structure functioned very well at that time.

Professor Schelling: I'm going to stick my neck out and probably get it chopped off. I'm a political scientist by training and inclination and, in this context, a problem which political scientists constantly face seems to keep appearing in this discussion. The level of abstraction between theory and the actual problems is so great that it's almost impossible to describe the data set upon which you

develop a generalization. In my own naive understanding of economics, the prime data set is all we have of the invisible hand doctrine, and it's a long way from there to OPEC. We've got an 'n' (number of producers) of one in OPEC. Therefore, OPEC probably doesn't fit most of the generalizations but, in fact, it does fit all of the generalizations which in my limited reading of economics I have ever read about in documents on oligopoly. This suggests to me that, if there is a basic research need, it might be on the definitional issue of what do we mean when we talk about actions being guided by conflicts working in competition. In political science, we're always assuming that sovereign entities and some of the non-sovereign entities are competing with each other and that they have, to a certain extent, overlapping and competing interests. We don't bother to say one is warfare and one is not. Instead, we try to say when is it harmful (and we need an operational measure of harm), when is it beneficial, and then try to put together some cost-benefit analysis to relate the two. For example, it's not clear to me why there is an assumption that we ought to break up OPEC. I've seen very little analysis of how to take advantage of it. What are the potential benefits? Now, as I've said, I've "stuck my neck out." The question which I hope to have raised is as follows: Is the problem between the level of abstraction from which the generalization should come and the very concrete, "nitty grittiness" of the problems which only surface one at a time where there is not a large enough 'n' to really study them in conflict?

Professor Shubik: I think the problem is with the word abstraction. The process of abstraction, as I understand it, means that you look at some entity and pick out its cogent features. A great amount of economic analysis in oligopoly theory is not abstraction; it's cutting the whole cloth. You know nothing about a particular institution; you know nothing about the mechanisms of the world; however, you have read a certain number of books written by other people who also know very little about those particular processes. Then, you devise a particular theory which has certain very nice elemental properties.

I would be the last one to pretend that there is no use for economic theorizing. But, when you get down to fundamentally process-oriented problems and when the numbers of institutions involved in these processes are fairly few, it is a good idea to know something about the concrete mechanisms before you try to sketch their dynamics. In particular, the most useful operational economic theory (at least micro-economic theory) is that wherein the static approximation to reality has a hope of paying off and providing useful insights, the truth of the matter is that there are no good, general, viable economic dynamics. We don't have the equations of motion, and we don't even have the structures involved upon which to really hang good equations of motion. This is not a plea for not doing any work in the area; on the contrary, it is the very reverse. We probably have to be a little more humble. There has to be a certain amount of tailoring the economic dynamics to certain subsets of problems. The first presumption has to be that the word abstraction becomes meaningful again;

i.e., that individuals who want to study about steel cartels better know the details with regard to the steel industry and how it differs from the oil industry. Fortunately or unfortunately, you are still going to have to know a lot of static micro-economic theory in order to help thinking about these things. The idea that a static theoretical base with no institutional understanding, is going to produce a reasonable, meaningful policy recommendation in highly dynamic situations is, essentially, a philosopher's stone.

Dr. Burstein: We have discussed the difficulty of rigidly defining alliance relationships and the extent to which American policy, for example, conflicts with the policies of its allies. Now, I'd like to consider how the OPEC price of oil is concerned. On the surface, it seems as though America gains a great deal vis-à-vis her allies. The higher price of oil has a much more severe impact upon our so-called allies than it does upon us. Our power in the world has increased substantially, if you consider the elements of rivalry in our relationship with European countries. Do you accept this as an hypothesis?

Dr. Weiss: I'd want to look at that one long and hard. Because we have put Europe through what is essentially an inflation-induced recession, our relationships with the European countries have not been enhanced. The Third World is in deep trouble, and some of that trouble spills over into our relationship with Europe.

Dr. Burstein: Hasn't Britain become a dependent state?

Dr. Weiss: If it has, is that good or bad? Off-hand, observing what goes on in our agency, I can't see any good coming from that. I don't accept the tenet that actions of OPEC have helped us gain leverage over Europe.

Professor Bergson: You raised the question of developing a vocabulary that deals with problems of economic warfare. As I consider the discussion that we've been having, I wonder what the relationship is between this and international economic policy. You think of yourself as being concerned with international economic policy. Why are we discussing all of these problems under the heading of economic warfare? Take OPEC, which wanted to make a lot of money. This was a principal concern in raising the price of oil. I don't think that "getting a big kick" out of injuring the Italian economy or the U.S. economy was a factor, even though the OPEC countries may have gotten a "little bit of a bang" out of doing so. Essentially, I'd say OPEC's motivation was to increase its revenue. The question is whether one should describe OPEC's economic policy, taken in the interest of maximizing its income, in terms of economic warfare. Then, there is the question of whether or not we should describe how we might respond to OPEC acts in terms of such a vocabulary. I can't imagine a situation wherein we would like to use that kind of vocabulary, even though we might. After all, when we were trying to cut off German access to raw materials

during World War II, this kind of behavior on our part could clearly be described by means of such terminology. But, I do wonder whether it is altogether appropriate to be generally using this kind of vocabulary. When I think of this vocabulary being used in other contexts (not in a meeting such as this, but elsewhere), I can't help feeling that measures proposed in the name of economic warfare have a couple of needless "strikes" against them, while another vocabulary (such as economic policy) might favor them. Warfare is not exactly a "plus" word. This doesn't dispose of the matter, but perhaps it is a little bit of what Dr. Weiss is urging us to think about in terms of a vocabulary.

Dr. Raney: The first overt pressures of the OPEC group seemed to be closely keyed to the Israeli war.

Professor Bergson: You have a point, but, if you look at the equilibrium situation that has emerged, it's difficult to think of OPEC's price rise in terms other than maximizing OPEC revenues.

FORMULATION OF A NATIONAL SECURITY POLICY

by

Dr. Oskar Morgenstern, Professor of Economics,
New York University

INTRODUCTION

As has been previously stated, one of the aims of this Workshop is to identify areas wherein the Office of Naval Research (ONR) may profitably spend research money. I think that it is our duty to direct our discussion towards helping ONR to identify unsettled problems and questions, while at the same time giving ONR some hope that answers can be obtained in a finite time span. The title of my talk is not quite what I had planned to present, so I will simply proceed with what I have thought about.

We are interested in national security, which is a function of our own condition and our own aims, as well as a function of the condition of the "others" -- some of which we are on good terms with, some of which we are not on good terms with (this is changeable) -- and a function of their aims, about which we know very little and can only make guesses. It is quite clear that this is a game situation, but I do not want to speak of it as "pro domo." However, I will say something about the aims towards the conclusion of my brief talk. For the organization of my remarks, I follow the old philosophical question-stating approach: "Where am I? What do I know? Where do I want to go?"

DATA, OBSERVATIONS, AND MEASUREMENTS

First, "Where am I?" Where is the present American economy and how well do we know it? Furthermore, what is the present American political situation and the military situation, and how well do we know these? Now, I am clearly not going to talk about the latter two, so I will only say something about the economics.

It has been one of my privileges in my long life to have met many very eminent people. I've been very often together with Einstein, and more than once, he has said to me the following, which I have not found in any of his publications so far: "Most scientists (and, you remember, by scientists, he meant physicists) naively think that they know what they should observe and how they should measure it." Let that sink in, please. They naively think that they know what they should observe, and he meant "observe" -- not just take a record.

Now, what happens in economics? Everybody talks about "data." What does "data" mean? It comes from the Latin "datum," which means "that which is given." The numbers, manufactured or otherwise obtained from business and Governmental activities, and the few other numbers calculated from them, are "given" information and need not coincide, in the least bit, with what we ought to look for. They are not observations; they are by-products of activity. Now, I have described this in very detailed form in my book On the Accuracy of Economic Observations (which I won't hesitate to quote here because why does one write books if they aren't to be publicized. I should have written "observations and data," but I chose that one). One of the points I make therein is that there is a very great difference in observing nature and observing social entities, such as the economy or political or military organizations. Nature is difficult to observe. It has taken hundreds of years to get a picture of what nature does, but nature makes no effort not to be observed. Nature does not deliberately hide information and it doesn't falsify information, but that is what goes on in the social world.

I'll give you a simple illustration. I have a friend who is President of one of the great Swiss banks. A few years ago, I was in Switzerland and, as we were taking leave of each other, he said that he had to go to a board meeting. I asked, "Now what goes on at your board meeting?" He replied, "Well, today we will get the balance sheet for the Board of Directors." I said, "Fine, and then what?" He responded, "On the basis of this, we make a balance sheet with which we go to the Swiss Government to negotiate the taxes, and afterwards we make a third balance sheet which we publish." On that basis, the economists then measure the profitability of banks elsewhere. This just a minor illustration; there are hundreds of them which I could produce, for it's been my interest to find such things.

Now, obviously, there is an error here. As far as errors are concerned, one has found that error is irreducible in the natural sciences -- to the great discomfort of all natural scientists. It is impossible to have any measurement which doesn't have an error in it, and why should that be different in economics? Where is the activity and the recognition by the economists who take cognizance of this and bring it into play in the proper manner? Of course, descriptions are also made in terms other than just numbers. There are some absolutely grotesque things to be observed. Let me recall an example just for the fun of it.

When the First World War broke out, there was a report that Russian troops landed in England to help the British troops. After the battle on the Continent went badly, there were rumors that 250,000 more men had landed in Scotland, and train delays which happened in England were said to be due to the Russians moving through England. Sir Stuart Coates wrote to his brother in the United States that 125,000 Russian soldiers marched across his estate in Perth, and there is testimony of thousands of people who have seen these "Russians, still with snow on their boots," in the month of August 1914. This whole rumor business was powerful enough for the Germans to withdraw troops from the Russian front in order to throw more into the West and to be better prepared for the strengthening of the Western Powers -- an interesting matter.

GROSS NATIONAL PRODUCT (GNP): A NON MEASUREMENT

I come now to the concept which is ruling all over the country, and that is the beloved GNP -- gross national product. I have written a lot about it, including a long paper: "Does GNP Measure Growth and Welfare?"¹ Of course, the answer is "no"; it measures nothing. I've decided that it is one of the most scandalous, so-called "concepts" in existence in economics, and I think that in later years (maybe in a few decades) it will certainly be acknowledged as such.

First of all, as a concept, it's a scalar -- one single number. One scalar is purported to measure the changes in an entirely complex system of conglomeration such as the economy. This is like measuring the growth of a human being from babyhood to old age with all his knowledge and all the changes in his body by a change in one scalar number. If it were at least a more complicated number, that would be something different. If it were a number with many components accounting for different things, it might be more acceptable. However, it also measures the malfunctions of this system in a positive way. For instance, if you're stuck in a traffic jam, up goes GNP! When planes can't land or accidents occur, up goes the GNP! Many other malfunctions of this kind are similar in terms of results, but I won't take any more time to discuss this.

This GNP number is used by the Council of Economic Advisors and by the Commerce Department, is calculated quarterly, is corrected for seasonal variations, and is divided by the number of people in the country who are living. Incidentally, inasmuch as we have population counts, how good are they? Ansley Coale, a Princeton professor and statistician, has studied a particular census and has discovered that 5,000,000 people were not counted. Five million people -- that's the city of Chicago -- were not counted, but that doesn't prevent the economists from dividing numbers by the total population. Then, we get the real GNP. They forget entirely that even the Government, which tabulates GNP, takes up to 10 years before it publishes what it considers to be the final GNP number. The successive corrections go up and down several times and the difference between the first and the last figures amounts to 2 or 3%. That doesn't seem like much, but let's look at 2 or 3%. Suppose the GNP, as stated, increases by 3% from one year to the next, but suppose the first number has a tiny stated error of minus 1% -- as mild as 1% -- and the second one has a plus 1% error. Is this then a 3% change? No, it's 5.8%. If it's the other way around, that is, if the first one is plus 1% and the second is minus 1%, the growth rate is .96%. Suppose the error is 3%. The first again minus 3, plus 3, then the real growth rate would be 9.37% and, if it's the reverse, it would be minus 3%. More than 160 years ago, the great mathematician, Gauss, said that the lack of mathematical education shows in nothing as clearly as in unlimited precision in numerical calculations.

¹In Social Responsibility and Accountability, J. Backman, (Editor). New York University Press, 1975.

Let that be written down, particularly now when we have computers to calculate even much more accurately than he did. Norbert Wiener, looking at all this, once told me that economics is, at best, a one-digit science. No, believe me, he did not make a joke; he simply expressed what he thought.

Furthermore, it is generally considered that the GNP concept is supposed to be equally applicable without any further corrections or restrictions to Ethiopia, the U.S., China, Indochina, and so on. It doesn't make any difference that one country is highly developed and has great technological equipment and that another country is a poor agricultural country. It all goes into "one pot" and, on that basis, governments make policy decisions. Here is a topic for ONR to do something about.

DISTINGUISHING AMONG ECONOMIES

Allegedly, we observe economies, but do we make any distinctions? There are some economies like the United States where there is probably something like 60% in service of activity and 40% physical output. In China, it's probably 10% in services and the rest is physical production. All right, what follows from that? We look at statistics; we look at physical statistics and oil statistics. Here they are: Saudi Arabia, Iran, and other countries producing so much. Then, suddenly the world is changed. Why? Because the Organization of Petroleum Exporting Countries (OPEC) has been created, and OPEC is something that is an abstraction. It's a cartel, and that's the end to statistics and an end to our picture. But it's there, so it's necessary to develop additional methods which would involve thinking in terms of countries, their plans, technological knowledge, the changes in technological knowledge (and also the introduction of technology), the type of economy, and the political structure. For example, I think that, in comparing countries, it would be enormously important to know the status of science in each country and the changes in the state of technology. I suggested that we might have presented a census of computers of various capabilities in different countries at the present time in order to get an idea of this direction. It could be done.

THE ERRORS IN ECONOMICS

As I have said, error is irreducible. This means that nature is stochastic. We live in a stochastic universe of physical, natural things. We also live in a stochastic universe insofar as the social and political things are concerned. What is the error in physics -- 10^{-15} or 10^{-17} , the so-called Ritchie constant? The measurement of light is also of that fabulous precision, but that little error is still there and it's irreducible, as Heisenberg has shown. Why is all this being written if it doesn't sink in? Error goes from those almost unbelievably small numbers to plus or minus 50% in some physical measurements, such as cross-section data in nuclear reactions! If you take an average of a plus or minus error of 2-3%, such an error is a good measurement made with

instruments in physics. What are the instruments which we are using in allegedly observing the economy? We don't observe it; we accept data poured out by others. Von Neumann once told me that economics is a million miles behind physics. I've printed that, so it should be on the record somewhere. I would also say that politics is probably still another million miles behind economics.

Now, then, we also form macro-units. The difference between how one gets from micro to macroeconomics is never quite clear. What is macroeconomics? Is it simply the aggregate of something -- the total quantity of money in circulation in the country and the changes in it? That's supposed to have some meaning for the changes in prices or production? All right, perhaps it has; this is obtained by merely counting numbers of workers in industry and so forth. That is a reality, but there are other macro-units. First of all, with respect to these macro-units, it is usually forgotten that if the quantity of money is distributed among a certain group of people in a country, there will be a very different effect than if this same quantity of money were in other people's hands in different proportions. Therefore, calculations based on changes in the total quantity of money which do not take into consideration how the changes occur and where they occur represent big gaps in macro-analysis, which is essentially an evasive oversimplification of the underlying reality.

Then, on the other hand, macro-units are formed. Labor unions have developed, cartels have formed, and other such entities do come into being. These units have power, but there is no evidence that changes in these units or the development of these new units are necessarily considered.

THE VULNERABILITIES OF ECONOMIES

Now, I come to the next point. What is the vulnerability of an economy? Are all countries vulnerable in the same sense? According to the ideas on the GNP, it doesn't make any difference. Everything is put in "one pot." It's quite clear that China is vulnerable to very different kinds of pressures than the United States, or the Soviet Union, or other countries. These are totally different kinds of economies in their composition. Are they raw material importers? Are they raw material exporters? What is their degree of dependence on the rest of the world? For example, with regard to specific materials, one may be vulnerable perhaps in terms of oil shortages, or mineral shortages, or food. Is the United States in this category? The answer to this question follows the nature of inquiry as to which specific policies are possible or impossible, practical or impractical.

In the work which Professor Gerald Thompson and I have published this year, Mathematical Theory of Expanding and Contracting Economies, we have raised the question and developed some theoretical approaches to what we call the "compressibility" of economies. We consider to what extent economic activities can be compressed without upsetting and destroying the basic functions of the economy. A necessary distinction which one has to make is between essential and inessential activities. This is a very

difficult, unpleasant thing to do because it seems to run counter to the firm tradition of so-called "wertfreiheit," or going back many years now to Max Weber: the need to stay scientific and to stay away from value judgements derived from political, social, religious, and other data. Yet, here, this seems to be necessary. For example, it can be shown that, if you were to eliminate all ballet performances from the U.S. economy, the mainstream of economic activity in the United States would not be affected very much. But you couldn't eliminate, for example, gasoline production; there would be a total collapse. So, one activity is inessential in that sense; the other is essential. I won't go further because of the lack of time and complexity.

Furthermore, many specific economic policies tacitly assume that the others (other actors) behave decently. For example, free trade is fine. Maybe it's true that this is an optimum condition maximizing something (which I won't quarrel with at the moment), but it's quite clear that maximization will occur only when the others don't engage in trade wars or currency wars. So, one country in a free trade condition more or less assumes at least stability in the behavior of the others. But, if they aren't stable in their behavior, then the whole free trade argument collapses. To what extent is that studied in economics? I would say it is very little explored. The questions here are deep and scientifically very interesting.

Incidentally, we are at the moment doing something which is much against the interest of our country; namely, the unlimited transfer of technology, especially to the Soviet Union. It brings back an observation made by Lenin, who said two things. He said, "If you want to destroy another country, the first thing you do is to destroy its monetary system." Well, we're having a nice inflation, so maybe we're doing that to their pleasure, all on our own. The second remark he made, and that applies to the technology transfer, was "When the time comes to hang the capitalists, they will beat their way to our door to sell us the rope with which we will do it" -- and that seems to be, at the moment, very much underway.

POWER

In the natural sciences, you have basic concepts. In mechanics, it's gravitation. But what are the basic concepts in politics and economics? In economics, we have more or less come to the point where we realize that it is utility. Without utility, we can't get anywhere. We can't talk about allocation or about optimum allocations and exchanges and so forth. This is still a field in which very much has to be done, of course, but I think we have an idea of how to go about it and in which direction to go. But, in political systems, what would be the basic concept? Clearly, power. But, is there anything remotely as far advanced in political theory with regard to a definition and characterization, let alone measurement, of power in its many, widely different manifestations comparable to the progress one has made in economics with regard to utility? I doubt it, and here I'll give you a little story.

I read this story as a child. It will show you something about the nature of power and one of its possible manifestations. The story is that, in the Middle Ages, there was ferocious emperor who, after a battle, entered into a village. He had a bath, and then he wanted to be shaved. He called the barbers and said, "Here is a little handful of gold. You shave me, but if you cut me, I will have you killed." The barbers all trembled. The gold wasn't enough for them to take the chance. But, finally, a young apprentice barber came forward and said that he would shave the emperor. He shaved him and nothing happened for he didn't cut him. The emperor turned to him and said, "How is it that you, young fellow, dared to shave me when your masters would not do it?" He wouldn't tell. The emperor said, "I swear by the Virgin Mary that nothing will happen to you, but I must know. The boy said, "Well, it's very simple. If I had seen that I had cut you, I would have right away cut your throat." So, where is the power, and how stable is power, and in which situation does power manifest itself? This is an illustration of much of what is to be observed at this time throughout the world.

Formerly, power was reflected by masses of soldiers. Today, it manifests itself in very different ways -- in nuclear power, perhaps. What power do highly industrialized powers have? Well, they have nuclear power. What kind of power do the underdeveloped countries have? Well, they can terrorize; they can threaten; they can blackmail; and they can do all sorts of things in the future as Professor Schelling described to us yesterday. They will be able to produce single nuclear explosions in order to acquire things. They can say that they have put a nuclear bomb in the center of Europe in order to blackmail. So, there is all this to consider about power -- novel forms appear, far outside the conventional thinking about military strength, response and planning.

PREDICTION

Now, come to the question, "Where do I go from here?" I have described that we don't know very well where we are or where we are going. So, we must make predictions. Let me give you a little list of things which have not been predicted by theories or by organized knowledge. Of course, anybody can say anything and, if you have 100,000 people saying different things, somebody will have allegedly predicted the event which eventually occurs, but that's not prediction.

The Reformation and Luther were not predicted. The French Revolution was not predicted -- not even by the people who laid the foundations for the French Revolution, like Rousseau. World War I wasn't predicted, and I'll say something more on that subject in a moment. The stock market crash of 1929 wasn't predicted. Pearl Harbor was predicted, but the communication of intelligence reports about the concentration of the Japanese fleet didn't reach the top echelon because it sounded so unlikely that people wouldn't let it go through the lower bureaucracy in the Navy. The Cuban missile crisis wasn't predicted. The Israeli-Egyptian war was not predicted. Atomic energy and the bomb weren't predicted. Quantum mechanics wasn't

predicted. The transistor, the laser, linear programming, if you wish, and OPEC were not predicted.

How well can we predict what will happen tomorrow? Nobody predicted that a Soviet airplane would suddenly land in Japan and give us information of an absolutely astounding character. There was a famous writer named Norman Angell (some of you may remember the name) who wrote a book in 1910 called The Great Illusion in which he proved that war was impossible. There was too much economic interdependence among countries, and the victors' losses would be equal to those of the vanquished; therefore, no country would be so foolish as to start a war. You may think that this is only one book. Oh no! It was translated into eleven languages. Forty study groups were formed in universities. Lord Escher, who was Chairman of the War Committee in England, said that war was more and more improbable. He lectured at the Sorbonne and at the United Service Club. Sir John French, the Chief of the General Staff, was present. They all agreed -- but, then, war broke out four years later.

On the other hand, at about the same time (1914), a book was published by the German General Bernhardi called Germany and the Next War which took the same facts and came to the opposite conclusion. He said that it was Germany's duty to make war on France and that it was unthinkable that Germany and France should ever negotiate. Incidentally, both this book and its author were profoundly disliked by Emperor Wilhelm II, who was later driven into the war.

GOALS

Finally, I will say a few words about the goals which we might establish. We must find ways for the United States to adjust itself to an ever-changing world, having in mind that we have an imperfect knowledge of our own condition and an even less perfect knowledge of the condition of the others; in particular, what their aims are and the constraints under which these aims can be pursued. We have to watch the world and anticipate, and then see whether or not we can derive from that new technology the implications for policy and changes in our relative position with regard to the rest of the world.

Obviously, our aim would be to preserve world peace. It may not be the most ideal situation, but at least there is no nuclear explosion and at the moment there is no Vietnam-type war. We must try to discover common interests with all potential and actual opponents. There are always common interests, and we must always negotiate with everyone. In fact, one negotiates and communicates with one's enemy even when there is a "shooting war" in progress; namely, by the manner in which the shooting is conducted. We may not shoot or fire as much as we could. This is an indication that, in many ways, while other communications are interrupted, one continues to tell others where one stands.

We must try to cope with the enormously increased speed of communications, information, and inspection. I haven't heard (and it's a pity that there isn't a single NASA person here) anything about the influence of space exploration on our thinking, on our study, and on our formulation of problems. Some months ago, I had a talk with Secretary Rumsfeld; Dr. Currie was present, but nobody else. I urged him to support basic research because we are living off our capital, and he was living off our capital -- this Secretary of Defense. Then, I asked him the following: "We can virtually see every cow in the Soviet Union, which we couldn't 20 years ago, and that certainly must have a tremendous influence on our strategic thinking. Suppose you suddenly observe that the Russians are assembling 10,000 tanks on the Eastern Polish frontier. What are you going to do now? Are you going to start nuclear war on Moscow, on Leningrad, or on those tanks? Are you going to mobilize NATO? Have you even thought about this possibility?" Technology has had a profound influence on the scope of thinking, and it is therefore in this abstract field where far more effort should be made than attaining a little more speed from a plane or something like that. You don't know what you're going to do with the plane when it flies a little faster or where you are going to use it. But, instead you are confronted with these other issues, and here we are living in this rather primitive world of merely accepting data, instead of going to look, to make entirely new observations of the type which are necessary. So, the decreasing reaction time and its influence on decision-making is one of the critical things at this present moment. Of course, this is true not only for us, but also critical for the Soviet Union. It's not critical for Uganda or Ethiopia, because they don't have such facilities. The world is widely differentiated.

Finally, I would say that maybe making our economy work better works against us, which sounds foolish. However, by that I mean the following: Suppose we integrate our economy by means of calculations from our wonderful computers. We would have optimum reduction of storage, for example, and we would get production output quickly transported and consumed. Such an economy is easily interrupted. Suppose we were less efficient. We would then have production output distributed all around in storage. It would be inefficient, but it would protect the economy. It's like having electric lights: when you cut the current off, everything is dark. If you have candles, you may destroy a few candles, but the rest burn and some light remains. So the question of self-sufficiency, how it can be obtained and whether it should be obtained, is a very interesting problem.

MORE BASIC RESEARCH

Finally, I would say let's put more money into basic research and especially in these areas which I have briefly identified. Let me add one final word which came up during our discussion here. If we discover policies which are really advanced, they would clearly be different from the existing policies. How do you communicate them to the decision

maker? If I introduce a new physical contraption, an automobile, or television, the user needn't understand or think about how it works. He turns on a switch and there is a picture -- even in color. The proverbial little old lady can drive a motor car and she need not know how many cylinders there are, if any, but she can drive the car.

The introduction of such things is easy. But, when we introduce them, what we do not know when we introduce a few cars is one thing, but if we bring in a few hundred million, that upsets the whole country and thus this is an entirely different matter. If you are sick, you go to the doctor, but you do not understand everything he/she tells you as to how the body chemistry works. However, you have confidence in him/her. You believe in his/her authority, and you have the example that other people have been cured and treated. Now come to the political and social world. Here, you are trying to convince the Cabinet members and the Secretaries, or you are going to demonstrate an entirely novel policy to the President. How are you going to do that? You have no authority; you cannot demonstrate; you cannot conduct any experiment. Moreover, if the new policy, as we hope, is extremely sophisticated and advanced, it will be different, and, consequently, it will be objectionable to many and will not be intuitively acceptable. It will sound perplexing and, therefore, it won't get across. Here is a problem deserving profound study. How do you train those who are in high offices so that they will be capable of accepting the discoveries of economists and political scientists and how do you deal with military commanders who also require an acceptance of this kind?

FORMAL COMMENTS ON THE PRESENTATIONS OF
DR. WEISS AND PROFESSOR MORGENSTERN

by

Dr. Steven J. Brams, Professor of Politics,
New York University

ANALYZING POWER

Dr. Morgenstern's amusing story about the ferocious King and apprentice barber highlighted the question: Who has power? Let's consider the situation in the barber story for a moment. It would appear that the apprentice barber had a good deal of power because, in effect, he had a dominant strategy. If he did not nick the King, then he would get the gold. If he did nick the King, then he would administer the coup de grace. How could he lose?

I think the King's situation was a little more problematic. I would argue that if the King had homicidal tendencies, then his threat was a rational strategy, because he may have the opportunity to commit homicide if one of the regular barbers chose to shave him and made a slip. On the other hand, if he had suicidal tendencies, he should be able to anticipate the response of the apprentice barber and the fact that he could be the witness to his own demise. So, I am not sure that the King did not have some power, given certain anticipatory powers, in this particular story. However, I think that the story illustrates well the problems connected with elucidating the concept of power. I would like to draw a few crude conceptual distinctions of the kind that Dr. Weiss was discussing earlier with regard to power and then suggest some paradoxes connected with the concept of power which may help us to understand why power and its manifestations are so surprising in international relations and other arenas. An analysis of these paradoxes may perhaps help us to anticipate and better predict the surprises to which they give rise.

POWER: THE ABILITY TO CONTROL OUTCOMES

In the literature of political science, the usual distinction made is between power as a quantity or possession (such as the much maligned GNP, or GNP per capita, or armed force levels) and power as a relation between two or more actors. A political scientist has defined this relationship with regard to the concept of power as follows: One actor has power over another actor to the extent that he can get him to do something he would not otherwise do. The problem with this definition is that it relies upon a contrary-to-fact conditional; we don't know, in general, what the actor would otherwise do if power is exercised.

There have been great problems in applying the different definitions of power. Let me suggest a somewhat different perspective which I think is more useful and more operational. Let's define power as the ability to control outcomes. This concept of power has been best applied in the study of power in voting bodies -- in particular, weighted voting bodies. Professors Shubik and Shapley introduced an index of a priori power some twenty years ago. There have been other indices. If one looks closely at some of the consequences of this particular concept of power, one encounters several surprises. Let me mention some of these, which I'll call paradoxes because they lead to certain surprises. I don't use the term "paradox" in its mathematical-logical form to mean a true logical contradiction between equally valid principles or inferences drawn from these principles; I use it in a much looser fashion. Here are some paradoxes we discover when we define power as the ability to control outcomes.

THE PARADOX OF LARGE SIZE

In general, it is advantageous for two individual actors to combine to form a coalition. By our measure of power, they increase their power by more than the sum of their individual powers should they act alone -- but not always. Sometimes it pays for some coalitions of actors to break up. We don't understand very well the conditions under which formation versus disintegration of coalitions of actors is advantageous. The surprise is, however, that sometimes it pays for coalitions to break up. I think that it would be worthwhile to investigate this further.

THE PARADOX OF NEW MEMBERS

Adding new members to a system sometimes results in the power of the old members (the original members) increasing rather than decreasing. There was an interesting manifestation of this in the European Community Council of Ministers when the size of the Common Market was increased from six members to nine members. One finds that the power of Luxembourg (which originally had one vote) in the Council increased rather than decreased when the three new countries (England, Ireland and Denmark) were added. In fact, in the original Council, Luxembourg had zero power; it was effectively a "dummy" and under no circumstances could its vote change the outcome.

THE PARADOX OF A COUNCIL OF QUARRELLING MEMBERS

Surprisingly, it is sometimes in the interest of two parties to quarrel so as to increase their power because they cut down certain coalition opportunities by their quarrel. The opportunities that remain result in their benefiting both individually and collectively. We normally associate power with a lack of conflict, but conflict can indeed increase the power of actors.

THE PARADOX OF CARTELS

Let's define a syndicate as a bloc of actors that acts together with one mind. Let's define a cartel as a bloc which decides by democratic procedures and majority rule how it will act, and only then does it act with one mind. In general, a cartel has more power than a syndicate. That is, internal democracy within the cartel results in the members having more power individually and collectively. This is, I think, somewhat paradoxical.

THE INFORMATION AND POWER PARADOX

I think there is a paradox of power associated with information which may or may not be at the disposal of members in playing particular games. For example, in the Prisoners' Dilemma game which, I am sure, many of you are familiar with, the dominant strategy of each actor is not to cooperate. How do we get out of the situation such that the non-cooperative outcome, which is an equilibrium, can be translated into the cooperative outcome, which is to the benefit of both parties, but not in equilibrium? If we assume that the parties have the ability to predict in the pre-play or bargaining phase of the game what the other players intend to do with a certain probability, we can determine threshold probabilities above which it pays them to take a chance and choose their cooperative strategies, which are dominated. So here, information (and intelligence) intrudes upon a discussion of power and proper strategies -- rational strategies -- in simple games that one can study.

GAME RULES AND POWER

The rules of the game might also have an effect, particularly the sequencing of winning outcomes. In tennis, for example, one must win a game by at least two points, and one must win a set by at least two games. So, there are particular rules which state that the winner must be so far ahead at each decision point in the compound game that tennis is.

Now, I would suggest that these decision rules have an effect on final outcomes. For example, in the game of tennis, if the probability is only .51 that one can win on an individual point -- that is, you are just slightly better than your opponent -- the probability is .90, on the average, that you will win the set. This means that a particular decision structure of tennis has an effect on the final outcome. I would suggest that, if we identify, for example, points in tennis with battles, games with campaigns, sets with wars, and perhaps matches with something larger, and if we can determine the rules of the game, we can then make calculations of the sort we can make in tennis with regard to the effect of one's ability to win at particular low levels and the ability to influence outcomes or to win at higher levels.

CONCLUSION

So, in summary, power is a complicated concept. It has proved relatively intractable in political science. With the help of a game-theoretic perspective, we are able to identify conceptually some surprising aspects of the manifestation of power (e.g., the paradoxes to which I have previously alluded) and we are also able to begin to estimate what power is a function of. First, it is a function of size of wealth or resources -- however you choose to measure size, and Professor Morgenstern has talked about the problems of measurement. It is also a function of conflicts or quarrels with other actors, which may not necessarily be to the detriment of the quarrelling parties. It is a function of the decision procedures, particularly the sequencing described by the rules of the game, if one can identify them. It is a function of the information one has about other actors and one's ability to predict their behavior. All of these arguments with respect to the function of power are important and, I think, enable us to get a better understanding of power, particularly its puzzling aspects, when we pay attention to them in the power equation.

FORMAL COMMENTS ON THE PRESENTATIONS OF
DR. WEISS AND PROFESSOR MORGENSTERN

by

Dr. Bernard Brodie, Professor of Political Science,
University of California, Los Angeles

INTRODUCTION

I came to this Workshop knowing only that Professor Morgenstern's speech would be feisty as well as wise. Of course, it turned out to be both. I, too, would like to pick up his statements about power as the basic concept in political science, and will, incidentally, implement his remark that, if economics is a million miles behind physics, then political science is also a million miles behind economics.

As Exhibit A, I chose something which I found only upon arriving here; namely, one of the entries in the paper that we were given called the "Selection of Relevant Extracts." The extract is by Ray Cline from his book entitled World Power Assessment. In this extract, there is a table showing what is called "perceived power" to which numbers are assigned. I am sure that this extract was included with "tongue in cheek" in order to show in what a powerless state is the examination of power in political science. To me, it is phenomenal that this could have been published. First, there is a formula at the top of the table (people like formulas nowadays) which reads as follows: Perceived Power = C + E + M X S + W. The key at the bottom indicates that C is "critical mass." In this case, it means population plus territory and so on. But, what fascinates me most is the second column, which is entitled "Coefficient for National Strategy and Will." In it, I noted that the United States is accorded a coefficient of .7, and that there are only two countries among the forty listed which have a lower coefficient -- one being Portugal and the other being Argentina. Among the countries which are at the top of the list in terms of the value of their coefficients on Israel, which I suppose is reasonable, and also Venezuela and New Zealand. This I find to be rather mystifying. I suppose if I read the entire book that I would better understand why the author arrived at these values, but I really do have other priorities.

What's wrong with assigning a coefficient for national strategy and will of .7 to the United States? Obviously, one of the things that is wrong is that this is a post-Vietnam attribution which disregards the high variability of this factor according to the crisis situation in question and the degree of preparation for it. In a past, which is not too remote, the United States has shown itself to have a very high coefficient with regard to national strategy and will -- perhaps too high a coefficient for its own good. Assigning numerical values to imponderables is likely to have impaired meaning, at best, but they should not be totally meaningless.

RELEVANCE OF MILITARY POWER

We have been hearing a great deal of late about the relevance of military power to various issues. This discussion is usually broken down into several subcategories. One, a somewhat more specialised kind of discussion, concerns the relevance of various kinds of fighting power to military power in general. The debate that is taking place is especially in regard to the utility of nuclear weapons. In my opinion, we have settled into a kind of conventional wisdom about nuclear weapons which I happen to regard as extremely dubious; for example, the assignment of negative utility to tactical nuclear weapons. However, I would rather talk about something else at the moment -- something which is discussed even more (certainly in political science circles); namely, the relevance or non-relevance of military power to certain political or economic problems like Vietnam or another oil embargo.

We keep trying to make distinctions, and then we quickly begin to blur these distinctions. It seems to me that there is, on the one hand, a considerable difference between saying that military power is irrelevant to a particular problem and saying, on the other hand, that it is relevant, but for special reasons unusable. These special reasons may be temporary or localized. They may yield to various changes in circumstances. Let's take, for example, Vietnam.

MILITARY POWER AND VIETNAM

It is now clear that our military intervention in Vietnam was ineffective in achieving the goals we apparently were trying to achieve. There were a number of reasons for this ineffectiveness, of which I would put near the top the divided opinion in the United States about whether or not we should have intervened at all. This division, of course, developed during the course of the intervention. It was not something which was very pronounced at the beginning, though it was present.

Concerning divided opinion of this kind, General Maxwell Taylor and numerous other individuals have a remedial prescription, which is to "knock heads together." This is the attitude which he adopts in his memoirs. But this prescription does not work particularly well in a democracy. Anyway, I would say that when people like Oskar Morgenstern and myself are agreed that the intervention in Vietnam was wrong, then there must really have been good reasons for not intervening.

MILITARY POWER AND AN OIL EMBARGO

Let me take another example which perhaps approximates a problem that is somewhat closer to us -- the problem of intervening militarily in the event of a repetition of the oil embargo. My example is the Suez crisis of 1956. Many of us here are old enough to remember

vividly that particular incident. I myself remember feeling how terribly anachronistic that particular intervention was. It was difficult to explain why, but it struck me that this sort of thing was out of date, and it quickly proved to be so. As we all know, it failed rapidly for several reasons: one was the opposition of the United States. An even greater, or at least equally important, reason was the great opposition within the United Kingdom. The fact that Trafalgar Square was flooded with masses of violently protesting people meant that they were unconvinced about the necessity of this act for the good of the United Kingdom. Subsequent events proved them to be right. We learned very quickly that the Egyptians were indeed capable of operating the Suez Canal, though denial of that capability was one of the avowed reasons for justifying the intervention. We also learned that, after the 1967 Arab-Israeli War when the Suez Canal was out of operation altogether for about 6 or 7 years, it was not so important anymore anyway.

Let's look at the oil embargo itself and possible military interventions in the event of a repetition. I remember that when Secretary Kissinger gave some hint of the fact that the United States had not entirely abandoned the idea of using force, a letter was written to the Editor of the Los Angeles Times which made a deep impression on me. A man wrote, "If anyone thinks that I am going to send my boy to be killed in Saudi Arabia so that some slob can fill the tank of his Cadillac, you have got another guess coming." I thought that was a very important letter, because it argued implicitly that, among other things, we could not possibly use military force in such a situation without an enormous amount of "preparation". Before people could even begin to think positively about using military force, the country would have to be convinced that it was really "up against the wall," rather than being constantly aware that we are wasting this resource enormously.

I offer these cases as examples of the relativity of military power and of the numerous factors which must be involved in a consideration of its utility.

FORMAL COMMENTS ON THE PRESENTATIONS OF
DR. WEISS AND PROFESSOR MORGENSTERN

by

Dr. Charles Wolf, Chairman of the Economics Department,
The RAND Corporation

TERMINOLOGY: ECONOMIC CONFLICT VS. ECONOMIC WARFARE

I have four points that I wish to make. The first relates to the question of vocabulary and terminology to which Gus Weiss referred and on which Abe Bergson commented. It centers on what I think has been a continuing lack of clarity in the matters which we have had in mind, especially our lack of precision in using the terms economic conflict and economic warfare almost interchangeably. I think the former is probably preferable and broader for reasons which I will detail.

One type of economic conflict involves the use of economic instruments for political-military objectives. The other kind involves political-military instruments used for economic objectives. I would suggest that these two types of conflict roughly coincide with the differences between economic conflict in the East-West context and economic conflict in the North-South context. When we talk about East-West economic conflict, we are talking about things like grain, technology transactions, direct investment, and so on. These economic instruments are used to further some political objectives like "detente" or "peace through strength" or an environment conducive to SALT and so on. Now, I am not saying that these behavioral assumptions or relationships are known, for they are not. Indeed, the two types of conflict share the common feature that the behavioral relations involved in them are not well known.

The other kind of conflict, the North-South conflict, involves the use of political-military techniques and instruments for primarily economic objectives; i.e., the use of negotiations, of debate, of U.N. pressures and of efforts to mobilize moral sensitivities, which Ken Arrow referred to yesterday. Additional potential techniques include coercive threats, either using weapons already held by the South or using the threat of acquisition of nuclear weapons as a coercive device among the various political-military instruments in order to achieve primarily economic objectives; namely, a redistribution of the world's products.

I think that both of these are economic conflicts. The first is closer to, but still different from, what has been classically called economic warfare. There is a variant of the first type of economic conflict that, I think, applies within the West; i.e., in intra-NATO relations, as distinct from between East and West. For example, I think, we are currently and increasingly concerned with

whether and how we can use economic instruments to bring about political-military consequences. We are concerned with whether and how we can use "offsets" or trade liberalization to bring about weapons standardization in NATO or to improve the political cohesion of the alliance. So, there is economic conflict within alliances as well as between adversaries. That is my first point.

RESEARCH PRIORITIES AND EMPIRICAL DESCRIPTIONS

My next two points relate to research priorities and research values. The first point was mentioned by someone yesterday; namely, the value of negative results, or the value of exposing ignorance where there has been an assumption or an assertion that mistakenly suggests knowledge. For example, we were talking about the relationships between economic well-being and political behavior. If you redistribute the world's products, will the South be more stable, pacified, or amicable? If you exercise the economic instruments to which I was referring (grain, technology, and so on) will this give you political-diplomatic leverage as implied, for example, in the Jackson Amendment? Hans Heymann asserted a contradictory proposition: that the only kind of leverage you can get from a particular economic transaction is in the same domain as that of the economic transaction. His proposition is that you can't exercise leverage by means of grain or technology exchange outside those domains. I think all of these are just not based on knowledge. They are all assertions and assumptions that may be heuristically useful and certainly interesting. But, it is certainly important to expose that we don't know these things, even though they are asserted as though we did.

The second point with regard to research priorities is the importance of empirical descriptions. We have been talking about theory and basic research. I think that it is important as perhaps a concomitant of basic research to get a better description of what is actually going on, where we are, where we are starting from. Notwithstanding Oskar Morgenstern's well-founded cautions and admonitions on the uncertainties and inaccuracies of economic observations, I think it would be highly useful to find out what the technology balance sheet is between the U.S. and the Soviet Union. We have a very elaborate pyramidal structure in the U.S.-Soviet Commission on Scientific and Technical Cooperation that was established in 1972 to facilitate the exchange of technology and information and to engage in joint research and development. The next level of the pyramid involves working groups on computer applications, on energy, on chemical catalysis, and on four or five other areas. The next tier of the pyramid involves four dozen scientific and technical cooperation agreements between the Soviet State Committee and a number of American firms, including GE, General Dynamics, ITT, Hewlett Packard, Boeing, Lockheed, and so on. Below that there are transactions -- there is licensing; there are commodities; and there are exchanges of visits involving literally thousands of Russians and hundreds of Americans. Nobody in the U.S. Government knows what this

balance sheet looks like -- what we are getting versus what are we giving, and the prices at which these transactions take place. It would be good to know this information.

Gus Weiss alluded to the question of international capital markets. In this context,

- Are the Russians going to be ahead of or in the same queue as the lesser developed countries (LDCs) in urging debt rescheduling?
- What is the situation with respect to international capital markets?
- With respect to foreign military sales to which Roger Shields alluded yesterday, the volume of foreign military sales internationally for all suppliers to all buyers last year exceeded the procurement budget of the U.S. Defense Department -- about 23 to 24 billion dollars as compared with the U.S. defense procurement budget of about 20 billion dollars. Who are these weapons going to? What are the "downstream" consequences of that accumulating volume of conventional weapons sales?
- What are the regional balances of power and "downstream" cost burdens on the developing countries?
- Is the redistribution of the world's products which is being sought through the new international economic order likely to be fully or substantially absorbed in meeting the operating and maintenance (O&M) costs of the weapons that are now being sold?

On all of the questions, what you do about them is clearly the pay-off. But, I don't think we even have the data, the descriptions, and so on that we need; we don't even know where we're starting from. So, I think there is great value in descriptive empirical research, rather than in theoretical modelling. I might interject a story here about that issue and the propensities of different disciplines and professions to engage in their own special brands of counter-productive behavior. The story relates to physicists, psychologists, and economists. One of each of these professions was adrift in a raft on the ocean and they had been drifting for hours and days. They were getting hungrier and hungrier, and they had but one can of unopened beans. So the question was: How are they going to open it? The physicist said: "Well, I can handle that problem." He took out his eyeglasses and he focused the radiation of the sun on the can to melt it. But, it was not a very sunny day and there was a cloud cover, so that did not work. Then the psychologist said: "Well, I think I can handle that problem. We've just got to concentrate our brainwaves so as to melt this thing." So, they concentrated for a few minutes but nothing happened. Finally,

the economist said, "Well, I can handle the problem. Let's assume that we have a can opener."

In short, I don't think that we want to engage in basic theoretical research proceeding from assumptions that are not grounded upon good empirical observations.

CONCLUSION

My last point really relates to the contrast that I noted between the discussion yesterday morning and this morning, on the one hand, and yesterday afternoon, on the other. Yesterday morning, Roger Shields and Ton Schelling were talking about present and future sources and types of economic conflict. During some of the discussions this morning, we were talking about very, very big problems -- like grain sales, foreign military sales, political leverage, orbiting junk in space, radioactive waste, proliferation, and so on -- very big issues to say the least. Whereas, in the afternoon session yesterday, we talked about very specific, well-formulated issues with regard to Soviet defense expenditures; i.e., different approaches to estimating them, ruble-dollar ratios, and trends. I think that there is an explanation for the difference between the precision and the focus of the two discussions. The difference relates to the 25 years or more of investment in time, money and talent in working on estimates of the Soviet national income and product, which was initiated by Abe Bergson and others. From that contrast, I would urge ONR and others not to underestimate the difficulty in terms of costs, time, and other resources that are needed to illuminate some of these big issues so that they can develop to the stage at which they can be analyzed with the precision that we were trying to exercise yesterday afternoon.

