



UNITED NATIONS  
GENERAL  
ASSEMBLY



Distr.  
GENERAL

A/8469 *and Add.1*  
22 October 1971

ORIGINAL: ENGLISH

Twenty-sixth session  
Agenda item 32

ECONOMIC AND SOCIAL CONSEQUENCES OF THE ARMAMENTS  
RACE AND ITS EXTREMELY HARMFUL EFFECTS ON WORLD  
PEACE AND SECURITY

Report of the Secretary-General

Pursuant to paragraph 3 of General Assembly resolution 2667 (XXV) of 7 December 1970, the Secretary-General has the honour to transmit herewith to the General Assembly his report on the economic and social consequences of the arms race and of military expenditures, prepared with the assistance of consultant experts appointed by him.

## CONTENTS

	<u>Paragraphs</u>	<u>Page</u>
Abbreviations . . . . .		3
Foreword by the Secretary-General . . . . .		4
Letter of Transmittal . . . . .		8
Introduction . . . . .	1 - 7	10
I.    QUALITATIVE ASPECTS OF THE ARMS RACE . . . . .	8 - 22	12
II.   THE ARMS RACE IN TERMS OF RESOURCES . . . . .	23 - 39	16
III.  THE DYNAMICS OF MILITARY RESEARCH AND DEVELOPMENT . . .	40 - 52	24
IV.   THE NATIONAL CONSEQUENCES OF THE ARMS RACE AND MILITARY EXPENDITURES . . . . .	53 - 89	28
V.    THE INTERNATIONAL CONSEQUENCES OF THE ARMS RACE AND MILITARY EXPENDITURES . . . . .	90 - 111	37
VI.   CONCLUSIONS . . . . .	112 - 120	42

## ANNEXES

I.    General Assembly resolution 2667 (XXV) . . . . .	45
II.   Military budget expenditure compared with other statistics, annual averages, 1967-1969 . . . . .	47
III.  Impact of disarmament on the demand for raw materials . . . . .	57
IV.   Bibliography . . . . .	59

## ABBREVIATIONS

OECD     Organisation for Economic Co-operation and Development  
SIPRI    Stockholm International Peace Research Institute  
USACDA   United States Arms Control and Disarmament Agency

## NOTE

The term "billion" has been used to signify a thousand million.

## FOREWORD BY THE SECRETARY-GENERAL

1. The primary purpose of the United Nations, as set out in its Charter, is to maintain international peace and security. The Charter also provides for this primary purpose to be promoted "with the least diversion for armaments of the world's human and economic resources".
2. Within days after the signing of the Charter in San Francisco on 26 June 1945, the explosion of the first atomic bomb ushered in the nuclear age. Since then disarmament, particularly nuclear disarmament, has been unanimously recognized as the most important problem facing the world. Despite continuous and intensive efforts, both within and outside the United Nations, the results achieved in resolving the problem have been far short of the needs. The arms race has continued. Military expenditures have steadily increased and more and more sophisticated weapons of mass destruction have been developed and stockpiled. The accumulation of weapons has reached a stage where it is more than sufficient to destroy all life on earth. The resulting situation constitutes a real threat to international peace and security. The need to halt and reverse the arms race before it reaches the point of no return is, therefore, a matter of grave concern to the international community.
3. It was with these considerations in mind that in 1970, the year of the twenty-fifth anniversary of the United Nations, I wrote:

"While progress in disarmament has been slow, science and technology - in particular, nuclear technology - have advanced at a formidable pace. Tremendous material resources and human creativeness have been applied to destructive rather than constructive purposes; and, despite repeated assurances to the contrary, the world becomes less secure with every new generation of more sophisticated weapons. This situation not only poses a continual threat to international peace, but also has a deep unsettling effect on human society, because of the dangers, anxieties and burdens it generates."\*
4. I also proposed, on 22 May 1970, in a statement entitled "Politics of Disarmament", that a study be undertaken of the economic and social consequences of the arms race, so that the problems of the continuing arms race and of massive military expenditures would be better understood and more fully publicized. Such a study should evaluate the effects of the incessant and rapidly increasing diversion of resources from peaceful to military purposes. This, I stated, would help to create a fuller understanding of the needs and the possibilities for reordering our priorities in the decade of the 1970s.

---

\* The United Nations and Disarmament, 1945-1970 (United Nations publication, Sales No.: 70.IX.1 and corrigendum), page v.

5. At its twenty-fifth session, the General Assembly, at the initiative of Romania, included in its agenda an item entitled "Economic and social consequences of the armaments race and its extremely harmful effects on world peace and security". Following the consideration of this item, the General Assembly unanimously adopted resolution 2667 (XXV) which, inter alia, called upon the Secretary-General to prepare, with the assistance of qualified consultant experts appointed by him, a report on the economic and social consequences of the arms race and of military expenditures and requested that the report be transmitted to the General Assembly in time to permit its consideration at the twenty-sixth session.