GENERAL DISCUSSION

Dr. Shisko: I have been working for a year in the area of long-term military competition. One of the things that I have been doing is trying to assemble some data on the activity in certain military areas with respect to both the Soviet Union and the U.S. I have consistently found that assembling these data on the Soviet Union has been easier than assembling comparable data on the U.S. The reason for this is that we have large, well-financed organizations whose sole job it is to collect data on the Soviet Union. In fact, they often get together and "negotiate" a certain number, so that whenever you do get a number that is the only number there is -- there is no disagreement. This calls to mind Professor Morgenstern's point about the accuracy of observations. You often find that the data you get on the Soviet Union is very precise -- it exists. Yet, when you go to the U.S. side, we find that the data are either diffused, do not exist, or reflect a great variation in the numbers released by different sources. We don't have an organization within the Federal bureaucracy that keeps track of U.S. data. We don't know where we stand in a lot of these situations involving potential economic conflict, because there is nobody charged with answering the questions: Where do we stand, and what kind of information is needed to assess where we stand? This is a real problem. We just don't keep track of ourselves as well as we keep track of all of our potential adversaries. I think that we need to do both well in order to develop a relevant policy.

Dr. Raney: There was a joke making the rounds in Washington a few years ago that the easiest way to find out how many people were employed by the CIA was to go to the Russian Embassy. I will assert, though, that you don't know how much you know about the Soviet's order of battle. The meaning of "data" as "something given" is very pertinent here. With respect to the U.S.S.R., you are simply given a clear, precise number, but you haven't the foggiest idea of its accuracy. A single number is very suspicious. As far as figures with regard to the U.S. are concerned, we do have a lot of "noise" in the system, unfortunately, but we are aware of the inaccuracies.

Professor Parker: I think that your point is very valid, but another point that one ought to consider is that a number of people have been trying very hard to attain more exposure of the uncertainties. This is very difficult to do, but it is a very standard problem. This is really the main point which I want to make. Herman Kahn pointed out many years ago that, at the time of Pearl Harbor, the U.S. knew much more about the deployment of Japanese forces and their order of battle than about U.S. forces. Conversely, the Japanese knew a great deal more about the U.S.

forces than they knew about their own. This is a general phenomenon flowing from the simple fact that you pay a great deal for information about the other side and, therefore, focus your attention upon it. By contrast, information about yourself is relatively free, chaotic, and in much greater supply. Thus, it is difficult to sort out. I don't think there is any reason, in principle, why one can't obtain the U.S. data with considerable precision.

Dr. Wolf: May I make a comment on this? Historically, one can say that perhaps the economists themselves are partly to blame for this situation. Specifically, the origin of obtaining an agreed figure from the Soviet sources was an attempt to apply cost-effective measures to activities in the Defense Department. This effort can be traced to McNamara's term as Secretary of Defense. Prior to his Secretaryship, there were such great divergencies among figures that there was no single number for anything. You can't have cost-effective measures unless you have numbers that are compatible. So, in a sense, our present situation is the result of trying to be more precise than the accuracy warranted.

Professor Shubik: We have heard Professor Morgenstern on various problems of accuracy, and yesterday we engaged in a discussion of Soviet data. But we still have to come back to some rather fundamental realizations concerning the aims of the reporting system. There are four specific questions that we need to ask ourselves: Who listens; who cares; who acts; and whose job is at stake? Those are probably the four fundamental questions in data generation. I hope that Andy Marshall will discuss some of these aspects tomorrow when he goes into organizational structure and decision-making. We also have to ask the questions: Accuracy for what, and when are these numbers introduced into specific decisions?

Oskar told us a little story about the Swiss bank. It was a nice little story, but the reaction of anyone who has operated in any bureaucracy larger than one person is: "Well, what else is new?" The name of the game in any bureaucracy is accounting for "fudge factors." Accounting for "fudge factors" means that somebody has a question which needs some data input. The data input is going to be an abstraction of all data available, and there is going to be one small set of aggregations that best answers that question. Now, if you intend to go to the "great data bank in the sky" in order to answer all questions, then you need to be aware of the standard rule for simulation. Any general, all-purpose simulation does absolutely nothing for anybody; the cost of being general purpose is the loss of resolution time. So, as soon as you start to answer more than one question with any set of data, that particular set of data starts to degrade relative to those sets of questions. Now, I don't want the remarks that I am making here to be interpreted as the standard "Oh-woe-is-me" reaction concerning the sad state of the world and the inadequacy of methodology. The simple facts remain that, as I listened to yesterday's discussion of Soviet data, there are many, good, useful purposes for which one

may want a set of numbers. But, I don't have a clear idea of how we use those numbers in U.S. decision-making. I also want to point out very clearly that I do not have a clue as to how the Soviets use their estimates of our numbers. I just want to call your attention to operational differences.

I do wish to stress that I am talking about military estimates by the U.S. of the Soviet Union and military estimates by the Soviet Union of the U.S. When we develop military estimates about the Soviet Union, an element of the "facts of life" in the United States is something called Congress. Every Congressman has a constituency; every Senator has a constituency; and sometimes, part of the ongoing debate is the "beautification" of some of the numbers to "scare the hell out" of a group of Congressmen or to provide a Senator with "hard information" (whatever that means) for certain interviews. So, we have a very difficult set of problems to satisfy. I don't know what the public opinion base is that a Russian Commissar has to be scared about. He may very well have a constituency which causes him to present figures in the same way as they are presented in our bureaucracy. Personally, I do not have a clue in this regard. However, I have been told by "Soviet watchers" that some of these answers could be given. If we don't have these answers, then I can tell you point-blank that this is an area into which we could pump a few thousand dollars to try to obtain some clues.

THE AFTERNOON SESSION, SEPTEMBER 14, 1976

TABLE OF CONTENTS

	<u>Page</u>
<u>Unconventional Methods of Economic Warfare</u> by Dr. Martin Shubik	F-1
<u>Formal Comments on the Presentation of</u> <u>Professor Shubik</u> by Dr. Jack Hirshleifer	F-15
<u>Formal Comments on the Presentation of</u> <u>Professor Shubik</u> by Dr. Earl Thompson	F-20
General Discussion	F-25

UNCONVENTIONAL METHODS OF ECONOMIC WARFARE

by

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INTRODUCTION

This talk contains a potpourri of thoughts which are possibly not as well organized as they might be, but are somewhat offbeat, and it might be worth the effort to at least look at a few half-baked ideas every now and then. Personally, I support the relatively conservative view that the reason why some fascinating ploys and dirty tricks have not been tried is because they will not work. But, such a conclusion remains to be established a little more solidly than we have established it at the present time. Frequently, new ideas turn out to be not so new -- to be ideas that had been looked at, rejected, and forgotten. Nevertheless, in the "fashion show" of research and bureaucratic methods, it is probably a good idea to go back every now and then and see what was looked at previously, why it was looked at, and what was done about it.

SUBSTANTIVE AND METHODOLOGICAL QUESTIONS

My first observation is that it is really quite surprising how small the literature is on economic warfare of a conventional or unconventional nature. You may find some material, classified as oligopoly theory, that is called economic warfare. (I think that is not a bad classification, because I believe that any economic model in which individuals take the other side's reactions into account is a fairly legitimate exemplar of economic warfare.) The literature is genuinely small. One is hard put to find 20 books of quality. Many of them are of the era of World War II, and a fair number are on the list that was distributed at this Workshop. Furthermore, there is extremely little on methodology.

CONVENTIONAL ECONOMIC WARFARE

The topic of conventional economic warfare can be subdivided in the following way:

- Tactical versus strategic,
- Short-term versus long-term, and
- Hot wars versus cold wars.

The concept of economic warfare is really very old. Certainly, much of the mercantilist view of trade was grounded in terms of conflict. Policies of protecting infant industries have been implemented for well over a hundred years, with rationales formulated in terms of military and strategic considerations. The attack weapons of conventional economic warfare have been tariffs, embargoes, currency controls, and credit conditions. The defense weapons have included stockpiling and autarky.

It would be a futile taxonomic process to try to make too fine a distinction between conventional and non-conventional economic warfare. A continuum exists as different methods blend into each other. With this in mind, we will go to the slightly less conventional.

Two tactics which seem to be in the gray area between clear examples of conventional and unconventional economic warfare are the smuggling of goods and smuggling in the transfer of technology. Currently, we seem to be giving away much technological know-how without an adequate consideration of the implications of doing so. But, in previous times, much smuggling did go on. Two important examples of smuggling -- not so much technology smuggling, but smuggling in natural resources -- are rubber trees and pineapples. The Dutch in Surinam protected the pineapple for some time before it was smuggled out successfully to Hawaii.

At this time, it is my belief that a key, specific item on which we should be supporting a major study is the evaluation of the effects of the transfer of computer technology and miniaturization techniques.

CHANGES IN THE INTERLINKAGE OF THE WORLD

I would like to propose that, in the last 25 or 30 years, there have been some qualitative changes in the economic structure of the world which may possibly lead to the opening of new dimensions in what we might consider as economic warfare. In particular, the economic interlinkage has changed in three important ways: (1) goods interlinkage (i.e., volume of trade); but possibly more important, (2) communication and credit; and (3) control interlinkage. These changes are manifested in our acceptance as "natural" that we can use an American Express Card in Moscow. The interlinkage of credit systems is a phenomenon that has mushroomed in the last 25 years. It undoubtedly existed, up to a point, many years ago with the Medici financing the King of England, but it was both quantitatively and qualitatively different at that time. Furthermore, tied in with these communication network interlinkages have been new institutional interlinkages; the multinational corporation and the international organizations complete with a burgeoning international civil service and a whole group of specialized international organizations dealing with special problems all over the world.

THE OLD VERSUS THE NEW:
COMMODITY VERSUS CONTROL ECONOMIC WARFARE

It may well be that we should be involved in trying to raise some new questions, rather than spending our time rehashing the old ones. There are many old questions which need to be rehashed, but we need to see if there are new items meriting study. In keeping with this observation, I suggest that the old economic warfare was primarily oriented towards goods and commodities. It may be that the new economic warfare is still that way. But, there is also a possibility that it may become increasingly directed towards striking at communication and control systems.

Furthermore, concerning economic control, the delicacy of credit relationships and of financial institutions and information agencies may present a new set of dimensions in the development of a new art form of economic warfare. Concerning this development, I suggest two rules that I believe are important in trying to invent new questions. The two rules are:

- Forget symmetry, and
- Think "crazy."

Symmetry

In many areas of study, symmetry is frequently the great simplifier which really pays off handsomely and helps in attaining all sorts of results. However, sometimes, especially in the study of conflict, the assumption of symmetry may be a dangerous, inhibiting device in taking a look at the other side. Among its several dangers, it produces an extreme form of an unthinking "me-too" reaction. That is to say, because something is good for the other side, it must be good for me; or, because he is spending X megabucks down a certain "rathole," I have got to get my megabucks down that particular "rathole." In this connection, I would like to suggest an analogy. It is much better to think of international economic warfare or competition in terms of the trident and net versus the sword and shield than to try immediately to symmetrize the weaponry menu. The different sides may have highly different goals, highly different capabilities, and even different tactical and, to some extent, strategic positions from which they start. The simple analogy with chess, or with any one of a whole series of symmetric board games, leads to symmetric mathematical formalizations, which can be dangerously misleading.

In particular, the lack of symmetry is quite clear in economic reality; the West and Japan are characterized by market economies which are high credit economies that are very complex in an open, loosely-coupled manner, and which, hopefully, (and I think this is an area of very important research) may have enough redundancy -- but, quite possibly, do not. We will return to the question of redundancy later. What I am referring to is the following. When a segment is

knocked out of a modern market economy, does the system have enough regenerative powers to keep functioning well because it has alternative channels for operations, or did we not build enough redundancy into the system so that it is extremely vulnerable? The Western economies contrast with the Soviet-controlled economies, which are basically low credit organizations. On the political side, the non-symmetries are even more striking. When we juxtapose the political and the economic structure, and include the bureaucratic structure, one does not have much symmetry remaining.

Think "Crazy"

In suggesting the rule of think "crazy", I want to note that it is impossible to generate all offbeat scenarios. One cannot do an exhaustive, set search on virtually anything in any behavioral science. Even in an essentially simple game such as chess, the possibility of an exhaustive, set search is just out of the question. On the other hand, that does not stop one from trying to dream up oddball situations and to analyze a few scenarios.

Why did I say think "crazy"? Basically, to warn us against the fairly heavy inhibitory mechanisms that we seem to have built within us which, very quickly, make certain ideas taboo to all. As an example, we think that germ warfare is a very unpleasant form of warfare. Yet, it is not merely an unpleasant form of warfare; it is something that is almost a "no-no" in even nice military circles. Decent people do not talk about germ warfare; they do not even talk about forms of gas attack. Phosgene produced some rather fancy casualties in World War I; people coughed their lungs out for years to follow -- if they survived at all. Thus, gas is a "no-no" which we leave to the special "dirty tricks boys", tucked away in the Pentagon or elsewhere out of sight.

As a particular example of an offbeat or think "crazy" scenario but in the context of what we are talking about here, I want to consider the possibilities of dropping large amounts of currency from the sky so as to cause social confusion in the particular target areas where we might drop that currency. Most offbeat suggestions, I suspect, can be dismissed as impractical, but they cannot be dismissed a priori and, it seems to me, that one wants to pay a little attention to checking some of them and making sure that that which you were calling "crackpot" was called "crackpot" for good solid reasons.

Dror has written a rather nice article discussing political phenomena such as Hitler, which he calls "Crazy States". I think that we need to consider when and why we might have crazy economies. Knowledge of the mechanisms which send political systems "off their rockers" is rather small. The same is true for economies. I would like to get back later to the question of the mechanics of major financial panics and disruptions.

SOME SPECIFIC POSSIBILITIES

A small shopping list of some specific possibilities for economic warfare is given below. In placing all of these case examples under the heading of "economic warfare", I construe the sense of economic warfare broadly. Some of these cases literally involve a certain amount of sabotage and weaponry, so it is warfare in a fairly close sense. In others, the acts described are not so closely linked to warfare in a narrow sense. The two major categories are:

- Economic systems and material conflicts, and
- Financial systems, markets, information communication and control systems conflicts.

Economic Systems and Materials Conflicts

One possible form of economic systems conflict is the favorable resource-consuming technology or arms race in which one encourages a competitor into the error of an assumption of symmetry and "me-too" in an area where one has a clear advantage in the damage exchange rate. The idea is that it is to one's advantage to have an opponent pour his resources and technology into a project where, for every dollar he spends, it costs you 30¢. It is not merely a matter of the money itself; it is a matter of locking up technical personnel and general resources.

We face a fundamental question. Have any of the arms races been planned to waste the resources of an opponent, or are they, in fact, merely happenstances of "me-too" assumptions made in applying symmetry-based reasoning? I suspect that they may have been caused by "me-too" thinking: "If he is buying that, we had better buy it as well."

Another question is: "Can we actually start and control races of this type?" If we wished to, I think we could. For example, I would be happier if we not only stopped giving away miniaturization and computer technology, but if we also started to signal very heavily about our expenditures on this technology and led the Soviets to sink an enormous amount into this research. Such a result would pay us off in several different ways: One, it would probably cost them much more than it would cost us; two, it would help verify our results; and three, it would give us possibly something to obtain from them, if they were successful. It is essentially another way of validating our own research, if we force a competitor to do a fair amount of research work in an area that we have already been over. Even at the risk of having them discover a few new devices, it would be, on the whole, a good thing for us if they sank resources into this research, rather than obtain it from us.

One of the difficulties in trying to control and manipulate competition in this area is that one of bureaucracy's major weaknesses is also its major strength; namely, most bureaucracies have

unbelievably slow response time and poor perception. The rule is: You can tell them anything, but who is going to listen? So, to some extent, attempting to purposely lure an agency into a particular posture is not as easy as it may sound sitting comfortably here at Airline House on a Tuesday afternoon.

Another problem that comes up in resource-consuming races is the question of false information. Tom Schelling touched on this issue yesterday. I want to approach it from a slightly different point of view. The major problem is (and this gets back to understanding how data are validated and utilized): Can you make claims that are heard clearly in such a way as to mislead? For instance, we could tell the Soviets: "Oh yes, we researched those V-2 rockets and they never worked. We researched that particular technology and we found the following errors" -- without telling them that you also learned how to get around the errors. This example presents the possibility of heading off opposing research work by the planting of misleading information.

Now, I have a comment or two on damage exchange rates in warm wars and in cold wars. Something which, as an outsider (i.e., someone not in the Pentagon and not in Washington), completely puzzled me in the last few years was the suggestion in various articles in the newspapers that the Soviet Union was going to cooperate with the United States on ending the Vietnam War. This idea seemed to me to be absolutely monstrous when one thinks of the joys they must have had when they calculated the damage exchange rate and what the war was costing the U.S. In my considered opinion, it would have paid the Soviet Union to have spent a little more money than it did in keeping the Vietnam War going for another few years, because it was just the nice sort of situation that could bleed the U.S. white.¹

Another specific example is Cuba. It is fairly clear, I think, that Cuba would be logistically expensive for the Soviet Union to support. The idea that the world has grown smaller is quite true, but it is still probably militarily true that the support of clients who are really very far away and logistically inconvenient is not that cheap an operation. I am not saying that it would be lovely to see the Soviets go "totally wild" on Angola, but I would like to point

¹ Dr. Morgenstern: I mentioned the same point yesterday. I pointed out exactly what you are saying in an "op ed" page in the New York Times many years ago. The real problem, to my mind, is how is it possible that the people in charge here didn't see this situation? That is the problem! How do you explain that?

Professor Shubik: I'm posing a question, not an answer. This is before the research, not after.

out that Angola is not next to Rumania. This fact, I think, is important to keep in one's considerations. Of course, it is also not next to the United States either, which is why Cuba is probably -- in damage exchange rate considerations -- more convenient to the U.S. than the Soviets.²

Another topic is oligopolistic behavior in multinational corporations. Again, I am somewhat pessimistic; an example for my pessimism is the technology drain to the Soviet Union. Despite assertions to the contrary and arguments in some "populist"-style writings, the U.S. has and, it could be argued, should have, very little influence on the policies of its multinational corporations. The possibilities are very minimal of the U.S. Government beating the U.S. international corporations into essentially state-political-goal-oriented extensions of the U.S. Government, as say, the Soviets might be able to do with a trade mission. This is another particular area where the non-symmetries of the situation have to be faced quite clearly. I don't think that we could encourage overseas corporations to play any terribly important international political role. They may play some surveillance role, but even then, I doubt the wisdom of such behavior.

² Dr. Morgenstern: The next thing, of course, is Yugoslavia, which is right near the Soviets. Then, they would be on the Adriatic.

Professor Shubik: I want to note another area which everybody has paid lip service to, but on which I have found very little strategic analysis. It may be simply that I'm not privy to the documents and that studies have been done, but I think that we need a serious analysis of what is meant by food economic warfare. I believe that the U.S. would have great difficulty waging a "food war" for several reasons. First, there is the question of the intermix of Government policy and goals with morality questions and public opinion. Then, there is the issue of the extent of Governmental controls on the independent marketing agencies and the agricultural sector. I do not believe that the U.S. Government has anywhere near the control in this area as is believed and argued in the press. Yet, the fact remains that the basic statistics of the changes in export surplus patterns in the world in the last 20 years or so imply that it is not so easy to dismiss the hypothesis that the U.S. could get as important a "lock" on the wheat supplies of the world as the Arabs have on the oil supplies. It may well be that the U.S. and Canada, with respect to wheat supply and demand, are not very far different from the Saudi Arabians. I feel that this is a serious area for research at all levels. I am personally pessimistic about the U.S. political, economic delivery system in this case, but the whole issue has to be thoroughly examined.

Tom Schelling also mentioned my next topic: the promotion of dangerous and/or illicit commerce, such as small arms trade, nuclear arms trade, drugs and narcotics trade. Concerning this issue, I think that it is worth considering the following proposal, which an extreme rightwing free trader might put forward: It is more in the self-interests of the major powers to encourage cash sales of "Saturday night specials" to the Third World than to supply free grain and medical supplies, together with cheap, long-term credit.

Leaving the determination of the advisability of this idea to you, I would like to make an observation about long-term credit. I strongly suspect that it is virtually never in our own self-interest to extend cheap, long-term credit to many of the developing nations. That doesn't mean that we shouldn't help them. I think that if you want to go as far as to extend cheap, long-term credit, then you should give them the resources, for, if you give them the resources, then you do not give them both the money and a hostage. If you give them long-term credit, you may delude yourself into believing that you are going to get paid back and thereby lay the groundwork for giving them more long-term credit when you do not want to. Give them the resources and "write it off the books" immediately. Don't carry it on the books as something you expect to get back unless the loans are restricted by basically conservative investment banking criteria.³

Financial Market System and Communication Conflict

I would like to direct my discussion now to financial systems market and communication conflicts. I have subdivided this topic into four sections:

- Subverting currencies,
- Destabilizing markets,
- Wrecking credit systems, and
- Breaking financial institutions.

Not much material has been written on these topics. One famous observation, though, was made by Lenin. He wrote that the subversion of a country's monetary system was an important act of warfare.

³ Professor Arrow: How do you explain the fact that there have been repayments of loans by LDS's?

Professor Shubik: I didn't say that all loans have not been repaid. I wanted to focus attention on the growing number of high-risk loans which should rightfully be termed grants and on the whole question of loan authorization to the Third World.

Not only has very little been written on financial warfare and the breaking of financial institutions, but also there does not seem to be much evidence that many financial institutions have gone under in a particularly spectacular way.⁴ This leads to a fairly natural question: Were previous economies so robust or so simple that attempts to subvert the financial structures were not worthwhile? It may have been that the simplicity of the organization made them less vulnerable in certain ways.

Concerning the subverting of currencies, I do not know of any cases where one country poured massive amounts of currency into another country as a tactic of economic warfare. I've talked with many people about this and several stories have surfaced. Apparently, the Japanese had the idea to subvert the Chinese currency early in World War II. Also, there is a story that the Soviets obtained the German plates after World War II. But, none of these schemes was actually implemented on a large scale. As an aside, it should be noted that the effectiveness of currency sabotage depends, to some extent, on the degree to which a society is cash or check-oriented. The countries which are probably the most vulnerable are countries in transition, midway between being underdeveloped and becoming developed. An old maxim of W.C. Fields speaks to this point: "Never hit a man when he's down. Hit him when he's half up, because he's off balance!" Moreover, with respect to many of the smaller countries, stealing their plates would not be overly difficult.

A think "crazy" scenario, which I'll describe to you for a different purpose, is purely tactical. Suppose one wanted to cause a great amount of short-term confusion and social stress -- perhaps as a preliminary to another action. I wonder what would happen if one dropped a couple of billion dollars in small notes on a place like New York City. A delivery system for such a scheme could be easily arranged. Mr. Jones from Kankakee, Illinois, on a flight pattern to Islip, could be in New York airspace without any difficulty. The number of planes which would be needed for this venture can be easily calculated; the number is not really very high. One might add to the confusion by scattering a billion in virtually genuine currency and another billion in five different types of good counterfeits. To check for just one counterfeit style is not easy for merchants to do. Imagine the effect on trade when the FBI alerted merchants to be on the lookout for five different counterfeit styles. Social dynamics also come into play. It might be,

⁴ Even the damage caused by hyperinflations does not appear to be as spectacular as one might suspect.

that, if you dropped Deutsch-marks on Freiberg, the good citizens would turn them in to City Hall by afternoon. If you dropped dollars on South Bronx, I'm not so sure!⁵

Another question which needs some careful research is the destabilization of markets. Why were the Cassandras on the recycling of the petro-dollars so wrong? More fundamental questions are:

- What is a market?
- What are international markets?
- What is the Euro-dollar market?

When we talk about markets in the medieval sense, we can say that the market in Carcassonne met for so many weeks, at a particular time of the year, and was frequented by certain people. When we talk about the Euro-dollar market, the particular entity is rather vague. There have been some writings on this, and I feel sure that Professor Triffen

⁵ Professor Arrow: This sounds like a tactic which would accompany an actual war. I can't imagine what the meaning of this would be. Let me ask a more general question: What good is an anonymous threat?

Professor Shubik: It's to occupy the opponent while you're doing something else.

Professor Arrow: These, then, are only short-term tactical maneuvers which are part of a larger scheme.

Professor Shubik: That is correct. I think that it is perfectly reasonable and legitimate insofar as this Workshop is concerned to consider tactics of economic warfare waged as an adjunct to a hot war. Not knowing the answer, I wonder why the Germans did not intersperse great dumpings of pound notes on England during their raids and why didn't we do that to Germany? I have asked Dick Cooper, Jim Tobin and various monetary economists, but I cannot find one single document on this subject. With respect to books, The History of Economic Warfare and The Encyclopedia of Behavioral Sciences are both very meager sources of information on this subject.

Professor Arrow: A notorious incident of counterfeiting on a rather large scale did happen in Portugal in 1950. Somebody in private enterprise got the real plates by a ruse and ran off a bunch of notes. Eventually, the counterfeiters were caught. But, in civil court, suit was brought against the bank for having carelessly guarded the plates. The problem was to establish the damages. At the time, the Portuguese economy was rather depressed, and the defense made an excellent case that the bank's blunder had, in fact, improved the state of the economy.

knows what the Euro-dollar market is, but not too many more people do. Suppose one were out to shoot the major participants in the Euro-dollar market! What actual individuals would one shoot? The targets are fairly obscure. I raise this question with reference to destabilizing markets, because it's not always true that the market target is that well defined.

Another reason why it is not necessarily easy to destabilize markets is the strength-weakness paradox. Let's look at the flow of petro-dollars to the Middle East. After the oil price rise, everyone was worried about the effects of the transfer of wealth to the Arabs. But, look at it this way. Yes, the Saudis are going to get \$50 billion in resources, but what one forgets is that there is a strength-weakness paradox. When the refineries of the area were U.S.-owned, the Arabs had the hostages. As soon as the situation became one where they held our paper, we then acquired the hostages. Our hostage power was increased through the transfer of paper wealth.

I have another question which I hope some of us may be able to answer a little more accurately. If the world is in debt to some entity for \$50 billion, it's very difficult for any country to cause sufficient confusion to hide the identity of the holder of that amount of debt. It's one thing if you are a small millionaire and you have a mere \$20 or \$30 million to hide. You can use a variety of techniques, such as Swiss banks to "launder" your money and confuse ownership. But, if somebody were to nationalize Saudi Arabian assets abroad, my guess is that only 5 or 10% of some personal accounts could escape capture, while 90 to 95% of those accounts would be "nailed" with the same accuracy as the Saudi Arabians could nationalize a refinery in Saudi Arabia. I may be wrong, but, nevertheless, the question of whether we actually have bona fide Saudi hostages or whether they can really hide things is a valuable topic for research. Presumably, there are some books to be published soon about how petro-dollar recycling was successfully achieved and why the cartel has remained stable for so long, but these, too, are issues that merit close investigation.

Now, I have a one-line throwaway called, "What About Gold?". At the price of \$100 per ounce, would fifty billion dollars worth of gold be a particularly important economic weapon in anyone's hands? My guess is no. The wild scenarios about countries shifting five billion dollars worth of assets overnight from one economic institution into another and, thereby causing havoc, have just not occurred. One of the reasons why this is true is that when there are only a few players in the game, a wild act by one player leads to a change in the rules. I think we've been seeing a changing of the rules of the game on gold.

With respect to panic, we can turn to the historical record to find some illustrative examples for study. The first panic which I call to your attention is the Chinese inflation in the twelfth century, which resulted in the banning of paper money in China. The Chinese Finance Minister of Kublai Khan is attributed with the first serious

invention of paper money. Unfortunately, two or three years after it entered circulation, there was inflation in China, and the Chinese recalled and burned all paper money. The use of paper money was banned.

Other panics include: the Dutch tulip crises, the South Sea bubble and John Law's assignats. A minor recent panic was the sugar-buying panic of a couple of years ago. This panic appeared to be primarily psychological. The world supplies of sugar were not excessively low at the time. It was just a rather bizarre situation.

Turning to the literature on panics, my library search uncovered several books on this subject. There is an English book by MacKay on panics and popular delusions, and there are a few novels: one about the "pit" and Chicago grain trading, and some others about Wall Street. There is also Dostoyevsky's classic "The Gambler." But, when you try to look for any serious study of the question of what are the generative forces that cause major panics like the Dutch tulip crises or the South Sea bubble, it cannot be found. The study of panics is not in the realm of what we call strict economic theorizing.

Concerning the vulnerability of markets and market-breakdown, I have to state that I am rather conservative in my beliefs. My thoughts are based on reflective observation, not on theories. I believe that markets change rather than break. They seem to be very liquid and very flexible organizations. Unpleasant surprises tend to change, but not kill, markets. Again, we know from finance and from oligopoly theory that many markets are very thin. One would think that a very thin market could be easily broken. Two questions come to mind:

- Can we identify where there are important thin markets?
- If we can, what can we do about it?

This relates to my other observation from which I offer you a hypothesis: When you have very thick markets (i.e., lots and lots of participants), people tend to stick to the rules of the game (of the market) because it's rather hard to get hundreds of thousands of people to cooperatively change the rules. When you have only five or six people in the market and somebody tries to push the rules to their logical, silly conclusion, the other participants announce that they refuse to play to that set of rules and a conference to change the rules is held. To some extent, this is what is happening with respect to international gold trading among nations. I wonder if, for example, in the case of aluminum and chromium, there is the appreciation that markets, if they are thin, are not fully governed by formal rules.

In the arena of dirty tricks, I want to make a few comments about the wrecking of credit systems. Suppose there were a small sabotage team operating in the United States. What would be its reasonable economic targets? Would it be better to blow up ball bearing factories or the check clearing facilities of the Federal Reserve System? Given that the Federal Reserve System clears about a billion checks a

day, a great deal of confusion and discomfort might result if checks were prevented from clearing. Martin Mayer, in his book The Bankers, describes what might be the likely effects. An example occurred a few years ago when a heavy storm in the Midwest caused a billion dollar change in the float on the East Coast because the planes carrying the cleared checks from the Midwest could not take off for a day. I think the question of whether there are particular areas and particular communication modes in our financial system susceptible to disruption should be examined carefully.

Data bank and computer communication sabotage is another such area. I feel that the more sophisticated our credit systems become, the more vulnerable that they seem to become. A few minor dirty tricks might be the flooding of markets with duplicate credit cards or distorting bank data on credit information.

Another "throw out" that I have is this: Is the postal system worth attacking? I pose this as a question, even though I am beginning to suspect more and more that the postal system is already an enemy agent! However, it might be possible that it could be made worse. There have already been some small occurrences of guerilla war on postal systems, but I haven't seen much written on mass attempts such as mass incendiary letters. One could go around the country mailing magnesium flare-type letters that would burst into flames later, thereby destroying the mail.

Another tactic might be the breaking of financial institutions. I do not know whether or not the failure of financial institutions has played a major role in the financial difficulties that have hit various countries. The classical example is the failure of the parts of the U.S. banking system during the beginning part of the Depression, which raises the question: Was that a symptom of, or was that a major contributing cause to, the Depression?

There is a certain amount of fiction on the breaking of banks.⁶ Martin Mayer's book refers to a novel in which an individual walks into a bank, asks for a loan, and his request is denied. The next afternoon, he returns with a million dollar withdrawal from a friend of his which was just enough to break the bank. The friend had sent him in saying, "See if they will make your loan; if they won't, we'll take care of them." This scenario would certainly hold true for small banks in the U.S. and even with respect to some Wall Street deals. Whether or not this could be of any national or global significance is not clear to me. It seems that breaking financial institutions is tougher than it appears.

Another example might be the stock market, which is very hard to break. The Securities and Exchange Commission (SEC) patrols it sufficiently well that it would be hard even for the Arabs, with their OPEC money, to disrupt the market.

A final possibility which I will note is the reality of interlocking financial institutions -- our domestic version being the role of the State of Delaware with respect to the rest of the country. Internationally, you may have a country which legalizes the illegalities of somebody else's financial institutions and thereby offers a great source of illicit dealings. An example might be Swiss banks, off-shore funds, and other havens for actions which would be illegal in the United States or elsewhere.

DISCUSSION

Professor Bergson: I would like to make a few distinctions in order to help us organize our reactions to 'his very interesting list of acts of economic warfare. We ought to distinguish between actions that others might take against us and actions that we might take against others. In thinking about actions of others and our responses, we might want to take into account many very extreme possibilities in order to be prepared for almost any eventuality. On the other hand, in thinking about actions that we might take, it might be useful to consider various reasons why we might want to wage economic warfare. My thinking on this matter has produced a list of three aims that we might wish to realize.

One aim for pursuing economic warfare is to improve our own position economically (perhaps also politically and militarily) without necessarily attempting to injure another party. The levying of a tariff is an act which might likely be motivated by this aim. A second type of motivation is that of injuring an adversary, which is a significantly different motivation. A wide variety of measures are at the disposal of policy makers to achieve this goal. Finally, we may wish simply to control an adversary's behavior.

Ken Arrow's reminder that we have to consider the political context -- whether we have a hot war, a cold war, or detente -- is very important in determining which aim would be the most appropriate. It may be that injuring an adversary might be appropriate in one context, but not at all in another. Measures taken to control an adversary's behavior might be appropriate at a time when causing injury to the adversary might be inappropriate. It might be useful to think further about these measures.

Professor Shubik: Let me briefly say that I'm in complete agreement with you. I regarded my task as to try to generate some questions. I am the first to admit that the taxonomy of these acts in terms of strategic and long-term versus short-term categories was inadequate. They were presented as a potpourri, but there are several research projects which need to be done in this area.

FORMAL COMMENTS ON THE PRESENTATION OF
PROFESSOR SHUBIK

by

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INTRODUCTION

I have greatly enjoyed the DDT (Department of Dirty Tricks) discussions by Tom Schelling and Martin Shubik. In that connection, I have a little story. About 15 years ago at Rand, Andy Marshall and I received news that a certain Government Agency's Department of Dirty Tricks was going to visit us. So, we spent a marvelous weekend brainstorming on different dirty tricks and, I must say, we came up with a good number of those on the lists that have been produced here. When the great day arrived, the delegates from the Agency walked in and sat down, but, when we tried to make our presentation, they cut us off right away. They told us that they were totally uninterested in our list of dirty tricks because they had their own ideas about dirty tricks. Their ideas about dirty tricks were as follows:

All of us here are familiar with the Leontief input/output system according to which, at least in the early models, if you could reduce a key sector down to 0, you could reduce the entire economy to 0. The Agency people were using a 150-sector input/output model of whichever economy they were working on as their target and had determined the one sector that could most economically be destroyed and which would bring the entire economy to a halt. I don't remember exactly which one it was, but it was something like the bicycle industry. If you could just blow up a couple of bicycle plants, that would end everything. So what was their problem? Their problem was this: They didn't think that blowing up bicycle plants was quite within their resources because they were an agency with a very limited budget. So, they were planning to spend a million dollars of their limited budget to expand this 150-sector input/output matrix into a 440-sector input/output matrix. That would have meant that, instead of having to blow up the entire bicycle industry, they might have been able to concentrate on perhaps 3-wheelers for 6-year-olds and thereby stop the entire economy. Their target economy still seems to be running, so evidently their method was somehow incorrect.

Turning from practice to theory, I'd like to put the ideas we've been discussing in a more general framework -- a framework that I mistakenly thought was going to be the title of this Workshop: "Long Range International Competition". Since I have already prepared some discussion of long-range international competition, you're going to get it anyway.

OFFENSIVE BEHAVIOR: A GENERAL THEORETICAL PERSPECTIVE ON ITS ORIGINS AND MEANS OF LIMITING IT

As a point of departure, I would like to redirect attention to the language that Tom Schelling used in his paper. He used terms like "offending behavior" and "intrusive actions". I think this represents a mode of thought which, while natural for us, is seriously misleading and represents perhaps our major national handicap in playing the game of power in the world as it actually is.

Mere Existence As "Offensive"

From a long-term point of view, the fundamental offense or intrusion of the other party to the conflict may not be any specific action on his part, but rather his very existence. We have a situation where all human populations in the various forms of society in the world -- capitalism, communism, democracy and so forth -- are competing for the limited resources of the globe. Hence, whether you adopt a biological view of survival of the fittest, or a political view in terms of power, you should not ignore the possibility that, for some power group on the globe, it may be the mere existence of the other party which constitutes his "offense" or his source of "intrusion." For Hitler, the offense of the Jews was that they existed. The fact that we choose not to look at the world in this manner does not mean that this is not the reality of the situation as viewed by others. This is the fundamental "fallacy of symmetry" that Martin Shubik warned against in a slightly different context.

Qualifications and Limitations

Because life would be impossible on the globe if everyone really acted on this basis every day, what are some qualifications and limitations on this ultimately total conflict? One is that there is perceived mutual gain from restraining competition and not assaulting one another on sight. This is what we call "enlightened self-interest". But, the trouble with enlightened self-interest is that it's a weak reed. There are free rider effects; it pays to cheat. Hence, if you only have enlightened self-interest to operate on, then you'd better not make any agreements that are not self-enforcing. What's the difference between self-enforcing and non-self-enforcing agreements? To use Martin Shubik's banker example, a loan with collateral is self-enforcing, while a loan without collateral is not self-enforcing.

A second means of limiting all-out war, which is at least potentially present in the power game, is the formation of a society. In this particular context, the structure would have to be a world society having some kind of international law and enforcement. This society doesn't presently exist. International relations remain fundamentally in a Hobbesian state of nature.

Finally, the third qualifier is a code of ethics or altruism. Whether this code of ethics emerges from humanistic or religious considerations, it is nevertheless to a considerable degree an important factor in the world. To summarize:

- The language of intrusion and offenses is really quite misleading in the absence of a system of law or of ethics that defines the rights of all parties in a way that all parties are at least willing to abide by; and
- In the international power game, we are not in the realm of law; therefore, the only things we have to rely upon are self-enforcing agreements or systems of ethics and values.

The system of ethics probably works pretty well between the United States and Great Britain, but it's also reasonably clear that the ruling elites in a number of societies in the communist realm or in the Third World don't share these ethical systems. Obviously, even we don't abide by ours a hundred percent; our preaching is better than our practice. But, nevertheless, it's a serious constraint on our action. By contrast, in the Soviet Union, the very definition of law is that which serves the Soviet State. They recognize no idea involving an objective system of rights. My paraphrase of the Soviet Constitution may not be technically correct, but, at any rate, I think it describes what Soviet law actually is.

In short, I suggest that we face a great danger by tending to make agreements that we treat as having the force of law on our side. Treaties are technically laws. Hence, we will continue to live up to them, even when it's against our interests. We will repay the loan, even if there's no collateral, but certain others would not. And, these certain others include the Soviet Union, according to Leites' view of the Politburo. But there are also the OPEC nations and, according to Adelman, there is no point in making agreements with them that aren't self-enforcing -- they'll just tear them up as soon as it becomes convenient to do so. You may think that I'm exaggerating the difference here for dramatic effect, but in my view, the "fallacy of symmetry" -- the usually implicit assumption that the "other guys" are really just like us, once you view things from their angle -- may end up as the fatal flaw in our policy. Even if there is no difference and we're really just as bad as they are, I think it's useful to view the international game of power in terms of a contest that, in some ultimate sense, may really be a ruthless one.

**OFFENSIVE BEHAVIOR:
SPECIFIC COMMENTS ON TAXONOMIC DISTINCTIONS**

Conflict -- and economic conflict in particular -- is likely to be around quite a long time. Wars somewhere between cold, middle, and hot will likely also be around and, therefore, some of these dirty

tricks are liable to be applied offensively or defensively. Moreover, it will not be solely under very extreme conditions that they will be resorted to by one side or the other.

Now for some specifics. Concerning the category of "tactics versus strategy", it's clear that, in terms of tactics, you can damage other countries by the kinds of techniques we have here. You might think of it as economic development in reverse. If having an integrated financial system is a good thing, then just disintegrate it. Instead of development, you have forced regression. But, there is a problem of identifying the specific strategic purpose of such tactics. Also, it can raise the problem of a warfare or hostility continuum: Will you actually want to apply one or more of these techniques?

The second point is that the connection between economic development and military power has lost the "neatness" that it used to have. Conceivably, the Soviet Union might disintegrate our financial system, reduce our GNP drastically, and still, nevertheless, strengthen our military power. This linkage between military power and economic development is complicated. In some respects, it is clearly positive. For example, there are some super-expensive weapons, like anti-ballistic missile systems (and, of course, these are weapons where we have a comparative advantage, so we signed away the right to have them; that was somebody's smart move along the line) positively associated with wealth. Some other things are so cheap as to be essentially neutral with regard to wealth and, finally, in other respects there seems to be a negative effect of economic development on military power. This is the case where a guy gets so fat and flabby that he can't really fight very well. Looking at it from another point of view, he's already so well off that he's got more to lose, and, therefore, you can push him an awful lot further before he works up his nerve to fight. So, while you can injure target economics, it's hard to think of a strategic situation where you can be reasonably confident that the tactics of dirty tricks will favorably affect the actual balance of power.

Another distinction that has been mentioned by quite a few people is defensive versus offensive tactics. I have uncovered some evidence that we at least contemplated the offensive use of these tools at one time. Still, from the U.S. point of view, it would probably be a more profitable use of our time to concentrate on defending the use of such devices by the other party.

Another useful distinction, from the analytical point of view, is between strategies that are based upon equilibrium concepts and strategies that are based on disequilibrium concepts. The equilibrium strategy uses comparative-statics models of the economy: it posits that if we take away some of the other guy's resources, he'll be poorer. It is within the capacity of our economic models to consider this, but the upshot is usually that, with the tactics of dirty tricks, you can't really make the guy that much poorer

so as to have much effect. On the other hand, the disequilibrium or disorganization strategy, which Martin Shubik seemed to say might be more troublesome, doesn't involve heavy destruction of resources. It presupposes a panic or some kind of a network of failures, which result in confusion and unrest. Various examples come to mind. The great power blackout of 1966, due to the failure of a \$1.50 part, literally stopped everything in the East in its tracks for over 24 hours. This example suggests that, conceivably, one could have substantial effects through disorganization strategies.

These points are related to the issue of the degree of vulnerability of different economies. Again, I don't think that vulnerability to sheer resource deprivation is very great. The effects just aren't that large. Yesterday, Professor Morgenstern talked about the compressibility of economies -- the minimum bare-bones of an economy. I doubt if that problem arises in U.S. defense thinking about economic warfare. I doubt that any economic warfare tools are going to have very much of an impact on us. On the other hand, working through disequilibrium strategies might be quite effective. One challenging intellectual problem which needs examination is the following: If, as you got richer, you also bought more "insurance" in the form of high degrees of redundancy everywhere, then there would not be much reason for a richer, more integrated economy to be more vulnerable. Yet, I suspect that, in reality, somehow redundancy does not increase rapidly with wealth -- or, at least, not without leaving some crucial gaps. If that is the case, it is obviously an important determinant of differential vulnerability. Redundancies include such things as stockpiles and reserves: not only policy stockpiles, but more importantly those that emerge naturally out of the private enterprise economy. Perhaps this vulnerability is one of the failures of laissez-faire that has not been sufficiently emphasized, because we don't think of these disaster contingencies very frequently.

Finally, let me return once again to the symmetry argument. Martin Shubik's emphasis was that we should not always think in terms of symmetry because of differing vulnerability of the economies involved on the two sides. It is not a war between two gladiators with swords but between two gladiators differently armed -- one with a sword and shield and the other with a net and trident. I would modify or generalize his proposition. It is not only a matter of technology, but also of systems of thought and values. To avoid the fallacy of symmetry, the differing value systems of the parties to the conflict ought to be considered as seriously as differing degrees of technological vulnerability or of offensive power.

FORMAL COMMENTS ON THE PRESENTATION OF
PROFESSOR SHUBIK

by

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INTRODUCTION

First, I just want to compliment Professor Shubik. When he called some of his dirty tricks, "crazy", it was an excellent choice of words. I would like to illustrate what I mean with a couple of examples and then move on to other matters that I want to discuss more fully.

BACKFIRING DIRTY TRICKS:
THE NEED FOR SERIOUS ANALYSIS

I think that the "me-tooism" strategy which some people notice in the world does, at times, exist, but we can't rely on it unless we understand why it exists. We need a more basic model of understanding of the process of "me-tooism". It does seem to exist in military budgets and expenditures. Martin Shubik's argument seemed to me to be that, if we spend more on defense, then they will too and, because of the inefficiencies in their system, we are going to make them poor -- relative to us. This, he presented as a "good" dirty trick. But, let's look at this tactic from another point of view. Because an increment of defense capabilities is "cheaper" for us than for them, as you "up the ante" and get them to increase their defense expenditures, you are increasing our wealth relative to theirs. In a sense, then, this tactic actually increases the value of their attacking us relative to the cost of not attacking because they are getting poor relative to the benefit of taking over the United States. The benefit of taking over the United States is the wealth which we have, and a measure of the cost is the wealth they have; since they are getting poorer faster than we are, the relative attraction for the United States is increasing. This fairly simple economic model creates serious questions about whether or not this dirty trick may, in fact, backfire.

The other dirty trick that I wanted to comment upon was dropping currency on a country. It would create inflation and cause confusion in some markets, but its aftereffects would also be to create a boom, increase tax receipts, and increase defense expenditures: somehow, this does not sound too dirty. A better strategy would be to take the money and buy something. Then, you would have some goods, which would give you some quid pro quo, and also you would have an even

more severe effect on the markets because supplies would be reduced and prices increased. In effect, it would have more of an effect on the markets for the same expenditure. This tactic does not look crazy at all. It is, in fact, realistic, because countries, in the past, have disrupted other countries with discontinuous purchases and sales. Hence, I think that we should be a little more careful when we suggest what a relevant dirty trick is. It is possible that the dirty tricks that we would consider by "thinking crazy" are all dominated by other dirty tricks.

TWO TYPES OF QUESTIONS

I have a couple of general comments on the questions that have been raised so far during this Workshop. It seems to me that we have asked two types of questions. The first type, raised principally by Roger Shields, pertains to matters that normal, ordinary economics can reasonably and easily answer. These include statistical problems, but economics is equal to the task. Then, there are other questions which pertain to the power relations among countries. These involve dirty tricks, the Schelling and Shubik strategies, and also relationships such as the type that Professor Morgenstern explored in his story of the barber. It seems to me that this latter group of questions is not amenable to normal economic analysis. Hence, we really have two different styles and two different types of questions facing us.

The real question is therefore: Which should we emphasize? I tend to favor the power question, because I think that is where the science of economics and social theory are woefully lacking. The other questions are relatively easy to answer. The economic contribution is easy to provide because economic theory is up to this.

Type I Questions: Clear Economic Answers

Straightforward answers to Roger Shields' questions in terms of what economics can do don't require very much expenditure or a lot of thought. The great fear as to whether or not the grain exports are going to increase Russian defense expenditures may seem like a dangerous and tough problem, but, really, it is very simple. All you have to do is: (1) calculate the effect of the grain exports on their defense expenditures, (2) compute the matching defense expenditures by the United States to maintain our security level relative to theirs, and (3) then tax our grain exports by the magnitude of our increased defense expenditures. That is a simple export tax; there is no great challenge to economics with that problem.

⁷ Question: Except that an export tax is unconstitutional.

Professor Thompson: An export control or general tax could do the same thing.

There is also the question of using economic weapons to counter the OPEC price increase. There are many retaliatory things that we could do. For instance, we could withhold food exports or withhold military exports to the Middle East. But, the simple economics of the matter is that, when faced with a monopolist, you should try to eliminate the monopoly problem. To do this, you simply agree on a two-part price with the monopolist. You pay him a competitive market clearing price and also a lump sum so that he does not charge monopolistic prices. There is no real challenge to economics in that kind of question. The real question is how you battle for that lump sum payment -- the fixed charge. That is a problem in bargaining theory which requires a deeper theory of determining distribution and power relations in the world than economics presently has. The economic discipline does not determine the lump sum; it simply determines the variable charge, the market price. So, economics can answer this question to a point, but a complete answer requires a power theory which we do not have.

We have also heard that we have a problem with relation to military sales to Europe because the European countries have been demanding that we buy equipment from them since they are buying our planes. In general, this type of sales arrangement is not necessarily an inefficient strategy. It will not be inefficient so long as both sellers are in monopolistic positions with regards to their specific items for sale. In Roger Shields' example, there was a clear superiority with respect to our plane; we had a monopolistic position. Now, if they have monopolistic positions in selling goods to us, it is often better for the parties to commit themselves, before bargaining, to a barter trade instead of a monetary exchange. In that way, there is less fighting over the monetary value, and, as long as the barter values are roughly equal, it can significantly reduce the bargaining costs. Otherwise, there is no reason for the parties not to use money. If this argument did not apply, we would just have to cut the price on our planes to reflect their bargaining power, and this, then, would not have been a reason for them to insist that we purchase certain goods from them. Again, there does not seem to be any challenge to economics in this problem.

The last issue that Roger Shields raised was the effect of a country's wealth on its level of defense. The question is: When a country expands its wealth (becomes richer), does it increase its defense requirements because it has become more attractive to the enemy, or does it decrease its defense requirements because, now having a stronger peacetime capital stock to draw upon in the event of war, it is easier for the country to defend itself? This was supposed to be a major issue that takes a lot of work. But, all you have to do is look at history which clearly shows that, when capital stocks increase, defense expenditures increase almost in proportion. This observation works against the theory that an increase in the capital stock makes it so much easier to fight a war that a country could decrease its defense expenditures. In fact, defense expenditures increase just about in proportion with the capital, and that is not a very difficult hypothesis to test.

What I am saying is that these questions, while important, don't really challenge economics and, I think, should not take very much of an economist's research time. These are relatively applied questions of a statistical nature more than anything else.

Type II Questions: New Areas for Research

On the other hand, there are those power questions which I thought the economists and game theorists were much more interested in than the other problems. Intellectually, they are more challenging. They have to do with what determines power and property in a setting without government, and, in particular, the role of the military in society. To put it another way, it is really the age-old question of domestic property determination of who guards the guards. Does the military really have somebody that guards them? I think that some fairly pure analysis of the problem indicates that no one guards the guards and that, in fact, the guards have a basic position in determining the institutions of a country. All over the world, where the military do not like the institutions, they change the institutions. This is almost universal, but it does not apply very much in the United States.

If it is true that the military do have a sort of a dominant power position in societies, then they have the responsibility for determining the rest of the institutions; they have a job of determining the political institutions, the form of the constitution, and so on. In the United States, the military has not taken this interest or the responsibility. George Washington assumed it many years ago, but we tend to say that what was good enough for him is good enough for us. Times are changing, however, and our institutions, severely tested in recent years, have been found wanting in several instances. What is warranted is support by the military of research into models of optimal governments, optimal political institutions, and optimal organizations for society in general.

No one else is or could be expected to do this. Neither Congress nor the President would have very much interest in supporting research into whether or not there should be a Congress or a President. It seems to me that this is the military's responsibility. Up to now, they have not been doing it here in the leading research center of the world -- the United States. Social theory, in terms of distribution determination and in terms of optimal government and political institutions, has lagged behind most other social theories simply because our defense establishment is acting so satisfied with the political structure.

The particular questions that are relevant here are questions about the suitability of democracy in fighting wars, whether they be military wars or economic wars. What we have done is to take away from democracy the fighting of military wars by giving the President special emergency and wartime powers and, very appropriately, giving

the President the ability to draft individuals into the military service and to institute price controls. These Presidential powers cut the cost of fighting a war to the extent that the President does not have to go to Congress when he fights a war and does not have to pay the cost of the war even though he realizes part of the value of winning a war. I am far from criticizing this. As a result, we have been militarily very secure. The key is that, when we suspend democracy during a war and do not allow the voters to decide to surrender because they'd rather be "red than dead," the decision to pursue the war rests with someone who does not have to pay the cost of the war. So, the President will fight the war and keep some of us "non-red," even though the whole public is saying "better red than dead."

The same political institutions do not apply to economic warfare, and that is a chief weakness of our current set of institutions. We are not in a position to suspend public opinion and normal democracy in an economic war situation. We do not have a President who has the problem of benefiting from an economic war without paying the cost of fighting the war. You do not have that natural incentive of the President to fight an economic war -- it is just not there. The biggest problem is that the President is essentially a political representative in an economic war, and, if he is not doing things that are popular, he is going to lose his job for he is sensitive to public opinion. So, in order to handle economic warfare situations, we seem to need an economic czar -- someone like the Chairman of the Federal Reserve Board who holds his position for fourteen years and is not going to be removed from the Board because of political pressure. I am not suggesting that this should be the President, but I am suggesting that it could be someone else. My point here is that you don't have an incentive system working in which the President gets part of the return, but does not pay any of the costs. I am therefore suggesting that we establish an economic czar who does have such an incentive system; this is sort of an additional element of the incentive system -- besides the relative permanency of the job. You would also give him an incentive structure that rewards him for economic benefits, but he does not have to pay the costs of certain economic losses which are defined from a particular point of view.

We do not have an economic czar, and it seems to me that is why we are losing in the area of economic conflict. We are not in a position to fight an economic war and we should not call it economic warfare until we have an institutional structure that is suitable for fighting such a war. In order to fight an economic war, we need someone to lead in battle -- to commit himself to countering a commitment by a foreign political power that does have the ability to make personal commitments and is not subject to political pressure.

GENERAL DISCUSSION

Professor Shubik: I agree completely with many of Professor Thompson's observations. One of the points which I was trying to make in my earlier commentary was, specifically, that we face a very difficult, non-symmetric problem in assessing economic warfare. Simply from a military standpoint, it is very difficult to try to function as a military organization with the additional problems of defending a democracy. Most of us in this room believe that we should remain a democracy, and, as such, we have to shackle some of our strategies. We are not going to nationalize all of our industries tomorrow morning, and we are not going to open a Gulag Archipelago. However, we do have some very, very tough problems. How do we confront possible adversaries who have very different social-political situations than our own? You may wish to say that we can't define economic warfare in the way that Professor Thompson has because we don't set up a central czar or central planning board. That just makes our problem somewhat tougher. In my discussion, especially with regard to the question of non-symmetry, I tried to stress the need for ONR to forge some useful communication between the academic community and the bureaucracy which would lead to the recognition that we have a very tough behavioral organizational problem in the U.S. In the Soviet Union, you don't have to waste your time researching a lot of behavioral aspects of the problem; you have "got a lock" on it. You don't have to worry whether a reporter from Pravda does not like what you are about to say or complains about your estimates. We do.

Dr. Burstein: I would like to add a paragraph to the remarks which I have previously made. I was thinking of: (1) World War II, during which the Germans were notable for an ineffective mobilization of resources, (2) the success of the British against Napoleon, and (3) the fact that Bismarck's government was no more authoritarian than that of Napoleon. Therefore, it seems to me that you will be very hard put to make a case for effectiveness of totalitarian regimes in any dimension of warfare, including mobilization.

Dr. Thompson: My point was that, under wartime conditions, democracy is effectively suspended in the U.S. by giving the President (our leader) the powers to draft and to control prices at will. Essentially, this gives him as many resources as he wants to fight a war, and allows him not to have to pay the cost of war, though he still gains with respect to the returns. Hence, he has an incentive to fight a war, even though its cost will be greater than the returns to society at large. He will still fight it, and that is what we want for defense. We want that commitment incentive. We don't have that when we make decisions in a pure democracy.

Professor Shubik: Jack Hirshleifer pointed out to me that, in my talk, I looked at the problem primarily from a defensive point of view. Most of the examples which I cited were concerned with possible Soviet interdiction in the U.S. Looking at unconventional economic warfare from an offensive point of view, I find myself in complete agreement with these last two remarks. There is no clear evidence that the Soviet decision-making system is less vulnerable than ours, and, in fact, it well may be that one of the costs of that particular regime is that it is more vulnerable. I say "well may be" because we are trying to talk openly here. However, there are a few Soviet experts present who might be able to enlighten us as to whether or not this question has been answered. It certainly has not been answered clearly to my knowledge. Just looking at the Soviet Academy of Sciences and Scientific Institutions, I think that there is a much worse conservative bias in the imperial Soviet Russia than there happens to be in the United States. The Soviet people in their various bureaucratic hierarchies are much more conservatively concerned with protecting their jobs and their status than, I believe, is the case here. This might make them much more vulnerable.

Dr. Wolf: The first problem we have is that there aren't any objective observers here. We are all partisans of one system or another. If the argument is to the effect that a system like the Soviet one is better able to mobilize population and resources for particular kinds of processes, history can provide the only valid proof for that argument. At the moment, we simply do not know whether or not our value systems and our way of organizing society is going to prevail in a world that will be inhabited by 6-7 billion people by the end of the century and will contain many other ways of organizing the energies of people. As a believer in our way and as one who has an investment in our value system, I would certainly like to associate myself with the various sentiments I have heard here. But, as someone attempting to make an impartial judgment, I don't think that we can argue that our kind of system and our values are necessarily going to meet the kinds of tests that lie ahead.

The way in which the Germans organized during World War II ultimately failed, but they were very effective against Poland and against France. The Russians did a pretty good job in responding to the Germans -- even granting that they received some outside help. I don't feel at all complacent about this kind of thing. Things won't necessarily always come our way just because we like our system.

Professor Bergson: I can't help recalling the famous meeting between Molotov and Hitler in an air raid shelter in Berlin during the War. When Hitler told Molotov that they had eliminated the British Air Force, Molotov wanted to know what they were doing in that shelter.

We are not going to resolve here just how weak or strong or how viable the Russian centralized system is. I am sure we are all

aware that this is a very complex matter. But, let us recognize that there are very good reasons for us to be concerned here about economic warfare. The reasons have something to do with the existence, viability, and astounding development of the Communist system around the world. It does pose a problem, and I assume that is why we are here today.

Professor Thompson: I was not advocating anything close to the Soviet system. I was simply arguing for one little change in our incentive structure; that is, the creation of an export control czar. The kind of analysis which I used to reach that conclusion, applied in a different way, leads to an explanation of how the Soviet government evolved and why it is going to drift towards the United States system.

THE EVENING SESSION, SEPTEMBER 14, 1976

APPENDIX G

TABLE OF CONTENTS

	<u>Page</u>
<u>Highlights of a Policy-Level Perspective on Economic Conflict and International Relations by The Honorable Robert Ellsworth</u>	G-1

HIGHLIGHTS OF A POLICY-LEVEL PERSPECTIVE

ON

ECONOMIC CONFLICT AND INTERNATIONAL RELATIONS

by

The Honorable Robert Ellsworth, Deputy Secretary of Defense

INTRODUCTION

Speaking to the assembled members of this Workshop on the subject of economic conflict, I feel somewhat intimidated. There was a man who survived a Johnstown flood a number of years ago and then spent the rest of his life, they say, talking about how he survived the Johnstown flood, the precautions that he had taken before the flood, and the moral to be drawn from the various things that had and hadn't happened to him. When he died and went to Heaven, he was greeted at the Pearly Gates by Saint Peter, who welcomed him by saying: "We are glad to have you. We want to congratulate you on the splendid life that you have led as a survivor of the Johnstown flood." Of course, that made the fellow feel quite at home. Then Saint Peter said, "This afternoon, we would like to have a little tea so you can meet some of your predecessors up here; it's a very select group" -- to which the fellow replied, "Fine, I would welcome that." Saint Peter then said, "It is customary at these welcoming teas that the new arrival make a few remarks. What would you like to talk about?" The new arrival said, "Well, if it is all the same to you, I would like to speak about my experiences as the survivor of the Johnstown flood." "Hm", said Saint Peter, "You are sure that there isn't something else that you would like to speak about?" "No", said the fellow, "I am quite sure there isn't something else I would like to speak about. It was the biggest thing in my whole life, and I would like to speak about that". "All right," said Saint Peter, "Just remember that Noah will be in the audience".

In addressing the question of economic conflict, there are a number of interesting and important elements of the problem that can be addressed. In the main, I am going to talk about two kinds of elements -- and possibly a third. The first two kinds of elements that I'm going to talk about are somewhat epitomized by the Ali-Norton heavyweight fight scheduled for September 28, during which Ali will earn \$6 million -- win or lose. That will certainly be a conflict. Is it about economics or is it about something else? Are economic strengths or weaknesses being deployed or are they being established as goals?

The second element of the economic conflict problem that I will speak about this evening is epitomized by Barbara Walters' shift from NBC to ABC. In order to achieve certain goals, she engaged in certain maneuvers which were reported to have resulted in a salary of \$1 million a year for 5 years. Did she do it for the money? She has also acquired a much more prominent position by being on the evening news rather than on a morning show. This situation reflects some of the things that we're talking about.

EXPLOITING ECONOMIC STRENGTHS:
AN ALTERNATIVE TO MILITARY ACTION

First, with reference to the Barbara Walters episode, can we exploit our economic strength? In Barbara's case, her economic strength was her "drawing power" with advertisers. This she employed as an alternative to some other actions to achieve her personal (political) objectives of greater prominence, a more secure position, and a firmer grip on the prestige that's associated with being "the person" on the evening news. This might be perceived as an exploitation of economic strength as an alternative to other (military) action in order to achieve personal (political) objectives. Of course, she didn't have military action in mind, but I think that the analogy is worth thinking about.

There are a number of instances in which this example describes how people interpreted the events of the times. For example, consider the embargo that the United States imposed upon Japan with respect to scrap iron and oil exports in the summer of 1940 which was followed by the freezing of all Japanese assets in the fall of 1941. These steps seem to reflect the exploitation of economic strengths as an alternative to military action in order to achieve political objectives. I think that our Government felt that these steps would be successful in deterring the Japanese from going to war. At the same time, however, it was believed that the Japanese would go to war against the British, the French, and the Dutch in Southeast Asia. But certainly, there was no thought that the Japanese would actually go to war against the United States. However, the United States did impose economic sanctions against Japan in order to deter Japan from going to war against anyone. Then there was the Arab oil embargo in 1973 which exploited economic strength as an alternative to military action in order to achieve political objectives. The Jackson Amendment was another example of the effort to exploit economic strengths by affecting conditions for trading in an effort to achieve political objectives -- in that case, an alteration in the Soviet emigration policy. Detente itself, as originally conceived, included a substantial element of the desire to achieve political objectives through economic instruments.

It was hoped that trade links and inducements to a wide range of good relations between the United States and the Soviet Union would be achieved by an increase in economic relations. There are other examples which, I'm sure, will occur to you.

There's another brief anecdote which I want to relate. Just before World War II, the British perceived that certain strategic materials were going to be extremely important in connection with prosecution of the war. So, they felt it would behoove them to exploit whatever economic strengths they could, not so much as an alternative to military action, but as support for military action which would eventually be utilized in the defense of political objectives. One action the British Department of Economic Warfare took was to send a representative to Ankara, Turkey, equipped with a large amount of money for the purpose of buying strategic materials. I don't know exactly what he was buying -- perhaps cobalt. At the beginning of his stay in Ankara, this individual called upon the very distinguished British Ambassador who, by the way, went down in history as the man who was the employer of Cicero -- the famous German spy in Ankara during World War II. He tried to explain to Sir Hugh what it was he was doing. After listening for a while, Sir Hugh finally waved his hands at this man from the Department of Economic Warfare in London and said, "Do not speak to me, sir, of business and finance. It goes right in one ear and out the other". Perhaps we, too, sometimes suffer from the Sir Hugh syndrome.

ECONOMIC FACTORS AS OBJECTIVES OF MILITARY CONFLICTS

Let me turn to the other side of the coin in connection with economic conflict; i.e., the use of military power to achieve economic objectives, and here, I will allude to the Ali-Norton fight again. It seems clear to me that the fighters' objectives are economic and that they're using the equivalent of military power in order to obtain their economic objectives. President Roosevelt often said that he felt World War II was caused by shortages of raw materials experienced by some of the world powers. He followed this observation by saying that he felt one way to end the war would be to share our raw materials on a more equitable basis. Hence, at least according to President Roosevelt, economic considerations and objectives were extremely important insofar as the causation of World War II and the length of the war were concerned. In September 1974, President Ford made a speech in Detroit to the World Affairs Council in which he said, "Throughout history, nations have gone to war over natural advantages such as water or food or convenient passages on land and sea." Obviously, economic considerations weigh very heavily in that statement. Jacob Bronowski, in his very popular book The Ascent of Man, says, "War is a highly planned and cooperative form of theft, and that form of theft began 10,000 years ago when the harvesters of wheat accumulated a surplus

and the nomads rose out of the desert to rob them of what they themselves could not provide. That is the beginning of war." Over the last 10,000 years, I think that there's a lot to be said for that proposition and perhaps, to some extent, it is still true today.

However, even though economic considerations might have been the cause of war, their removal will certainly not spell the end of war. Down through the years, and even today, many other factors have played crucial roles in connection with war. For example, look at the wars that are going on right now. Fortunately, they're very small wars, but in the conflicts in both Ireland and Lebanon, religious dogma is a major causal and exacerbating factor. In Southern Africa, where there now appears to be actual warfare, the primary cause is racial. Economic matters are not the sole determinants of war by any stretch of the imagination.

AN AGE OF PEACE

Fortunately, the United States is not engaged in any major war. There has not been a major war between the major industrial powers of the world for a significant period of time. The British historian, Michael Howard, says that we are living in an age of peace. He means that this is a period of time when there is no major war between the major industrial powers, and, furthermore, when most people don't think there will ever be such a war again.

There have been some ages of peace in the past. In the 1830s and the 1840s, there was widespread feeling that there would never be another period like the era of Napoleon. We held these beliefs in America too. However, as we know, it wasn't too long until major wars again erupted. But, that was an age of peace -- no question about it. After the Boer War in the very early years of the 1900s, people also felt that there would again be an age of peace and that there would never again be a major war. Certainly during the 1930s, people were determined that there should not be another war. But, we all know, at the ends of those ages of peace, there were major wars between the industrial powers.

Today, our age of peace is different in two respects from those previous ages of peace. In the first place, it has lasted a relatively long time -- over 25 years and that's longer than any previous ages of peace. Secondly, there's the presence of nuclear weapons with their tremendous destructiveness which serves as an inhibiting element insofar as military conflict is concerned. It is very widely felt in this country and through the whole civilized world that the destructiveness of a large-scale war between the United States and the Soviet Union is considered to be so great that the risk of such a war is not to be taken seriously. Other issues,

such as economic and social issues, have superseded military action in the arena of conflicts. For these reasons, it is widely felt that we are, in fact, living in a true age of peace which will continue without end.

THREATS TO THE CURRENT AGE OF PEACE

Notwithstanding, one sees continuous (and I use the word advisedly) and tremendous military build-ups not only by the two super powers, but also by a number of lesser powers. Looking ahead to the next 10 years, one can perceive the potential for serious kinds of engagements between the Soviet Union and the United States. In Europe, for example, the combination of an upheaval in Eastern Europe and weakness in Western Europe could give rise to serious engagements between the United States and the Soviet Union. In the Middle East, should the Arab-Israeli war again erupt into actual conflict and should the Soviets feel that they must intervene for various reasons, the United States would be faced with the situation that it is the only country which could do anything about Soviet intervention in that area. Of course, in Northeast Asia, the Korean Peninsula continues to be an area with the potential for serious conflict.

FUTURE PERSPECTIVES:

ECONOMIC FACTORS AND POTENTIAL MILITARY CONFLICT

Oil Prices and Conflict

Now, I would like to talk briefly about some possible economic conflicts, the related potential for military conflict, and the complex interactions among them. For the purposes of this portion of my discussion, let me focus upon the Middle East. When the OPEC countries raised the price of oil as much as they did during the winter of 1973-74, their action had impacts of various kinds with which we're still living and which have still not been satisfactorily resolved. For one thing, the rise in the price of oil had tremendous impact on the economies of all of the countries of the world; in particular, the economies of the industrial countries of the world. It appears now that that impact has been handled relatively well. The rise in the price of oil also had tremendous impact on what is now called the Fourth World of lesser developed countries (LDCs) -- and, in fact, that rise in price may have created the Fourth World (e.g., LDCs which have no oil). In this case, in particular, one cannot be satisfied

that the longer term effects of the impact of that price rise have been resolved in a satisfactory way which will not at some future time result in serious problems involving military conflict. Another effect of the price rise was the creation of a great stream of wealth into the treasuries of the oil-producing countries -- particularly in the Middle East. This has led to an arms build-up which has seriously eroded Israeli security and has begun to undermine the stability of the Middle East area -- an area to which I have already referred as having a potential for creating problems between the United States and the Soviet Union over the next ten years. The price rise also created strong OPEC interests in measures of all kinds that would reduce investment in other potential sources of oil and that could also have some longer term adverse impacts on the potential for military conflict.

Middle East Oil and the USSR

There's another somewhat more immediate problem which relates more to oil supply than to the price of oil. The United States, Europe, and Japan are all critically dependent on Middle East oil for the viability of our economies and, therefore, of our societies -- even more so now than we were at the time of the October War in 1973. Therefore, the strategic position of the United States in the world today hinges upon the reliability of that supply of oil from the Middle East. The Soviets have an interest in the oil in the Middle East for two separate reasons. First, beginning in the early 1980s, the Soviets are going to have some real problems with energy supply. They can handle these problems by not meeting the rise in demand, but it would be very difficult for them to do that. They can also handle these problems by developing their own energy resources in Siberia, but it will be very difficult for them to do that. Such a venture would require enormous amounts of capital and technology and is a high risk operation at best. They could also attempt to solve their problems by attaining an ever increasing access to the cheap, easy-to-extract oil of the Middle East. That's one reason why the Soviet Union has an interest in the Middle East.

In addition to and separate from that reason, the Soviet Union has a natural interest in the Middle East because Middle East oil is a strategic keystone to the position of the United States in the world. As a matter of fact, it's the strategic keystone to the position of the entire advanced industrial world.

So over the next few years, the Soviets will have very great incentives to control or divert the oil of the Middle East. Consequently, the credibility of the U.S. capability to react as necessary to any such Soviet adventures will be important in the years ahead. A relatively im-

portant element of that credibility will be our military strength -- the military strength of the United States together with that of our allies. Other elements in that credibility will be the:

- National spirit and will which we display between now and the time any possible Soviet move would be seriously contemplated,
- Skill with which we handle our approach to foreign problems, and
- Intelligence, imagination, and the courage that we bring to bear.

This is quite a challenge to the United States in the years ahead, given our political system. In the Department of Defense, of course, we are principally concerned with the technical military capabilities.

CONCLUSION

In conclusion, being here in Northern Virginia, the site of so much spirited and courageous military activity at the time of the War between the States, I'm reminded of the story of Happy Chandler whom, you recall, was at one time a Senator, a baseball commissioner, but most of all Governor of Kentucky. One time while he was campaigning, Happy was out speaking when a fellow came up to him and said, "Governor, my grandfather always said he would whip anybody who spoke against Chandler." And Chandler said, "That's wonderful, son. I really appreciate that" -- and then he added: "My grandfather was a sergeant in Morgan's cavalry . . . and he used to say, 'We could whip those damn Yankees with corn stalks, but the trouble was, those damn Yankees wouldn't fight with corn stalks.'"

THE MORNING SESSION, SEPTEMBER 15, 1976

TABLE OF CONTENTS

	<u>Page</u>
<u>Internal Competition for Soviet Resources in the Decade to Come</u> by Mr. Patrick J. Parker	H-1
<u>Dealing with Raw Material Supply Interruption: A Role for U.S. Agricultural Exports</u> by Dr. William Schneider	H-13
<u>Formal Comments on the Presentations of Mr. Parker and Dr. Schneider</u> by Mr. David Kassing	H-22
<u>Formal Comments on the Presentations of Mr. Parker and Dr. Schneider</u> by Dr. Dermot Gately	H-26
General Discussion	H-30
<u>An Informal Discussion of Soviet Demographic Trends</u> by Dr. Murray Feshbach	H-35

INTERNAL COMPETITION FOR SOVIET RESOURCES
IN THE DECADE TO COME

by

Mr. Patrick J. Parker, Professor,
Naval Postgraduate School

INTRODUCTION

Three or four possible different ways of organizing our thinking about economic warfare have been discussed thus far during this Workshop; namely, offense and defense, the North/South or East/West juxtaposition, hot or cold war, the extent of competition and conflict, and the degree to which an explicit set of rules is recognized and observed. I will consider the kind of economic warfare which takes place in peacetime and is distinguished from normal competition by the degree to which behavior diverges from the normally accepted rules of the game. In this regard, I agree with Jack Hirshleifer that one has to be especially careful about the asymmetries that may result when two competitors view the rules of the game in very different terms and yet attribute their own views to each other. In such circumstances, what may seem to be quite normal behavior to one side may be perceived as an act of economic warfare by the other. Jack Hirshleifer's point that, when dealing with all but a small group of countries with whom we have close cultural and historical ties, we ought to assume few if any rules and require that most economic agreements be self-reinforcing in one way or another is both correct and important. A cursory look at the record suggests that we don't usually behave that way, especially with the Russians, and that we frequently attribute to them a willingness to follow our rules, despite much evidence that theirs are quite different.

I want to limit my remarks to economic warfare with the Russians in peacetime or, if you like, to those initiatives that could be subsumed under the heading: "Carrying on the competition by all means short of war." With due regard to Professor Morgenstern's comments and recognizing (1) the poor quality of the available data, (2) some of the conceptual difficulties surrounding their construction, and (3) the fact that there are many players, some of whom are likely to have more or less broad views of what constitutes self-reinforcement in agreements than others, I want to develop a future context within which we can discuss competition with the Soviet Union over the next decade. I think it is clear that current theory and data will not support a generally agreed upon, precisely defined, context. Accordingly, my purpose to some extent, is to dramatize the need for additional research so as to bring about a greater degree of consensus among well-informed men. The policy implications of different interpretations of the same basic information are very large and can effect the whole structure of our relationships with the Soviet Union -- up to and including the likelihood of war.

So, I will try to build something a little more than a "strawman," but a little less than a well-supported prediction, in order to evoke controversy and to help focus the research that needs to be done. Simply stated, research needs to be done to define those economic initiatives which will make a difference in dealing with the Soviet Union and to figure out what the difference would be.

I am not a Soviet scholar. My interest in Soviet matters is relatively recent and is derived from a job that I held until two years ago in the Department of Defense and in which I had to try to make some sense out of the array of conflicting information that was available to me on Soviet behavior. Let me then share with you some of the tentative conclusions that I reached and explore with you their implications for our behavior in economic competition with the Soviets. To do this, I would like to request your patience while I describe three somewhat separate and initially disconnected themes, but which I will later bring together.

AN ECONOMIC AND NATIONAL SECURITY PROFILE OF THE U.S.S.R.

What does the Soviet Union look like with respect to broad-gauge economic issues and national security to someone with some training in economics (but not in Soviet economics) who finds himself in a position at a sub-policy level in the U.S. national security establishment?

Soviet Economic Problems

First, let us consider some major economic problems which confront the Soviet Union.

Declining growth rates

Despite interesting periods of good performance, the Soviet economy is profoundly flawed. Although there have been intermittent periods characterized by impressive growth rates, there is an emerging consensus among both the people who look at the Soviet Union here and there that the Soviet Union is experiencing a serious decline in economic growth which will continue into the future -- stabilizing at $3\frac{1}{2}$ - $4\frac{1}{2}$ % per year, which are somewhat lower levels than we have witnessed since World War II.

Demographic changes

Second, there seems to be general agreement on the principal causes of the foregoing problem. In virtually all of the work that I have examined, the principal causes are the declining growth in population and the changing composition of the Soviet population. As a result, the labor force will grow more slowly and the composition of the new entries will be from the Soviet minorities, rather than the great Russians. From an economic point of view, this latter development can be described as a problem requiring greater investment in

human capital in order to bring the minorities to the same level of productivity as the great Russians because much education, or investment in human capital if you prefer, takes place in the home, but to a lesser extent for the minorities, on balance, than for the great Russians. Therefore, bringing the minorities to the same level of productivity imposes a greater burden on the State. So, the changing composition of the population and a decline in its growth rate will change the labor force in ways that will present the Soviets with some very difficult problems.

Substituting capital for labor

If, indeed, these demographic considerations are important in explaining declining economic growth, they tell us that, for the Soviets to maintain previous growth rates, they must make up the difference either by increasing education, improving productivity, harnessing, developing and absorbing technology better than they have in the past, and increasing the capital budget to increase the capital-labor ratio or by a combination of all of them. In the past, Soviet dependency upon increases in the work force and capital investment for economic growth has been greater than in the West. Yet, not only will the Soviets face qualitative and quantitative problems maintaining their work force, but also the Soviet capital budget will undergo great pressures over the next few years as it competes vigorously with the consumer sector, and especially the defense sector, for funds.

Uncertainties and technology transfer

Some very interesting considerations relate to technology as a contributor to Soviet economic growth. The Soviets have not been particularly good at either developing or absorbing technology. On the other hand, one of the greatest uncertainties that we face is whether or not the Soviets, whose technological record has been largely based upon their internal ability to develop new technologies, will have a markedly different record when emphasis is placed upon absorbing new technologies from outside. The question of Soviet response to technology transfer is as yet poorly understood and is an area that needs a good deal of work. It may be that their problem isn't only invention, but also absorption, in which case, technology transfer assumes very different, and less ominous, implications. John Despres is going to make some comments about that whole process and Steve Rosefielde is developing some interesting new data that he may discuss.

Let me summarize then by saying that there seems to be a consensus that Soviet growth rates will decline and that the only possible domestic source of amelioration for these declining economic growth rates will be for the Soviets to learn how to utilize technological innovation better than they have in the past.

The Soviet Defense Burden

Now, let me turn to the Soviet defense burden. We are all aware of the changing estimates of the size of the defense burden in the Soviet Union. There is a growing consensus that the percentage of Soviet GNP devoted to national security in the Soviet Union is between 10 and 20 percent and probably around 12 to 15 percent. Why are these figures interesting at all? Their main interest to us is that they provide some idea of "how much the defense shoe pinches." Hence, it is less important to think about how big the number is than how it's changing over time -- a change which needs to be juxtaposed with the aforementioned trends in the economy as a whole. Inasmuch as the CIA is presently attempting to reconstruct past history in the light of new procedures and evidence so as to establish a new estimate of the trend in the Soviet defense burden, we don't have the Agency's definitive answer to this question yet, but the statistics look to me as though they tell the following story.

A critical appraisal of CIA estimates

In the late 1950s and early 1960s, when the ruble-dollar ratio numbers were first developed, a major effort was made to estimate Soviet defense expenditures. Initially, these estimates were probably fairly good. For a variety of reasons, some of which have been mentioned here, the accuracy of these estimates slipped over the ensuing 10 or 15 years until the underlying imperative for the recent corrections became very large. Pressures for revision included not only the fortuitous collection of new information and the growing criticism from outside researchers, but also a growing realization that the necessary corollary to the low estimates of defense budgets -- namely, ever-increasing efficiency in the Soviet defense sector -- just didn't seem to stand up.

A further and important consideration was the growing discrepancy between Bill Lee's estimates and the old CIA estimates. Yet, although Bill's procedures provide the best analysis we have of Soviet budget aggregates, they are also a fairly "thin reed" in and of themselves.

A continued increase in defense expenditures

However, both Bill Lee's numbers and the CIA numbers suggest that Soviet defense expenditures have been growing fairly fast. A number in the order to 8 to 10 percent per year seems to emerge as a pretty good bet from incomplete data. Unfortunately, to my knowledge, we are not planning to undertake serious estimates of the future trends with respect to these numbers.

The increasing defense burden

The most important use to which these numbers can be put is in examining future trends within the Soviet Union. There is no evidence which would indicate any slowdown in the rate of growth in

the Soviet defense budget and a reasonable pessimist -- not a "worst-case" individual -- would estimate a continued growth in Soviet defense expenditures of about 8 to 10 percent per year. Such a projection is consistent with the application of Bill Lee's procedures to the published data in the Soviet 10th Five-Year Plan. Now, if one combines 3½ to 4½ percent economic growth with an 8 to 10 percent growth rate in defense expenditures, the burden is obviously growing fast, and there is also a natural self-limiting process at work. With these growth rates superimposed upon a defense budget of about 15% of the GNP today, the Soviets will be spending between a quarter and a third of their GNP on defense by 1985. Is this believable?

Soviet Defense Capabilities

In turning from that question, a second one comes to mind: What are they buying and why? Quite clearly, the capabilities of the Soviet military forces have been improving relative to those of the West.

Nuclear forces

The first area that one should look at is the changing capability of Soviet strategic forces. Given the very long lead times that are associated with new U.S. force initiatives, we may be moving into a period in which a Soviet first strike against U.S. nuclear forces countered by a residual U.S. return strike against the remaining Soviet forces would result in a profound asymmetry in the capabilities of the remaining forces. For example, a former Deputy Secretary of Defense, Paul Nitze, has estimated that, whereas U.S. residual forces might only be able to destroy something less than 10 percent of the Soviet population and 20-30 percent of Soviet industry, the destruction inflicted upon the U.S. by the Soviet residual forces could exceed 80 percent in both of these categories. Although the question of whether or not these calculations are correct is important, the question of whether or not they are believed may be equally important. The fact that they have been made by responsible people both inside and outside the Defense Department and also probably in the Soviet Union means that they represent the kind of information that could well be given to the national leadership in time of crisis and would certainly affect the kinds of actions which might be taken. If, in a crisis in the early 1980s, the military establishments would tell the leadership on both sides that, in an all-out nuclear exchange, the U.S.S.R. will survive and the U.S. will not, that fact in itself would make a difference, whether the calculations are correct or not.

Conventional forces

At the same time that the U.S. nuclear posture is perceived to be deteriorating, the capabilities of Soviet general purpose forces are growing, and there are larger and larger areas of the world, some

of which involve vital U.S. national interests, where the Soviets can deploy overwhelming forces relative to those which the U.S. and the indigenous population can assemble -- and they can do it more rapidly. This adverse trend will continue into the future.

Thus, calculations, based on facts and reasonable assumptions suggest that the nuclear deterrent isn't as good as it used to be and that the conventional balance, in key parts of the world, is not very "healthy" either. Now, let me weave together these three themes which I have described.

CONCLUSIONS

Possible Soviet Adventurism

First, the Soviet economy is characterized by declining economic growth with no evidence of any slowdown in the growth of the Soviet military budget. Their military buildup is self-limiting, both because of the nature of the arithmetic and because the population problem becomes gross around 1985. With the military forces absorbing something upwards of 4½ million men, they just won't have enough manpower to do both jobs beyond 1985. This self-limiting military buildup is taking place at a time when U.S. national security expenditures have been diverted for a substantial period to Vietnam and where the lead times are such that, even if we start now, we are going to find it very difficult to redress the military imbalances prior to 1985. If these numbers and trends are roughly accurate, we may be entering an extremely dangerous period in our relationships with the Soviet Union -- a period in which they may try to operate on that increasingly dismal fraction of GNP going into national security by increasing their economic growth rate through international adventures of one kind or another.

Of course, the alternative proposition must be considered with equal seriousness. The Soviets may not carry through with some of the military programs that we see are being started now, and the growth of Soviet military capabilities and budgets may decline. In that case, we don't have a particularly worrisome problem, but we can't count on it happening that way, and it would be dangerous to do so. Consequently, as prudent men, we must look at international initiatives which might have high payoffs for the Soviets during this period of temporary military imbalance. The purposes that I had in presenting this particular discussion are two-fold: First, there are trends in Soviet military capabilities, in their economy, and in their defense budget that, although uncertain, are sufficiently believable to be worrisome. Second, if these trends are right, they may suggest certain kinds of international initiatives that would pay off well for the Soviets during the coming period of military imbalance. Finally, they may suggest measures and, in particular, economic measures which the U.S. ought to be taking vis-à-vis the Soviet Union in order to slow down, deter and inhibit such moves.

Middle East Oil

Let me be a little bit more specific with regard to one obvious case in point. The Soviet agricultural situation is dismal. If some of the "weather Cassandras" are correct, it is going to become much more dismal. There is no area close to the Soviet Union that looks like a promising prospect for ameliorating their agricultural problem. Accordingly, they may be forced to become increasingly dependent on the West and, in exchange for that dependence, will want to provide themselves with some symmetrical offsetting bargaining power. In the short term, the most obvious candidate is Middle East oil. I say short term, because U.S. programs can redress the military imbalance beyond 1985, and alternative U.S. energy supplies can be developed by then, too. Also, as suggested, the Soviet military buildup may be limited after 1985. Accordingly, as one case in point, we need to look very seriously at the prospects of some kind of Soviet initiative to bring some or all of the Middle Eastern oil under Soviet control between 1978 and 1985. The scenario of thirty divisions marching across the Iranian border seems to me to be a little bit overdrawn. But, it does not take very much short of that to begin to catch a reasonable man's attention -- the Shah is mortal and not very popular. We have seen near-successful Communist uprisings in Iran several times in the past, both prior to World War II and twice since. A future uprising could be successful and accompanied by an invitation for Soviet assistance and aid. Very quickly, you could have a Communist government and Soviet military forces in Iran. This, of course, is only one of many possible examples, but under the military conditions which I have mentioned, we could do very little about it.

General Soviet Initiatives

I want to finish on the note that we should expect certain kinds of international initiatives from the Soviet Union over the next decade. Understanding their economic problems should give us a clue to what kind of initiatives. If the Soviets engage in activities abroad, one of the major purposes will be to ameliorate their domestic economic problems. What kinds of things would they be likely to do? One obvious answer involves energy because it would be valuable to them and would provide additional leverage over the West -- but there may be many others. They may try to coerce countries which are technologically more advanced to provide technology on a more advantageous basis. Some of the things that one might expect here include additional credits and non-self-enforcing contracts with regard to the establishment of advanced technological production capabilities within the Soviet Union, but we need more than examples.

So, the final question that I would like to leave with you is this: Does the Soviet economy with all its problems, but operating with the backing of substantial and enhanced military capabilities, give us any clues as to the kinds of things that we might expect, and will our possession of these clues put us in a better position to respond when the time comes?

QUESTIONS AND COMMENTS

Dr. Morgenstern: I would like to make one brief comment. In your presentation, you seemed to concentrate on symmetric physical phenomena. In other words, we have nuclear weapons, so they produce nuclear weapons; they increase their inventory, so we respond in exactly the same manner; technology versus technology; and so forth. What is omitted in the general discussion of these matters is an effort to respond to an opponent in an entirely different area where he might be weak. I will give you a concrete illustration.

I find it very odd that the highest officials of the U.S. Government, including the President, never publicly raise the question: What kind of country is the Soviet Union? It is a giant prison. They imprison their own people; they don't let them travel freely throughout the world. What are they afraid of? Are they afraid that their people will leave and never come back or that they will come back with very different ideas? Compare that to us. Not only do we let our people go anywhere they want to, but also we even allow them to go to the Soviet Union. We are confident that they will come back and that they will see the difference in the standard of living, liberty, and freedom. I wonder what the Soviet Government would say if such statements were made at the highest level and not just over the radio.

You point out correctly that the Soviet minorities are increasing relative to the great Russian population. Why not work on the minorities and instill in them the idea that they should exercise their own self-determination? Why not ask about the Party in the Soviet Union? Ask what a party means? Where is the other party in the country? How are they organized, and why are they not organized? Is not this a way of introducing into the discussion of military matters an entirely different consideration wherein they are weak and wherein we are absolutely strong? Then, many other things of a physical nature could happen which would be to our advantage.

Mr. Parker: I completely agree with you. In my discussion, I in no way intended to suggest that simply because the Soviets are doing something in the military arena that we ought to respond with some military program. In fact, the purpose of my remarks was that, given the realities of the military situation (a military situation which, in the short term, we can do very little about), we ought to be thinking much more about the kinds of considerations that you mention.

An area which I ignored in my presentation is the changing nature of the second economy in the Soviet Union. We have very little understanding of this subject. We don't even know the composition, size, or growth rate of that economy. Obviously,

if the second economy is growing very rapidly, this has very profound implications. For example, we do know that over a quarter of total Soviet agricultural products come from the second economy. However, I don't know whether or not that percentage is growing very fast, and I don't know what percentage of the second economy consists of agricultural products and what percentage of other things. If the U.S. could encourage measures that would tend to make the second economy thrive, it would certainly have an impact. Whether or not that impact would reduce or increase the likelihood of warfare with the Soviet Union, we don't know. These are some of the kinds of things that a workshop of this sort ought to be considering.

Professor Weitzman: I cannot agree with the proposition that the Soviet Union will be driven by profound economic problems to engage in international adventurism. There may be some truth that the U.S.S.R. economy is not as well off as it could be, but the idea that the Soviets are in such bad shape now that they are going to resort to adventurism seems to me to be farfetched.

Let's look at the Soviet dependence upon the West for grain. They have good harvest years, and they have bad harvest years. When they have a bad year, we tend to exaggerate the problems with regard to Russian agriculture, and when they have a good year, we tend to forget about those problems. They've had two bad harvests during the last Five-Year Plan; that's one more than they usually have for a Five-Year Plan. But, the U.S.S.R. is still a mighty agricultural power. Since World War II, the rate of growth of their agricultural sector has exceeded ours by 10 percent. Most of the grain that they are importing is being used to raise their standard of living. The bulk of their grain has gone into livestock production.

Similarly, in the energy sector, I was surprised at the comment last evening that, by 1980, the Soviets will experience an energy crisis. The Soviet Union is a leading producer of oil -- producing over 400 million tons a year. The Soviets export over 30 percent of their production to Eastern Europe and to the West. Their oil production is growing at the rate of 6 percent per year, and they are in the intermediate stage of developing their Western Siberian fields. The U.S.S.R. may run out of oil someday, but probably not soon.

The Soviet economy is slowing down, but its growth rate over the past five years compares favorably with most Western nations. So, this scenario of their being pressed by their faltering economy into international adventurism may be a bit farfetched.

Mr. Parker: I did not intend to convey the impression that the Soviets would be forced by their faltering economy to commit

acts of international adventurism. Rather, the point I wanted to make was that, if they are making very large investments in military forces such that these forces are growing in strength to a point where they could be used successfully to coerce (possibly without firing a shot) at a time when they are also having serious economic difficulties, then one reasonable thing to worry about is whether or not they plan to use those forces. When I say "plan to use them," let me emphasize that I do not necessarily mean "plan to use them in a shooting war," because military forces can be used in many ways short of actual warfare. I certainly did not mean to paint a picture of a desperate Soviet Union being driven by insoluble internal economic problems resorting to rash international adventures. The picture which I attempted to convey was that, given the very large military investments which they are making, some segment of the Soviet leadership may view their military forces as a profit center and may seek opportunities to remedy some of their domestic economic problems through the use of coercion abroad. I think that this is a somewhat more measured picture of my remarks than your interpretation.