6. Pursuant to this resolution, I appointed the following group of 14 consultant experts to assist me in the preparation of the report called for by the General Assembly: Mr. Gheorghe Dolgu, Professor of Economics, University of Bucharest, Member of the Romanian Academy of Social and Political Sciences; Mr. Willem F. Duisenberg, Professor of Macro-Economics, University of Amsterdam; Mr. Vasily S. Emelyanov, Corresponding member of the Academy of Sciences of the USSR, Moscow; Mr. Plácido García Reynoso, formerly Professor of Mexican Legislation on Economics, School of Economics, University of Mexico, Mexico City; Mr. Vojin Guzina, President of the Federal Commission of Nuclear Energy, Belgrade, Professor of Economics, University of Belgrade; Mr. Douglas Le Pan, University Professor, University of Toronto, formerly Assistant Under-Secretary of State, Canadian Department of External Affairs, Ottawa; Mr. Ladislav Matejka, Deputy Director of the Research Institute for Planning and Management of National Economy, Prague; Mr. Akira Matsui, Commissioner, Japan Atomic Energy Commission, Tokyo; Mr. Jacques Mayer, Directeur des synthèses économiques à l'Institut national de la statistique et des études économiques, Paris; Mr. Maciej Perczynski, Professor of Economics, Polish Institute of International Affairs, Warsaw; Mr. Mullath A. Vellodi, Joint Secretary, Department of Atomic Energy, Government of India, Bombay; Mr. Henry C. Wallich, Professor of Economics, Yale University, New Haven, Conn.; Mr. Kifle Wodajo, Minister in the Foreign Service of Ethiopia, Addis Ababa; Lord Zuckerman, formerly Chief Scientific Adviser to the Government of the United Kingdom; Professor Emeritus, University of Birmingham, Professor at Large, University of East Anglia.

7. Mr. Mangalem E. Chacko, Deputy to the Under-Secretary-General for Political and Security Council Affairs, whom I designated as my representative to be in charge of the preparation of the report, served as Chairman of the Group of Consultant Experts on the Economic and Social Consequences of the Arms Race and Military Expenditures. Mr. Alessandro Corradini, Chief of the Committee and Conference Services Section, Disarmament Affairs Division, acted as Secretary of the Group. The Group was also assisted by Mr. Sidney Dell, Director of the New York Office of the United Nations Conference on Trade and Development, by Mr. Frank Blackaby, until recently editor of the SIPRI Yearbook of World Armaments and Disarmament, and by members of the Department of Political and Security Council Affairs.

8. The Group of Consultant Experts held three sessions, between February and September 1971, in connexion with the preparation of the report. In an opening statement I made to the Group at its first meeting, I drew its attention to General Assembly resolution 2667 (XXV), which should serve as the basis for the terms of reference of the experts. The various considerations, which the General Assembly had taken into account in requesting the preparation of the study and

which coincided with my own views, were set out in that resolution. I expressed confidence that the Group would assess the magnitude of the dangers of the arms race and the economic burdens which it created and that it would consider the most effective ways of reducing and finally eliminating both the dangers and the burdens and thus facilitating the implementation of much needed programmes of economic and social development in the coming decade. I also expressed the hope that the Group would be able to submit a unanimous report.

9. In the preparation of its report, the Group had before it, in addition to the information made available by the individual experts, replies of Governments to a note verbale dated 1 March 1971 enclosing a questionnaire sent by the Secretary-General in pursuance of paragraph 4 of resolution 2667 (XXV) as well as communications received from specialized agencies and from non-governmental organizations and institutions in response to requests addressed to them by the Secretary-General pursuant to paragraph 5 of the resolution. The note verbale of the Secretary-General, the replies of Governments and the communications from the specialized agencies and from non-governmental organizations and institutions are reproduced in an addendum to the report.

10. I am gratified that the Group of Consultant Experts has been able to submit a unanimous report embodying its findings and conclusions. After carefully studying the report, I have been impressed not only by the high level of competence with which the experts carried out their difficult and delicate task, but also by the effective way in which they have analysed the facts, set forth their views and drawn their conclusions. I should like to take this opportunity to express to the experts my appreciation and thanks for accepting my invitation to serve on the Group in a personal capacity and for having submitted to me a unanimous and valuable report.

11. I have decided to accept the report of the Group and to transmit it to the General Assembly, as the report called for by resolution 2667 (XXV).