Professor Bergson: Professor Parker has expressed a widely held view, with which I agree, regarding general trends in the growth of the Soviet economy. The evidence is overwhelming that the rate of growth has been slowing down. For the next ten years, a 3 $\frac{1}{2}$ to 4 percent rate in the GNP growth is in the right ballpark. While this rate of growth is certainly respectable, it is modest in terms of the Soviet aspirations of the past and is by no means distinguished for a country at the Soviet Union's stage of development. I would differ with Professor Parker on the causes of the slowdown in the rate of growth and give somewhat more emphasis to a retardation in the rate of technological progress and somewhat less emphasis to demographic factors as they have operated thus far. Demographic factors will probably become somewhat more important in the future. But, despite the different emphasis on causal factors, I think that this portrait of the trends and prospects for the rate of growth of the GNP is one that would be widely accepted.

With regard to defense expenditures, Professor Parker was very cautious. Obviously, anyone who is concerned with this and is at all sensitive to the limitations in our evidence has to be cautious. Yesterday's discussion indicated how much we are "at sea" in this area. I was uncomfortable about the growth of the Soviet defense establishment before the recent CIA revision of its estimates, not only on the basis of the physical series that we have been observing, but also in terms of the dollar aggregation which shows (even though recently revised) a quite respectable rate of growth over time. The volume of the real defense outlay is not 8 to 10 percent, but is on the order of 4-plus percent a year. To the best of my knowledge, the CIA has not abandoned this estimate of the rate of growth for the real volume in dollars. Of course,

the rate of growth in constant ruble prices could be different and, if we had reliable data, this would very likely be true. I think that the ruble figure would be higher than the dollar figure, principally because of the much lower weight that the ruble figure will give to manpower, as compared with hardware, relative to the weight given to these two components in the dollar aggregation.

In any case, if we accept the CIA measure in constant dollar prices of 4-plus percent, it is reasonable to think that the corresponding rate of growth in terms of ruble prices would be higher. I am a little surprised that you think the figure is as high as 8 to 10 percent in constant prices. That is a very high figure. If that figure were correct, it would become self-limiting in the future. I made some brief calculations which indicate that, if you start with Soviet defense expenditures as 15 percent of their GNP in rubles for 1970 and allow a 3½ percent rate of growth in the GNP and 10 percent for defense, defense expenditures would constitute 40 percent of the GNP by 1990. If that were correct, we would be observing a very tense situation which would have to be self-limiting in some ways. The principal moral which I drew from our discussion yesterday and from your discussion today regarding Soviet defense expenditures is that a major research effort has to be made in order to clarify our understanding of just what is going on.

I don't think that we ought to settle too easily for "thin reeds" in this area. Let's face the fact that Professor Parker has given a lot of attention to the scattered evidence that is available. It is very difficult to go beyond "thin reeds" in this area, but, nevertheless, this is such an important matter that we have to make a considerable effort to do better. Let us be clear. An issue which came up yesterday and is relevant here is that the ruble figure is important. In thinking of the defense burden from the Soviet standpoint, dollar valuations are just not adequate. Dollar valuations, however, are perfectly adequate when we are comparing Soviet capabilities to ours -- taking the physical series, on the one hand, and dollar figures on the other. But, without ruble figures, we won't understand the kind of problems the Russians face in allocating resources to different uses. We have to have some idea about the trends in ruble terms. At this point, I hesitate to give much weight to the 8 to 10 percent figures, especially in view of the very "thin reeds" upon which they are based. But, the moral I draw is that we really ought to make quite an effort to do a little better on these estimates.

The agriculture issue is very complicated. If you look at the trends that Marty Weitzman cited, the rate of growth of output per capita is not bad. Quite to the contrary, the average rate of growth of agricultural output per capita is very respectable. Soviet agricultural production fluctuates enormously, and these fluctuations have been very much in the news during the last five years. Thus far, the Soviet system has been very vulnerable to weather changes, and the Russians are very much concerned about this situation. Incidentally, here is something that we ought to consider. The Soviet

performance in dealing with weather fluctuations has not been good. Moreover, their overall strategy to cope with these fluctuations has not been successful, so they have been revising their policy in this area. They are making major commitments of resources (in the order of 25 percent of the capital investment of the country) in order to limit their vulnerability to weather fluctuations and to limit their dependence upon U.S. grain.

Dr. Morgenstern: Professor Parker will have a brief word in reply to the last remarks, but first, I have two comments. In addressing the assembled group, I can simply say "Gentlemen," because not one woman is here among us. Also, in our discussions, China has been mentioned only once. To my mind, these are serious gaps in our Workshop.

Mr. Parker: In response to Professor Bergson's comment, the principal purpose of my discussion was to point out the "thinness of the reed" as much as anything else, and to stress the urgent need to work on these problems. I am in complete agreement with you on this matter.

DEALING WITH RAW MATERIAL SUPPLY INTERRUPTION:
A ROLE FOR U.S. AGRICULTURAL EXPORTS*

by

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INTRODUCTION

The unacceptability of armed conflict as an instrument of diplomacy has not yet become a cliché, but it is increasingly difficult for a modern industrial state to exercise military power to do other than respond to a direct military attack. Yet, threatening behaviors among nations continues to be practiced, though it falls short of direct military attack. The OPEC embargo of 1973-74 is a conspicuous example, but is by no means the only one. The sponsorship of transnational terrorists (Libya), the maltreatment of resident foreign nationals (Uganda), and interference with fishing in international waters (Iceland, Ecuador, Peru) illustrate the diversity of international conflict where the direct application of military power has not been found to be acceptable by the affronted parties. This paper will briefly address one dimension of the larger problem of developing an efficacious response to conflict at a scale which does not justify military action. This paper will examine the problems, prospects, and execution of a policy of manipulating U.S. trade in agricultural exports as a response to foreign raw material supply interruption.

ECONOMIC ADVANTAGE FOR DIPLOMATIC OR POLITICAL GAIN

The use of economic advantage for political or diplomatic gain or, in its less elegant formulation, "economic warfare," is widely discussed, but most frequently, the issue arises in the context of military conflict. Has the use of economic advantage for economic warfare purposes been taken seriously? For some time, economic warfare has been out of fashion with policymakers as a meaningful instrument of national policy. There was strong academic interest

* This is the full text of a paper prepared by Dr. Schneider for the Workshop and which served as the basis for his presentation during the Workshop.

in the subject during World War II and the Korean War, but little serious research has been done since then.¹ The USA has had statutes in force ever since the Trading With the Enemy Act of 1917 to provide a legal basis for the conduct of economic warfare. But, in recent years, specialists and policymakers alike have been disenchanted with the efficacy of such measures to support foreign policy objectives against substantial adversaries. As a consequence, most of the economic warfare measures instituted since World War II, which have been directed primarily against the Soviet bloc, have not been energetically enforced. With the exception of some of the most sensitive military technology, little effort has been made to prevent leaks of important civilian technology to the Soviet bloc. Nor is there a significant consensus among policymakers as to how (if at all) economic warfare should be conducted in the future as an element of national policy against actual or potential adversaries.

The Arab oil embargo imposed on the United States and other nations in October 1973 has, however, stimulated a reconsideration of the utility of resource control as a means of influencing international diplomatic behavior. The Arab oil embargo, designed primarily as an instrument to support Arab policy objectives in the Middle East conflict, is interesting from a number of perspectives:

- Unlike the conventional perception of economic warfare, where the objective is simply to inflict some substantial losses on a potential opponent in order to limit his war-fighting capability, the Arab embargo was limited to specific diplomatic objectives in a well-defined set of circumstances. The connection between the sought-for behavior of non-Arab states and the termination of the embargo was made explicit by the OPEC nations. As a result, nations heavily dependent on imported oil (for example, France and Japan) could be induced to cooperate with the OPEC governments conducting the embargo, and this made it more difficult for other countries to organize an effective opposition to it.

¹ For useful discussions of economic warfare, see Gunnar Adler-Karlsson, Western Economic Warfare: 1947-1967 (Stockholm: Almqvist and Wiksell, 1968); R.L. Allen, Soviet Economic Warfare (Washington: Public Affairs Press, 1960); H.S. Ellis, Exchange Control in Central Europe, Harvard Economic Studies No. 69 (Cambridge: Harvard University Press, 1941); A.O. Hirschman, National Power and the Structure of Foreign Trade (Los Angeles: University of California Press, 1945); J. Viner, Dumping, A Problem of International Trade (Chicago: University of Chicago Press, 1923); Y. Wu, Economic Warfare (Englewood Cliffs: Prentice-Hall, 1952). A review of the development of the subject can be found in the International Encyclopedia of the Social Sciences, p. 467.

- The extent to which resource control may be effective as a means of influencing governments does not necessarily imply a total cutoff of deliveries. There can be dramatic political payoffs from a small cutback, or even in a failure to expand production at an anticipated rate. The Arab oil embargo in 1973-74 involved a reduction of less than 10% in pre-embargo shipments to the oil-importing nations.²

The question for the U.S. is whether or not economic warfare can become a useful addition to the range of alternatives available to policymakers in support of diplomatic objectives. The employment of such measures against the Soviet Union to inhibit the transfer of military-related technology has been an important component of U.S. foreign economic policy for 25 years. However, these efforts have tended to focus on the transfer of industrial technology, because of the perception that such technology was the linchpin of the Soviet (or any modern) military machine. The conviction (with little evidence to support it) was that denial of crucial industrial technology would be the most effective means to inhibit the growth and modernization of the Soviet military establishment.

When the issue is posed in these terms, it tends to obscure the potential impact of more indirect means of waging economic warfare that could be more effective as a way of influencing the character of resource allocation within the economy of the target nation, and thereby affecting the resources available to its defense sector. Moreover, amid the resource abundance the USA has enjoyed for most of this century, there has been little motivation to consider the utility of economic leverage as an instrument to facilitate access to raw materials or to influence other aspects of U.S. diplomacy.

Too often the efficacy of economic warfare has been denigrated because expectations were grossly exaggerated. A recent study of the history of U.S.-Soviet trade, and the American efforts to inhibit such trade by statute, argues that economic warfare measures must have a direct major impact on the military or economic potential of an adversary, if they are to be successful.³ U.S. strategy to undermine the military capability of Nazi Germany by saturation bombing of supposed bottlenecks in the German economy was not really

² A useful review of the Arab oil embargo may be found in R. Johns, 'How the Arabs Took Stock of the Power of Their Oil', Financial Times, March 22, 1974.

³ F.D. Holzman, 'East-West Trade and Investment Policy Issues: Past and Future', in Soviet Economic Prospects for the 70's, Joint Economic Committee, U.S. Congress, 27 June, 1973.

successful. While the Germans were prevented from producing adequate supplies of some strategic items, they were nevertheless able to maintain a formidable military capability. "Denials, whether by bombing or embargoes, to be really effective must be very broadly based and nearly complete." Moreover, "at present, in peacetime, even a very tight embargo may be a cause of passing inconvenience and delay, and perhaps a small cost, but no more. An embargo must be virtually airtight to achieve a significant effect."⁴ The author concludes that a U.S. trade embargo against the Soviet Union could not be very effective in inhibiting Soviet economic and military development.

By thus establishing a very high set of expectations for economic warfare, such techniques have often been dismissed since the mid-1950s, when they were tried and found to be almost wholly ineffective for the purposes intended. This paper will argue, however, that this perspective on economic warfare is inappropriate, and only serves to discourage U.S. policymakers from taking advantage of one of their most formidable long-term assets -- the capacity of the U.S. economy to support U.S. foreign policy objectives. Economic warfare cannot be expected to carry the entire burden of containing a strong and aggressive power. As one of several coordinated elements in a broad foreign policy strategy, however, economic warfare can make an important contribution to the achievement of long-term foreign policy objectives, and may be highly effective in the short term. It can be a useful device for affecting the pattern of resource allocation within the target country. Denial of trade in some areas, while encouraging it in others, can alter the pattern of growth in an economy that favors one sector, while leaving another dependent upon foreign resources.⁵

U.S. AGRICULTURE IN THE INTERNATIONAL MARKET

The U.S., in particular, and North America, in general, are the principal sources of agricultural export commodities for the world market. The U.S. lead in agriculture is greater than Arab dominance of the petroleum market. This dominance has been growing as a consequence of a multiplicity of factors, such as declining agricultural

⁴ Ibid., p. 663.

⁵ There is recent evidence that the economic warfare conducted by the Arab League, the practice of the Arab Boycott Office of prohibiting foreign firms from transacting business with member nations if they do certain types of business in Israel, has had some success. The boycott has successfully prevented Israel from broadening her industrial base. Despite numerous devaluations, the Israeli balance of payments (merchandise) has never been in surplus. See Alain Cass, 'Assessing the Effects of the Boycott', Financial Times, 21 November, 1974.

productivity in some regions (especially in the Soviet Union and Africa), a high birth rate, the shift in climatic patterns in North Africa, and the shift in taste from low-quality protein (direct consumption of grain) to high-quality protein (livestock) as a consequence of rising per capita income.

While world agricultural production has increased 30% since 1960, per capita production has increased only 2% in the developing nations. This is the result of population increases outstripping the 29% increase in aggregate agricultural production in these nations. The developed nations of the world had a similar increase in production (31%), but were able to increase per capita consumption by 17% because of a more moderate population growth. These figures, however, conceal great differences among the nations of the world. Many have actually experienced a substantial worsening of the situation in recent years.

Because of dwindling world grain reserves, the ability of the world agricultural economy to respond to shortfalls in supply is increasingly dependent upon North American, and principally U.S., agricultural exports. World grain reserves have been declining since the early 1960s. According to the Overseas Development Council, reserves, as a percent of annual world grain consumption, have declined from 26% in 1961 to 7% in 1974.

Historically, increases in agricultural output have come as a consequence of increases in planted acreage and yields per acre. There have also been substantial improvements in the yield per acre in cereal production as a result of improved technology, particularly in high-yield strains of wheat and rice. In some cases, especially Pakistan, the yield per acre has nearly doubled.⁶

As noted earlier, however, as per capita income increases, there is a marked change in preference in favor of the consumption of high-quality protein, especially livestock converting high-protein feed grains into beef, pork, and poultry. On a per capita basis, the average American consumes over one ton of grain per year, only 150 pounds of which are consumed directly; the remainder is consumed indirectly in the form of animal protein.⁷ It is in the production of feed grains that the United States has its most conspicuous and enduring predominance.

The United States, which exports 75% of the total North American feed grains in the international market, is also dominant in soybean production -- the most important source of livestock protein. Throughout the 1960s and 1970s, the United States produced 90% of the world's

⁶ J.R. Brown, World Without Borders (Vintage: New York, 1973), p. 98. These developments are popularly known as the Green Revolution.

⁷ Ibid., p. 96.

exports of soybeans.⁸ Moreover, because of the importance of soybeans to the diet of both the developed world (in the form of indirect consumption through livestock) and the developing world (nearly one billion people consume soybean products directly as a protein source), U.S. dominance is likely to continue for many years to come. With the exception of Brazil, which has begun to produce soybeans, the United States is the only nation with a significant surplus available to the international export market. The ability of the United States to expand soybean production is limited, however, by technology and the absence of unplanted acreage. In recent years, the major portion of the fourfold increase in the soybean crop (85%) has come about through the additional planting of soybeans. Increases in yields are not susceptible to the technological changes that we have experienced with wheat and rice.

While there has been a fourfold increase in the production of soybeans since 1950, yields per acre have increased only 1% (one-fourth of the average annual increase for corn over the same period). Non-grain substitutes for protein are difficult to obtain. The most important, fish, has been a declining source of protein since 1969, after increasing by 5% annually since 1950. Moreover, several of the 30 kinds of commercial-grade fish now being taken will not sustain the current level of the catch. Advanced technological efforts to produce synthetic forms of protein from petroleum are not yet a cost-effective solution and may not be so for several years.

As a consequence of several factors, including organizational shortcomings, inadequate investment in agriculture, increasing population, climatic shifts, and increasing per capita income, there has been a worldwide increase in the demand for agricultural products from the surplus-producing nations of the world. Since 1971, U.S. food grain exports have nearly doubled, from 16.9 million metric tons to 32.7 million metric tons in 1973-4, and the upward trend has continued since then. Moreover, worldwide exports from the major producing nations have increased by 27% over the same period. The export of food grains reflects substantial shortfalls in many parts of the developing world as a result of extended droughts.

The export of feed grains, which has increased almost as spectacularly, underlines the constant shift in preference to the indirect consumption of feed grains via livestock. Japan increased its imports of feed grains by 28% over the same period. These growth rates exceed the average increase of 23.4% for U.S. feed grain exports as a whole.

For different reasons, circumstances in the developing world also suggest a continued interest in purchasing U.S. agricultural products. Historically, the nations of Africa, Asia, and South America were self-sufficient in grain production, but this has

⁸ Ibid., p. 98. The value of soybean exports exceeds the dollar value of computers, jet aircraft, and wheat.

changed since the mid-1930s. They have gone from a net exporting position of three million metric tons exported annually in the 1934-38 period to a net importing position of 43 million metric tons in 1973, according to an Overseas Development Council estimate.

These increases in demand, when set against supply shortfalls and changes in taste in the developed world, have left a very formidable burden on the developing nations. Since FY 1972, the grain imports of the developing nations of the world have increased from 20.6 million metric tons to 26.7 million in 1974. At the same time, there has been a 207% increase in the price of grain which more seriously inhibits the development of many of the nations involved than the recent increase in the price of petroleum.

In short, the developments in the international agricultural market -- both supply and demand -- imply sustained dominance in agricultural exports for the United States as well as large-scale food deficits in much of the world.

IMPLEMENTATION AND ITS PROBLEMS

There is a serious danger of the usefulness of agricultural exports as an instrument of diplomacy being "oversold" by advocates exaggerating the efficacy of this form of economic warfare -- as was often the case with advocates of economic warfare in industrial products. Some of the most important concerns to note are as follows:

- Resource "warfare" is a short-term phenomenon for either the United States or an adversary. Nations sponsoring resource cartels which seek diplomatic or economic advantage could do so for a brief period, normally not more than three years, because substitutes or alternative (higher-cost) sources of supply would cause the significance of the resource supply interruption to diminish over time.
- No nation is completely vulnerable to economic warfare; at most, economic warfare can influence the behavior of a target nation at the margin by imposing high short-term costs of substitution.
- Short-term substitution costs can be mitigated by modest changes in inventory policy.
- Many of the proposals for implementing economic warfare through the use of agricultural exports are self-defeating because they involve governmental intervention on a scale which would diminish the incentive of the agricultural sector to produce a surplus.

To acknowledge that problems of implementation as well as expectation exist is not equivalent to denying the potential utility

of agricultural exports as an instrument of foreign policy, if employed in concert with other policy instruments. In an important number of scenarios, agricultural export manipulation is a symmetric and probably efficacious response to raw material supply interruption brought about in an economic warfare environment. It does not require the use of military force; its effectiveness hinges on the same mechanism (i.e., the imposition of short-term costs on the target nation); and the duration of its effectiveness is brief.

Two mechanisms would be useful to implement such a policy. The first is for the Federal Government to obtain tight control over the flow of agricultural exports. There has been substantial pressure in recent years to do this for reasons that are primarily protectionist in nature; namely, to minimize the impact of foreign demand on domestic U.S. prices by restricting exports to a level that would limit price increases to an acceptable level. Until the aftermath of the FY 1972 grain sales to the Soviet Union, there was little serious effort to carry out such a program because of its potential adverse effects on international trade. However, the impact of the July 1973 embargo on soybean exports -- especially in Japan and Europe, which are heavily dependent on U.S. soybeans -- was formidable and illustrated the kind of reactions that could be expected from any significant interference with international agricultural trade. The licensing machinery established under the Export Control Act of 1949, however, does provide the necessary vehicle for limiting agricultural exports if the U.S. should wish to do so.⁹ Under this system, all agricultural exporters would be required to obtain a valid export license, in a manner similar to present controls on the export of strategic materials and technology to the Soviet Union.

Commercial sales to friendly nations would be routinely approved, but exports to nations with which the USA had a powerful political reason to make sales conditional upon some diplomatic arrangement could be rigorously controlled. At the same time, this form of control would be far less intrusive than some of the proposals that have been advanced in the wake of the Soviet grain deal -- the effect of which would be to make agricultural exporters almost totally subject to Government monitoring of their business affairs. In addition, this procedure would transform agricultural commodities into an instrument of both economic and political significance, and U.S. policymakers would have available an additional tool of diplomatic leverage without major institutional changes.

Such a proposal has been advanced in various forms, but has the undesirable property of imparting a significant degree of market

⁹ This Act was replaced with the Export Administration Act of 1969, which was extended on August 29, 1972. The purpose of the new Act was to reduce the extent of controls, but the machinery of the old Act was retained.

uncertainty to commercial agriculture -- therefore providing a disincentive to agricultural production.

A modification of this proposal more consistent with the commercial interests of the agricultural exporting nations would be the establishment of a U.S. Government reserve, carefully partitioned from the domestic market, that would be employed for both humanitarian and political purposes. The most important attributes of this system would be as follows:

- Any commercial sales from this reserve, whether foreign or domestic, would be at a price that approximated recent market prices at the time of sale.
- The food reserve should be accumulated by the Government in a manner that would minimize the impact of such purchases on prices in domestic and foreign markets. This could be accomplished by adding to the reserve only in years when there is a significant surplus in domestic agricultural production.
- Humanitarian relief would be coordinated with other agricultural exporting nations; but the reserve would be subject to the equally valid claims of U.S. diplomatic interests.

The availability of both the mechanism of control and the resource of a domestic reserve would make possible the exercise of economic warfare in agricultural commodities as a routine component of U.S. diplomacy. Not unlike many dimensions of existing diplomatic practice, the mere existence of the institutional mechanisms would constitute a formidable contribution to the effectiveness of U.S. diplomacy toward countries for which agricultural imports constitute a national necessity.

In the long run, the United States is not highly vulnerable to foreign resource interruption. The economic system, through the price mechanism, can exploit higher cost substitutes. However, U.S. short-term vulnerability can be reduced by a rationalized national stockpiling policy for resources whose substitution costs are greatest. Unlike traditional "strategic reserve" theories, stockpile levels should be adjusted to reflect the time required to shift to substitute materials or alternative sources of supply -- not to time periods which reflect an estimate of the duration of a resource supply interruption. A more effective national stockpiling policy may permit agricultural exports to play a greater role in future U.S. diplomacy than merely an instrument to respond to resource supply interruption.

FORMAL COMMENTS ON THE PRESENTATIONS OF
MR. PARKER AND DR. SCHNEIDER

by

Mr. David Kassing
Director of the Center for Naval Analyses

A ROLE FOR MILITARY FORCE

It is fashionable today to question the utility of military power and military force. Yet, our very first speaker, Roger Shields -- and Bill Schneider, too -- went against the tide and told of instances where military power has been used successfully. Roger Shields argued that the Indians, the North Vietnamese, and the Arabs (to a degree) were able to exploit military power for their national advantage. Although he didn't discuss the conditions at the very end of the Arab-Israeli war, you may recall a late-night National Security Council meeting and a "brutal" note from the Soviets that precipitated a U.S. military alert. I raise these points to remind you that military force will continue to have a role. Certainly, if Pat Parker is correct in his analysis of the Soviet economy, its military growth, and the resulting "crunch," the Soviet leaders may employ military force. This is something we should not forget.

RESEARCH OF GOALS

In the context of ideas, we have heard about offending behavior and unconventional economic warfare, but very little has been said about the purpose of such unconventional or offending behavior. A category such as "purposefully offending economic behavior" should be one that the Office of Naval Research (ONR) focuses its research activities upon. In evaluating weapon systems, we set up scenarios, look at the objectives to be achieved, and compare the costs of alternative means of achieving them. I think that such a general approach is also appropriate to problems of economic warfare. Many unconventional means of economic warfare, it seems to me, are appropriate to some problems or threats to the national security of the United States. Under other conditions, a military response is appropriate, and there are probably many in between. The conditions under which economic power and military power are complements or substitutes are something that basic research by ONR could begin to address.

Emphasis on economic warfare in peacetime is appropriate. I wouldn't recommend to ONR that a research program on the employment of economic warfare tools in a hot war situation receive much priority at all. I believe that "detente" will continue for some time and

that the rivalry between the East and West will continue at levels short of all-out warfare. In such competition, economic warfare may have a small effect. I do not think that we can, even by the device of manipulating grain exports to the Soviet Union, have a major effect on resource allocation in the Soviet Union.

EVALUATING THE FOOD WEAPON

Bill Schneider has outlined one particular weapon of economic warfare. It is fair to say that he has developed his proposal in a great deal more detail than any other that I have heard. It falls in the area of conventional economic warfare -- that is, commodity control. It is not among the "flashier dirty tricks" or non-conventional approaches that Tom Schelling and Martin Shubik have talked about.

I can't offer an analysis of the costs and effectiveness of the food weapon relative to alternatives that the U.S. might employ in countering cases like another OPEC embargo because I am not sure what commodity alternatives we have -- or whether they are appropriate. Bill Schneider does make a reasonably convincing case that the general situation in the world food markets is, in some ways, parallel to the one that OPEC faced in the oil markets in 1973; namely, that

- Demand for food -- specifically grain -- has been growing significantly and is likely to remain high;
- Substitutes are not readily available;
- Production for export is concentrated in nations that have a general common heritage and interests with the United States; and
- Stockpiles are not large relative to consumption.

To the degree that these considerations parallel those that enabled OPEC to exploit its advantage, the U.S., in conjunction with other producers of feed grains, could make a condign response to another oil embargo.

Limited Scope for Unilateral Use by the U.S.

In any evaluation of the use of the food weapon, there are a number of things to consider. The U.S. does have an important role in the world agricultural market -- Bill Schneider says "dominant." Nonetheless, successful employment of the food weapon would require cooperation from other suppliers -- suppliers not just out of production, but suppliers out of stockpiles as well. These suppliers may not even be affected by the offending behavior or threats that trigger our response, and it may be difficult to win their cooperation. In other words, I don't see that food is a weapon that we can employ unilaterally.

Moreover, quantities are important here, and I think that it would be worth developing an understanding of the flows and the stocks in the world grain market. It is quite possible that we might like to target some nations that have been entirely dependent on the United States for imports in the normal day-to-day trade of the world during the past 10 years, but the absolute level of their imports might be so small that it could be supplied by a small drawdown of stockpiles held by, say, Poland. I don't think that we know what the nations we might want to act against require in the way of food, and this is a subject worth looking into.

The Issue of Public Opinion

Yesterday, Bernard Brodie reminded us of the difficulties of conducting a military campaign when domestic public opinion is divided. It is hard for me to envision an important situation in which an economic response, rather than a military response, would be appropriate and in which public opinion would strongly support our use of food as a weapon. That is a second problem which has to be considered in any examination of the role of the food weapon.

Effects on Domestic Agriculture

A third consideration, and Bill Schneider has recognized it, is that there will necessarily be domestic price effects and domestic market effects. A stockpile cannot be created -- and I don't have any idea how large a stockpile or reserve would be required -- without having the domestic price higher than it would otherwise be. There is also the potential incentive effect on domestic production if the Government organizes, interferes with, and operates in the world food market; Bill also alluded to this.

AREAS FOR RESEARCH ON THE FOOD WEAPON

So, the use of grain export controls as a weapon has some attractions. But, you have to sit down and evaluate how costly it might be in all of the ways that I have mentioned, including the circumstances in which the food weapon might be employed. All of this suggests that one of the things that ONR might wish to do (and perhaps this comes closer to applied research than they are interested in becoming) is to examine research with regard to the food market and the potential effectiveness of food as a weapon.

SOVIET MILITARY GROWTH

In commenting on Pat Parker's discussion, I think some division of labor and specialization is appropriate. Murray Feshbach has already volunteered to talk about the demographic problems in the Soviet Union, and I will let him do so in a minute.

Soviet military capabilities have been growing, not just in the composition of their forces (and some of this has been spectacular -- in strategic forces, in airlift, and in naval capabilities), but also in the employment of these forces. CNA examines the behavior of the Soviet Navy with a fair amount of care, and we see an increasing tendency on the part of the Soviets to employ their forces in a coercive manner. I don't mean to suggest that the Soviets might become militarily adventurous in a big way, but they certainly are more adventurous than they were a few years ago.

However, my understanding of the growth rate of Soviet national security expenditures in rubles, which is implied in the recent revised CIA estimates, is that it is about 5%, rather than the 8 or 10% that Pat Parker used. It may be that this is still an understatement by the CIA, but I think the burden is on Pat to show that his figures are more accurate.

If there is a "crunch" between programs and resources, how the Politburo or CPSU will resolve it is nothing about which I have any special understanding. However, it does seem to me that they may have some limited objectives for the size of their military forces and may be moving rapidly to achieve them. The growth of their defense expenditures may then level off.

Concerning the suggestion that the Soviets might move into Iran to acquire oil, the thought occurred to me that it might solve our energy problem as well as theirs. In those circumstances, the Saudis and others who have large reserves of oil -- even larger than those of the Iranians -- might have second thoughts about their relations with the West.

FORMAL COMMENTS ON THE PRESENTATIONS OF
MR. PARKER AND DR. SCHNEIDER

by

Dr. Dermot Gately, Professor of Economics,
New York University

INTRODUCTION

In discussing Dr. Schneider's presentation, I'd also like to comment on one of my own interests; i.e., analyzing the OPEC cartel. Before I address the main thrust of Dr. Schneider's paper, I'd like to comment on one thing that both Dr. Schneider and Dr. Kassing have mentioned which I think is misleading. They both cited the U.S. position in international agricultural markets as being dominant and comparable to OPEC dominance in the world oil markets. The reason why this statement is misleading is that we need to distinguish between production and exports. In oil, a large portion of production is traded internationally. In food, a large portion of world production is not traded internationally. So, while the United States might have a large share of world trade in food, it does not have a very large share in world production of food. And, in terms of market dominance with respect to food, I think that world production is far more important than world trade.

Having had access to Dr. Schneider's paper before this Workshop, I've had a chance to go through it carefully, and I disagree sharply with his findings. In the interests of organizing my comments, let me quote from Dr. Schneider's paper in a way that I think honestly reflects its thrust; to wit, "As one of several coordinated elements in a broad foreign policy, economic warfare can make an important contribution to the achievement of long-term foreign policy objectives, and it may be highly effective in the short run." By economic warfare, I believe that he means relatively tight controls over agricultural exports (i.e., controls over to whom we sell), which are coupled with stocks of U.S. agricultural reserves.

THE USE OF U.S. AGRICULTURAL EXPORT CONTROLS

In reading through Dr. Schneider's paper, I felt uncomfortable at times because he does not clearly distinguish between what to me are really two very different uses of U.S. agricultural exports. One use can be called "the food weapon." This would involve the tactic of selective embargoes against particular countries, completely comparable to what OPEC calls the oil weapon. When I say the oil weapon, I want to emphasize that I do not include price increases at all as part of the oil weapon. I am referring only to the oil embargo.

The other which he suggests is using "U.S. agricultural exports as a long-term asset contributing to the capability of the U.S. economy to support foreign policy objectives." To me, this statement is a highly general description of the role that U.S. agricultural exports could play in furthering U.S. foreign policy. Let's say that U.S. agricultural exports could contribute to the global perception of the United States as a leader among nations in helping to meet basic human needs. Indeed, this is a highly moral goal for our foreign policy. So, these are the two different purposes for which we could use agricultural exports as a tool of foreign policy.

Now, I would like to disagree as politely and as respectfully as possible with the thrust of the paper. First of all, let me distinguish between a long-term use of the food weapon in economic warfare and a short-term use. In a long-term policy of using agricultural exports as a weapon, the U.S. Government must decide to which countries it would sell its exports and to which countries it would not sell its exports. I don't believe that such a policy could, should, or would be used by the U.S. I think that it's unrealistic to think that the U.S. political system and the U.S. Government would have either the desire or the capability to implement such a policy. I'm still talking about using the food weapon over the long term. I don't believe that this weapon could be used for a variety of reasons, the most important of which is the problem of transshipment. While we might embargo U.S. food sales to Abu Dhabi, it would be likely to turn out that Abu Dhabi could receive American food transshipped via Saudi Arabia or another country. This is one serious problem in actually implementing such a policy.

Another reason why the long-term use of the food weapon would be self-defeating is that the implementation of the political criteria for exports (i.e., who can receive U.S. food) would severely damage our international reputation as a responsible trading partner. Our normal trading partners who, with some recent exceptions, consider us to be a responsible trading partner would be understandably concerned if we started imposing political criteria on who can obtain our wheat or our soybeans. I should think that it would encourage our major trading partners to be much more concerned about reducing their dependence upon us.

Humanitarian Food Exports: An Aid to U.S. Foreign Policy

The other use of U.S. agricultural exports is, I think, far and away the most important; that is, agricultural exports can play an important role in providing indirect support of U.S. foreign policy objectives. The role they can play is one of identifying the U.S. within the community of nations as a leader in helping to meet basic human needs. Nothing more than this, however, can realistically be expected.

THE SHORT-TERM UTILITY OF THE FOOD WEAPON

Let me talk now about the short-run utility of food as a weapon and about using food as a retaliatory weapon against a resumption of the oil embargo or some other comparable embargo. Again, we have the efficiency issue involving the problem of transshipment. We also have the potential problem of food reaching a given country from an alternate supplier. This problem of policing the embargo -- which is especially acute when the food embargo is not coupled with a military blockade (which is a step exceeding economic warfare) -- seems to spell failure for this tactic.

The other important questions which would have to be addressed include the identification of countries susceptible to this tactic. In other words, what countries would be so dependent upon us for food and so isolated that this weapon could be used effectively? I can't think of very many countries that would satisfy these conditions, but one would be Hong Kong, for example. I'm not sure how dependent upon food imports the countries are along the Persian Gulf. My guess is that it would require only some very simple back-of-the-envelope calculations in order to figure out what countries we're talking about and that the results would indicate that food is not likely to be a very effective weapon in any foreseeable circumstances.

OPEC AND ECONOMIC ANALYSIS

Now, let me proceed to my own interests in analyzing OPEC. This involves one of the subjects that Roger Shields raised on the first day of the Workshop; namely, the analysis of cartels. I think that looking into the theory of cartel behavior and into the general theory of oligopoly are very fruitful areas for both applied as well as basic research. I became interested in this question because of the great attention paid to the increase in the price of oil and the embargo. To me, it was embarrassing and scandalous that economists could disagree so strongly on the two questions of the sustainability of the price increases and of the stability of the cartel.

In Newsweek in 1974, Milton Friedman, a well-known economist, stated two things: first, that the price was going to tumble very soon (the price was then at \$8 per barrel) and, second, that, even if OPEC cut back its production to zero, it could not keep the price as high as \$10 per barrel. His predictions have not been entirely correct. The price has not tumbled; it has been increased. It has appeared to be very sustainable, and OPEC has not been forced to cut its production to zero. To the contrary, OPEC is now producing anywhere between 26 and 30 million barrels of oil per day, which is not a great decrease from what it produced in 1973.

The other general statement that many people were making was that it was axiomatic that all cartels are unstable and that OPEC would

fall apart. No distinction was made between cartels dealing in goods that are reproducible and cartels dealing in exhaustible resources. I've been researching this literature and working on some of these questions. To me, it's an area where there's a great deal to be done. There are a number of tools that have been and could be applied, but much more work has to be done.

This research is also very important in analyzing a variety of proposals with respect to U.S. energy policy. Dr. Kissinger has proposed an international floor price. I'm not sure what sort of economic analysis went into this proposal (I haven't seen any), but I'd be very interested to learn what the basis was for his proposal.

Another interesting policy for the U.S. is the so-called "Dutch Solution." The Dutch have natural gas resources, and what they're doing is to explore, map, and develop those resources to the point that they are all ready to be turned on -- but to hold them in abeyance. Instead, they'll continue to import until they're threatened with a cutoff or an exorbitant price increase -- then, they will turn to their own resources. In some respects, it's comparable to having a very large stockpile.

By contrast, the policy of the U.S. Project Independence in utilizing American resources has been christened the policy of "Exhaust America First."

We have done some work in the analysis of cartels, but there's a great deal more to be done, and I think that it would be very fruitful research.

GENERAL DISCUSSION

Dr. Morgenstern: I did not realize that Professor Lucas had to leave the Workshop early. Otherwise, I would have interrupted the order of presentations and asked him to say something. Professor Lucas is not only an eminent mathematician and Professor of Operational Research and Industrial Engineering at Cornell, but also he has just spent several months in the Soviet Union. It's a pity we did not elicit some comments and reactions from him. I have heard a lot from him during informal conversations, but I do not feel that I would do justice to his comments. However, he did say to me that the Soviet Union is not quite in the situation which has been described here. The Soviet people are still very much under the influence of having gone through the Second World War, and they are willing to sacrifice, if necessary, by reducing their standard of living in order to accomplish something which might be presented to them as a national goal. I would add that our discussion so far has concentrated very heavily upon physical things and has omitted possible changes in the Soviet type of management. They have an enormous reserve, which is reflected in their inefficiency. If they became more efficient, the whole picture would change with the same physical data.

Mr. Simpson: Professor Lucas told me that his major impression was that there is tremendous slack in the Russian economy. In this context, he quoted a Soviet coatroom attendant's comment to the effect that "coatroom attendants are the biggest industry in Russia." In other words, there's tremendous underproductivity -- people take easy jobs and don't work hard at all. Therefore, as you say, there is inefficiency.

Dr. Morgenstern: This is a reserve which doesn't express itself in the physical numbers.

Mr. Simpson: Yes, but it would be very hard to capture that reserve, given present institutional arrangements.

Dr. Morgenstern: The point is that there are other aspects which need to be brought into the picture.

Dr. Feshbach: Of course, the management could be changed to eliminate this inefficiency. This is exactly what the head economist in Czechoslovakia, Ota Sik, has said. Many Soviet analysts also know about this inefficiency, but the fact is that the Communist Party is not willing to give up its powers voluntarily.

Dr. Wolf: I would like to introduce a different viewpoint. Suppose that this kind of workshop were taking place in the Soviet

Union and that Soviet analysts were looking at U.S. economic efficiency. They would certainly say that the U.S. has a flawed economy because unemployment is 7.6 percent; inflation has improved from 2 digits to one digit; and the growth rate has just gone from being negative to being positive. Furthermore, it might be pointed out that military expenditures have resumed their buildup, but that this buildup is likely to be self-limiting due to worries about inflation and domestic competition for resources. Therefore, these analysts might suggest that the Soviet Union worry about the danger of the U.S. resorting to adventurism as a way of overcoming the internal inconsistencies of the U.S. system. Furthermore, the U.S.S.R. should be prepared for the U.S. to engage in economic warfare and to inhibit Soviet bargaining on food, technology, or whatever. So, according to this point of view, the world is very dangerous for the Soviets. More alarming scenarios might include the U.S. making attempts to penetrate Eastern Europe or to activate the eastern border of the Soviet Union with China. Can any of us foresee these scenarios -- this interpretation of the facts -- coming true? I think not. They represent an excessively simplistic view of the future and of the evolution of politics. Likewise, I would say let us not slip into too the cut-and-dried ways of looking at the U.S.S.R. in our analyses.

Professor Rosefielde: In the debate over Soviet military expenditures, is the accuracy of the weapons count an issue?

Mr. Parker: I don't think that there are large disagreements about the actual number of physical items, though the count has changed somewhat. My principal concern is over the increasingly technical complexity of Soviet weapons which have been designed, developed, and procured in the last year. From the new generation of ICBMs to the new MIG-25s, Soviet weapons have become much more complex and sophisticated. This is a trend which began in the mid-sixties.

Professor Bergson: You're not challenging the dollar figures?

Mr. Parker: If the monetary figures fail to reflect this increasing complexity of Soviet weapons, then the costs are underestimated. Indeed, the people who make the cost estimates for U.S. weapons systems use similar procedures and similar parametric, cost-estimating relationships to estimate the costs of Soviet weapons -- and we do have the U.S. "track record" showing the predictive capability and biases in these cost-estimating relationships.

Next, when computing the ruble value of a certain technological improvement, the use of U.S. cost data and ruble/dollar ratios fails to reflect the U.S.S.R.'s higher costs relative to those of the U.S. In other words, when the U.S. incurs a 4 or 5 percent increase in costs as it moves into an area of more advanced technology, the cost to the Soviets of a similar move would be relatively higher because of their comparative disadvantage in areas of advanced technology. A move by the U.S.S.R. similar to a move by the U.S. is more expensive for the Soviets. So, if you had a 5 percent increase in the costs of

the dollar component (which may already be underestimated, given the U.S. cost-estimating "track record") this could become a 6 or 7 percent increase in the costs of the ruble component.

Professor Bobrow: I'd like to pick up Dr. Wolf's excellent comments and add another "string to his violin." I can imagine a briefing in the Kremlin a couple of weeks from now during which all of the facts that Charles mentioned are presented and to which Soviet intelligence adds the following news item: "Meeting of Leading Defense Intellectuals and Government Officials at Airlie House on Economic Warfare -- Deputy Secretary of Defense Makes Trip to Meeting." One can see how a curious kind of "snowballing" could develop.

The "string" I want to add to Dr. Wolf's violin is to offer another way of viewing likely Soviet behavior in the years to come. This is not to say that Pat Parker's possibility is necessarily wrong, but rather to provide at least an alternative viewpoint. Suppose that you are a Soviet leader and that you believe these demographic studies are fairly accurate. Furthermore, suppose that you believe that, in 1990, you will be surrounded by a significant number of very hungry, highly populated nuclear-armed nations and that the U.S. will be plagued by the systemic pressures outlined by Charlie Wolf.

- What should you do then about the development and acquisition of military technology -- particularly high-performance, high-lethality conventional and nuclear technology?
- What should you then be doing with chemical and biological warfare?
- What should you be doing with civil defense?

I'll conclude by saying that ONR's research program should at least explore these and other conceivable characterizations of the problem-solving behavior of anyone we're trying to understand.

Mr. Despres: I'd like to make a few general observations about a number of the issues which have been raised. I see a parallel between this discussion of economic warfare and discussions of the arms race in which I have participated. By focusing primarily on the economic domain of the competition, we tend to exaggerate the importance of the economic domain and to exaggerate the intensity of the economic interactions which appear to be going on in the international arena. The arms race has been the subject of a lot of alarmist discussion in the past and, indeed, the momentum of the arms competition, by all appearances, is not only unabated but, in certain critical respects, has been accelerating. On a more general level, however, there is neither economic warfare nor an arms race. The behaviors of states have to be viewed as a whole -- as a general competition having latent possibilities for a variety of more or less

heated contests by means of arms and by other means among a variety of potential actors. The outlines of the actual contests involving arms or economic warfare are not clear. The diversity of latent possibilities is the most important element to emphasize in this general competition. These possibilities can be divided into two categories: one is East/West and the other is North/South.

For purposes of organizing the East/West lines of research, I would recommend beginning with the biggest, most enduring, and most reliably predictable of problems: the momentum of Soviet military development. The Soviet military buildup is worrisome because of the variety of direct and indirect problems which it could pose to ourselves and to our friends and allies abroad. Hence, there is a need for some new and more fruitful approaches to the analysis of Soviet political/economic developments in relation to civil and military developments. Research should focus particularly on those areas where there is competition for resources within the Soviet Union, because a long-term objective of the U.S. ought to be to limit the momentum and the rate of growth of Soviet military power -- ultimately (although this is at best a long-term possibility) in a reciprocal and multilateral way. We need to develop a much more discriminating and precise understanding of the role of Soviet/American economic relations in the context of an international environment which the Soviets do not necessarily view to be inherently more benign for the United States. In this context, we have to concentrate on developing better ways of evaluating our strengths as well as their vulnerabilities and weaknesses -- not for purposes of waging all-out economic warfare or pursuing an arms race to the finish, but for purposes of motivating and facilitating lines of development within the Soviet Union that serve our long-term interests.

On the North/South side, a case can be made that, in the past, we have been among our worst enemies. In particular, the proliferation of nuclear technologies is a matter for self-restraint. The problems posed by the proliferation abroad of increasingly lethal and damage-producing arms, both conventional and nuclear, may be substantial, indeed, in the long run.

Dr. Morgenstern: I agree that there have to be longer views in addition to the shorter ones. Obviously, we aren't involved in economic warfare at the moment but, nevertheless, it doesn't hurt to think about what might be done if and when such an occasion should arise. This is certainly clear.

Among the long-term considerations of which we should be aware is the growth of science in the Soviet Union which will make itself felt, not tomorrow, but in 5, 10, or 20 years hence. Consider the fact that some of the finest books on chemistry, physics, and mathematics are Russian books which are printed and sold out within a few weeks in numbers of 50,000 to 70,000 copies. They cost about a ruble and a half, which isn't very expensive -- even at the lower income level of Soviet life. These books on chemistry and physics are bought to be read, not as a substitute for a bicycle or something else. What the effect of this interest in science will be is

a very important question. I was encouraged to learn during a conversation at dinner last night that Secretary Ellsworth is aware of this. But, what is the case in the U.S.? A good book of this kind is printed in two or three thousand copies and can cost \$48.00. Half of the copies go overseas because English is spoken all over the world. Russian books stay in the Soviet Union. There's a big difference right there. Professor Lucas, with whom I discussed this, absolutely agrees, and you can easily check this. All that you have to do is to find a book printed in the Soviet Union and then look at the back of the title page. It will tell what the book costs and how many copies are being printed. Professor Lucas also said that the scientists do good work. Their reports are embellished with a few words about Marxism at the front and at the back, but in between, there is solid, first-class work. I could give you many illustrations.

Dr. Feshbach: On this question of the scientific/technical revolution which the Soviets have been talking about, I asked Mikulinskiy, the Director of the Institute of History, Natural Science, and Technology about its meaning. His response was somewhat reinforcing. He said that there will be a conjuncture of all this computer analysis, computer application, and new discoveries in science that will enable the Soviets to make a major take-off in the 1980s which will make up for all of their other deficits. Well, maybe so.

Dr. Morgenstern: Yes, there you are; that's the case. I know the Mikulinskiy situation. This is evident in the publications of that Institute; most of the publications are by Russians. Also, there has been a relative decline, if not an absolute decline, in the state of science in the United States, as compared to Western Europe.

AN INFORMAL DISCUSSION OF SOVIET DEMOGRAPHIC TRENDS

by

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INTRODUCTION

I will discuss Soviet demographic trends, both in terms of the slowdown and constraints on economic growth as well as the internal competition for resources (in this case, human resources) between the military sector and the civilian economy. My presentation is based upon a paper which is included in a volume on "Soviet Economy in a New Perspective" to be published in a few weeks by the Joint Economic Committee of Congress and upon a paper which Stephen Rapawy and I have written on this subject.¹⁾

An interest is in the growth of able-bodied persons in the Soviet population. The Soviets define able-bodied persons as males between the ages of 16 and 59 years and females between 16 and 54 years -- this is the official definition. Using this definition, there were approximately 100 million able-bodied persons in the U.S.S.R. in 1950.²⁾ Now, taking this population group by the planned period and extending it to the year 2000, we may observe that some very remarkable changes will take place, particularly in the 1980s. I propose to look at the implications of these changes, to discuss some interesting regional factors which will occur, and then to look into the military aspects of these changes.

GROWTH TRENDS OF PERSONS OF ABLE-BODIED AGES

If you look at the average annual net increments of able-bodied persons added to the Soviet population during the period of the 1959-1966 seven-year plan, the figure was at a low point of around 700,000.³⁾ This figure was so low that it reflects a net decrease in the population of able-bodied persons during the period. In one year, 1961, the Soviets had to draft two cohorts into the military (not only the 19-year-olds) to fill their military quotas. This low figure of 700,000 was improved and roughly doubled to a level of 1,600,000 in the period

1) "Soviet Population and Manpower Trends and Policies," by Murray Feshbach and Stephen Rapawy, Foreign Demographic Analysis Division, Bureau of Economic Analysis, U.S. Department of Commerce, June 1976.

2) See Table 1.

3) See Table 2.

TABLE 1
ESTIMATES AND PROJECTIONS OF THE POPULATION IN THE U.S.S.R.:
1950 TO 2000

(In thousands, as of July 1)

Year	All ages	Able-bodied ages ¹	Year	All ages	Able-bodied ages ¹
1950.....	180,075	103,345	1975.....	254,462	144,406
1951.....	183,191	104,848	1976.....	256,885	147,200
1952.....	186,378	106,708	1977.....	259,352	149,881
1953.....	189,491	109,184	1978.....	261,869	152,229
1954.....	192,710	112,033	1979.....	264,438	154,193
1955.....	196,159	114,658	1980.....	267,057	155,773
1956.....	199,658	116,873	1981.....	269,716	156,932
1957.....	203,170	118,639	1982.....	272,400	157,726
1958.....	206,806	119,574	1983.....	275,089	158,292
1959.....	210,529	119,606	1984.....	277,758	158,770
1960.....	214,329	119,459	1985.....	280,383	159,191
1961.....	218,145	119,622	1986.....	282,941	159,523
1962.....	221,730	120,233	1987.....	285,417	159,935
1963.....	225,063	121,245	1988.....	287,803	160,558
1964.....	228,149	122,586	1989.....	290,100	161,239
1965.....	230,936	124,142	1990.....	292,324	161,902
1966.....	233,533	125,681	1991.....	294,492	162,506
1967.....	235,994	127,183	1992.....	296,613	163,023
1968.....	238,317	128,632	1993.....	298,694	163,613
1969.....	240,552	129,957	1994.....	300,738	164,410
1970.....	242,757	131,685	1995.....	302,746	165,388
1971.....	245,083	134,015	1996.....	304,717	166,485
1972.....	247,459	136,491	1997.....	306,650	167,821
1973.....	249,747	139,021	1998.....	308,543	169,523
1974.....	252,065	141,663	1999.....	310,397	171,443
			2000.....	312,215	173,378

¹ Officially defined as males 16 to 59 years and females 16 to 54 years, inclusive.

Source: Unpublished estimates and projections of the Foreign Demographic Analysis Division prepared in June 1972 for the years 1950-69 and in March 1976 for the remaining years.

TABLE 2

ESTIMATED INCREMENTS TO THE POPULATION IN THE ABLE-BODIED AGES
IN THE U.S.S.R., CENTRAL ASIA AND KAZAKHSTAN,
AND THE TRANSCAUCASUS, BY PLAN PERIOD: 1959 TO 2000

(Based on data as of January 1, in thousands)

Plan period	U.S.S.R.		Central Asia and Kazakhstan		Transcaucasus	
	Total increase	Average annual increase	Total increase	As a percent of national increase	Total increase	As a percent of national increase
1959-65.....	5,173	739	(NA)	(X)	(NA)	(X)
1966-70.....	7,808	1,562	(NA)	(X)	(NA)	(X)
1971-75.....	12,727	2,545	3,085	24.2	1,075	8.4
1976-80.....	10,408	2,082	3,495	33.6	1,148	11.0
1981-85.....	2,687	537	2,823	105.1	701	26.1
1986-90.....	2,830	566	2,338	103.8	531	18.8
1991-95.....	4,020	804	3,565	88.7	628	15.6
1996-2000.....	9,013	1,802	4,999	55.5	1,082	12.0

NA Not available.

X Not applicable.

Source and methodology: Estimates of the Foreign Demographic Analysis Division, March 1974. The projections for the years 1973-2000 were based on the assumptions that fertility will remain constant at the estimated 1972 level, that mortality will decline by an amount equivalent to an increase in life expectancy at birth of approximately 2.5 years, and that net migration will be insignificant.

1966 to 1970 and was virtually tripled to 2,500,000 from 1971 to 1975. Today, the situation looks good and, given the fact that able-bodied persons are over 16 years of age, we can use the life tables and a 1973-1974 data base to estimate the number of persons in the able-bodied age categories to 1990. Hence, it is only beyond 1990 that our figures become projections. During the current period from 1976-1980, a slight slowdown is observed but, beginning in the 1980s, major changes become evident. From 1981-1985, the number of able-bodied persons drops to 537,000 annually and, in the 1986-1990 period, it only improves to 566,000. This is a precipitous drop. The average annual increase of able-bodied persons during the 1980s is less than one-quarter the increase during the 1970s. In the 1990s, this figure improves to the level of 800,000 and then moves to the relatively high level of roughly 1,800,000 by the turn of the century.

The decline of able-bodied persons during the 1980s, however, is a crucial trend. How can this dramatic decline be explained? One explanation is the precipitous drop in birthrate in the European portion of the U.S.S.R. Another factor is the aging of the population due to consequences of World War II.

THE REGIONAL FACTOR

Several facets of this manpower decline in the 1980s have very significant implications, among which is a regional dimension. As I have indicated, the various nationality groups in the U.S.S.R. have different birthrates. As a whole, the country has a birthrate of roughly 16 or 17 children per thousand women.⁴⁾ But, in the Central Asian areas (which are defined as the four Asian republics of Uzbekistan, Turkmenia, Kirgiziya, and Tadzhikistan, plus Kazakhstan), this figure increases to 2½-3 times more than the national average.⁵⁾ During the 1971-1975 period, these Central Asian republics accounted for one-fourth of the U.S.S.R.'s total average annual increase in able-bodied persons.⁶⁾ Presently (i.e., from 1976-1980), they account for one-third of this increment. However, because of these differences in birthrates, Central Asia will contribute 105 percent of this increment by 1981-1985. Moreover, the Central Asian share will continue to be high in the 1986-1990 period when it will contribute 104 percent of the new manpower. However, this figure decreases to 89 percent in the 1991-1995 period and to 56 percent in the 1996-2000 period. Given that the population of the U.S.S.R. is currently composed of 256 million people and that Central Asians presently constitute 10 percent of the population, then the year 2000 will see the rise of Central Asians to the status of being a full 15 percent of the population of the U.S.S.R. Even more important is the fact that, by the year 2000, the whole southern tier of Central Asia, plus the Transcaucasus will provide

4) See Table 3.

5) See Table 4.

6) Op. Cit., See Table 2.

TABLE 3
VITAL RATES FOR THE U.S.S.R.: 1950 TO 2000
(Per 1,000 population)

Year	Births	Deaths	Natural increase
1950.....	26.7	9.7	17.0
1960.....	24.9	7.1	17.8
1970.....	17.4	8.2	9.2
1980.....	19.2	9.3	9.9
1990.....	17.3	9.8	7.5
2000.....	16.0	10.2	5.8

Source: TsSU SSSR, Naseleniye SSSR (chislennost', sostav i dyzheniye naseleniya) 1973; statisticheskoy sbornik, Moscow, Statistika, 1975, p. 69 for 1950-70, and estimates and projections of the Foreign Demographic Analysis Division, prepared in March 1976, for the remaining years.

one-third of the potential cohorts entering the military services. This is extremely important because these people are not Russian-speaking, not urbanized, and not industrialized -- which creates problems in terms of managing the state-of-the-art technology in the civilian economy as well as in the military sector.

Question from the floor: Does it make any difference whether or not you consider the Russian ethnics who just reside in those areas?

Dr. Feshbach: Not in terms of birthrate. They tend to be somewhere in between the birthrates "back home and in the imperium."

Question from the floor: Are these "displaced" Russians a very large group?

Dr. Feshbach: In Kazakhstan, the Kazakhs are a minority in their own republic. When you look at the share of the nationality groups in the rural populations, the 58.7 percent in Azerbaydzhan and 73.7 percent in Kazakhstan have not changed significantly at all.⁷⁾ Instead, other nationalities imported into the urban populations have accounted for the increases.

⁷⁾ See Table 5 (which are 1970 figures).

TABLE 4
 VITAL STATISTICS FOR THE U.S.S.R. BY REPUBLIC: 1950 TO 2000
 (per 1,000 population)

Republic	1953			1960			1970			1980			1990			2000		
	Births	Deaths	Natural Increase	Births	Deaths	Natural Increase	Births	Deaths	Natural Increase	Births	Deaths	Natural Increase	Births	Deaths	Natural Increase	Births	Deaths	Natural Increase
U.S.S.R.	26.7	9.7	17.0	24.9	7.1	17.8	17.6	8.2	9.2	19.2	9.3	9.9	17.3	9.8	7.5	16.0	10.2	5.8
Baltic republics	20.5	12.6	7.7	19.3	9.1	10.2	16.2	10.1	6.1	15.7	11.0	4.7	14.5	11.2	3.6	13.5	11.8	1.7
Estonia	18.4	14.4	4.0	16.6	10.5	6.1	15.8	11.1	4.7	15.0	10.9	4.1	14.0	10.9	3.1	13.1	11.6	1.5
Lithuania	17.0	12.4	4.6	16.7	10.0	6.7	16.5	11.2	5.3	14.7	10.7	4.0	13.7	10.7	3.0	13.0	12.3	0.7
Latvia	23.6	12.0	11.6	22.5	7.8	14.7	17.6	8.9	8.7	16.7	10.2	6.5	13.7	11.3	2.6	12.4	12.3	0.1
R.S.F.S.R.	26.9	10.2	16.8	23.2	7.4	15.8	16.6	8.7	5.9	16.7	10.2	6.5	13.7	11.3	2.6	12.4	12.3	0.1
Belorussia	25.5	8.0	17.5	24.6	6.6	17.8	16.2	7.6	8.6	18.2	8.7	9.5	16.1	11.3	4.9	14.0	10.1	4.0
Ukraine	27.8	8.5	19.3	20.5	6.9	13.6	15.2	8.9	6.3	16.0	10.3	5.6	13.8	11.2	2.6	12.8	12.0	0.8
Moldavia	28.9	11.2	17.7	29.3	6.4	22.9	19.4	7.4	12.0	22.1	8.3	13.9	18.2	8.7	10.5	17.5	9.2	8.3
Transcaucasian republics	27.9	8.5	19.4	26.6	6.6	20.0	23.9	6.6	17.6	25.8	6.9	18.1	24.3	6.8	17.6	21.1	6.8	14.2
Georgia	23.5	7.6	15.9	24.7	6.5	18.2	19.2	7.3	11.9	18.7	6.9	11.8	18.2	6.8	11.4	19.1	6.8	12.3
Armenia	32.1	4.2	27.9	40.1	6.8	33.3	22.1	5.1	17.0	18.1	6.9	11.1	17.0	6.1	10.9	18.1	6.8	11.3
Azerbaijan	21.2	9.8	11.4	42.8	6.7	35.9	29.2	8.7	22.9	18.1	6.9	11.2	18.1	6.1	12.0	18.1	6.8	11.3
Kazakhstan	37.6	11.7	25.9	37.2	6.6	30.6	23.4	6.0	17.4	26.0	6.7	19.3	24.4	6.8	17.6	21.7	7.0	14.7
Central Asia	31.7	8.9	23.0	36.6	6.0	32.6	31.3	6.0	27.3	26.5	6.2	20.3	26.8	5.5	21.3	24.0	5.0	29.1
Uzbekistan	30.8	9.7	21.1	39.8	6.0	33.8	31.6	5.5	28.1	26.0	6.2	20.3	26.8	5.5	21.3	24.0	5.0	29.1
Turkmenia	38.2	10.2	28.0	42.4	6.5	35.9	35.2	6.6	28.6	26.0	6.2	20.3	26.8	5.5	21.3	24.0	5.0	29.1
Tajikistan	15.4	8.5	23.9	36.9	6.1	30.8	30.5	7.4	23.1	26.5	6.6	19.3	26.8	5.5	21.3	24.0	5.0	29.1
Tadzhikistan	20.4	9.2	22.2	31.5	5.1	28.4	34.8	6.4	28.4	26.5	6.6	19.3	26.8	5.5	21.3	24.0	5.0	29.1

NA Not available.

Source: 1950-1970: Data for individual republics were obtained from *Trudy SSSR, Demograficheskii sbornik i statisticheskie sborniki*, Moscow, Statistika, 1975, pp. 64-65. Figures for regions were derived from statistics reported in *Trudy SSSR, Demograficheskii sbornik i statisticheskie sborniki*, Moscow, Statistika, 1971, pp. 16-11 and 64-65, and population data reported by republics in *Trudy SSSR, Demograficheskii sbornik i statisticheskie sborniki*, Moscow, Statistika, 1979, pp. 10-11. 1980-2000: Foreign Demographic Analysis Division's estimates and projections: U.S.S.R., March 1976; others June 1976.

TABLE 5. RURAL POPULATION AS A PERCENT OF TOTAL POPULATION
AND TOTAL NATIONALITY, BY REPUBLIC AND BY NATIONALITY: 1959 AND 1970

Republic	Total republic population		Nationality population		Nationality within titular republic		Nationality
	1959	1970	1959	1970	1959	1970	
	(1)	(2)	(3)	(4)	(5)	(6)	
U.S.S.R.....	52.1	43.7	52.1	43.7	(X)	(X)	
Baltic republics.....	51.7	42.6	58.7	49.9	59.7	50.8	Baltic nationalities
Estonia.....	43.5	35.0	52.9	44.9	53.1	45.3	Estonians
Latvia.....	43.9	37.5	52.5	47.3	53.3	48.3	Latvians
Lithuania.....	61.4	49.8	64.9	53.3	66.4	54.1	Lithuanians
R.S.F.S.R.....	47.6	37.7	42.3	32.0	45.1	34.4	Russians
Belorussia.....	69.2	56.6	67.6	56.3	74.5	62.9	Belorussians
Ukraine.....	54.3	45.3	60.8	51.5	63.4	54.2	Ukrainians
Moldavia.....	77.7	68.3	87.1	79.6	90.4	82.8	Moldavians
Transcaucasian republics...	54.1	48.9	57.6	51.1	60.5	53.0	Transcaucasians
Georgia.....	57.6	52.2	63.9	56.0	65.1	57.2	Georgians
Armenia.....	50.0	40.5	43.4	35.2	47.8	37.3	Armenians
Azerbaijdzhan.....	52.2	49.9	65.2	60.3	63.7	58.7	Azerbaijdzhanis
Kazakhstan.....	56.2	49.7	75.9	73.3	75.7	73.7	Kazakhs
Central Asia.....	55.1	61.9	79.1	75.3	80.2	76.5	Central Asians
Uzbekistan.....	66.4	63.4	78.2	75.1	79.8	77.0	Uzbeks
Turkmenia.....	53.8	52.1	74.6	69.0	73.7	68.3	Turkmen
Kirgiziya.....	66.3	62.6	89.2	85.4	89.0	85.5	Kirgis
Tadzhikistan.....	67.4	62.9	79.4	74.0	80.4	74.5	Tadzhiks

X Not applicable.

Source:
 Column 1 and 2: TsSU SSSR, Narodnoye khozyaystvo SSSR v 1974 godu: statisticheskiy veshegodnik, Moscow, Statistika, 1975, pp. 9-11.
 Column 3: TsSU SSSR, Itogi Vnesoyuznykh perepisi naseleniya 1959 goda SSSR (svodnyy tom), Moscow, Statistika, 1962, pp. 184 and 196.
 Column 4: TsSU SSSR, Itogi Vnesoyuznykh perepisi naseleniya 1970 goda: nacional'nyy sostav naseleniya SSSR, soyuznykh i avtonomnykh respublik, kraev, oblastey i nacional'nykh okrugov, Vol. IV, Moscow, Statistika, 1973, pp. 20 and 35.
 Column 5: Table 53 in the corresponding census volume for each republic of the 1959 census.
 Column 6: TsSU SSSR, Itogi, Vol. IV, 1973, pp. 43, 55, 152, 164, 191, 195, 202, 208, 233, 229, 253, 256, 263, 267, 273, 275, 276, 278, 280, 283, 284, 288, 295, 297, 303, 305, 306, 309, 317, and 319.

The Transcaucasus consists of three republics: Georgia, Armenia and Azerhaydzhan. During this period, the population of these republics represent roughly another 15 percent add-on to the foregoing figures. Therefore, there is a net decrease in the population of the rest of the country with respect to the size of the population of able-bodied persons. Again, this is a very crucial fact, because all other sources of the labor supply have literally "dried up." According to Soviet figures, by 1971-1975, natural growth will represent 92 percent of the new increments to the labor force -- the balance reflects primarily the release of labor from collective farms.⁸⁾ Therefore, the U.S.S.R. is totally dependent on the natural growth of its population. There is very little importation of foreign labor.

THE CIVILIAN/MILITARY COMPETITION FOR LABOR:

A CRISIS IN 1983

In order to examine the competition for labor, it was necessary to study military manpower requirements. In this context, I've constructed a hypothetical model, which is reflected in the Joint Economic Committee paper. If you take the changing size of cohorts of males of military draft age (18 years old) in 1975, this group is represented by a figure of around 2,500,000.⁹⁾ By 1987, this figure drops to a low of around 2 million. However, simultaneously, there is a growth in the full-time education of those at higher levels (beyond general secondary, from 18 years of age and older). This group expands to around 500,000 at about the midpoint in this period as a drawdown from the males available for military service. This pool is further reduced by only a very small number of deaths. Emigration is virtually negligible, so it can be disregarded. In addition, however, there are some deferments (some of which are permanent and some of which are only temporary) for which the model makes some adjustments. All of this is summarized in Table 7 which follows:

TABLE 7. PERSONS OF ABLE-BODIED AGES AVAILABLE FOR MILITARY SERVICE (All data refer to 1975)

Size of the 18 year-old cohort (able-bodied agents)	2,500,000
Educational Deferments	-500,000
Non-Educational Deferments	-250,000
Temporary Deferments and Expired Exemptions	+200,000
18 year-olds available for military service	1,950,000

8) "Labor Constraints in the Five Year Plan," Soviet Economic Prospects for the Seventies, Murray Feshbach and Stephen Rapawy, June 27, 1973, p. 12.

9) See Table 6.

TABLE 6

HYPOTHETICAL MODEL OF THE POTENTIAL SUPPLY OF 18 YEAR OLD MALES
FOR THE MILITARY AND FOR THE ECONOMY: 1975 TO 1990
(In thousands)

Year	Males, 18 years of age as of July 1	Minus, educational deferment, full-time studies in:			Minus, male deaths	Minus, males with exemptions and deferments for non-educational reasons	Net number of males 18 years of age available for the draft and for the economy	Net number of males as percent of male cohort
		Higher education	Specialized secondary education	Vocational-technical education				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1975..	2,493	230	167	98	4	249	1,745	70.0
1976..	2,558	231	167	104	4	256	1,796	70.2
1977..	2,603	233	167	109	4	260	1,831	70.3
1978..	2,646	234	167	114	4	265	1,862	70.4
1979..	2,637	235	167	119	4	264	1,848	70.1
1980..	2,542	237	167	124	4	254	1,756	69.1
1981..	2,432	238	167	124	4	243	1,656	68.1
1982..	2,308	239	167	124	4	231	1,543	66.9
1983..	2,173	241	167	124	3	217	1,421	65.4
1984..	2,106	242	167	124	3	211	1,359	64.5
1985..	2,062	243	167	124	3	206	1,319	64.0
1986..	2,020	245	167	124	3	202	1,279	63.3
1987..	2,012	246	167	124	3	201	1,271	63.2
1988..	2,034	247	167	124	3	203	1,290	63.4
1989..	2,097	249	167	124	3	210	1,344	64.1
1990..	2,142	250	167	124	-	214	1,384	64.6

	Plus, males whose exemptions and deferments have expired	Total available for draft	Minus, conscripts	Conscripts as percent of:		Net number of 18 year olds available for economy
				Cohort	Net number available	
	(9)	(10)	(11)	(12)	(13)	(14)
1975..	204	1,991	1,688	67.7	64.5	263
1976..	217	2,013	1,688	66.0	63.9	223
1977..	220	2,051	1,688	64.8	62.3	263
1978..	225	2,087	1,688	63.8	60.9	399
1979..	232	2,080	1,688	64.8	61.2	392
1980..	234	1,990	1,688	66.4	64.6	302
1981..	237	1,893	1,688	69.4	69.2	205
1982..	237	1,780	1,688	73.1	64.6	92
1983..	233	1,654	1,688	77.7	102.1	-34
1984..	229	1,588	1,688	80.2	104.3	-100
1985..	222	1,541	1,688	81.9	108.5	-147
1986..	217	1,494	1,688	83.6	112.6	-192
1987..	213	1,484	1,688	83.4	113.7	-204
1988..	212	1,502	1,688	83.0	112.4	-186
1989..	210	1,534	1,688	80.5	108.6	-134
1990..	211	1,595	1,688	78.6	105.8	-97

Source and methodology:

- Column 1: Unpublished estimates and projections of the Foreign Demographic Analysis Division prepared in March 1974.
- Column 2: Based on the following information and relationships: There were 365,600 admissions (of both sexes) at the beginning of the 1974/75 school year (TSRU SSSR, *Narodnaya khozvaystva SSSR v 1974 godu, statisticheskii voprosnik*, Moscow, Statistika, 1975, p. 693). Females comprised 30 percent of all students enrolled in all divisions (TSRU SSSR, *Zhannochiny v SSSR, statisticheskii voprosnik*, Moscow, Statistika, 1975, p. 69), and therefore, there were 262,800 males admitted. Despite a general decline in the male cohorts throughout most of the period, it was assumed that there would be some growth in admissions to full-time studies up to 1990. Thus, the number of males admitted directly from general secondary schools is arbitrarily assumed to increase up to 250,000; this number probably is minimal. A straight-line interpolation was used for the intermediate years. The total number of graduates from all divisions of general secondary schools in 1967 and 1970 were 2,355,000 and 2,591,000, respectively (TSRU SSSR, *Narodnaya khozvaystva, umba i kul'tura v SSSR, statisticheskii voprosnik*, Moscow, Statistika, 1971, p. 102). According to Zhil'tsov (Ye. Zhil'tsov, "Ml' srednikh uchebnykh zavodov i povysheni ubshchubrasovatel'nogo i professional'nogo umeniya naseleniya" in D. I. Valentyev et al. [Eds.], *Obrazovatel'naya i kultural'no-professional'naya struktura naseleniya SSSR*, "seriya narodonaseleniya," Moscow, Statistika, 1975, p. 81), 14.7 and 13.2 percent of the 1967 and 1970, respectively, of general secondary school graduates went directly to full-time studies in higher educational institutions. For 1967, the resulting number of students (346,200) represents 78.7 percent of all admissions to the day division and for 1970, 79.2 percent. Thus, 79 percent was used to apply to admissions of males to full-time day studies in higher educational institutions.
- Columns 3 and 4: Similar procedures and sources as in column 2, with admissions to specialized secondary schools kept constant throughout the period, and those to vocational-technical schools growing until 1980 and kept constant thereafter.
- Column 5: Unpublished estimates and projections of the Foreign Demographic Analysis Division.
- Column 6: Estimated as 10 percent of the cohort in the given year.
- Column 7: Column 1 minus the sum of columns 2-6.
- Column 8: Column 7 divided by column 1.
- Column 9: Includes 45 percent of male entries to *VIUZ* 4 years earlier. This is based on 30 percent for higher education school graduates who have to serve only 1 year rather than 2 for all others on the average, minus 3 percent to allow for ROTC graduates who are not drafted subsequently. In addition, 2 percentage points are added to the 45 percent to allow for death of invalid parents as well as other reasons changing deferment status. Arbitrarily taken as 3 percent of cohort 3 years earlier.
- Column 10: Column 7 plus column 9.
- Column 11: See text, at 75 percent of 4.5 million military with 2 years average service, 1,687,300 per year rounded to 1,688,000.
- Column 12: Column 11 divided by column 1.
- Column 13: Column 11 divided by column 10.
- Column 14: Column 10 minus column 11.

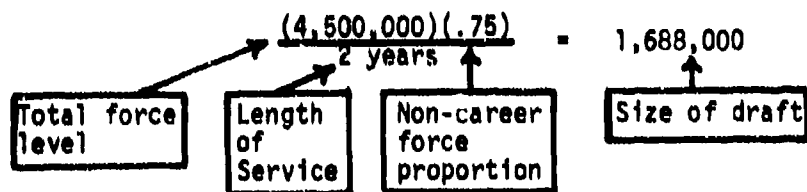
A figure of 1,950,000 therefore emerges as the size of the 18-year-old cohort available for the draft.

Given this pool of eligible 18-year-olds, the next issue is to determine the size of the Soviet manpower pool needed annually to maintain the current level of Soviet Armed Forces. Let's assume that 4.5 million is the total number of men currently in the Soviet Armed Forces. According to some people, this figure is higher and may approach 5.2 million. Of course, the higher the force level, the more difficulty the Soviets will have in maintaining it and a larger draft will be required. However, 4.5 million is a good estimate; it gives the Soviets the benefit of the doubt.

Next, we need a ratio of career force personnel to draftees (non-career force personnel). From information available to me, using a career force proportion of 25 percent is a reasonable estimate; hence, the non-career proportion would be 75 percent. These, then, are the categories which the draft must satisfy.

The last component in the equation is the length of military service of draftees. Two years, I believe, is a good average figure, because most Soviet personnel are drafted for two years of service. Sailors and members of certain small forces must serve three years, but these personnel are balanced by graduates of higher education who are drafted to serve only one year. Two years, then, is a reasonable average.

When all the factors are put together and the arithmetic is performed, we emerge with a figure of 1,688,000 men representing the size of the force needed to be drafted in order to maintain the present level of the Soviet Armed Forces.



If we accept this output of the model to be reasonable and true (which I believe it is), then, in 1983, the Soviets will face a severe manpower crisis. They cannot fill both their military manpower needs while continuing to introduce a reasonable number of people into the labor force in consonance current patterns.

Dr. Arrow: You don't have to draft young men into the military service in the same proportion a particular age cohort represents in terms of the population as a whole, do you?

Dr. Feshbach: We have a situation wherein one-third of the new increments to the labor force are coming from Central Asia, Kazakhstan, and Transcaucasus during the years 1976-1980. Moreover, these men have a lesser tendency to go on to full-time higher education than do Russians or others. They are available. Yet, because of their relatively low level of skills and education, these non-Russians tend to be put into labor-type battalions and not into the elite forces. The question is therefore where will the elite forces come from? This is where the Soviet military manpower crisis will manifest itself most seriously.

To ameliorate the manpower shortage, the Soviets are trying to bring pensioners back into the labor force. However, because of aging, more people will be retiring in the future than now. In the 1950s, the male population over 59 years and females over 54 years represented 10 percent of the total population. By the year 2000, according to projections, this figure will be 19.4 percent¹⁰⁾ -- so, it's doubling. Obviously, more people could work longer but, according to Soviet estimates, this is a very small potential group in the future.

Question from the floor: In your judgment, what is the possibility of transferring labor from agriculture to the military?

Dr. Feshbach: Very small. Despite the fact that agriculture is the occupation of over a quarter of their total civilian labor force (while ours is only about 4 percent), these workers are mostly old, unskilled and female. The Soviets claim a 3,500,000 reduction of collective farm persons over the next 10 years through mechanization.¹¹⁾ The net decrease in the number of state and private farm personnel is one tenth that figure. Hence, they are having a terrible time raising their own agricultural labor productivity.

This concludes my informal discussion on Soviet demographic trends.

10) See Table 8.

11) See Table 9.

TABLE 8
PERCENT DISTRIBUTION OF THE POPULATION BY AGE GROUP IN THE
U.S.S.R.: 1950 TO 2000
 (Based on the population as of July 1. Figures may not add to 100.0
 percent due to rounding)

Age group	1950	1960	1970	1980	1990	2000
0 to 15 years.....	32.2	31.6	30.7	26.1	27.0	25.2
16 to 59/54 years.....	57.4	58.7	54.2	58.3	55.4	55.5
60/55 years and over.....	10.4	12.4	15.1	15.5	17.6	19.2

Source and methodology: Estimates and projections of the Foreign Demographic Analysis Division, prepared in March 1976, which were based on the age-sex distributions from the 1959 and 1970 censuses and official figures for total population, births, and deaths for the years 1950-74. The projections for the years 1975-2000 were based on the assumptions that fertility will decline by 7 percent between 1975 and the year 2000, that mortality will decline by an amount equivalent to an increase in life expectancy at birth of approximately 2.5 years, and that net migration will be insignificant. Three different projections are used throughout the paper. The first, prepared in March of 1974 for the U.S.S.R. as a whole is usually juxtaposed with the regional projections prepared in June of the same year. In March of 1976, new estimates and projections were prepared for the U.S.S.R. as a whole. It is anticipated that new regional projections will be developed later this year. The March 1976 projection gives a population total for 1990 that is smaller by 2,500,000, or less than 1 percent, than the previously projected total. By the year 2000, the new total is 5,500,000, or 1.8 percent, less than the figure previously projected.

TABLE 9
ESTIMATES AND PROJECTIONS OF THE LABOR FORCE IN THE U.S.S.R.:
1950 TO 1990
(In thousands, as of July 1)

Year	Civilian labor force									
	Total	Males	Females	Armed forces	Total	Monagri-cultural sectors	Agricultural sectors			Private
							Total	State	Collective farms	
1950	97,643	(NA)	(NA)	4,600	93,041	42,796	50,245	4,261	36,079	3,912
1955	104,937	(NA)	(NA)	5,800	99,137	49,753	49,384	6,865	32,411	11,108
1959	109,264	52,722	56,542	3,900	105,364	57,786	47,584	6,359	31,723	9,502
1960	110,132	53,215	56,917	3,973	106,159	60,723	45,436	7,764	28,853	8,819
1965	116,494	56,420	60,074	3,360	113,114	73,077	40,037	10,091	21,343	8,693
1970	125,612	61,283	64,329	3,535	122,077	84,577	37,500	10,594	19,669	7,237
1971	127,672	62,515	65,157	3,675	123,997	87,028	36,969	10,700	19,248	7,021
1972	129,722	63,736	65,986	3,675	126,047	89,609	36,438	10,907	18,826	6,805
1973	131,610	64,876	66,734	3,725	127,885	91,977	35,905	10,913	18,406	6,589
1974	133,600	66,065	67,535	3,835	129,765	94,388	35,377	11,019	17,985	6,373
1975	135,767	67,350	68,417	4,005	131,762	96,916	34,846	11,125	17,563	6,158
1976	137,987	68,670	69,317	4,005	133,982	99,666	34,316	11,232	17,142	5,942
1977	140,140	69,956	70,184	4,005	136,135	102,350	33,785	11,338	16,721	5,726
1978	142,214	71,241	70,973	4,005	138,209	104,955	33,254	11,444	16,300	5,510
1979	144,261	72,473	71,728	4,005	140,196	107,473	32,723	11,550	15,879	5,294
1980	146,068	73,648	72,420	4,005	142,063	109,870	32,193	11,657	15,456	5,078
1981	147,753	74,726	73,027	4,005	143,748	112,086	31,662	11,763	15,037	4,862
1982	149,215	75,681	73,534	4,005	145,210	114,079	31,131	11,869	14,616	4,646
1983	150,521	76,534	73,987	4,005	146,516	115,916	30,600	11,975	14,195	4,430
1984	151,672	77,294	74,378	4,005	147,667	117,597	30,070	12,082	13,774	4,214
1985	152,647	77,960	74,687	4,005	148,642	119,103	29,539	12,188	13,352	3,999
1986	153,466	78,526	74,940	4,005	149,461	120,453	29,008	12,294	12,931	3,783
1987	154,207	79,036	75,171	4,005	150,202	121,725	28,477	12,400	12,510	3,567
1988	154,950	79,505	75,445	4,005	150,945	122,998	27,947	12,507	12,089	3,351
1989	155,734	79,987	75,737	4,005	151,729	124,313	27,416	12,613	11,668	3,135
1990	156,555	80,503	76,052	4,005	152,550	125,665	26,885	12,719	11,247	2,919

NA Not available.

Source: Stephen Rappley, Estimates and Projections of the Labor Force and Civilian Employment in the U.S.S.R.: 1950 to 1990, U.S. Department of Commerce, Bureau of Economic Analysis, 1976 (forthcoming), Variant I.

THE AFTERNOON SESSION, SEPTEMBER 15, 1976

TABLE OF CONTENTS

	<u>Page</u>
<u>Bureaucratic Processes and Economic Warfare</u> by Dr. Graham Allison	I-1
<u>Formal Comments on the Presentation</u> <u>of Professor Allison</u> by Mr. Andrew Marshall	I-15
<u>Formal Comments on the Presentation</u> <u>of Professor Allison</u> by Dr. Davis Bobrow	I-18
<u>Concluding Observations</u> by Dr. Kenneth Arrow	I-24

BUREAUCRATIC PROCESSES AND ECONOMIC WARFARE

by

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INTRODUCTION

In sitting through the first couple of days of this Workshop, I've been fascinated with the details, but dismayed by the diffuseness of the discussion and confused, not to say dumbfounded, by the subject. I was speaking with my wife on the phone last night. She asked what I had been learning. I replied that nothing comes to mind more strongly than a remark made by Alfred North Whitehead while he was chairing a meeting at Cambridge. Bertrand Russell had been invited to the meeting to give a lecture and he announced that he was going to give his lecture on the subject of "The Cosmos." The cosmos was a subject about which Whitehead thought that nothing was known and, in particular, about which he thought that Russell knew nothing. Russell gave his lecture -- which was amazing, fascinating in detail, somewhat dismaying in its diffuseness, and dumbfounding to the audience -- and then stopped. There were no comments, so Whitehead proceeded to close the meeting with the remark, "We're all most grateful to Lord Russell for the unequalled skill with which he has left the fundamental darkness of the subject unobscured." What my purpose might be today is to try to somewhat obscure the brilliant displays of the fundamental darkness of the subject of economic conflict and national security.

ECONOMIC CONFLICT AND U.S. NATIONAL SECURITY: A FRAMEWORK

I took as my text today a couple of quotes, some heavy German language from Helmut Schmidt and some more direct and expressive language from former President Nixon:

"Economic policies today are strategic decisions, and economic decisions today have almost the same political impact on the history of the world as former decisions on SALT or NATO had."

Helmut Schmidt, Chancellor of the
Federal Republic of Germany (1976)

"(Expletive deleted) the lira."
Richard Nixon (1972)

A Case Study: The OPEC Embargo

Let me start with an example which has substantially motivated the current fashion of interest in economic warfare or economic conflict. It's an example that's been mentioned several times during this Workshop, but one which I think we generally tended to shy away from analyzing in much detail because the track record of forecasts and predictions about the OPEC embargo is not very good. Yet, it is one in which many of our methods have a very good track record. Therefore, it's probably worth our going back over this a little more carefully.

I'll sketch some of the facts of the situation. The embargo was not an unheard-of event. Indeed, at the outset of the Nixon Administration, a Cabinet-level Task Force was established on oil import control, and a study was conducted by this Task Force under the Chairmanship of Secretary of Labor Shultz. The Task Force included the other major Secretaries of Departments and much of the staff work was done by Phil Areta and others.

In February of 1970, the Task Force made its report to the President. One of its findings was that, despite its national security rationale, the present import control system was not adequately responsive to present and future security considerations. The report stressed the need for increasing oil imports to meet U.S. security needs and recommended a gradual abandonment of the existing quota system and its replacement with a tariff system designed to discriminate against insecure sources of oil. In reaching its conclusions, the study explicitly considered a number of oil embargo scenarios for the years 1975 to 1980 -- each of varying duration and a varying number of participating countries. The report asserted that an embargo was unlikely, but warned that the risk "may nevertheless be real enough to warrant expenditures to guard against it." Nonetheless, the report concluded that if appropriate emergency measures were taken, the U.S. should be able to cope with embargoes rather comfortably.

The optimistic undertone of that report (if you read it today) stemmed from a number of sources. In 1969, the market was glutted with oil. OPEC had demonstrated little cohesiveness, and the number of oil-exporting countries was estimated to be growing at the time. The optimism expressed in the report was also based on faulty projections of supply and demand. It turned out that demand was seriously underestimated by the report, and that U.S. production and the availability of Canadian and Latin American oil were all overestimated. To its credit, the report did recognize that there was some uncertainty about the forecast and proposed that future import controls "be the subject of an annual report and adjusted periodically if import volumes or domestic production significantly exceed or fall short of predictions and/or if the security of imported supplies either worsens or perceptibly improves."

As you probably recall, the report stimulated rather vigorous opposition from the domestic oil industry and, as a result, was largely shelved. Oil continued to receive intermittent attention by the U.S. Government. There was an Inter-Agency Oil Policy Committee established in 1970 under the aegis of the Office of Emergency Preparedness that turned out to be wholly ineffective. There was an Energy Office in the Treasury Department, an Oil Import Policy Group in the Interior Department's Office of Oil and Gas and, finally, in early 1973, the Energy Policy Office was created as part of the White House staff. None of these agencies had much weight; none took a very serious or hard look at the problem; all viewed the issue primarily through domestic lenses; and the foreign policy aspects of the problem went largely unattended.

Meanwhile, the assumptions upon which the Shultz report was based were being steadily undermined. U.S. demand soared; U.S. production declined; Canada and Venezuela imposed some export reductions; U.S. imports from other sources grew (in particular, Arab sources); and there were a series of world hikes in the price of oil which demonstrated the possibility of effective cartel action. By 1971, King Faisal of Saudi Arabia was telling all high-level visitors to Saudi Arabia that, at some point in time, he was going to have to use his "oil weapon," unless U.S. policy in the Middle East became more even-handed. Some investment bankers in New York began advising their clients accordingly. Expert opinion was divided. Indeed, many of you will remember Professor Adelman's article demonstrating why an effective OPEC embargo was impossible. But, there were people who thought that there was some substantial chance that it could happen. At any rate, it was the kind of contingency against which the U.S. should hedge, but the U.S. became steadily more vulnerable and, in 1973, the oil embargo occurred. The rest of the story has become history. Most of us are familiar with the effects of oil prices on inflation, on the transfer of real resources to the OPEC countries, and on the Fourth World.

If one looks at the Shultz report of 1969 which, in retrospect, is not a bad report, the place where one naturally faults the activities of the U.S. Government is the inaction during the period between 1969 and 1973 and, in particular, the inaction in monitoring variables which the Shultz report clearly identified. Projections were not watched, and the likelihood of a threat and concrete actions that could be taken to deal with it were not seriously considered.

I think that it is fitting, particularly in a Workshop sponsored by ONR (which has a rather direct relationship with the Navy) to note that not all the elements of the U.S. Government were, in this instance, "caught with their pants down." There are organizations which routinely do identify contingencies -- some of them incredibly farfetched, as we have heard at this Workshop -- and spend large amounts of money guarding against them, regardless of whether or not they are low probability and high disutility events. These organizations are, in particular, the Military Services. The Navy's

four major oil reserves can clearly meet the Navy's oil needs for over 300 years. So, it was not impossible to think of taking actions that could have had some effect on the probability of the embargo or would have some effect on the costs of the embargo if it occurred.

As a concrete instance of economic conflict and national security, the oil example is valuable in leading us to consider whether or not research could improve our ability to cope with issues of this kind and whether or not research could improve the quality of the forecasts or improve the ability of the U.S. Government to take actions to deal with identified contingencies on the basis of some estimate of their probabilities. Basically, I am urging those of us who favor certain methods of correcting these problems to consider how we could improve forecasts about future contingencies or could improve the capability of the U.S. Government to act on the basis of the forecasts that are available. Indeed, as a very crude exercise, I could pass around a sheet of paper and take bets on what the price of oil will be in real terms a year from today; five years from today; and ten years from today. The pivotal questions that each one of us would have to consider include:

- What would you want to know in order to place your bet, if your bet were to cost you something and not be simply for fun?
- What is there in the way of information, by way of method, and by way of technical capability that you would want to know to place a bet about an issue such as this?

Alternatively, if the U.S. Government were to create (as a number of people have called for, including Adelman) a monthly auction of entitlements for the oil that will be imported into the U.S., the Government would want to know the effect of such a program on the price of oil, on the supply of oil (again country by country), and on other U.S. interests. If you were charged with making these estimates, what would you require in the way of data and in the way of methods? Is there any reason to believe that research would likely improve estimates on an issue like that? If the answer is "no", then the rationale for research is limited, as generally I believe it is. So much for the oil example. Let me suggest, though, that it is not a bad issue for us to come back to as we consider concrete proposals for improvements in methodology.

A Reminder

I have been somewhat struck that, in focusing on economic warfare -- and particularly on the bizarre, incredible, and abstruse aspects of economic warfare -- we have been generally assuming a backdrop of a larger framework for thinking about issues of economics, economic competition, and economic conflict. But, nowhere in our discussion have we ventured to analyze this general framework and how the particular activities in which we're interested relate to it.

If Clausewitz was right in his proposition that war is a continuation of politics by other means, economic warfare, by implication, is a continuation of economic relations by other means. Economic relations among countries involve competition which has both conflictual and cooperative elements. This subject is the whole focus of a branch of economics. No one here represents this branch of economics, and I am not going to propose myself as a representative of it. Nevertheless, we should recall that there is a branch of international economics dealing with the issues of economic relations and even with the subsets of the more conflictual aspects of economic relations among states. That discipline does provide something of a backdrop for the subject which we are talking about here, and it ought to be better recognized.

Some Conclusions

I think that if one takes the even larger subject of international relations (war and the prevention of war aside), economics is what most international relations are about. Moreover, foreign economic policy encompasses the most substantial, sustained, and difficult relations that most nations have with each other. In particular, the current, growing internationalization of the economies of the advanced industrial nations make economic issues crucial to interstate relations and to the achievement of basic intrastate economic objectives. Examples like the subsidized sale of U.S. wheat to the Soviets in 1972 and its effects on American bread prices, the OPEC manipulation of oil prices in 1973 and its effects on U.S. inflation, and the devaluation of the dollar and its impact on inflation are all pertinent. For the foreseeable future, the U.S. is joined to a world economy of production, trade, and money. This interdependence brings certain advantages and certain disadvantages. On the advantage side of the ledger, one gains a more stable international political order and a higher standard of living than would otherwise be possible. However, as disadvantages, this interdependence makes U.S. prices, wages, and jobs sensitive to events abroad, and it makes other nations even more highly sensitive to the U.S. rate of inflation, our character of production, and whether we happen to be inflating, reflating, or deflating. What this means is that an array of traditional issues in international economics are becoming a more important aspect of the whole character of the American foreign policy, international relations, and national security calculations. Therefore, interactions between the U.S. and other economies present a major source of threats to American security and well-being and present a major set of opportunities for the U.S. in achieving its objectives in international relations. President Eisenhower frequently pointed out a fact that is worth remembering. He said that the foundation of national security is a healthy economy and that, where we have stakes in the security and well-being of other countries, activities that may bankrupt Italy or the U.K. pose, in many instances, as great a threat as military actions for which we may be spending great amounts of money to protect ourselves against. Thinking of an array of dangers is very important. It is also important to remember that international economics and international politics are inextricable elements in a larger maze. The architects of our post-World War II international economic policies have been

influenced principally by what are taken to be the lessons of the thirties which, I think, have largely been correct guidelines for policy. The main lessons of the thirties were that the institutions, procedures, and habits which govern behavior in international economics carry profound political implications and that, if international economic arrangements fail to meet the minimum requirements of important participants, international political stability cannot be maintained for a very long period of time. Hence, in thinking about U.S. foreign policy and the actions that the U.S. takes with respect to our broadly defined national security (that is, the security and well-being of Americans and the people and countries to whom we have commitments), it is important to consider that, in the array of activities of international economics, events can occur and actions can be taken by foreign governments which can pose major threats to U.S. interests or provide the U.S. with major opportunities. To focus, then, on economic conflict and its relations to national security seems to be to be exactly the kind of thing that our Government has not done well and that it ought to do better. This recognition should have very important implications for people who define their "sector of the front" as national security, but mainly in a more traditional, military manner.

Some Suggestions for Research

Some suggestions that I will offer have already been mentioned in our discussions. First, we need a much clearer definition of the domain of economic conflict in national security and, in particular, a definition of economic conflict in national security that begins, not I think from lists of the bizarre, but from a careful examination of the branch of economics called international economics. In addition, this framework for thinking about issues of economic conflict needs to attend, more than international economics has in the past, to the relationships between economics and politics, between economics and the prevailing rules of international order (what Dr. Kissinger would call the structure of peace), and between economics and military power.

Hence, my first conclusion with regard to research is that this is an area where there is a lot of conceptual geography to be done and the conceptual geography ought to begin with the fairly well-developed discipline of international economics. Moreover, the research ought to proceed in the direction of attaining a better understanding of the relationship between international economics and politics and military concerns.

THE PRESENT ORGANIZATION OF THE U.S. GOVERNMENT FOR FOREIGN ECONOMIC POLICY AND ECONOMIC CONFLICT: A SHAMBLES

The second subject that I want to address involves a long argument which is of critical importance in considering ways of improving U.S. policy but which is tangential to the aim of this Workshop. Therefore, I will treat it very briefly. The proposition is that the present

organization of the U.S. Government with respect to foreign economic policy and economic conflict is essentially a shambles. I could cite many examples. We could look at oil policy since 1973 and ask: After having been "bitten once", what is the capability of the organism to adapt? If the probability of the first embargo was very low, but nonetheless occurred, the probability of some other event in that domain might now be estimated to be somewhat greater. In any case, given that the costs of the embargo are now more well known, it might be thought that, even if the probability of the event has not changed, more thought would be given to designing better insurance policies for the U.S. against a repetition of the event. There has been a lot of thought about the possibility of future embargoes and even some activity in this regard. The International Energy Agency has been created, and there has been some agreement on sharing and stockpiles and some rhetoric on conservation. But, if you look at the domestic side of U.S. energy policy, the U.S. is more dependent upon imported oil now than it was before the embargo; the U.S. is substantially more dependent upon Arab oil than it was at the time of the embargo. This dependence on oil has potentially large ramifications for U.S. national security interests. The reasons why the U.S. has not acted more forcefully could be discussed at great length. Let me just highlight a couple of points which I think are more directly relevant to our subject.

On the one hand, when issues of international economics and international conflict -- issues like oil, soybeans, or inflation -- are considered by the White House Executive Office, they face both an intellectual and an organizational disjunction that tries to distinguish rather sharply between domestic policy, on the one hand, and foreign policy, on the other hand. Consequently, the Cost of Living Council embargoed U.S. soybean exports in 1973 because the escalating price of soybeans was inflating the cost of chickens (chickens eat soybeans). Because the Cost of Living Council had been charged with controlling chicken prices, it called for a soybean embargo. The effects of this embargo on the Japanese were significant. The Japanese had been repeatedly assured by both the President and Ambassador that the U.S. would in no case embargo soybeans -- a staple of the Japanese diet secured largely from U.S. exports. This embargo, coming in the wake of a series of other shocks, forced the Japanese to question our commitments and to seek an alternative soybean supply from Brazil, which now supplies about 40 percent of Japan's soybean imports. This was an all told fiasco, both diplomatic and economic, which resulted from looking at the issue solely from the domestic side. The pitfalls of approaching an issue solely from the foreign side of the problem can be seen in the case of oil. The oil issue was "slotted" as foreign national security belonging to the domain of Dr. Kissinger. Consequently, the domestic prerequisites for an effective U.S. oil policy (for example, conservation) and the domestic components of an effective foreign economic policy have been substantially neglected. Stated simply, the proposition is that, first, the U.S. Government as currently organized,

is substantially inadequate in assuring that the full ramifications, both domestic and foreign, of decisions are understood before decisions are made. Secondly, as currently organized, the U.S. Government is substantially inadequate in ensuring that the actions of the various departments, agencies and committees bear some consistent relation to each other and collectively serve some national purpose.

Another major source of inadequacy in both the current structure and performance of the U.S. Government in the area of economic conflict is in identifying potential threats and opportunities: assessing the odds of various contingencies and designing appropriate U.S. actions and counteractions. I can't help but include a brief advertisement of a book by a fellow named Peter Szanton and myself to be published in November by Basic Books which solves all these problems.¹ The solutions are so exciting that I will leave them for you to read, but maybe I'll say one word.

The first proposition of our book is that the solutions which we propose are not final solutions. We look to the Cabinet and its subgroups as a device for airing the full array of ramifications of issues -- particularly issues like oil, soybeans, or inflation which have very substantial domestic and foreign implications -- and encourage some Cabinet responsibility for implementation of national policy in contrast to what Evans and Novak call the current helter-skelter system. The conclusion with respect to research to be drawn from this area of concern is that we need much more careful analysis of the strengths and weaknesses of assorted Federal structures and processes for dealing with issues like energy, inflation, or soybeans. In devising processes of simple decision and coordination, I do not subscribe to the notion that we need either a set democracy or a czar. While I don't think that this is a particularly good topic for ONR to investigate, it is a topic for someone to research. A topic which is more appropriate for ONR, and on which I will say a little more, is in improving methods and capabilities for forecasting economic events abroad, for assessing the actions of foreign governments, and for designing U.S. actions.

PREDICTION = BETTING

Several speakers at this Workshop have already made a few remarks about prediction. For example, Professor Morgenstern gave a list of events that had not been predicted. His list included the Great Depression, the Cuban missile crisis, and the oil embargo. But, I didn't quite understand the precise notion of prediction to which he was making reference. I didn't know whether we were talking about predicting the arrival of a planet or, rather, talking about something more like general predictions in the physical sciences. For our business, I think that a much better metaphor for thinking about

¹ Remaking Foreign Policy by Graham Allison and Peter Szanton, Basic Books, Incorporated, November 1976.

predicting is the metaphor of betting. All frivolousness aside, the best simple-minded test of a man's expertise in a specific policy area is his ability to win money, on average, from a series of well-formed bets with other reasonable men about occurrences in that policy area. We could go through each phrase in that proposition if we had time. But, let me just state it boldly and suggest to you why it is a useful device.

In thinking about improving our predictive capability, we, as researchers, have an incentive to talk about improving our understanding of areas but are disinclined to address the issue of testing the improved understanding. The reason why this is true is obvious. A presumed expert has no incentive to participate in what might constitute a test of his expertise. The intelligence community learned this many years ago, and the academic community has not been far behind. Indeed, as most people who give advice about investment have learned, you are more likely to make money selling your advice than you are taking your advice.

Nonetheless, if the business is to improve our betting capability and to see how better forecasts can be made, judgments about whether the bets are good or bad and the establishment of a track record seem to me to be essential; in particular, given the prevailing state of the art. I think that we need work on better formats for betting and establishing track records. We need more work on formulating bettable propositions, particularly bettable propositions that become one of a series (so that the bets are not simply random). These are problems that are dealt with to some extent in Las Vegas, in London, and in the stock market, but not very much in the intelligence community or in the U.S. Government. Also, there need to be devices for eliciting from people who have good track records what the variables are on which they focus and what is their implicit understanding of the relationship among the variables.

Even macro-economic forecasts, the most developed forecasting activity of economists, involve complex intervariable relationships. For instance, when making bets on the next quarter's GNP by means of a model like the DRI model, somebody like Otto Eckstein frequently says that he looks at the model's initial output, then considers all the other issues and factors which he thinks should not be in the model, and adjusts the product of the model up or down accordingly. Finally, he puts it back into the machine and obtains his forecast. This is a perfectly reasonable approach. In estimating GNP, a lot of the structure of the problem has been identified. In some cases, as in the Brookings's Model, two hundred variables have been identified and the relations among them specified. Yet, in order to have your outcome be a winning bet, you need the Government well represented in the model. It is a factor which

needs to be taken into account in some more ad hoc fashion, and some judgment needs to be made about it -- some estimate of its directional impact on GNP three quarters in the future. Finding devices to enable people to do this who know about economic actions that, for example, the Egyptians or the Saudis are likely to take, is another problem area where there has been a little progress. More progress could be made.²

² Professor Bergson: I am a little uneasy about your requiring that the experts win money from each other. I think of two men, who had studied coin tossing and became experts in this area, betting each other on the outcome of coin tosses. Neither one of us should win any money at all. I also think of the case of funds investing money in stocks. We do find some funds doing better than others, but the differences can have a purely random quality. I wonder how one could determine whether success was due to expertise or simply random chance. I'm not objecting to the betting analogy; I just wonder if you described it properly.

Professor Allison: Betting is not meant to be an exhaustive test or the only test but, rather, just a handy, simple-minded test. I think that your point about the flipping of a coin is a good example. In that situation, both of you should know enough to bet that a series of tosses will result in a random distribution. In the case of the stock market advisors, while some people purport to have proof that the market is, in fact, a random walk, I don't know if I understand that argument and, in any case, I don't believe that it is true. If one is investing, knowing something about the recent track record of economic advisors is an interesting and important piece of information. It may be that the market is a random walk and that advisors are randomly distributed, but nonetheless, I get more assurance by the fact that I can look and see what a broker's track record has been for the past 5 years. If it is bad, I change. Again you might say that his track record is just the behavior of a rat in a maze -- a random occurrence. This may be, but it's this, as compared to the alternative.

With reference to improving our predictive capability, if you are investing in research, you are probably investing in processes that are going to yield better forecasts. But, an inherent difficulty in thinking only about the processes without any test of the processes is that one can always make the so-called "astrology" argument. Some people argue that astrology is a young and underdeveloped science. They feel that there just has not been enough money spent on work to identify the precise location of the planets and not enough statistical estimation of the precise relationships between these positions and the point in the calendar when you are born. So, if you look only at the processes and you don't ever test the method, astrology may be a young science in the process of developing, but, then again, it may not.

It just happens to be that, in the area of predicting economic conflicts, there is a lot of basic work which needs to be done in prediction. For example, the mathematicians have tried to devise what they call a reproducible scoring system which will encourage people to bet their true estimates of the odds by giving them a pay-off function. Unfortunately, it is a pay-off function only in the currency in which you happen to be placing the bets. The difficulty is that many people, particularly experts, would rather be known for having won the bet than to have won any particular amount of what you are betting about. Consequently, the utilities captured in the pay-off don't include all of the utilities of the folks who are placing the bets. This is an interesting problem that you could imagine working on: to try somehow to get the utilities which are captured in the pay-offs to be more complete for the people placing the bets. Similarly, I think that even working out tables for various policy areas and getting well-formed bets are not easy tasks at all. This is particularly true of bets in which you can decide afterwards who won and need a satisfactory criteria for doing these decisions. Similarly, devices are needed to get people to articulate the factors they judge to be critical in placing their bets. This is an area in which there could be a lot of interesting and productive work.

PREDICTING AND INFLUENCING ECONOMIC ACTIONS OF FOREIGN GOVERNMENTS

Current Capabilities

Current capabilities for predicting and influencing the economic actions of foreign governments are poor. Governor Carter told the following story at a meeting of the Trilateral Commission last year. He said that he had taken a trip to Europe because he thought he should get some sense for European affairs and international relationships. So, he arranged a trip and went to each of the European capitals. He would first visit the Embassy, see the Ambassador, and ask questions about what was going on -- trying to get some sense for the government and how the political parties might change. In particular, he would inquire about economic events. He would ask how the country is reacting to the increases in oil prices and what the next budget was likely to be. Then, since he is from Atlanta where the Coca-Cola Company is located, he would go see the local Coca-Cola representative and ask him similar questions. Governor Carter found that invariably the Coca-Cola representative knew a lot more about what was going on in France, Italy, Germany, or England, than did the Ambassador or the people brought in to do the briefings. Andy Marshall and I were talking about this the other night, and Andy, as usual, said, "So what else is new?" Yet, it is unfortunately true that the U.S. Government, in the area of making predictions about economic events in other countries is probably poorer than it is in making forecasts about some political events in those countries -- a standard which is already hard to beat. One reason for this is that there is no focus in the U.S. Government for identifying contingencies,

assessing threats and opportunities, developing capabilities, or designing initiatives in the area of predictions or bets about economic events. The Treasury Department claims some responsibility for this, but is not really a Ministry of Finance. The Defense Department tends to regard foreign economics as "beyond its purview," although I think this discussion has provided interesting counter-examples to this type of thinking. The Council on International Economic Policy (CIEP), the principal instrument in the U.S. Government for doing this task, is essentially bankrupt. Furthermore, authority over economic issues is spread very broadly within the U.S. Government. Indeed, given the kind of society that we are, authority over these issues is spread throughout society.

Strengths of the Tools for Prediction

I think that there are some strengths in international economics. International economic theory made good predictions about what floating or freer exchange rates might bring and argued that this was a move in the right direction. Propositions about gains from trade that come straight out of international economics are generally a useful backdrop for bets about the array of goods that will be available under trade, about the costs of those goods, and about the pressures on domestic suppliers. Although current macro-models don't do very well on inflation or as well as they should on GNP, they do, nevertheless, provide some interesting and important predictive power. Basic international supply and demand analysis for various commodities is also useful.

Weaknesses of the Tools for Prediction

The main weaknesses stem from the central role that governments play in international economics. Consequently, an analysis of supply and demand for something like oil, which does not fully take into account governmental effects (such as Adelman's arguments prior to 1973 and Friedman's argument that, given the excess supply of oil, a high price for oil could not be maintained) can turn out to be inaccurate. The limits of the prediction come mainly from the fact that the "g" (the government) in an equation about the economy of a particular country is very hard to model. Indeed, the "g" is generally not susceptible to the same tools and methods that are used in working on the other factors. One of my "hobby horses" is that efforts to use a unitary maximizing model for thinking about the government's behavior do not lead to very strong inferences about what the government is like to do in future situations. Indeed, our methods for deriving these objective functions do not seem to me to be very useful. Consequently, statements about what France's or Saudi Arabia's objectives are and inferences made from that level of a unitary state objective function with respect to likely actions seem to me to be not especially useful.

Promising Avenues for Improving Predictions

The key to improving predictions lies in trying to think in finer categories -- through disaggregating the "g" with the help of models

and frameworks. I think Martin Shubik made this point quite forcefully on Monday. I have worked on several alternative frameworks or models of the factors causing governmental action and the bases for making bets about governmental action. One of these, called Model 2, focuses on the organizational units of a government and tries to model the behavior of each of these units along the lines of Cyert and March's satisficing behavior in their book The Behavioral Theory of the Firm. An alternative model, Model 3, focuses on the bargaining among players at the top of the government who strive to do well in terms of competing objectives and rather different estimates of what the situation is.

Both of these frames of reference provide interesting and useful heuristics for identifying the array of causal factors which constitute the necessary and sufficient conditions for government action in particular arenas. A useful method for moving forward in this area, although not as formal a method as those methods with which most people here would generally work, is called causal mapping. It involves the identification of the array of causal factors that affect Saudi actions in OPEC with respect to changes in the price of oil.

In addition, I think that there is still room for substantial improvement and useful research in the analysis of macro-factors of other economies. For instance, an understanding of the state of the German economy and the likelihood of the German Government finding itself in a surplus or deficit position, given its existing tax rates, would have been valuable information to have had in planning the appropriate U.S. action with regard to NATO offset payments. Similarly, conventional wisdom now says that we need a new form of micro-sectoral analysis which identifies bottlenecks and more disaggregated characteristics of the U.S. economy in order to understand inflation and management of the economy. This is also a good area for work to improve our understanding of the economies of other countries which are especially important to us.

Suggestions for Research

It would be possible, and not difficult, to design an effective test where, beginning with a crude base, one would attempt to develop a methodology for making bets about events and actions of foreign governments in the economic arena. One would take a couple of cases (France, Germany, or the U.K.) and assemble a group of experts. The results would likely be useful. There are also opportunities for further research in the area of organizational analysis, in particular with regard to increasing our understanding of organizational capabilities and indicators of likely organizational action. John Despres has done work on this with respect to Soviet organizational behavior which suggests that observing an organizational footprint, which generally comes before a particular action, may be about as interesting and useful a short-term indicator of the probability of some future action as more general studies of the intentions of the Party.



ESTIMATING THE CAPABILITY OF THE U.S. GOVERNMENT
TO RESPOND TO OTHERS, TO TAKE INITIATIVES, AND TO MAKE ADJUSTMENTS

My last point is to look at the same organizational and political factors that I've previously discussed from the standpoint of U.S. organizational capabilities in designing U.S. responses to economic conflict abroad and in designing U.S. initiatives to take advantage of opportunities in the international economic arena. In particular, I will mention one point that Charlie Wolf and I have spent some time working on. I think that there is a significant opportunity in the area of what's been called "implementation analysis." It involves taking four categories of actions that the U.S. would like to be able to take, either in response to some contingency or to exploit some possible situation, and doing a PERT chart of all actions that would have to be taken along a time line for the U.S. to accomplish its goals. One goal might be fine-tuning export controls in order to exploit discontinuities on the frontier of Soviet production possibilities in a particular area. Fine tuning with the machinery that we currently have for controlling strategic exports seems to me to be a good idea in the abstract; indeed, I would favor it in general. But, it seems to me that, if the U.S. Government were intelligent enough to do this in an effective way, the intelligence so employed should probably be re-deployed to some more important and pressing problems. Attending to U.S. organizational capabilities to take certain actions and, then, adjusting our preferred response in terms of our particular capabilities seems to be another area that is ripe for research.

FORMAL COMMENTS ON THE PRESENTATION OF PROFESSOR ALLISON

by

Mr. Andrew Marshall, Director of Net Assessment,
Office of the Secretary of Defense

INTRODUCTION

I find myself in general agreement with much of what Graham Allison has said, but I would like to reinforce a couple of his points and cast a new light on a few of the other matters which he raised.

ECONOMIC ISSUES AND FOREIGN POLICY

First, as he pointed out, economic issues are really at the center of many issues in foreign policy. What seem like largely political or military issues in our relations with foreign countries often have a major economic aspect -- the real issues may be the impact on jobs or the future of some industry. On the other hand, what seem like pure economic issues quickly become political issues for the U.S. or other governments. The point is that it is often very difficult to separate economic affairs from political and foreign policy concerns.

INTERNATIONAL ECONOMIC THEORY

Graham proceeded from this point to say that this Workshop ought to have someone in attendance who is an expert on international economics. I don't really know what the state of that field is and therefore I am unable to fully judge how deprived we are. I must say that I have a bit of skepticism about how relevant traditional international economic theory is to the issues we are discussing. A friend of mine, a former high-level economic policy maker, said that the main thing that he learned from his four years in Government was the lack of relevance of much of the international economic theory to top-level policy making because it left out the political aspects. It dealt with international economics primarily in terms of trade and market behavior. In his experience, the political considerations so dominated in the decisions of which he had knowledge that he found standard international economic analysis of less use than he thought it would be. Of course, the political aspects often derive from economic gain or losses by specific governments or influential players within countries. I would join both Martin Shubik and Graham Allison

in stressing the focus on institutions and institutional decision processes that will have to characterize the analysis of economic conflict.

FRIENDS CAUSE PROBLEMS TOO

I would like to return to some things that some other people have said in the proceedings of this Workshop. I don't think that Jack Hirshleifer meant to convey the impression that our relations with allies, friends, and societies with which we have cultural ties are, in some sense, less of a problem or more amicable than they are with societies that are more remote or less friendly. I would like to say that a good number of our problems do, in fact, arise in relations with friends. The problems arise because their internal political processes are upset or react to some change in the economic welfare of some interest group or organization, and it becomes a matter between governments to measure the impact and to try to limit the harm done. Friends are an important source of problems because we care and have close relations.

ECONOMICS AS A TOOL IN INTER-STATE TENSIONS: A NEED FOR RESEARCH

I also want to say that Graham's talk touched upon what I would suggest as the primary areas of future research from a broad national security perspective. The first of these is one in which economic developments can lead to situations of direct concern to the Defense Department. For example, economic developments in the relationships between states can lead to the possibilities of warfare or tension in an area where we would have to intervene. At the Workshop banquet, Secretary Ellsworth gave one example: he described developments which may give the USSR a strong interest in Middle East oil. Another example emerges from a look at the impact of the rise in oil prices on the various Middle Eastern countries. The raising of the oil prices has exacerbated the growing disparities within the region between those who have oil and those who do not. While Egypt's GNP per capita is low and is likely to stay about where it is, the per capita income of some of her neighbors has skyrocketed. The continued development of this sort of an imbalance could be a potential source of violence in the Middle East.

The other general area that would be interesting to look at is using economic measures as an alternative or complement to the use of military forces in political-military crises, or to the attainment of foreign policy goals. The increasing interdependence and interweaving of the world economy is the new reality which perhaps makes the use of economic leverage possible. When I refer to the use of military forces, I am thinking essentially of the non-fighting, political use of military force.

I would not include study of Soviet defense expenditures as part of the economic conflict research area. There are many areas of economic study related to economic conflicts that could, in a very broad definition, be included but it will probably be more fruitful to focus initial attention on the two areas which I have just indicated, at least from a Department of Defense perspective.

RESEARCH ON DECISION-MAKING PROCESSES

With respect to Graham's research suggestions, I very much support what he said. I think that our understanding and modes of analysis of the behavior of other governments or other major actors, such as OPEC, are poor. We need to disaggregate and try to understand the internal dynamics of decision making within these governments and organizations. Several years ago, I tried to find out what kind of information the U.S. Government had on the subject of economic decision-making in a few countries. I was disappointed with what I found. Certain individuals, such as an Assistant Secretary of the Treasury, may know a great deal about particular countries which he had learned through his personal experience. But, I was testing what might be called the organizational knowledge of the U.S. Government with respect to information on such subjects as:

- The relevant organizations and processes of foreign governments and societies,
- Who are the key people, and
- What are their backgrounds.

I found that knowledge was very limited and not significantly better than one could obtain from the popular news magazines of the country or an article in The Economist. We should be able to do better than that. We need to increase our knowledge of other governments and their decision-making processes, whatever your view of the future of economic conflict as a field of research or practical concern may be. Perhaps, as Graham suggests, one of the models that he mentioned, if applied, may help us demonstrate a new approach to understanding the behavior of other governments. This research approach would not, in most cases, use any new analytic tools or involve mathematical models. The first steps would be to have some people try to learn a great deal about the organizations, the individuals, the internal processes, procedures, sources of information involved in decisions, and so on. What you need, first of all, is a description and some attempt to bring to bear general notions about the nature of decision-making processes in governments and in large organizations.

FORMAL COMMENTS ON THE PRESENTATION OF PROFESSOR ALLISON

by

Dr. Davis Bobrow, Professor of Government and Politics,
University of Maryland

INTRODUCTION

I often find that I'm misunderstood in these situations involving minority membership so, I'll begin by telling a story which will show you my positive intentions and may also help clarify some ideological misperceptions. The story is set in Novosibirsk, and it concerns Uri Kokoshun. Uri is sitting in his room late one afternoon with the Secretary of the Party Committee from his work unit who says to him, "Uri, this must be a most exciting afternoon for you, because tonight the unit is going to meet and elect you to membership in the Party." Uri says, "Well, it's not very exciting." The Party Secretary says, "How can this not be exciting? This is one of the great moments in the life of a Soviet worker." Uri says, "You see, it's happened to me three times before." "But you told me you weren't a member of the Party." "Well, I'm not." "Well, what happened?" Uri said, "I'll be glad to tell you, and perhaps you can explain to me what went wrong, because I don't really understand it myself. The first time was just after Stalin's funeral. I was working in Moscow, and I was sitting having a conversation like this with the Secretary of the local unit. I asked him, 'Comrade, this funeral for Stalin was a most magnificent thing; how much did it cost?' He said, 'Plus or minus 20 million rubles,' and I replied, 'For that, you could have a funeral for all the members of the Central Committee.' That was the first time. The second time, I was working in Karkov, and the XXth Party Congress had just adjourned. The Secretary of the Party Committee from the work unit came to see me in my room. He noticed that I had two pictures on the wall, one of Malenkov and one of Krushchev. He said to me, 'Take that idiot's picture off the wall', and I said 'Which one?' The third time was just a few years ago. The Party Secretary had come to my room and he said, 'It's a shame you're not coming to the meeting tonight.' I said, 'Well, I wish I could, but I have these other commitments.' The Party Secretary said, 'Well, given the way everything's gone this year, this meeting will probably be the last one.' And I said right away, 'If I'd known it would be the last one, I would have come'."

Dr. Morgenstern told his story about the Emperor and the barber and, as you will recall, the Emperor finally found someone who would shave him with the understanding that if he was nicked, even once, the barber would lose his head. The young apprentice barber bravely shaved the Emperor, and the Emperor was not nicked. The Emperor asked him why he would dare to do this after the more experienced barbers had refused. The apprentice said. "If I had nicked you, I would have slit your throat."

I have also heard a slightly different version of this story. The way that the tale was told to me shifts the thrust from that of being a commentary on power to an insight into policy analysis. The story goes like this: The Emperor is lying there with his eyes closed. The apprentice shaves him. Still lying there very relaxed, the Emperor tells the apprentice to take a hot moist towel, place it over the area that he has just shaved, and then hold it up so that any blood on it would be seen. The apprentice does as he's told, and the towel is perceived to be bloodless. The Emperor says, "Young man, you're marvelous. How did you do this?" The young man says, "I can't tell you that. It's a trade secret." The Emperor said, "You are a treasure to the nation. You can tell me the truth. I guarantee you that nothing bad will happen to you." The apprentice says, "If you make such a promise, I will tell you. The secret is that I had no blade in my razor so, of course, the stubble is still on your face." That's a policy analysis story.

On the assumption that ONR is really interested in a research program in this area -- which means that ONR is willing to start a program which would not yield any useful returns for at least five years and more likely longer -- I would like to do two things: first, raise some questions and, then, make some suggestions. My questions are grounded upon the opinion that at least part of ONR's research program should start from assumptions quite different from those that seem to have pervaded most of the discussions during the last two days. My suggestions relate to research guidelines and reflect several of my recent papers.

RETHINKING BASIC ASSUMPTIONS:
U.S. FOREIGN ECONOMIC POLICY

Can we possibly understand the consequences of foreign economic policies if we do not understand their domestic distributional consequences within the U.S. and within target nations? The answer is no.

Do we understand the distributional consequences within the U.S. of most U.S. foreign economic behaviors -- de jure or de facto policies? No, and often when we do, we don't want to talk about them. By the verb "understand," I am referring not to the organizing of statistics about units that are common in economic analysis, but rather to the translating of the data into costs and benefits to the units that are important in the political process. A Government official once asked me, "Why does U.S. private enterprise do so much better at international bargaining than does the Government?" I thought about this question and got the idea of developing it into a research proposal. I talked to a good economist who said that he would help out. He suggested, "Why don't we begin with the analysis of just one trade item in order to minimize our complications. We need some large, lumpy commodity to make research of the transactions less complicated. Let's take air frames" -- and so we did. We made a list of possible explanations which included bargaining skill, quality of product, price, maintenance record and so forth. Very reasonably, we decided that we would start by interviewing people

involved in this trade. With this outline and agenda, we submitted the proposal. At first, everyone was very enthusiastic about it, but then, someone saw it and said, "I'm not going to touch this with a 'ten-foot pole'." Later, when I was reading the newspapers, I came across several articles about some of the foreign/domestic distributional aspects of the international air frame trade and, then, I understood why our proposal was rejected.

Can you intelligently put together effective foreign economic measures without coordinated, coherent domestic economic measures? The answer is no. Can we do that now? No, and Graham's absolutely right.

Is the foreign economic policy problem solely one of private goods or is it also one of public goods? It is also very much one of public goods.

Is the foreign economic policy problem for most countries one of short-term maximization of benefit or is it one of being risk averse to long-term dependency and powerlessness? It's implausible not to be significantly risk averse, but, do we take this into account when we view how others react to us? The answer is no.

What's a feasible structure for the foreign economic goals of the U.S.? Is it to maintain our current share of the world's wealth and resource consumption? If we're talking about the period after 1985, I don't think so. If you say there are alternative feasible structures for goals, do those alternatives make a difference in terms of the research one does? Yes, I think so.

Are the United States and the Soviet Union going to be as important in the international economy in 10 or 15 years as they are now? No, less important. Does that make a difference in the research? Yes, I think so.

Is it reasonable, normatively, to say that nations possessing indigenous raw materials have property rights with respect to those materials? Hence, these nations are impelled to sell them at the market-clearing price and, in so doing, do not exploit us? Yes, I think so. Does this make a difference in the research one does and the feelings one is entitled to have about what's going on (e.g., OPEC) and about the normative tone of what are appropriate policy suggestions? Most definitely.

Is the thinking which has been done about deterrence since the late 1950s -- the salient variables identified, the attention to strategic interaction, the assumptions of symmetry, and the sampling of the possibilities of space -- a worthwhile example to follow in thinking about economic conflict/cooperation and mixed-motive games of the 1970s and 80s? Very imperfectly. Are we in danger of trying

to go at it the same way? I think so. Except in our general discussion, there has been very little talk about possible adaptive responses to our behavior by smart and reasonably motivated "other" regimes. Neither has there been much consideration of what the net outcome would be and where we will stand.

If you cannot understand how to effectively stimulate economic development from outside a nation (which usually means you do not understand the internal mediating processes within that nation), can you understand how to effectively reverse, degrade, block or obstruct economic development from outside? This is an open question, but it isn't obvious to me that you can understand how to block development if you can't understand how to stimulate it.

Given the contextual variation in the internal structure of possible recipient states, do we really understand how to stimulate externally economic development? If we understand it, why have we done such a bad job at it? There is no evidence the Russians have done much better.

Finally, is it reasonable to expect that a "free lunch" of simultaneously acquiring both military and economic benefits is possible? For example, is it reasonable to assume that we can "have our cake and eat it too" with Iran by gaining economic advantages, balance of payments advantages and possibly, energy supply dependability advantages and, at the same time, improve our national security posture through the massive sales of American weapons? It is possible. Almost anything is possible, but I've become convinced by economists that there are very few "free lunches" and that the "free lunches" which are available usually make you sick unless you're a very hardy person. If you're willing to start entertaining questions, questioning implicit premises, looking at alternative notions about the world in which the results of research are to be applied, then there are several points which a research program in this area ought to concentrate upon. In citing these points, I'm not disagreeing with what Graham Allison or Andy Marshall said, but rather expanding on some things which they didn't have time to mention.

AREAS FOR RESEARCH CONCENTRATION

First, research needs to be done in the area of political economy. In this research, "political" must be conceived more broadly than simply organizations which carry out the rationally established policies of economists. The "political" factors of utility functions, national memories, and that multiple games are being played simultaneously, of which the economic game about any particular transaction is only one and is variable in importance across participants, must be considered. This approach can be usefully taken towards cartels.

Second, a premise of the potential research should be that the world is very, very heterogenous. We need to improve our methodological and conceptual tools for the comparison of political-economic systems.

In particular, we need to improve our ability to assess the "management capacity" of other nations. I'm not referring to how many people with the equivalent of Harvard MBAs a nation has. If this were the criterion, then clearly North Vietnam would have had no management capacity. To the contrary, their capacity was in fact fantastic. If we are really concerned with the assessment of substitution possibilities and of compression, then, the issue of the management system becomes absolutely critical. The researcher studying management capacity must proceed from the basis that management capacity is a joint function of a number of characteristics of a social system at a point in time.

One of these factors is the public's perception of the reasons for society's problems, dilemmas, and hardships. A second element is the extent to which the government has legitimacy and is thought to have competence. While all these factors are variable, they are measures of the historical experience of governments in coping with economic perturbations and must be considered very, very strongly. The problem, then, is to turn this research into something more technically powerful than a set of observations. This is where the development of models becomes important. There are enough cases so that some can be modelled, and the models can be tried out and fine-tuned.

The third suggestion is to perform a set of historical performance analyses of ourselves which can be coded by a panel of judges and then treated statistically to establish an informed taxonomy. As a premise, we should drop the pretense that the United States is, by and large, the defensive party in economic conflict. If we have trouble dropping this self-deceiving notion, a lot of Chilean refugees would be glad to set the record straight. Our explicit policy towards Cuba was to try and destroy its economy. We may not have gone about it very well, but that's another matter. While our implicit policy towards the Allende regime may not have been this strong, it was, nevertheless, very offensive.

The whole question is where one cuts into these chains of action and reaction to try and distill some reasonable explanation. We should look at some conventional/unconventional cases -- some wherein we were clearly the offensive party, some wherein we were clearly defensive, and some mixed cases -- and, among other things, try to establish whether or not, in retrospect, they were "worth the candle" in terms of governmental energy expended -- given other problems and challenges. Secondly, it would be valuable to assess the immediate, after-the-fact appraisal of the adventure to determine if this would be the appraisal that we would make now. As we start discriminating among past events, further guidelines for assessing more current situations should become apparent.

Finally, we need some strong formal work in what is now a fairly thin area: our institutional arrangements to increase the possibilities of joint action. Right now, it's fine to say that you're always

going to get suboptimal provision of public goods. I'm glad to live with suboptimality, but how far does this have to go? Some strong theoretical work and then some fairly formal experimental work of the kind ONR has sponsored in other areas can result in discovering classes of situations and structures under which the following three trends would be more apparent than in the present "natural" arrangements:

- Greater confidence and trust in the continued provision of goods which have long lead times and which are provided incrementally in an international economic situation;
- Better ways of arriving at what are regarded as equitable forms of marginal cost-sharing, including side payments; and
- Ways of grasping similarities and differences in valuation of the goods in question, even when they are not inputs to production.

In addition, a hard look needs to be taken at the trade-off within the U.S. between the private and public sectors and, internationally, between secrecy and coordination. This is a formal problem which should lend itself to some basic research.

CONCLUDING OBSERVATIONS

by

Dr. Kenneth Arrow
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INTRODUCTION

In my closing remarks, I'll attempt to draw together some of the themes that we have been considering on this subject of economic warfare and national security research. Specifically, I will discuss basic research projects which ONR might fund. Had I more time to review the notes that I have taken during this Workshop, my remarks would reflect fewer personal biases and prior judgments than the case will be. Unfortunately, our time is running out.

In my consideration of basic research projects, I want to look at this issue somewhat differently than has been done so far. In other words, I'm not going to propose a new method of cataloging methods of economic warfare. Furthermore, I'm going to exclude from consideration what we call factual or background studies. These are studies of the structure of the economies with which we're dealing, to the extent that they differ strongly from ours. We've had long discussions about one such country -- the U.S.S.R. -- which is, no doubt, the most important country for our purposes. But, we must recognize that economic relations between ourselves and our allies and Third World countries may indeed be of more consequence. If our aim is to exert leverage over the U.S.S.R., it may be that more powerful leverage results from working through other countries. So, factual studies of countries obviously play a very distinct role in policy evaluation, as do historical studies of economic warfare in the past. These are areas, however, which I will not consider at this time. First, I want to look at basic research efforts into the consequences of economic warfare measures. Analysis of the consequences may be divided into three conceptual categories.

CONSEQUENCES OF ECONOMIC WARFARE MEASURES

The first category has strong ties to standard economic analysis. Given that we are adopting some kind of economic warfare measure or, conversely, that another country has adopted this measure relative to us, what are the consequences? An equilibrium system of some kind is being disturbed and we need to understand its comparative dynamics. The first question regarding a particular economic warfare measure is one of feasibility: Can "Country X" exercise a monopoly power vis-a-vis its target, "Country Y?" We have seen that, for the U.S., food is a debatable question. Despite our predominant role in food

exports, it may be that the correct basis of monopoly power is the total amount of food in the world and not the marginal amount distributed by foreign trade. Many other cases could be cited.

One very interesting and not-so-classical issue concerns control over technological developments and technological diffusion. This issue is usually thought of in terms of releasing or withholding technology. To me, the assumption of control over technology diffusion is not necessarily feasible or true. For instance, despite all the secrecy in the world about atomic bombs, diffusion of the knowledge on how to make these bombs was not prevented. Secrecy may have imposed a greater cost, but it was still accomplished. The most important fact about any technology is to know whether something can be done. The most important empirical fact about fission bombs was that they could be made. But, on the other hand, there is the example of sophisticated computing where the knowledge that it was feasible and being done on a large scale in the United States was not sufficient to enable the Soviets to develop comparable capabilities.

The question may arise as to whether or not we should even try to develop certain types of technology. I realize that it's heretical to talk about repressing technological progress but, since I've been engaged in a recent nuclear energy study, I've become concerned that some kinds of technologies should not be developed because of likely diffusion once the mere fact that they can be done becomes known. If the concept of laser isotope separation of U-235 and U-238 is proven practical, it's not going to be terribly difficult for a lot of countries to imitate this discovery. Hence, the fact that it can be done is the most crucial thing. Certainly, we can facilitate or hinder the direct transfer of technology but, in the long run, we're not going to have any great control. From the standpoint of nuclear proliferation, we might be a lot better off if that line of investigation had never been pursued.

Of course, the other facet of technology diffusion is that its effects may be positive. We may want to strengthen certain technologies on the grounds that they're advantageous to us. Technological warfare works in many ways -- one of which is to aid in the economic development of a country. Technology transfers can promote interstate friendship or, if relations are already friendly, these transfers can strengthen ties and common defenses.

A further category which we have to think about is: consequences to whom. We have a whole category of actors in this particular drama: allies; Third World countries, which may be neutral or semi-hostile; and, of course, China and the Soviet Union. The interactions are multiple. We may have an interest in forcing a certain consequence for "Country A" because this consequence for A is in turn a specific consequence for "Country B", where B may equal the U.S.S.R. Along the lines of multiple interlinkage, there is the issue of effect-isolation and of making oneself or one's allies more independent, for

example, of shocks from the Soviet Union. This matter of independence has surfaced with regard to oil. Obviously, one of the policies that we are considering is of independence, not only for ourselves, but also for our allies whose freedom from manipulation by OPEC, in this case, and by the Soviet Union, in the long run, is relevant to us.

The third category for analysis with respect to the consequences of economic warfare measures is to classify the effects according to whether they simply relate to the economic level of a country or whether they impact directly upon a country's military and/or political potential. These direct impacts can either be damaging or helpful, depending upon the particular country and the goals of one country vis-à-vis another. Some of our strategic materials embargoes were motivated not so much to hurt the economy of the Soviet Union as to directly influence their military potential. Our discussion of grain indicates more indirect kinds of consequences.

There's another kind of economic warfare question: crisis management. Suppose something happens which is a very short-run situation.

- How do we meet it?
- The oil embargo is a clear case in point; how do we respond to it?
- What institutions have to respond to it?
- What, in some sense, are rational measures to be taken against it to minimize the impact?

In a given crisis situation, there are a variety of possible responses, some of which are considerably broader than others and which, if there is proper management, reallocate our resources to meet the situation. By the same token, we could think of other countries responding to our defensive measures of that sort as a subtle kind of interaction. Furthermore, crisis management is not simply a short-run problem. The existence of a crisis management capability has long-run implications, for it may deter a crisis from arising. Assuming that precipitating a crisis is somehow costly to the initiating country, the existence of a suitable crisis management policy may force the would-be crisis initiators to reassess their likely benefits and conclude that the results aren't worth the costs.

Somewhat related are methods which will insulate military/political power from economic warfare policies. Stockpiling is the example which comes to mind as a means through which, at least in the short run, we can maintain a capability against an economic weapon. There are longer-run autarkic solutions through the substitution of domestic goods -- the very old method of insulating yourself against foreign economic manipulation. These are anticipatory defensive measures, which are actually the economic equivalent of fortresses.

This concludes my discussion of the first issue: consequence analysis. I think that we all saw these matters arise during the discussion -- a list of issues lending themselves to fairly straightforward economic analysis, but which has by no means been carried out. I will now turn to two further categories which seem to involve research beyond the current state-of-the-art analysis.

ECONOMIC INFORMATION AND DECISION-MAKING

The whole question of economic information and decisions needs to be explored. Discussion of decision-making problems usually centers around two issues. One issue was raised by Graham Allison in his presentation. Given the way that the actual decision-making apparatus, with all of its bureaucratic and other structures, is, in fact, responsive to shifts in information (to news), how are information shifts handled? How does the apparatus acquire news? How accurate is its response to news? What happens when new information is conveyed and made the basis of new decisions?

A second issue is that, in any conflict situation (and particularly economic conflict in a multi-polar world), you have to signal. You may want to signal your intentions for the purpose of threatening, for the purpose of cajoling, or for the purpose of alerting your allies. Of course, there's also the possibility of concealing intentions, but I think that, in economic warfare, you most often want people to know why you're doing something. Also, signals must be credible indications of intentions and not merely words which are very cheap, but not credible.

Thirdly, the idea of rational expectations has been suggested by recent work in domestic macro-economics. The point is that policies don't appear on the world scene "out of Jove's head" in the way that the birth of Minerva took place. Policies spring out of a certain matrix which can be analyzed by other countries. Therefore, they have expectations of your behavior. In the case of the Japanese response to our soybean embargo, the experience of having their soybean supply cut off caused the Japanese to regard the United States as an unreliable source and to look for alternatives. This is one kind of response signal. In other words, policies may be considered in the light of consistency and the atmosphere and expectations which consistency creates. I am assuming that other countries can see through what you're doing, interpret your actions, and then make a correct prediction. There's always a chance of deception and of building up expectations only to cut them down. Hence, there is always a degree of uncertainty, which should be recognized. This uncertainty factor has been stressed a number of times by Dr. Morgenstern and others; Graham Allison looked at it in a somewhat cheerful and positive tone. The idea is that, when you predict, you try to make your predictions optimal, recognizing that you are likely to be confronted with surprises. More precisely, if you've really done your analysis, you have no surprises because you know a lot of things that could happen -- which therefore means that they would not be surprises. As

far as ordinary decision-making procedures are concerned, this is perhaps not a very useful outcome. However, it should be. If one of the things you know about the world is that you don't know what is going to happen, that is, in itself, an important fact about the world and one that should be recognized in the long literature on decision-making under uncertainty. The problem here is more nearly one of formulating the uncertainty in usable ways, so as not to overwhelm the absorption capacity of the decision maker, as well as the idea of educating decision makers. Presumably, this is happening to some extent in business and hopefully will happen in public affairs as well. There are uncertainties that decision-making procedures have to recognize. This puts a value on acquiring more information, but also forces the recognition that, no matter how much information you acquire, you will be left with residual uncertainties. Therefore, you want policies which are, as nearly as possible, robust to your uncertainties and which reflect them in some way or another. You don't want a policy which, under some credible set of events with a significantly high probability, will yield disaster.

POWER AND GAME THEORY

Let me turn now to a third category: the whole question of power. This issue might also be called research on game theory, because game theory, in its broadest extension, really does cover the same category. Someone suggested that power (be it an embargo or a tariff) can be used to achieve three goals: (1) you might want to just injure the other party, (2) you might want to take action because it's advantageous to do something that really injures the other party, or (3) you might be doing it as a threat. In this context, you may offer the other side two alternatives by saying: If you behave one way, I'll reward you. If you behave another way, I'll hurt you.

All of these goals are subsumed in a properly formulated game theory model but, there are problems of two levels. One problem is at the fundamental level of categorizing games in general, and the other relates to games of a more specific nature (e.g., economic warfare games) and analyzing them in their specific context.

For our purposes, we want to recognize that the power in the model has to be a mixture of economic, political and military power. All of these things interact, and their precise interaction is the key factor with which we are most concerned. Of course, we could consider the pure economic situation where economic power is used for economic ends. But, as Secretary Ellsworth said, this is just another name for international economic policy. In this Workshop, we're thinking more of other ends, perhaps economic power to be used for military ends or political power to be used for economic ends.

In any concept of a game, there is an equilibrium or end that you're striving to achieve, and it is with reference to this end or

equilibrium that Jack Hirshleifer's points about the nature of international agreements become important. In a world where there is no superordinate legal entity, an equilibrium (an agreement) can be maintained in two ways. One way is essentially through ethical dictates and constraints. The other involves a state of affairs, which may or may not be embodied in an agreement, where both parties continue to operate in a certain way because neither side finds it profitable to disturb the equilibrium; it's a self-enforcing situation. Both of these concepts result in a long-run equilibrium situation, and both are somewhat similar to the prisoners' dilemma where people cooperate because they know that, if they don't, the next time around they could have their "throats slit." In my opinion, these are some basic conceptual levels that I have been able to distill from the discussion during this Workshop.

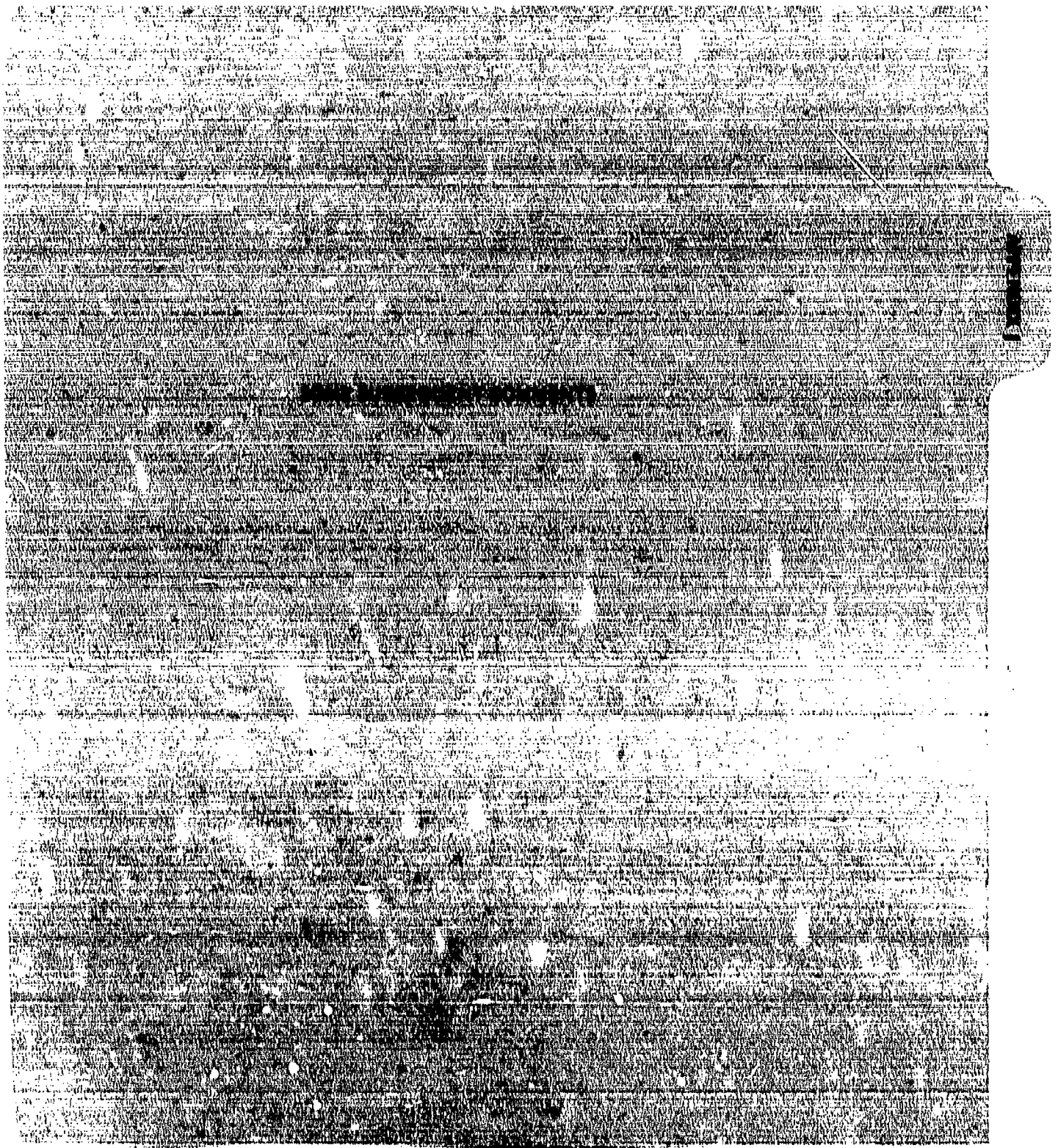


TABLE OF CONTENTS

	Page
<u>Economic Conflict and National Security</u> by Major General Robert N. Ginsburgh (USAF, Retired)	J-1
<u>Economic Conflict</u> by Commander Rolf H. Clark	J-4
<u>The Use of the Morgenstern-Thompson World Model for the Study of Problems in Economic Warfare</u> by Dr. Gerald L. Thompson	J-6

SOME SUBSEQUENT COMMENTS

ON ECONOMIC CONFLICT AND NATIONAL SECURITY

by

Major General Robert N. Ginsburgh (Ret.)
Editor-In-Chief of the Strategic Review*

The very fact that a workshop was convened on economic conflict, together with the high caliber of the participants, illustrates the growing awareness and concern about the impact of economic conflict on our national security.

Although much of the discussion during the Workshop was diffuse (which was to be expected in an exploratory conference of this nature), it seems to me that it provided a rare opportunity for the GE-TEMPO Center for Advanced Studies and the Office of Naval Research (ONR) to create a focus and framework for on-going research in this area.

Obviously, the first requirement is to define the problem. The problem is not international economic competition or economic cooperation. While these areas certainly warrant further research, it ought not to be the business of ONR or the Department of Defense (DoD) to sponsor research for the purpose of improving the competitive position of the United States in the world economy. The problem is not how the United States should wage economic warfare in peacetime. Certainly the actions of some other nations today are tantamount to undeclared economic warfare, but I do not believe that it is in the interests of the United States to wage economic warfare under current conditions -- nor do I believe that it could be supported by American public opinion. On the other hand, it would be appropriate to give further thought and to sponsor at least a modest amount of research for the contingency planning of economic warfare measures which might be appropriate in support of a "shooting war."

There is, however, a more urgent problem; namely, the vulnerability of the U.S. economy to actions by other nations which could adversely affect our national security. On the other side of the coin, there are probably economic actions which the United States might take which could strengthen our nation's security. In these areas, ONR and DoD should have an important, though not exclusive, role.

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Thus, I would propose that further research sponsored by ONR and DoD focus upon the national security aspects of foreign economic policy. This would include both U.S. economic policy and the economic policies of other countries which might affect U.S. security. In this context, it might be useful to follow the pattern of military planning and begin with a Threat Analysis. Economic threat analysis would include:

- U.S. economic vulnerabilities;
- Theory, concepts and doctrine behind the foreign economic policies of other nations or blocs -- priority effort should probably be placed on the USSR, China, and the Arab and "non-aligned" countries;
- Historical evaluation of operational economic policies of these nations; leading to
- Projections of their possible and probable future economic policies.

The Threat Analysis could then lead to a consideration of alternative U.S. policies to cope with both current and projected threats. Alternatives should include political, economic, diplomatic, and military options. They might include "offensive" as well as "defensive" options and could include "unconventional" as well as "conventional" options. Analysis of alternatives should include economic, political, and military feasibility and desirability. It should also consider the feasibility and desirability of economic actions as an alternative to military options and whether or not particular economic actions might lessen or increase the possibility of war.

An important area for consideration is the organization of the Government to deal with this whole issue. In other words,

- How can the results of this research be brought to the timely attention of decision makers?
- What steps are necessary to insure the relevancy of the research to the concerns of the policy makers?
- How should the Government be organized to properly analyze economic threats, devise alternative actions, decide upon appropriate actions, and coordinate the implementation by Governmental and non-Governmental Agencies?

- Should we expand the stature, authority and sub-structure of the Council on International Economic Policy (CIEP) so that it is equal to the National Security Council (NSC) and should the NSC be reorganized so it is equipped to cope with these issues, or are some other organizational arrangements warranted?

Somewhere along the line, it will be necessary to develop a national consensus on how the U.S. Government can, and the extent to which it should, use the economic power of the nation in support of non-economic goals. When military power is involved in support of national security objectives, the Government, of course, has a monopoly on the use of that power. When economic power is involved, however, our Government does not -- nor would we want it to -- have the same degree of control.

In organizing the research program itself, I would suggest that it would be most useful to establish broad areas of research within an overall framework, rather than sponsoring a myriad of individual, small, unrelated research projects. It might also be useful to sponsor level-of-effort support of certain groups of individuals in order to improve our national capability in this area over a period of time.

SOME SUBSEQUENT COMMENTS

ON ECONOMIC CONFLICT

by

Commander Rolf H. Clark,
Office of the Chief of Naval Operations (OP-96 D)

These comments were prepared in response to the invitation of the Chairman of the Workshop to submit additional comments and suggestions with regard to the subject addressed during the Workshop; namely, economic conflict and national security research. In this context, these comments reflect my personal views, and do not represent an official Navy position. I will discuss but two issues. The first concerns policy matters which should be considered before ONR (Office of Naval Research) sponsors any empirical studies or "applied" research in general. The second concerns techniques relating to the type of "basic" research which might be sponsored.

With regard to the first issue, it seems important that ONR not sponsor research in the areas of "offensive" economic warfare mentioned by various speakers. It is not the Navy's mission to disrupt through economic ventures. It is not even a Navy mission to disrupt another country's naval activity through economic means. It could be politically damaging to the Navy if ONR sponsored any research of this offensive nature. Consider, for example, such hypothetical headlines as: NAVY PROPOSES "FOOD WEAPON" AS INTERNATIONAL COERCION METHOD. Such inevitable publicity must be considered before ONR ever sponsors research on controversial subjects.

"Defensive" economic conflict is another matter. Navy missions cannot be performed without economic resources -- fuel, manpower, steel, and like. It seems perfectly valid and politically acceptable for ONR to sponsor research aimed at foreseeing and adjusting for possible economic actions by other countries which could result in decreased U.S. Navy capabilities. As an example, it may be effective to develop means of estimating the impact on U.S. Navy capabilities of technology transfers in other fields (such as occur, perhaps, in electronics and computer technologies through multi-national firms). Studying the impact of such transfers would seem to be a politically acceptable area of research for ONR sponsorship. Determining means of diminishing Soviet naval capabilities through multi-national technology transfer would not seem to be appropriate research for ONR to sponsor. The latter would appear to be a State Department and CIA matter.

So much for policy issues on potential ONR research. What of the more mechanical issues? The foregoing comments are not very relevant to the more arcane area of "basic" research. In this area, I felt that too little was said during the Workshop about the feedback effects of many of the proposals. The world is a closed system wherein actions cause reactions. The dynamics of closed systems are much less obvious than those of open systems. Neither the inputs nor the outputs of an economic conflict in a closed world system are exogenous. Rather the outputs become inputs for the next time increment. The concern by some over the distinction between macro- and micro-models may have been alluding to such feedback issues, but the point was not made clearly enough.

One form of useful basic research would be in those technical area dealing with dynamic systems. State-Variable Analysis and Optimal Control Theory have already been adapted from their engineering origin for economic systems, but more work is needed to make them useful. The technique of System Dynamics should not be overlooked. It does essentially the same thing as State-Variable Analysis, but has the strong advantage of being understandable to decision makers.

Again with regard to techniques, I am told the new catastrophe theory treats the problem of unexpected occurrences. This problem was repeatedly discussed during the Workshop as a "thorn" to prediction. Perhaps ONR-sponsored basic research in that area would be warranted.

Finally, more than just the techniques proper need to be developed. The real payoff may be in making the techniques understandable to and accepted by decision makers. Professor Allison's term "implementation analysis" could be borrowed to apply to the art of implementing techniques, as well as implementation of policy.

SOME SUBSEQUENT COMMENTS
ON THE USE OF THE MORGENSTERN-THOMPSON WORLD MODEL
FOR THE STUDY OF PROBLEMS OF ECONOMIC WARFARE

by

Professor Gerald L. Thompson, Carnegie-Mellon University

INTRODUCTION

In Chapter 11 of the book^{1/} Mathematical Theory of Expanding and Contracting Economies which Oskar Morgenstern and I (M/T) published this year, we defined and made an initial study of the properties of an expanding world economy model. In this model,^{2/} several countries (each represented by an expanding open world model^{2/}) interact by producing, exporting and importing various goods, as necessary, in order to achieve an overall world economy. The countries individually and simultaneously achieve an external balance of payments condition and an internal balance of profits condition. We extended the concept of comparative advantage to include expansion, and showed that each good which was an important factor in international trade would have its export price determined by a single country -- at least if we assume that the countries do not collude on the determination of the price.

It is the purpose of this commentary to sketch how further study of the M/T world model may be used to introduce the game theory ideas of cooperation, collusion, threat and counter-threat, technological innovation, limited resources, etc., into the model and to see how these may be used to formulate, compute and study economic warfare games. In the long run, if the necessary data were acquired, the necessary computations on real world countries can also be made.

The One-Country Open Expanding Model

Having exposted our model in its original form^{2/}, again in a much more lengthy book form^{1/} complete with examples, computations, etc., and finally in a popular form^{3/} soon to appear, I shall merely describe briefly some of the important features of the one-country model.

1/Oskar Morgenstern and Gerald L. Thompson, Mathematical Theory of Expanding and Contracting Economies, Heath-Lexington, 1976.

2/Oskar Morgenstern and Gerald L. Thompson, "An Open Expanding Economy Model," Naval Research Logistics Quarterly, 16(1969), pp. 443-457.

3/"Expanding and Contracting Economies," by O. Morgenstern and G. L. Thompson will appear in a forthcoming issue of Scientific American.

In the one-country open model, we start, as do other expanding economy models, with input and output matrices, an expansion factor, and an interest factor. However, we do not require that an industry be profitless to be run as positive intensity. Instead, we have some profitable industries such as: agriculture, food processing, light industry, heavy industry, construction, essential transportation of people and goods, mining, refining, etc.; and we also have some unprofitable industries such as: government, education, personal services, recreation, philanthropy, medical care, personal transportation, pollution disposal, national defense, advertising, research and development, and so on. Note that the words profitable and unprofitable are meant in the input-output sense only, and are not meant to imply value judgments. In order to force the unprofitable industries to be run, we have in the model lower bounds on their intensities and, to limit the intensities of the profitable industries, we impose upper bounds. These upper and lower bounds are called control variables. The settings of these control variable are determined by internal and international political and economic considerations.

In addition to its own activities, the open economy can export and import goods at stated export and import prices. The reasons the economy would want to export and import are to increase its own expansion rate and to make a more varied bundle of goods available to consumers. As might be expected, if the economy exports a good, then the internal price of the good is equal to the export price, while if it imports the good, the internal price is the import price. If it neither exports nor imports that good, the internal price lies between the export and import prices.

We showed that, given certain reasonable assumptions, a solution to the expanding, open-economy model exists which satisfies an external balance of payments condition and an internal balance of profits condition. We also showed how to add consumption to the model in various ways.

All of these ideas and others, together with numerous examples that illustrate them, are discussed in the references listed in the footnotes.

The N-Country Expanding World Model

To form a (necessarily closed) world model, we put together several one-country open models and added constraints to control the physical flow of exports and imports among the countries. The first problem to be solved was that of determining the export and import prices for goods. In the reference given in Footnote 1, we determined the initial values for such prices by putting all of the activities of all countries into a single expanding model and solving that model to determine these prices. Once the initial prices are given, we put them in the model and gradually impose the control variables for each country until a solution to the world model is obtained.

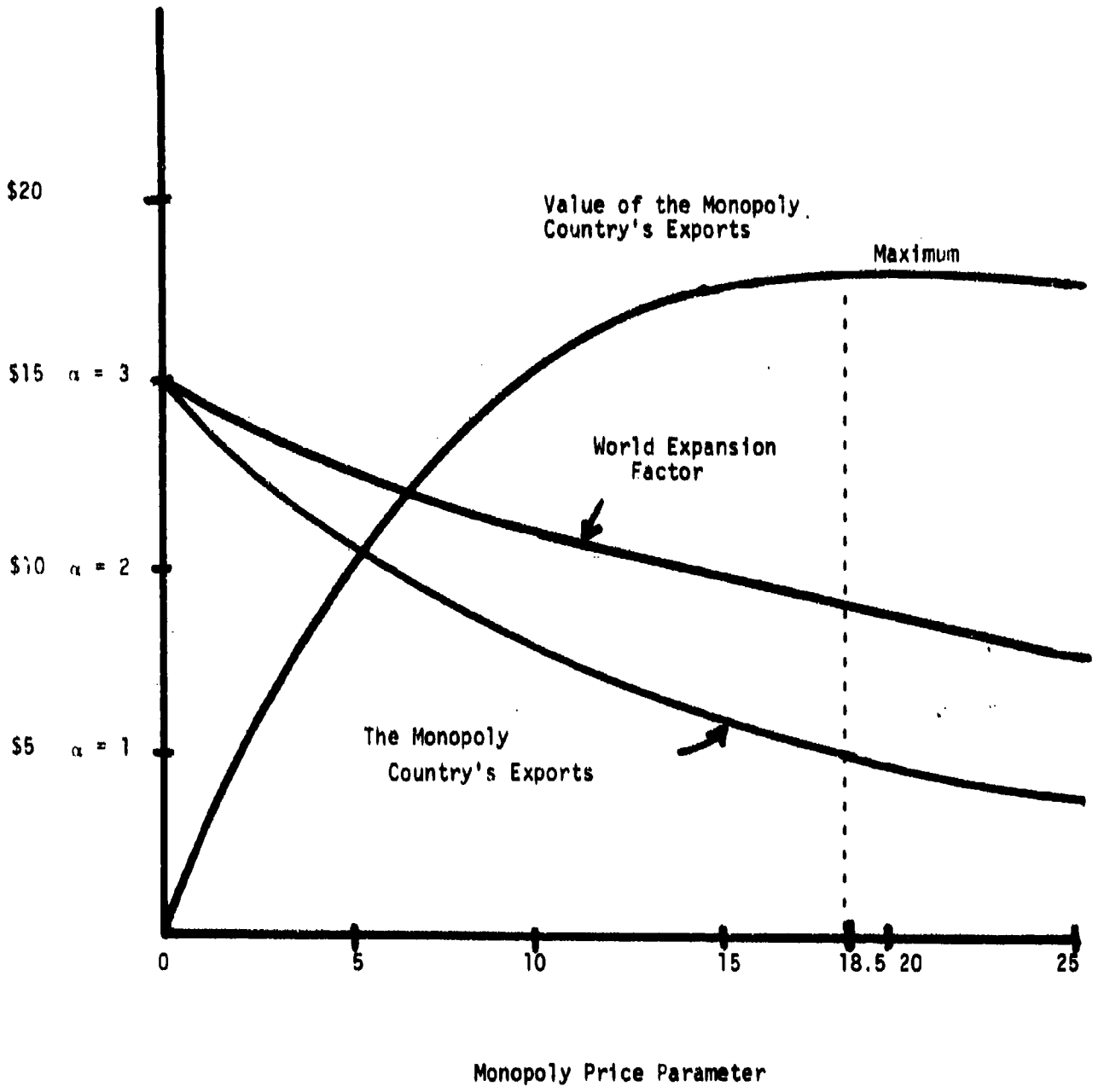
Once this was done, we were able to extend Ricardo's notion of comparative advantage for a given expansion rate. Thus the only countries that export a given good must have a comparative advantage in producing that good at the given expansion rate.

From this, it follows that for any good that is exported in any solution to the world model, there will be one producer who has marginal comparative advantage in producing that good at the given expansion rate. Those producers having greater comparative advantage will already be producing the good at their highest rates, and those with lesser advantage will be producing at their lowest rates. It therefore makes sense to give the marginal producer of the good the ability to change the price of his good within the limits imposed by the closest neighboring, more efficient and less efficient producers.

To illustrate this, I have modified Example 11-2 on pages 182-185 of the reference in Footnote 1. In the example, there are 3 countries, each producing wheat, chickens, and eggs and each having a comparative advantage in the production of a single one of these goods. I modified the model to permit Country 1, which was efficient in wheat production to change the export price of wheat. The results are shown graphically in Figure 1. It is assumed that Countries 2 and 3 keep the export prices of their goods fixed, and only Country 1 changes its price. Note that as it increases its price from zero, the world expansion rate goes down and the amount of its exports also goes down; however, the total value of Country 1's exports goes up sharply. The rate of increase of this value slows down because the total value function is convex and eventually the total value reaches a peak. At the peak, the total exports are less than a third of what they were at the beginning. More importantly, the world expansion rate at this point is less than half of its starting value.

It is possible that something similar to this happened in 1973 when OPEC raised the price of oil. However, it would be necessary to gather much data and make very many computations to be sure of this.

A further step beyond the foregoing simple example is to permit several efficient producers of the same commodity in the world model to band together into a cartel and change the price of the commodity with the assumption that the other countries will not react. We could then draw a curve similar to that in Figure 1 for each producer country. One obvious conclusion from doing this would be that, for any commodity price, some of the cartel producers are likely to be at more favorable points on their curves than others. Hence, the cartel would have to resort to side payments within the cartel (which is probably politically unacceptable) or else these inequalities might be exploitable by the countries outside the cartel.



Monopoly Price Parameter

Figure 1

One can imagine a more complicated economic game with several cartels, each manipulating the price of a different good. It is clear that a true game theory situation results, with threats and counter-threats, spies and counter-spies, cooperation and collusion, wealth and resource limitations, and technological competence and innovation all playing a role in the solution concepts. Such a game would be dynamic; i.e. played over time. Finding the solution to this game is without question beyond the current knowledge of economics and game theory.

One can still go further and imagine two or more economic blocs, each with an internal dynamic game, and with further dynamic games being played among the blocs. This leads to an even more difficult problem.

The purpose of this commentary was not to solve games of economic warfare, but rather to sketch a framework in which the necessary calculations can be done to initiate their study.

A SELECTED BIBLIOGRAPHY

APPENDIX B

TABLE OF CONTENTS

	<u>Page</u>
<u>Books</u>	K-1
<u>Articles</u>	K-5
<u>Reports</u>	K-11
<u>Hearings</u>	K-14

A SELECTED BIBLIOGRAPHY

This bibliography reflects a cross-section of the books, articles, reports, and hearings which pertain to one or more facets of the broad, complex subject of economic conflict and national security. Obviously, it is not an all-inclusive bibliography, but it was considered to be a useful, representative selection of relevant literature by the Workshop participants. However, suggestions with respect to other pertinent written materials are always welcome.

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SELECTION OF RELEVANT EXTRACTS

APPENDIX I

TABLE OF CONTENTS

	<u>Page</u>
<u>East/West Economic Conflict</u>	L-1
<u>North/South Economic Conflict</u>	L-4
<u>Embargoes, Conflict over Scarce Materials, and Economic Warfare</u>	L-12
<u>Inter-state Power Relations: An Analytic Framework</u>	L-27
<u>Dependence, Independence, Inter- dependence: The Case of Oil</u>	L-33

A SELECTION OF RELEVANT EXTRACTS

The extracts contained in this appendix were selected and compiled for the purpose of providing the Workshop participants with some insight into the background materials pertaining to the broad, complex subject of economic conflict and its possible implications for national security. In this context, these extracts were considered to be quite helpful and are therefore included in this report in the interests of affording the reader with the same initial overview of the subject.

As may be noted, the extracts have been organized in terms of the following four categories:

- East/West Economic Conflict;
- North/South Economic Conflict;
- Embargoes, Conflict over Scarce Materials, and Economic Warfare;
- Inter-state Power Relations: An Analytic Framework.

Also included at the end of this appendix is a paper entitled "Dependence, Independence, Interdependence: The Case of Oil," which Dr. M. A. Adelman, Professor of Economics at the Massachusetts Institute of Technology (MIT), prepared for the Workshop.

EAST/WEST ECONOMIC CONFLICT

● In a recent article in The Washington Post, Arthur Cox argues that the effective use of trade as an economic deterrent against Soviet aggression could provide the necessary political leverage to end the cold war and to attain "true detente."

The standard US response to Soviet support for liberation struggles has been military...As we have seen, our vast military arsenal does not provide the answer to an Angola or a Yom Kippur war. Something else is needed to inspire a change in Soviet policy. Such a change might occur if we, together with our allies, organized our trade with the Soviet Union in such a way as to provide maximum political leverage.

...trade with the USSR would be regulated. The only way this can be accomplished is for the industrial democracies to agree to cooperate... There would be a planning mechanism for East-West trade with stress on the technology of consumer production and grain trade. This is where the political leverage can be found.

Commenting on the Angolan crisis and the possibility of the use of grain for leverage, Cox asserts:

T Cox, Arthur, "Trade as a Weapon," The Washington Post, August 8, 1976.

The US political position was so untenable that its challenge to the Soviets was impotent...But in the future there could be an entirely different scenario. The US and its allies could decide to end the cold war -- no more clandestine involvements such as occurred in Angola....If a grain boycott was desirable, the US would act in concert with Australia and Canada.

To have any significant leverage on Soviet foreign policy, the industrial democracies would have to be prepared to divert and/or subsidize at least two-thirds of their exports to the USSR -- including all grain and most modern technology.

Sanity requires a two-fold process. There should be negotiations with the Soviets for a mutual phase-out of clandestine warfare and arms transfers to the nations of the Third World. At the same time, the industrial democracies should indicate a willingness to increase East-West trade substantially if the Soviets give up their conspiratorial adventures abroad. Such a concerted policy unquestionably would inspire a significant struggle within the Kremlin. Some of the old Bolsheviks and KGB leaders would hold out for the decaying ideological world view, but it is a good bet that, in time, the more pragmatic moderates would have their way.

• The following statement on national policy surveys past and potential trade between the US and communist countries, and suggests the need for reducing US restrictions on East-West trade:²

We believe that as a matter of principle special constraints should not be imposed on the functioning of international markets except as required by an overriding public interest, and that if such constraints are imposed they should be removed as the public interest permits. The practical values to be served by removing restrictions on international trade include economic benefits but extend well beyond them. At a time when the United States and the state-trading socialist countries have been seeking ways to improve and stabilize their mutual political relationships, willingness to trade is in itself a sign of amity that helps dissipate

² "A New Trade Policy Toward Communist Countries," A Statement on National Policy by the Research and Policy Committee of the Committee for Economic Development, September, 1972.

tensions. Through trade, moreover, new channels of communication are opened which help reduce the danger of either side misinterpreting the intentions of the other. Trading partners tend to have an increased stake in the peaceful settlement of disputes. Although improved communication and mutual understanding cannot be expected to solve fundamental conflicts of interest, they at least encourage a rational approach to negotiating a maximum area of agreement--as indicated by President Nixon's discussions in Moscow during May 1972 and the subsequent trade negotiations between the United States and the Soviet Union.

NORTH/SOUTH ECONOMIC CONFLICT

• In an address on May 18, 1975, Secretary of State Kissinger discussed North/South economic conflict and offered an American approach to the major issues at hand. With regard to trade and commodities, he stated:³

The threat to our national security from a disruption in supplies of most raw materials is limited. We depend on imported raw materials for only 15 percent of our total needs; only three percent of our raw materials are imported from developing countries.

But we do have a concern for a flourishing world economy. In raw materials interdependence is as real as in energy. There exist common interests in a reliable and flourishing trade on mutually beneficial terms. It is in our interest, because the growth of the industrial nations will increasingly depend on raw material imports, and because our growth depends on a healthy world economy. It is in the interest of developing countries, because their exports are often the principal source of development financing. It is in the interest of the world community, because the poorer countries can gain a sense of responsibility and participation only from the sense that their concerns are taken seriously.

The United States is aware of the dependence of many countries on their earnings from a single commodity. It is legitimate and reasonable that they should seek a reliable, long-term stable source of earned income for their development.

However, we do not believe that tying commodity prices to a world index of inflation is the best solution.

In his concluding remarks, the Secretary noted:

These are the problems of the economic structure. They represent, in their scope and implications, a basic challenge to the economic system of the past generation and a basic test of the world's political future. They have become one of the central concerns of our diplomacy.

³ Kissinger, H., "Strengthening the World Economic Structure," Department of State Newsletter, June, 1975.

The present international economic system has served the world well. Future prosperity in this United States and throughout the globe, depends on its continued good performance. We are prepared to engage in a constructive dialogue and to work cooperatively on the great economic issues. We cannot accept unrealistic proposals. But we must act to strengthen the system in areas where it does not function well.

These issues are not technical; they go to the heart of the problem of international order; whether the major industrial nations and the developing nations can resolve their problems cooperatively, or whether we are headed for an era in which economic problems and political challenges are solved by tests of strength. Will the world face up to the imperative of interdependence? Or will it be engulfed in contests of nations or blocs?

The role which the United States takes will be crucial. Will we fulfill our responsibility of leadership? If we know our own interest, we will.

• In the following article⁴, Irving Kristol (the Henry Luce Professor of Urban Values at New York University, co-editor of the quarterly The Public Interest, and member of the Wall Street Journal's Board of Contributors) focuses a critical eye on the rhetoric and the realities behind North/South economic conflict and urges the United States not to endorse any new international economic order based on notions contrary to basic American philosophies and institutions. According to Irving Kristol, what the "Third World" is saying is not that they need our help, but that their poverty is the fault of our capitalism -- that they are "exploited" nations while we are a "guilty" people.

It has been very worrisome, these past months, to observe the apparent willingness of many State Department officials to reformulate American foreign economic policy in the hope of achieving a more amiable "dialog" with the so-called Third World. It is true that, for the moment, the Treasury seems to have blocked such an effort. And it is also true that, by appointing Daniel Patrick Moynihan as Ambassador to the United Nations, Secretary Kissinger has indicated his own awareness that a candid debate may, under certain circumstances be the most appropriate form of dialog. Nevertheless, the State Department's instinctive approach to this issue has been little less than frightening. Frightening,

⁴ Kristol, Irving, "The 'New Cold War'," The Wall Street Journal, July 17, 1975, p. 1.

because any effort to create "a new international economic order," as is now being demanded in every international forum, must entail some basic changes in our domestic economic order. Frightening, too, because it reveals such a complete misreading by our foreign policy establishment of what our controversy with the "Third World" is all about, and of the political realities that lie beneath it.

In all fairness to the State Department, one must report that its interpretation of America's position in the world is not capricious or arbitrary. It is, fundamentally, the fashionable liberal view, to the effect that we have entered a new era of foreign policy which Newsweek has termed "The World's New Cold War" -- i.e., a war of the "poor nations" against the "rich," a sort of international version of the class struggle aiming to redistribute wealth "equitably." And since there is no liberal-chic idea which cannot find some distinguished "concerned business leaders" eager to subscribe to it, this is also a view that many in the business community sheepishly go along with. The Club of Rome and the Trilateral Commission, both supported mainly by grants from large corporations, are very busy popularising this interpretation of world affairs. As Professor Zbigniew Brzezinski, of the Trilateral Commission, has put it: "The main axis of conflict at most international conferences today is not between the Western world and the Communist world but between the advanced countries and the developing countries."

Now, this statement is partly and superficially true -- and is an excellent argument in favor of having fewer such conferences, most of which are only a form of political theater in which the poor countries try to blame everyone but themselves for their problems. The statement is also partly and fundamentally false. The main axis of conflict can be more accurately described as being between liberal-capitalist societies (mainly affluent) and those societies -- whether communist, socialist, or neo-fascist (this latter category prevailing especially in Africa) -- which, whether poor or less affluent, are opposed to liberal capitalism in principle.

A Matter of Attitudes

It is not simply a question of "world poverty." It is much more a question of one's attitude towards liberal political and economic systems, and towards liberal civilization in general. This explains why those "less developed" countries are always attacking the United States and never say an unkind word about the Soviet Union -- not exactly a poor country. Nor do they show any animus toward Saudi Arabia, now fabulously rich as the result of the exorbitant price it demands for its oil from both rich and poor countries alike. Indeed, the very definition of "the Third World" entails a hostility toward liberal capitalism. Otherwise, how can one explain why Saudi Arabia and Cuba and Algeria are fully-accredited members of the club, whereas Israel, Taiwan, South Korea, and Turkey are not?

In truth, this "new cold war" is not really about economics at all, but about politics. At bottom, it is a conflict of political ideologies. What the "Third World" is saying is not that it needs our help but that their poverty is the fault of our capitalism - that they are "exploited" nations while we are a "guilty" people. And to the degree that the United States officially accepts the terms of the debate set down by the nations of the "Third World," it also accepts moral responsibility for their poverty.

Nations are poor for any one (or any combination) of three reasons: (1) history, (2) culture, and (3) misgovernment.

By "history" one simply means the fact that some nations began to industrialize and modernize themselves later than others, and it inevitably takes time for them to "catch up." It need take nothing more than time, as the case of Japan illustrates. But it does take time -- and any nation that claims "it doesn't have the time" is merely asserting, with a kind of childish petulance, that it impatiently wants the fruits of economic growth now, before the growth itself has been accomplished.

By "culture" one simply acknowledges the fact that certain traditional ways of life, which doubtless have their own substantial virtues, are inimical to economic development. All immigrant groups to South America, a potentially rich continent, quickly prosper: this has been the experience of Italians, Germans, Japanese and Jews. The native and Hispanic populations do not prosper so easily -- because their ways of life are not so oriented toward the production of wealth. And does anyone doubt that if, overnight, the 500 million Indians were miraculously replaced by the same number of Swiss, India would soon be numbered among the more affluent nations?

By "misgovernment" one simply refers, among other things, to the fact that most of the poorer countries are dominated by political regimes that are anti-liberal in their politics and anti-capitalist in their economics. These governments are ideologically committed to the redistribution of wealth and to the frustration of business enterprise which creates wealth. Since the wealth they wish to redistribute does not exist in their own countries, they have decided to redistribute the wealth of the United States and the nations of Western Europe. And their rationale for doing so is that this wealth, in the first instance, derives from an "exploitation" of their countries by the capitalist world.

It is this last accusation which provides the impetus for "the new cold war." It is, on its face, absurd. The supposed exploitation derives from the fact that the poorer nations export raw commodities to the industrialized nations. Since they have nothing else to export, and since these exports are paid for, this is a perfectly natural and not at all unhealthy state of affairs. For the better part of the 19th Century the United States was in exactly this condition: it was the income from the sale of cotton, wheat, and minerals which eventually formed the basis for our industrial development. But many of the underdeveloped countries today, having witnessed the success of the OPEC cartel, would like the United States and Europe to help them establish similar cartels in other commodities. To justify this demand that we organize international trade to our own disadvantage, they offer various woolly, neo-Marxist arguments to the effect that their poverty is the result of our prosperity.

Ambassador Moynihan's Response

Incredibly enough, many Americans (and even more Europeans) seem inclined to appease rather than repudiate this claim. The sensible response has been outlined by Ambassador Moynihan. It is to the effect that their "economies do less well than they ought: that the difference is of their own making and no one else's, and no claim on anyone else arises in consequence." But his is a lonely voice in American foreign policy circles. The State Department itself is very much a non-ideological institution, and never fully appreciates the ways in which words and ideas ultimately shape world politics, and always prefers negotiation to confrontation. It cannot get much excited over the principle of expropriation (without due compensation) of American business overseas; it cannot see the ideological significance of setting up various "world authorities" to stockpile commodities and rig the international markets so as to "help close the gap" between rich and poor nations. It cannot even see the practical implications of such arrangements -- i.e., that you cannot "collectivize" and "plan" the international market economy without at the same time intervening massively in domestic market arrangements.

But what it cannot see, others can. There is, for instance, a whole flock of "progressive" and socialist economists in American academia who favor "a new international economic order" precisely because its consequences are bound to run against the grain of our liberal capitalist system. In effect, they are trying to launch a reform movement through the back door -- the front door now being under critical scrutiny after our dubious experience with those "Great Society" programs of yester-year. They feel that if the United States gets itself committed to the propriety and justice of a massive international redistribution of wealth and income, through a "planned world economy," then there is no way it can avoid a commitment to a similar redistributive policy, and a similar commitment to planning, internally. And they are absolutely right.

There is always a good case, in both principle and prudence, for the more affluent being charitable toward the poor - even to those whose poverty is largely their own fault. Nor is there any reason to expect, much less insist on, gratitude: such benevolence is supposed to be its own reward. But when the poor start "mau-mauing" their actual or potential benefactors, when they begin vilifying them, insulting them, demanding as of right what it is not their right to demand -- then one's sense of self-respect may properly take precedence over one's self-imposed humanitarian obligations. If the United States is to gain the respect of world opinion, it first has to demonstrate that it respects itself -- its own institutions, its own way of life, the political and social philosophy that is the basis of its institutions and its way of life. Such a sense of self-respect and self-affirmation seems to be a missing element in our foreign policy. It is no wonder, therefore, that we are making such a mess of the "new cold war."

• In an article on the subject of a meeting of the discussion group of the Trilateral Commission in Kyoto, Japan, Robert C. Christopher made the following observations:⁵

It was, in short, a remarkable cross section of the interlocking establishments of the world's leading industrial nations. And the way in which it had been assembled was almost as remarkable as the gathering itself. All 98 of the eminent participants had come to the ancient Japanese capital of Kyoto to attend a meeting of a discussion group somewhat awkwardly known as the Trilateral Commission. A brainchild of David Rockefeller which was transformed into reality by Zbigniew Brzezinski, the head of Columbia University's Research Institute on International Change, the Trilateral Commission is, in a sense, an international lobby -- a well-financed organization of private citizens dedicated to promoting closer cooperation between the U.S., Canada, the nations of Western Europe and Japan.

⁵ Christopher, Robert, "The World's New Cold War," International, June 16, 1975.

Insistent Demands: Because it is primarily concerned with the affairs of the world's most prosperous nations, critics have sometimes dismissed the Trilateral Commission as simply "a rich man's club." To some extent that label is deserved. And that made all the more extraordinary the theme which loomed largest in the discussions at Kyoto. Time and again, speakers from a dozen nations came back to the same point: somehow the present international system must be changed so as to accommodate the increasingly insistent demands of the poor nations for a greater share of the world's wealth. Underlying this judgement lay an assumption which was most dramatically stated by Brzezinski. "The main axis of conflict as most international conferences today," he said, "is not between the Western world and the Communist world but between the advanced countries and the developing countries."

Inevitably, some members of the Trilateral Commission doubted that the new nations would ever develop enough economic and military power to compel the industrialized world to heed their demands. But most seemed to agree that this was not really the point. What the new nations do possess, as Brzezinski pointed out, is negative power -- the power to refuse their cooperation in the maintenance of world order and thereby to promote violence and chaos.

Just about everyone at Kyoto was agreed on what the new nations wanted. The catchword for that was "equity" -- a reallocation of wealth and political power that would put the developing countries on a more equal footing with the industrial states. "The global distribution of income and wealth will become a central problem of international politics during the final quarter of this century," proclaimed Harvard's Professor Graham Allison.

When it came time to sum up the meeting, Francois Duchene of Britain's University of Sussex somewhat sardonically noted that "there has been total agreement on the need to improve the world and total disagreement on how to do it." There was some truth to that -- but also some exaggeration. For at least the movers and shakers gathered in Kyoto had found themselves largely in agreement in their diagnosis of the world's central political problem. As a group, they were in a rare position to press this diagnosis on the world's policymakers. And diagnosis, after all, is a necessary preliminary to any cure.

EMBARGOES, CONFLICT OVER SCARCE MATERIALS, AND ECONOMIC WARFARE

• In the wake of the Arab oil boycott, the President of the United States directed that a study⁶ be conducted to identify and assess potential threats to U.S. supplies of critical raw materials.

Embargoes and Other Interruptions -- A supply interruption can result from an embargo (denial of a product to a particular user or users) or from events that do not even involve us, such as a civil war or a natural disaster. In any case, the loss of supply could seriously hurt our economy, adversely affect our national security, or reduce our foreign policy maneuverability. The lost supplies do not have to account for a large portion of our needs to be highly disruptive. For example, the crude oil embargo covered only 15% of our petroleum and 8% of our energy needs. It should be emphasized, however, whatever type of disruptive event, they are rare. Since the end of the Korean War, the only time our economy and other developed countries were seriously affected by a foreign move was the recent action by the oil exporting countries.

Embargoes of raw materials are highly unlikely. They do not make economic sense in terms of producers' revenue objectives. The objective of increased revenue argues for selling at a high price rather than denying the product altogether. An embargo, however, may be undertaken for political reasons, as in the case of the Arab oil producers. If the politically inspired embargo is to be sustained, the producing countries must also have economic muscle. The Arab oil producers had both political desire and economic strength. This combination was not found in any other group of producer countries we have examined. In particular, a realistic basis in political interests for an export embargo action by producers is difficult to identify.

U.S. Strategic Considerations

The degree of supply restriction entailed in price gouging or cartel-like action would not have a serious effect on U.S. defenses. The portion of U.S. consumption of critical materials required for defense production -- generally 10% to 20% in the event of war and about one-half of that in peacetime -- can be met under any foreseeable restrictions of this type. However, since such supply restrictions during a war would eventually influence the well being and efficiency of the labor force, they could have important secondary effects if sustained over a long period.

⁶ "Special Report: Critical Imported Materials," Council on International Economic Policy, December, 1974.

Supply interruptions or cut-offs could cause problems in supporting our defense during a national emergency. Almost all imported commodities have some defense-related applications. Obviously, we must protect against supply disruptions due to war conditions. Additionally, even though the probability of supply interruptions due to embargoes, civil disturbance, or other political factors may be low, the cost would be so great in a war that such interruptions should also be guarded against.

• In an editorial research report in which she examines the nature of trade cartels,⁷ Mary Costello provides the following overview of the historical impact of cartels on world stability and then examines means by which boycotts and embargoes by cartels can be opposed and effectively countered.

In the short term, it has been suggested that importers of oil and other commodities form a counter-cartel and either raise the price of goods and services they sell cartel members or withhold those goods and services until the cartel agrees to lower prices. The products frequently mentioned for counter-cartelization are foodstuffs, weapons, and technology.

A food boycott against the oil cartel, Andrew Tobias argues, "would never work--the relatively little food OPEC needs would come from someone; perhaps even the Russians." Weapons, and industrial equipment, which most OPEC members desperately want or need, are perhaps likelier candidates for counter-cartelization. The United States, Western Europe and the Soviet Union have a virtual monopoly on the former and, with Japan, possess most of the equipment and know-how that OPEC countries must have to modernize. If the United States and its European allies could agree to withhold arms or technology from cartel members, most observers doubt that such staunch anti-Communists as the Shah of Iran or King Faisal of Saudi Arabia would turn to the Soviet Union for this equipment.

The proposal for increasing the price of goods exported to the oil producers "has at least three drawbacks," Keatley asserted in The Wall Street Journal. "It assumes that Western industrial nations would act together rather than underbid one another, an unlikely condition. It assumes that export sales could cover most increased oil costs, which they can't. And it forgets that members of the Organization of Petroleum Exporting Countries would probably use the price rise as an excuse to increase oil prices again, further accelerating the world's inflationary spiral."

⁷ Costello, Mary, Editorial Research Reports, "International Cartels," 1974, Vol. II, No. 18, November 8.

• The following article by Richard J. Levine,⁸ a writer specializing in military affairs for The Wall Street Journal, addresses the question "Is Military Action An Acceptable Means of Forcing the Removal of Nonbelligerent Embargoes or Sanctions?"

Throughout its 90-year history, the U.S. Naval War College here has tried to anticipate events and prepare American officers for them.

In the years before World War II, the College placed heavy emphasis on the coming conflict with Japan, developing in its "war games" the strategy and tactics that helped win the battle of the Pacific. With the onset of the Cold War, the College started offering students large doses of geopolitics, science, economics and management as well as traditional military subjects.

Now, in the wake of the Arab oil embargo, the War College has begun to grapple with a new subject--the role of military power, especially naval power, in a period of growing U.S. dependency on imported oil and metals.

This is an extremely sensitive issue for a military establishment still scarred by its experience in Vietnam. It raises the specter of military action designed to insure continued American access to raw materials and fears of nuclear confrontations between the U.S. and the Soviet Union. It is also an extremely complex subject, dividing the experts and producing better questions than answers at this point. But as hopes fade for U.S. energy self-sufficiency by 1980, it looms as a legitimate concern of national security planners, one they can ill afford to ignore or minimize.

"Can the military contribute anything to the resolution of this largely economic issue?" pondered Vice Adm. Stansfield Turner, the thoughtful President of the War College, in preparation for a recent conference here on "Resource scarcity as a possible source of future conflict."

"Can the availability and display of military force prevent other nations from taking actions inimical to our interests, or doesn't this work any more? Is military action an acceptable means of forcing the removal of non-belligerent embargoes or sanctions? Would stockpiling necessary raw materials be preferable to an equivalent investment in military forces?"

Good questions. But later, in summing up the three-day conference, Adm. Turner was forced to concede that there is "uncertainty as to the extent of (potential

⁸ Levine, Richard J., The Wall Street Journal, "Armed Force and Scarce Materials," July 17, 1974, p. 1.

resource) scarcity" and "uncertainty as to the applicability of military force." While several conference speakers downgraded the value of military power in dealing with resource problems many (though not all) of the students instinctively rejected this view. Yet even the most hawkish officers seemed to lack a clear idea of how such force might be employed in what Henry Kissinger has called an era of "global interdependence."

Adm. Zumwalt's Warning

One American officer who has attempted to define the relationship between military power and energy shortages is Adm. Elmo Zumwalt, the recently retired Chief of Naval Operations. To his credit, Adm. Zumwalt raised the issue publicly in early 1972, when few Washington officials were worrying about U.S. dependence on Persian Gulf oil. In his budget presentation that year, the controversial CNO cited a "new" and "emerging" role for the Navy -- protecting oil tankers en route to the U.S. from Soviet warships.

"During the past year, it has become increasingly clear that by 1985 or so we will have to import perhaps a half of the petroleum we need," Adm. Zumwalt lectured Congress. "This will require from several hundred to over one thousand tankers, each of 70,000 tons, fully committed to deliveries of oil to the U.S. The potential for coercion of the U.S., with or without allies, inherent in this situation is ominous when one considers the measures the Soviets are taking to improve their navy."

Based on this analysis, the admiral concluded that the U.S. Navy needed more and newer escort ships, mini-carriers, destroyers, frigates--to meet this threat and keep the seelanes open. Viewed against the past year's events, the Zumwalt statement seems prescient, at least in part. But at the time, it was dismissed by a leading Pentagon critic, Rep. Les Aspin (D., Wis.) as merely "a desperate attempt to justify unnecessary increases in the Navy budget."

In addition to Adm. Zumwalt, two other important government officials have discussed the military implications of growing U.S. reliance on overseas resources--Senate Foreign Relations Committee Chairman J.W. Fulbright and Secretary of Defense James Schlesinger.

In a Senate speech in May 1973, the iconoclastic Fulbright speculated about the possibility of U.S. military intervention in Mideast oil-producing states.

"Our present policymakers and policy-influencers may come to the conclusion that military action is required to secure the oil resources of the Middle East, to secure our exposed 'jugular,'" the Arkansas Democrat insisted. "There is no question of our ability forcibly to take over the oil-producing states of Middle East. They are militarily insignificant, constituting what the geopoliticians used to call a 'power vacuum.'"

About a half year later, with the Arab oil embargo starting to pinch in the U.S., Mr. Schlesinger spoke out for the first time. "I would not want to completely reject the possibility, but it is difficult to imagine circumstances in which the U.S. would move and employ vigorous physical actions to protect economic interests."

A few weeks later, on Jan. 7, the tough-talking Pentagon boss went further, warning the Arab oil producers against using their economic power "in such a way as would cripple the larger mass of the industrialized world. That is running too high a risk, and it is a source of danger, I think, not only from our standpoint but from the standpoint of the oil-producing nations." Although Mr. Schlesinger added that he thought it "won't come to a show of military force," his statement prompted Arab vows to destroy the oil fields themselves if attacked.

Such bold rhetoric generates headlines, of course, and may even, as some experts suggest, help deter future economic sanctions against the U.S. but it tends to over-simplify dangerously a complex issue on which there has been little serious behind-the-scenes study and even less public discussion. Which is why the work being done here -- confined thus far to the pages of the Naval War College Review and last month's conference -- is so riveting.

The lead article in the May-June issue of the Review is entitled "Oil and National Security." Its authors are two young civilian defense analysts, Barry M. Blechman (currently with Washington's Brookings Institution and

formerly with the Center for Naval Analysis) and Arnold M. Kuzmack (a naval analyst at the Defense Department in the late 1960s). Their main conclusion is that creation of a national oil stockpile is "the only strategy that promises to be effective against peacetime and wartime supply interruptions." Stockpiling oil, they believe, would reduce the vulnerability of U.S. officials to economic pressure to shape foreign policy to Arab whims and also "serve to assure U.S. oil supplies in the event of a major war with the Soviet Union."

In the "highly unlikely" event of such a conflict, Messrs. Blechman and Kuzmack argue, it would be "virtually impossible to prevent" the Soviets from successfully disrupting the oil-importation at its weakest link -- the Strait of Hormuz at the entrance to the Persian Gulf -- by laying mines.

Because tankers would be unable to pass through the strait, the analysts maintain, "it makes little sense to spend substantial sums of money to strengthen other parts" of the oil system from the Gulf to the continental U.S. Thus, they argue, "A program to build destroyer escort ships to convoy tankers from the Gulf to the U.S. would not appear to be an efficient allocation of resources."

Nevertheless, the authors don't lightly dismiss the relevance of military power -- and action. "Military force," they write, "can be an effective political weapon in the event of peacetime supply interruptions, despite the recent trend to downgrade the utility of military force as a means for the superpowers to secure their objects vis-a-vis smaller nations."

Then, in words reminiscent of Sen. Fulbright's, they declare: "A military intervention to terminate an oil boycott could well appear to be a viable option if the boycotting states controlled a sufficient portion of world production and were willing to maintain the boycott long enough to seriously impair the functioning of the U.S. and the West European economies... A U.S. administration faced with an oil-related economic slump as well as consumer (that is, electorate) pressure to 'do something' might well feel compelled to exercise this option."

This is strong stuff. And the authors admit there are risks -- the difficulty of running Arab oil fields "in the face of sabotage or other opposition" and, even more dangerous, the possibility of Soviet counteraction. But from the safety of their typewriters, Messrs. Blechman and Kuzmack forecast little likelihood of "Soviet involvement."

A Nuclear Crisis?

Perhaps. But other experts aren't so sure. They predict that any U.S. intervention in the Persian Gulf states could quickly lead to a nuclear crisis between Washington and Moscow. Indeed, retired Vice Adm. John M. Lee told the conference that as the military forces of the U.S. and the Soviet Union come into essential balance, "military operations are of declining utility" in achieving national purposes: "The truly vital problems of the human race, the gut problems, aren't susceptible to military solutions," he said.

That kind of talk from an admiral left a number of military men muttering that his perceptions had been distorted by long years of working on arms control problems. But it did gain support from several other conference speakers -- Robert E. Hunter, foreign policy advisor to Sen. Edward Kennedy, and Karl E. Birnbaum of the Swedish Institute of International Affairs.

As Professor Birnbaum sees it, the fact that the Arabs were able to impose their embargo, production cutbacks and price increases on the U.S., Western Europe and Japan demonstrates that military solutions to energy problems are no longer possible in today's world. "It's inconceivable that 10 to 15 years ago, (small) nations could have gotten away with what they did," he said, implying that at that time the Arabs surely would have faced military action.

But even this analysis is disputed by some experts. One school holds that the only reason the industrialized democracies didn't resort to force was that the Arab actions weren't so severe or so prolonged as to endanger their survival. In the future, the results could be different.

equilibrium that Jack Hirshleifer's points about the nature of international agreements become important. In a world where there is no superordinate legal entity, an equilibrium (an agreement) can be maintained in two ways. One way is essentially through ethical dictates and constraints. The other involves a state of affairs, which may or may not be embodied in an agreement, where both parties continue to operate in a certain way because neither side finds it profitable to disturb the equilibrium; it's a self-enforcing situation. Both of these concepts result in a long-run equilibrium situation, and both are somewhat similar to the prisoners' dilemma where people cooperate because they know that, if they don't, the next time around they could have their "throats slit." In my opinion, these are some basic conceptual levels that I have been able to distill from the discussion during this Workshop.

NO FURTHER COMMENTS

TABLE OF CONTENTS

	Page
<u>Economic Conflict and National Security</u> by Major General Robert N. Ginsburgh (USAF, Retired)	J-1
<u>Economic Conflict</u> by Commander Rolf H. Clark	J-4
<u>The Use of the Morgenstern-Thompson World Model for the Study of Problems in Economic Warfare</u> by Dr. Gerald L. Thompson	J-6

Confronted with sharply conflicting expert testimony, it is difficult for the layman to draw firm conclusions about the value of military force in dealing with potential future raw materials problems. However, it seems clear that constraints on the use of military power are much greater than in the past. What is required is sober study of the whole issue rather than brash statements from high-ranking officials. For "gunboat diplomacy" in a world of proliferating nuclear weapons and shrinking resources is potentially suicidal.

• A research project conducted by Professors Choucri, Laird, and Meadows at the Massachusetts Institute of Technology "traces the effects of domestic needs and scarcities in advanced technological societies upon international behavior" for the purpose of developing conceptual tools to predict future responses of nations faced with resource scarcity.⁹

In a world of finite resources, the net effect of increasing demands for external resources is to provide unavoidable limitations on the availability and accessibility of raw materials for all states. Where resources are plentiful, this situation is not likely to have serious implications for the conduct of international relations. However, when resources become more scarce and costly, competition may take on a distinctly political complexion tending potentially toward conflict both among industrialized societies or between technically-advanced and less-advanced societies, or both.

...it is important that we apply, further develop, and refine existing methodologies now for determining and analyzing the relationships and interdependencies involving organization and habit structure, the generation of demands, acquisition of resources and the pricing system, major allocations for specialized capabilities, economic and population growth, international competition and conflict, and so forth. It is necessary to assess the comparative advantages and costs and alternative technologies drawing upon particular deposits of resources, and to design alternative strategies for meeting human demands in viable and non-violent ways.

⁹ Choucri, N., Laird, M., Meadows, D.L., Resource Scarcity and Foreign Policy: A Simulation Model of International Conflict, Center for International Studies, Massachusetts Institute of Technology, Cambridge, Mass., 1972.

In the interest of illustrating the behavior of a state attempting to deal with the "dual imperatives of growth and constraints," the foregoing authors observe that Japan is a most revealing example:

During the interwar period, Japan invaded several adjacent regions to secure raw materials and additional food and to provide added space for eventual emigration. As long as Japan concentrated her activities in low capability countries with primarily agrarian economies, these expansions were relatively costless; however, when she came into contact with other industrialized states, her attempts to develop a "Greater East Asia Co-Prosperity Sphere" were severely constrained. Eventually, Japan perceived war as the only viable course of action to secure resources and needed markets.

Today, Japan's position is not too dissimilar. Her reliance upon external resources is much greater than before the war. However, other avenues are now open, such as extensive trade with the West and with client or host states in Asia. As long as these relationships are not disrupted, there probably will be no serious international problems. However, if severe obstacles -- political, economic, or otherwise -- to resource acquisitions or access to markets arise, Japan (along with other advanced industrial nations) possesses the technological capability to undertake a militaristic or coercive course of action. This is not to suggest that such avenues are inevitable, but that it is not inconceivable for earlier patterns of behavior to reemerge if the proper conditions are present.

The implicit, but as yet untested, hypothesis in the foregoing is that the failure of attempts at non-coercive expansion, such as commercial or trading activities, will lead (if the capabilities are available) to militaristic alternatives: industrialized states will employ brute force before willfully accepting the economic costs of resource scarcity. A related hypothesis -- closing the feedback loop -- has been put forth by Chou En-tai in a recent interview with James Reston. "Economic expansion is bound to bring about military expansion. And that cannot be restrained by a treaty. Look at all your nuclear bases in Japan. Even if you are to withdraw your nuclear weapons, the nuclear bases are there, and they can make use of them." These hypotheses converge around the consideration that international conflicts

may be traced to technological, economic, and ecological differentials among nations.

When viewed in a comparative context, the profiles of nations along with the demographic, technological, and resource dimensions, might provide some clues into political predispositions and international behavior. Historically it has appeared that the outcomes of expansion, conflict, and violence differ considerably whether the population-technology-resources calculus for a particular nation registers on a high or low end of the spectrum, or variations thereof.

• An excerpt from the International Encyclopedia of the Social Sciences briefly outlines the characteristics of economic warfare and state trading as follows:¹⁰

Economic warfare and state trading

All the techniques of economic warfare, many of which have already been mentioned, may be classified as acts of buying or selling, borrowing or lending. The use of these techniques is consistent with either private or state trading. If private trading is the predominant form, however, then economic warfare can be waged only insofar as the government intervenes and acts, either positively or negatively, to influence the decisions of private traders.

A government-imposed quota or increased tariff in a country where private interests do the foreign buying may be an act of economic warfare if its intent is to improve the country's relative power position. A loan, sale, or purchase of some product, bilateral balancing of trade, and many other measures may also constitute economic warfare. The ingredient common to all these techniques is government action. Private actions may in some cases have the same result as economic warfare, although they are not necessarily so intended. Only government action is intended to be in the national interest and only government action, directly or through private traders, can constitute economic warfare.

TO Sills, David L. (editor), International Encyclopedia of the Social Sciences, The MacMillan Company and The Free Press, Vol 4, 1968.

• Dr. Yuan-Li-Wu, author of Economic Warfare,¹¹ conducted an extensive study of the nature of economic warfare; the role of trade, foreign aid, and financial controls on such warfare; the impact of economic coercion during World War II; and the relationship of economic warfare to foreign policy.

The concept of economic warfare may be interpreted in two different ways. In a narrow sense, it refers to all those international economic measures which directly enhance a country's relative strength. These measures are to be taken primarily, though not exclusively, during a military conflict in order to supplement other forms of warfare. In a broad sense, it comprises all those foreign economic policies that may have as their long-run objective the enlargement of a country's sphere of economic influence (and possibly a consequent contraction of that of a potential adversary).

...let us repeat again that although the object of economic warfare is fairly simple, the choice of methods depends upon a number of factors. We have already mentioned (1) the distinction between long-term and short-term considerations and (2) the stage of economic development of the adversary as two important factors. In addition, we should note the following: first, the scope of a shooting war or the extent of alignment during a rearmament race (the number of neutrals and their economic and political importance) will have a bearing on the effectiveness of different methods. The extent and intensity of any actual fighting tend to affect not only the will of employing specific economic warfare measures but also the quality of neutrality. Foreign countries that are not immediately involved themselves in any international struggle often try to hide behind a cloak of nebulous neutrality as long as they can, and in the absence of any large-scale shooting, they may remain in such a position for a long time. Differences between conditions of a "cold war" and those of a "hot war" are often related to these two factors.

Economic warfare is a means of reducing the enemy's relative power. But it by no means guarantees its instigator that the result will not be the establishment of no more than a near equality of power in the long run. Since war

¹¹ Wu, Yuan-Li, Economic Warfare, Prentice-Hall, Inc., New York, 1952.

can be avoided only if one side possesses a decisive preponderance of power, economic warfare may help to avoid war only if it can create such a relative power situation by itself. In the long run, it may do so. But it also may not. Economic warfare is decidedly a necessary weapon to assure victory, but it is not necessarily a means to avert an active conflict. The latter depends upon so many other things that any generalization in the abstract is not very meaningful.

The Dynamic Nature of Economic Warfare

The successful achievement of an international alignment giving a particular country a preponderance of readily available material and human resources may be regarded as the optimum fulfillment of economic warfare only from a static point of view. An aggressive policy would not stop at the mere isolation of the enemy bloc as an economic entity. For if it is an accepted principle that in economic warfare one should aim at diverting neutral supplies away from the enemy, there is no reason why the same principle should not be extended to the enemy bloc itself. The integrity of the enemy group and the realization of its policy as a unified economy dedicated to war or mobilization should not be accepted as sacrosanct or inviolate. On the contrary, aggressive economic warfare requires the adoption of all measures to disrupt the enemy's internal financial and direct economic controls and to cause the economic ties among member countries of the enemy group to disintegrate. When the enemy group is a newly formed alliance, the aim should be to prevent any serious consolidation of its economic power. A clear analysis should be made of the basis of the economic strength of the enemy group, as well as of its members, and measures should be developed pin-pointing the specific objectives. Propaganda and psychological warfare, with other measures short of direct and open military operations, may then be used in a sustained campaign to weaken the enemy bloc's economic potential.

For instance, the direct collection by the government of sufficient quantities of food to feed a large army (perhaps a system of taxation in kind) often underlies the whole structure of a peasant economy's war program. If this is accompanied by a forcible redistribution of land, the potential resentment of the population and the disillusion of the new land-holders might conceivably be exploited by covert means to disrupt the country's war fiscal program. Moreover, it may not be impossible to create financial chaos by overt financial operations such as those discussed in Chapter 5. If economic confusion can be created only in certain limited regions of the enemy bloc, it is well to realize that such a partial success

would reduce the enemy bloc's economic potential as a whole and that economic disintegration often follows its own law of acceleration. The sustained effort of Communist parties in sabotaging economic recovery in Europe, the successful fanning of inflationary forces in China, especially between 1947 and 1949 both by economic and other means, and similar attempts in Burma, Indochina, and the Philippines represent practical applications of a dynamic conception of total economic warfare. It goes without saying that comparable measures might be adopted in reverse.

• In an article in World Politics,¹² Anna P. Schreiber reviews two studies of the application of economic sanctions -- the US boycott against Cuba (1960-) and against the Dominican Republic (1960-62) -- in order to develop some generalizations about the role of economic weapons as instruments of foreign policy. Her conclusions are as follows:

In summary, economic coercion did put pressure on the Cuban economy, creating shortages and making economic development more difficult to achieve, but other factors contributed to these conditions. The US trade embargo placed the burden of Cuba's support on the Soviet Union, and may have reinforced its leaders' conservative attitude concerning the spread of revolution in Latin America. By helping to bring about and maintain a deep Soviet involvement in Cuba, economic coercion did not serve U.S. interests. It contributed to the tension between the Soviet Union and the United States, expressed in such dangerous confrontations as the missile crisis of October 1962. It is possible that the extension of Soviet influence in Cuba and a clash between the Soviet Union and the United States might have occurred even in the absence of a policy of economic coercion, but that policy clearly hastened these developments. U.S. economic coercion also provoked bad feelings between the U.S. and some of its friends and allies who were reluctant to support these measures. The policy has not brought down Castro's government; rather, it has given him a rallying point for the people and a scapegoat on which to blame his problems. As a concrete sign of U.S. hostility, the policy made it easier for Castro to justify a large army and totalitarian controls.

Although economic coercion would thus appear not to serve many U.S. interests, it was applied because it met public demands for action against Castro. The Government, reflecting the demands of an enraged public, was unwilling to allow Castro to benefit in any way from U.S. trade. The

¹² Schreiber, Anna P., "Economic Coercion as an Instrument of Foreign Policy," World Politics, April, 1973, No. 3, Vol. 25.

policy was a punitive reprisal against actions interpreted as being contrary to U.S. interests. In addition, economic coercion was applied and maintained as a symbolic affirmation of the U.S. belief in its right to maintain a position of preeminent influence in Latin America. It was a declaration of U.S. opposition to the spread of revolution and Communist influence in an area deemed to be within its "sphere of influence." For more than a decade, successive U.S. Administrations have felt that such a symbolic statement needed to be made in a forceful, concrete fashion. With the passage of time, goals and attitudes may well evolve and U.S. policy-makers may finally decide that the utility of economic coercion as a symbol has decreased. In view of the disadvantages of the policy described above, economic coercion against Cuba might in that case be abandoned.

Economic coercion was one important element leading to the brief success of U.S. policy in the Dominican Republic in the period 1960-1962. However, military threats and intense diplomatic activity were an equally essential part of the American efforts to guide Dominican political events in the desired directions. By blocking increased Dominican sugar sales in the U.S. market, the policy of economic coercion denied the already depressed Dominican economy access to one possible road to recovery. Economic coercion also gave U.S. diplomats leverage during negotiations with various Dominican political factions: U.S. negotiators could threaten to continue trade limitations or promise large future sugar quotas in exchange for desired actions. In the absence of complementary military pressures, however, it is unlikely that economic coercion alone could have dealt with the two attempted coups d'etat.

The experience of U.S. economic coercion against Cuba and the Dominican Republic suggest the limits of this type of activity as a tool of foreign policy. Its effectiveness may well depend on the support of diplomatic and military pressure.

It is mainly its symbolic function that makes economic coercion a tempting policy to governments. Regardless of its concrete impact on the target state, a government may consider economic coercion useful if it serves to declare its position to internal and external publics, or helps to win support at home or abroad. As long as economic coercion can serve such primarily symbolic functions, governments will no doubt continue to use it as a tool of foreign policy.

• In a report for the Ford Foundation¹³ dealing primarily with the dangers of nuclear proliferation and the need for reshaping national perspectives and reviewing strategic policy, Professor Garry Brewer addresses the role of economic tools which could be implemented in unconventional conflicts of the future.

The world's population will double in 35 years at current rates of population growth...What is likely to happen in the future when surpluses are outstripped by the worldwide demand for food? The future has lately been ominously alluded to by several politicians. Senator Herman Talmadge, it has been reported, recently told a gathering of Kansas farmers that "agri-business means agri-power." The concept has been cropping up more frequently than ever, and implicit in the concept is a policy advocating the use of food as a coercive weapon. Food is a weapon.

Are there other likely, but as yet unrealized, weapons that might be employed in unconventional conflicts of the future? The answer is yes, and several of these have already appeared on the international scene.

Oil was used against the developed nations by the oil cartel in the early 1970s, and is likely to be used again as the leadership of the Middle East is forced to play its main trump card to attain world stature and power. Other natural resources have been similarly used, but with less success to date, mainly because of substitutional effects and the absence of political cohesion and solidarity among those controlling the resource in question. We should expect more of this kind of behavior, however, as certain natural resources are used up.

Technology has been used as a carrot in the past, and will likely be used as a stick in the future. ... "their (commodities and technology) use will become increasingly coercive and competitive throughout the next decade or so as the basic fact of unconstrained population growth places unimagined stresses and burdens on social and political institutions around the world."

Unconventional warfare, in this sense, describes the likely situation where combatants wage wars over any or all of these commodities or products. Each represents a creative potential for both aggression and hostility.

¹³ Brewer, Garry D., "Existing in a World of Institutionalized Danger," Technical Report No. 102, March, 1976.

INTEP-STATE POWER RELATIONS: AN ANALYTIC FRAMEWORK

• At the core of inter-state economic conflicts are calculations and perceptions of inter-state power relations. Ray Cline, in his book World Power Assessment,¹⁴ discusses the strategic shifts occurring in international affairs and presents a new framework for analyzing power relations among states. As he states in his introduction:

...this book undertakes to study the elements of power in international politics and the gradual shift in the balance of those elements among nations and groups of nations in terms of a new formula based on old truths. To suggest the geographical foundations of this method of strategic analysis, and yet emphasize that the kind of power we are talking about is essentially political and economic, as well as military, I use a new word, "politectonics". By this I mean to denote the formation and breakup of power groupings, mainly regional in makeup, that determine the real balance of influence and force in today's international affairs.

Special Economic Strengths

An endless number of economic factors might be taken into account, but in this first attempt to assess perceived power in this way we have selected five for which reasonably good data are available. To these five we have assigned equal value, with the total possible weights equal to the highest GNP value weight. The inclusion of these factors is intended to augment the standards for comparison of economic strengths. They are: energy, crucial non-fuel minerals, steel manufacture, food, and foreign trade. Others would be useful additives but these five are recognized and highly visible elements of national economic capability. The judgements leading to such weighting are very general and to some extent arbitrary, but they reflect the common perceptions of international power.

Final Assessment

The calculations of perceived national power in accordance with our macrometric measurement formula are now complete including subjective judgments about national strategies and national will. At this point it is possible to

¹⁴ Cline, Ray S., World Power Assessment: A Calculus of Strategic Drift, Georgetown University, the Center for Strategic and International Studies, Washington, D.C., 1975.

complete a final table showing 40 nations of high strategic priority in 1975. The table on the following page is arranged in order of politectonic zones, and within the zones in order of total weights of perceived power. This table allows some useful insights into the distribution of international power. First, there are enough nations with clearcut strategic aims, and disciplined national support for those aims, to raise the total number of weighted units to a perceived power above the total based on size, economic strength, and military capability alone -- that is, from 495 to 531.7.

Second, a loss of coherent strategic direction changes power totals drastically. Politectonic Zone I, North America, is approximately equal with Zone II, the Soviet bloc, in the more quantifiable forms of power, but the coefficient for strategy and national will reduces perceptions of U.S. and North American power while it multiplies perceptions of Soviet bloc power.

Third, by all calculations, West Europe remains the politectonic zone with the highest total of perceived power. Even discounting non-aligned Communist Yugoslavia and politically endangered Portugal, this zone is still perceived as having more power than either North America or the USSR and East Europe when viewed as a unit. The leading individual states in West Europe still play primary roles in international affairs. There would be a drastic change in the world balance of power if West Europe drifted away from its strong historic ties to North America as these were set forth in the Atlantic Community concepts of the 1950s and 1960s.

Fourth, the control of vast oil supplies and political tensions in the Mideast make this politectonic zone the most potentially volcanic region in the world. The tremors of dislocations in this unstable area spread immediately all over the globe. They have special impact upon the industrial economies of Northeast Asia and West Europe. The present trend is toward division along a political fault line with Iraq and Syria leaning toward the Soviet zone and most of the other states leaning toward the United States or West Europe.

Fifth, the militant communist regimes of East Asia are not yet formidable enough to challenge the superpowers effectively on a global front, but the perceived power of China, North Korea, and Vietnam is causing their Asian neighbors deep concern over their own security and independence. The romantic promises of revolutionary Maoist doctrine appeal to the young and underprivileged everywhere, causing present disorders motivated by dreams of the future.

$$\text{Perceived Power} = (C + E + M) \times (S + W) *$$

Zone	Country	Elements of Perceived Power	Coefficient for National Strategy and Will	Total Weighted Units of Perceived Power	Politectonic Zone Totals
I	United States	50	0.7	35	62.9
	Canada	20	0.9	18	
	Mexico	11	0.9	9.9	
	<i>Subtotal</i>	81			
II	USSR	45	1.5	67.5	104.7
	Poland	11	1.0	11	
	East Germany (DRG)	10	1.0	10	
	Czechoslovakia	7	1.0	7	
	Romania	7	1.0	7	
	Cuba	2	1.6	3.2	
<i>Subtotal</i>	82				
III	China (PRC)	23	1.0	23	46.6
	North Vietnam (Indochina) (with South Vietnam)	10	1.4	14	
	North Korea	6	1.6	9.6	
<i>Subtotal</i>	39				
IV	West Germany (FRG)	18	1.5	27	104.8
	France	20	1.2	24	
	United Kingdom	19	1.0	19	
	Italy	15	0.8	12	
	Netherlands	8	1.5	12	
	Spain	10	0.8	8	
	Yugoslavia	8	0.7	5.6	
	Portugal	4	0.3	1.2	
	<i>Subtotal</i>	102			
V	Iran	14	1.4	19.6	34.5
	Egypt	9	1.1	9.9	
	Saudi Arabia	7	1.4	9.8	
	Turkey	10	0.8	8	
	Israel	4	1.8	7.2	
<i>Subtotal</i>	44				
VI	India	16	0.8	12.8	23.8
	Pakistan	11	1.0	11	
<i>Subtotal</i>	27				
VII	Indonesia	12	1.0	12	15
	Singapore	2	1.5	3	
<i>Subtotal</i>	14				
VIII	Japan	17	1.0	17	38.1
	China/Taiwan	8	1.5	12	
	South Korea	7	1.3	9.1	
<i>Subtotal</i>	32				
IX	Brazil	16	1.3	20.8	31.4
	Venezuela	6	1.5	9	
	Argentina	10	0.5	5	
<i>Subtotal</i>	32				
X	Nigeria	11	1.0	11	28
	South Africa	11	1.0	11	
	Zaire	6	1.0	6	
<i>Subtotal</i>	28				
XI	Australia	12	1.1	13.2	16.2
	New Zealand	2	1.5	3	
<i>Subtotal</i>	14				
		Totals 495		511.7	511.7

- * C = Critical Mass (Population + Territory)
 E = Economic Capability
 M = Military Capability
 S = Strategic Purpose
 W = Will to Pursue National Strategy

Sixth, the clusters of power in all of the other peripheral Eurasian politectonic zones (South, Southeast, and Northeast Asia) are not strong enough to resist outside pressure from either the USSR or the Asian communist nations without substantial reliable political and economic support from the United States and West Europe. Without such help, political instability in Asia is virtually inevitable.

Seventh, the outer circle zones (South America, Central and South Africa, and the Australia-New Zealand ocean area) are not yet powerful enough and are still geographically too remote to affect the world balance of power in the 1970s. Their present regional policies and their future strategic importance are important for longer-range U.S. policy planning, which should aim at persuading nations in these zones to support the independence of peripheral Eurasian nations from communist domination.

Eighth and finally, the power position of the United States as perceived in 1975 remains strong. With key alliances in other regions and with the survival of present international trade patterns, the United States with its existing alliance system is superior in potential power to any likely adversary or combination of adversaries. Yet the United States is having difficulty in maintaining this power position. There has been a failure of U.S. political leadership to lead in a clear national strategic direction. The people of the United States do not know for sure who our enemies are, what dangers to the United States they represent, or what is worth fighting for abroad. This situation has caused a loss of confidence among those nations dependent on U.S. security guarantees and the complex structure of U.S. overseas alliances is crumbling. The global balance of power is, in this context, at best in rough equilibrium, and dangerously unstable.

U.S. Policy: An Analogue from History

If the United States is to balance its foreign policy commitments with its national power, alliances with overseas nations are crucial, as the analysis of the world balance of power in earlier chapters of this book indicates. Key strong nations in the whole politectonic structure must be preserved lest the crumbling of some destroy the foundations on which others rest.

Every man will have his own prescription for a redefined U.S. strategy that would win national support and permit the United States to conduct a foreign policy in pursuit of a favorable balance of world power. From my viewpoint, the most promising strategic blueprint of the

1970s and 1980s would be a limited system of core alliances formed or reconfirmed on a voluntary basis by strong nations strategically linked by common political, economic, and security interests with the United States. The model ought to be the Athenian League of the fifth century B.C. which defeated the onslaught of the armies sent by Persian tyrants to conquer Greece. The Athenian League's use of seapower and voluntary fiscal contributions, as well as the ships and fighting men, of allied Greek city-states permitted the mobilization of military forces which were more dynamic and better led than those of the much more powerful absolute monarchy the Greeks were fighting.

For many years the Athenian League experienced a period of remarkable success in keeping peace and protecting commerce in the whole Eastern Mediterranean. The wellsprings of what we consider civilization stems from this era. Only later the states of the League fell to bickering among themselves over burden-sharing, and Athens attempted to use naked force against her own allies to hold them together rather than working out clear common policy purposes. In these circumstances the alliance fell into disrepair and its ill-conceived and badly managed military ventures eventually destroyed it, along with the fortunes of all the member states.

What is needed now in the aftermath of the American Age of the 1950s and 1960s is to reconstitute a pattern of key alliances—a kind of latter-day Athenian League—on the basis of informed common understanding of the problems ahead. Such a group must be strong enough to encounter hostile moves by potential totalitarian adversaries. The aim of the United States should be to select and work closely with the main allies with whom we share interests and strategic aims. The ultimate goal is not imperial hegemony but a common dedication to insuring the safety and desired way of political and social life of these nations' respective citizens. To evoke the best and most realistic aspirations of the people in each society is the real role of national strategy.

Today what the United States needs is a consensus in support of a nontotalitarian alliance capable of maintaining an approximation of the present balance of world power. The right alliance at this time can stop unfavorable trends. It can only be a strictly voluntary association of a core group of friendly states, committed to a mutually beneficial cooperation with each other, in economic relations, in military burden-sharing, and in political planning. Its goals would embrace the essential purposes of the North Atlantic community, but its scope would be broader geographically and its functions not limited to military planning.

Other states should be viewed as potential associates of such a core group, and not as adversaries, unless they choose to be. The numerous nations of the Third World may join such an alliance if they accept the common strategy. Economic aid to all needy nations on a humanitarian basis ought to be one of the stabilizing policies of the alliance. It is unrealistic, however, to expect the less powerful nations to carry the burden or take the risks of major allies. Many political and social changes will disrupt the power potential of the hundred-odd weaker states. Not all of today's nations will survive, since local and tribal loyalties are strong and divisive in many regions. The leading nations, however, the core group, must stick together firmly in maintaining something close to the balance of power of the mid-1970s since all of them will otherwise suffer individual losses of security and influence adding up to an irreparable shift toward totalitarian domination.

The best name for such an association of independent nations might be "Oceans Alliance", in reference to the Atlantic and Pacific seaways which link these states. The many international associations in which the United States participates could continue as at present. The core group of nations in an Oceans Alliance structure would simply have to bind themselves to cultivate economic interdependence and cooperation in support of a common strategy.

DEPENDENCE, INDEPENDENCE, INTERDEPENDENCE: THE CASE OF OIL¹⁵

1. Dependence on any nations or persons requires: first, an essential product or service; second, its control by a single hand or united group. We need food, but farmers cannot deny us food so long as they are many and not united; hence we are not dependent on farmers. We are dependent on those persons who in concert control the supply of oil, and may restrict its production. Control of supply is the essence of monopoly, and dependence only an aspect of monopoly.

2. The cartel of the oil-producing nations has two special features which increase dependence.

a. Oil is a non-durable good, needed in a continuing stream. It is quite unlike the metals. The service we get out of steel or aluminum is embodied in an enormous stock of durable instruments. The stock is consumed only very slowly. So a year's cutoff by a steel or aluminum monopoly would deny us only the small annual increase in the stock, and we would have enough time to retrieve the situation. Oil stocks are normally a small percent of current consumption, and a cut-off does quick damage.

b. The oil cartel is composed of sovereign states. Some of them have accumulated very large foreign-exchange holdings, and can the more easily do without current income.

3. It is impossible to make any binding agreement with the sovereign monopolist of a non-durable good.

An agreement can only be enforced by competition or law or both. If anyone persistently violates his word, people will go elsewhere, and after a while he is out of business. Or else a court will say: perform or we will seize your assets. But the monopoly has suppressed competition, so there is no place to go. And sovereign states are beyond any law. Hence any agreement is truly "inoperative."

Experience supports logic. The OPEC nations have made, each of them, several agreements on oil in the last decade, and have broken every one. They are not bad people, or at least no worse than anybody else. Some of them envy and hate us, others feel differently, but that too does not matter. The market structure does.

Cooperation with the oil-producing nations is not good or bad; it is illusory. No matter what we give them, like accumulated wealth, once it cannot be withdrawn, it becomes irrelevant. They need only keep a bargain when it suits them.

¹⁵ A paper prepared for the Workshop by Professor M. A. Adelman, Department of Economics, Massachusetts Institute of Technology (MIT).

4. The cartel nations are not dependent on us because we have no monopolies comparable to their oil monopoly. However much they need our food or industrial products, they are sure of getting them by normal purchase, if not from one country then from another. The industrial nations are not united to control prices, and are not going to cut off their supply. (Nor, in my opinion, should they try.)

Trade may be called "interdependence," if we prefer five syllables to one. Aside from this, to speak of "interdependence" between oil producing and consuming nations simply ignores the structure of markets on both sides of the fence.

5. Political objectives are irrelevant to the operation of the cartel. Each cartel nation seeks power to advance its own political aims. The royal road to power is money. Therefore, despite any political diversity these nations agree on the cartel objective: maximum revenues. They may disagree on what price would maximize revenues, in short or long run. It is a difficult, perhaps insoluble problem. Moreover, they do not agree on how to divide up those gains; the discord has been contained, so far. But thoughts of splitting the so-called OPEC moderates from OPEC extremists, linkage with non-oil issues, political settlements, etc. disregard the nature of the cartel and are addressed to phantoms.

Mr. Kissinger's thesis that world oil prices are "political prices" is gratuitous error. When higher prices increase the revenues of the sellers, we need no far-fetched political hypothesis to explain them. But the hypothesis was pretty thoroughly tried in 1974. Astute diplomacy, with a little help from our friend the King of Saudi Arabia, would get the world price down from the "excessive" level of \$9.00 a barrel. (It is now \$11.50 and will be raised again.) In 1974 Saudi Arabia talked lower prices. It was the leader in raising prices, repeatedly. The Saudis promised an auction in Summer 1974 and won praise for their moderation. They they cancelled the auction for the best of reasons: it would have decreased the price.

6. Because the cartel members are sovereign nations, they can if necessary suppress competition by force, or the threat of force. Iran can limit outshipment from the Persian Gulf, at least until the Saudis build their pipeline to the Red Sea. Saudi Arabia will soon be, if it is not already, able to invade and occupy the neighboring areas in the Southern Persian Gulf. Distances are short, local population scanty, the terrain ideal for a quick move. Thereby the Saudis can shut down capacity which today is over 6 million barrels daily, nearly a fourth of cartel production. All the delusions about weakening the cartel through conservation and non-OPEC energy, even if real, would have no comparable importance.

7. The United States has always supported the cartel, without explaining why, either to insiders or outsiders. When the Libyans opened Pandora's box in 1970, we know now that some oil companies advised resistance; some, compliance; and some waffled. The United States Government insisted on giving the Libyans what they wanted. The then Managing Director of Shell later wrote Senator Church he did not know why.¹⁶ In September 1974 (after the auction fiasco) Secretary Kissinger and President Ford made "tough" speeches. But when Federal Energy Administrator Sawhill was asked what plans there were for bringing the price down, he replied truthfully that there were none. Mr. Kissinger was angry; Mr. Sawhill was fired; and the comic interlude was over. Recently, Mr. Parsky of the Treasury has said that "breaking up OPEC would be detrimental,"¹⁷ but he does not explain why. Nobody on Capitol Hill has enough interest or curiosity to ask him. In a recent article¹⁸ which was widely noticed because of the leak of State Department documents to a friendly writer, we twice hear the official view that cooperation with oil producers, particularly with Saudi Arabia, has been a great success. The Saudis have "a vast commitment by the U.S. Government to play a major part in fashioning their infra-structure and to sell, over the years, arms worth many billions of dollars." Giving the cartel-in-chief the power to suppress competitors strengthens the cartel, and enriches the members. Then the richer the cartel nations become, the easier for them to restrict output, the more dependent and insecure we are, and the less amenable they are to any American policy or interests.

8. The persistent attempt to import oil from the Soviet Union shows a pitiful ignorance. The Soviet Union has no excess capacity. Every barrel they sell us would be subtracted from a barrel sold elsewhere -- most likely to Italy, which thereupon would buy more from the Persian Gulf, at some trouble and expense to itself. Nothing whatever would be accomplished, except to make us look like fools.

9. The export to OPEC nations of \$100 billions of year of arms, civilian goods, construction services, public relations services, etc., while making some individuals rich, measures the transfer of wealth from them to us. It weighs most heavily on the less developed countries whom we must somehow bail out. They demand, and we will probably give them, the poisoned apple of commodity agreements, which will impoverish them further.

¹⁶ Multinational Corporations and American Foreign Policy. Hearings before the Subcommittee on Multinational Corporations of the Committee on Foreign Relations. 92nd Congress, Second Session, Part 8, pp. 771-773 (1975). For brief explorations of this history and what followed, see "A Diplomatic Situation Where Oil and Hauteur Just Didn't Mix", Washington Post, March 14, 1976, p. F11, and "How OPEC Came to Power," Forbes, April 15, 1975, pp. 69-85.

¹⁷ Time, January 19, 1976, p. 54

¹⁸ Edward R.E. Sheehan, "How Kissinger Did It," Foreign Policy, No. 22, Spring 1976, pp. 3-70.

10. The arms race paid for by oil money is making the world a more dangerous place. Every little patch of barren ground or sea water which might possibly contain oil is worth haggling or fighting over -- so much for any hope of a Law of the Sea or orderly exploitation of mineral resources in or out of it.

11. During the production cutback of 1973-74 (the so-called "embargo") the industrialized democracies fell apart. Member nations of the European Economic Community broke their own law, the Treaty of Rome, which prohibits restrictions on movements of goods, in order to help cut off the Netherlands. As in the 1930's, Europeans hastened to make friends with the tiger in the hope he would go eat someone else.

Yet the fraction of oil imports lost in the cutback was approximately the same for the "friendly" British (as the Arabs called them), the "odiously neutral" Japanese, the "unfriendly" United States. There was no embargo against this country, and grovelling did not make oil imports elsewhere any more available than here.

A selective embargo was and is impossible. If oil becomes unusually scarce in some consuming countries, prices rise there. The producers who don't cut back increase profits by diverting exports there, until prices are roughly equalized. (The oil companies did well to anticipate the inevitable.) The non-Arab governments have no difficulty in doing well by doing good. American imports are now between 6 and 7 million barrels daily and by 1980 they are expected to be around 9 mbd. Non-Arab OPEC capacity is today 14.5 million, and growing.

This is both good and bad news. The Arabs cannot hurt us without hurting everybody even worse, since we import much less of our oil consumption. (There was far more chaos here in 1973-75 than elsewhere, but we did that to ourselves.) But in hurting everybody else they also exert pressure on us. Therefore even zero U.S. oil imports would not remove energy dependence, only mitigate it. So long as the cartel keeps prices very high, the oil producing nations get increasingly rich, and can more easily afford production cut-backs.

12. There is no gift or concession anyone can make which will secure oil supply. The idea that "we must come to terms with them because they have the oil and we need it" is a cliché that gained acceptance because it was vague, and now seems clear because it is familiar. If the United States does anything that a large group of oil-producing countries do not like, they can use the threat of interrupting or reducing supply. Whatever we do to please them becomes past history, and they can use the same weapon later.

13. An orgy of constructing plants for shale oil, coal-based gas, etc., with direct or hidden subsidies, would at best provide very expensive permanent assurance of a very small part of the fuel supply, ten years from now. (It would also tell the cartel that oil is worth to us much more than even the prices they charge today.) But what we need is a short-time assurance of a large part of the fuel supply. It is useless extravagance to subsidize existing high-cost technology. Public resources should be used for research and development which have some prospect of reducing costs.

14. A stockpile would help. Half a billion barrels would tie up an investment of about \$8 billion. But even on conservative assumptions (see Appendix) it would protect us for about a year and a half -- provided that we reduce consumption by 10 percent through a severe excise tax, with rationing to prevent hoarding, recycling tax revenues in order not to penalize consumers as a group. Such a conservation program costs us nothing until it goes into effect. And the knowledge that we are prepared makes another cutback less likely.

15. Every cartel with excess capacity is vulnerable to disruption by buyers. Just now, the oil cartel's excess is massive. Hence what the cartel nations fear, as Iraq said so well last autumn when threatening Kuwait for a trifling price cut, is "competitive bidding among producers," i.e. among producing nations.

The United States could take the hint. As a large buyer, it could inject some competition, exploit the cartel's one weakness, lower its own import costs and disrupt cartel cohesion. A detailed plan for this has been published elsewhere.¹⁹ There is no stomach in Washington for this or any other scheme of defense. "Independence" and "interdependence" are the national tranquilizers. A modest suggestion: better to do nothing than to do harm. But the illusion of doing something is the opiate of the statesman - a comfort to those who will not think.

¹⁹ Briefly, it provides that imports be fixed to equate demand with supply. Import entitlements or tickets would be sold monthly at public auction to anyone paying in advance. This would create a primary market of some 200 million barrels monthly. Resale of tickets would be permitted, creating an unlimited secondary market. It would be impossible to prevent secret cheating through third parties' gradually bidding up the price of import tickets. The scheme has usually been mis-stated as a government import monopoly. A collusive bid by OPEC would do them no good because it could not be enforced. Evasion is too easy and profitable, not merely to get additional sales revenue, but to keep what a country already has. See M. A. Adelman, "Oil Import Quota Auctions," Challenge, January-February 1976, pp. 17-33.

Appendix. Protection by Stockpile Against 50 Percent Arab Cutback in 1980

Assumed: Arabs produce 65 percent of OPEC oil; no non-OPEC imports; no significant excess capacity; hence 50 percent Arab cutback = 33 percent less output; consumption cut 10 percent by excise tax and rationing.

	Before Cutback	After Cutback	Difference	Units
1. Total consumption	20.0	18.0	-2.0	mbd
2. Total imports demanded	10.0	8.0	-2.0	mbd
3. OPEC supply	10.0	6.6	-3.4	mbd
4. Deficit			-1.4	mbd
5. Thirty percent of normal stocks (34 x 20 x 0.3)		270		mb
6. Security stockpile		500		mb
7. Total stockpile		770		mb
8. Days' supply (770 ÷ 1.4)		550		mb

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APPENDIX N

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Recent events and trends in world affairs have focused attention upon the issue of inter-state economic conflict and possible national security implications in the decade ahead. In this context, the Office of Naval Research (ONR) took the initiative within the Department of Defense (DoD) to sponsor a workshop which would bring together key individuals from Government, the academic community, and the private research sector for purposes of exploring and discussing the national security implications of future economic conflict and the possible needs for research on this subject. This report presents not only a		

20) summary of the highlights and results of the workshop, but also a detailed record of the proceedings.

The main body of the report consists of a concise, point-by-point presentation of the principal consensus, as well as divergent views, opinions, and comments of the Workshop's participants with respect to economic conflict and national security research. The organization of the highlights of the proceedings of the Workshop reflects four major subject areas which may be briefly summarized as follows:

- Concepts, Definitions, and Current Methods of Analysis
Recognizing that this Workshop "broke new ground" by initiating exploratory discussion of the very broad issue of economic conflict, much attention was necessarily, and appropriately, devoted to defining the problem in terms of conceptual parameters and a vocabulary. During this discussion, the question "What are we talking about?" was addressed.
- A Profile of Economic Trends in the U.S.S.R.
The second subject area considered during the Workshop was the present and likely future domestic economic situation of the principal adversary of the U.S.--the Soviet Union. The general thrust of the discussion was directed towards an assessment of the overall status of the Soviet economy, the identification of specific constraints and burdens on the Soviet economy, and the development of some explanations of the implications of these trends.
- Current U.S. Government Forecasting and Policy Formulation Capabilities
The next general category of discussion during the Workshop involved an assessment of the capabilities of the U.S. Government to devise and implement policies involving economic conflict and to predict and to respond to economic conflict initiatives by other countries. Among the various case studies considered, particular attention was devoted to the U.S./NATO offset negotiations, the U.S. Government prediction of and response to the Arab oil embargo, and the general U.S. experience with policies of economic warfare.
- Suggested Areas for Research
The participants made special efforts to suggest guidelines, as well as to identify substantive areas and specific analytical techniques, for a research program which will address economic conflict as it relates to national security. General principles with respect to the scope and character of a potential research program were outlined and specific projects were proposed.

The footnotes provided in the Highlights of the Proceedings of the report enable the reader to refer directly to the appropriate appendices which contain a detailed record of the proceedings of the Workshop. The appendices also contain a selection of relevant extracts, a bibliography of economic conflict literature, some relevant comments prepared by several participants subsequent to the conclusion of the Workshop, a list of the Workshop participants, and the distribution list for this report.