12. In so transmitting the report, I should like to make a few brief observations. Although statistical study of world military expenditures, as the experts point out, is still in its infancy and comparatively little research into the question has been encouraged, the scale of the economic burden resulting from the arms race can be readily appreciated from the figures carefully assembled by the experts. Some of these figures deserve special mention. In 1961, when the report of the Secretary-General entitled Economic and Social Consequences of Disarmament was being prepared, the world was spending roughly \$120 billion annually for military purposes, equal to \$150 billion at 1970 prices. By 1970 annual military expenditures exceeded \$200 billion. The experts also estimated that if annual military expenditures continue to absorb their present percentage of world output, they could well reach the level of \$300-350 billion (at 1970 prices) by 1980, with a total outlay for the current decade of about \$2,650 billion 750 more than was spent from 1961 to 1970.

13. The report stresses that in a period during which no major countries have been at all-out war with each other, it is a new departure for the world to devote so large a proportion of its resources to military uses. It also points out that, although the relative share of world output devoted to military uses seems to have levelled off in the past few years, there is no ground for optimistic inferences, because the allotment of a constant percentage of a steadily rising

world output to military expenditures is precisely a formula for an unending arms race. It is equally apparent that a falling percentage could conceal an absolute increase in military expenditures. Moreover, a decline in the volume of resources, relative to gross national product or even in absolute terms, could be more than offset by the development of more deadly weapons.

14. Naturally enough, a good part of the report is devoted to an analysis of the national consequences of the arms race and military expenditures, with stress on "lost opportunities" in the civil field, as a result of resources being allocated for military purposes. Due attention is also given to the broader international consequences, in particular, the negative effects on international security, restrictions on international trade, and negative impact on the volume of aid by the developed to the developing countries. The report also makes it clear that whatever "spin-off" effects there may have been from military technology into the civilian field, it can reasonably be assumed that they could have been generated without the competitive challenge of militarism.

15. A very positive feature of the report is that, in dealing with the quantitative aspects of the arms race, it never loses sight of the more subtle but equally alarming consequences of the qualitative aspects of the arms race. With the acceleration of technological change, the perils which military expenditures have brought in their wake have become so acute as to provide man with the means of his own ultimate destruction. Security cannot, therefore, be achieved by further accumulation of destructive power. For, in the words of the report, the arms race has already resulted in the stockpiling of more destructive power than has any conceivable purpose.

16. Finally, as regards the conclusions contained in the report, I find them not only convincing but inescapable. I endorse these conclusions, and in doing so, I wish to express the hope that this report will contribute, in some measure, to the achievement of the primary purpose of the United Nations, to which all Member States are equally dedicated. The facts and figures which are assembled in the report and the conclusions contained in it should galvanize the world community into more strenuous and effective action to halt and reverse the arms race.

LETTER OF TRANSMITTAL

25 October 1971

Sir,

I have the honour to submit herewith the unanimous report of the Group of Consultant Experts on the Economic and Social Consequences of the Arms Race and Military Expenditures, which was appointed by you in pursuance of paragraph 3 of General Assembly resolution 2667 (XXV) of 7 December 1970.

The consultant experts appointed in accordance with the General Assembly resolution were the following:

Mr. Gheorghe DOLGU

Professor of Economics, University of Bucharest;  
Member of the Romanian Academy of Social and Political Sciences

Mr. Willem F. DUISENBERG

Professor of Macro-Economics, University of Amsterdam

Mr. Vasily S. EMEL'YANOV

Corresponding member of the Academy of Sciences  
of the USSR, Moscow

Mr. Plácido GARCIA REYNOSO

formerly Professor of Mexican Legislation on Economics,  
School of Economics, University of Mexico, Mexico City

Mr. Vojin GUZINA

President of the Federal Commission of Nuclear Energy,  
Belgrade; Professor of Economics, University of Belgrade

Mr. Douglas LE PAN

University Professor, University of Toronto; formerly  
Assistant Under-Secretary of State, Canadian Department  
of External Affairs, Ottawa

Mr. Ladislav MATEJKA

Deputy Director of the Research Institute for Planning and  
Management of National Economy, Prague

The Secretary-General  
United Nations  
New York



Mr. Akira MATSUI

Commissioner, Japan Atomic Energy Commission, Tokyo

M. Jacques MAYER

Directeur des synthèses économiques à l'Institut national  
de la statistique et des études économiques, Paris

Mr. Maciej PERCZYNSKI

Professor of Economics, Polish Institute of International  
Affairs, Warsaw

Mr. Mullath A. VELLODI

Joint Secretary, Department of Atomic Energy,  
Government of India, Bombay

Mr. Henry C. WALLICH

Professor of Economics, Yale University, New Haven, Conn.

Mr. Kifle WODAJO

Minister in the Foreign Service of Ethiopia, Addis Ababa

Lord ZUCKERMAN

formerly Chief Scientific Adviser to the Government of the  
United Kingdom; Professor Emeritus, University of Birmingham;  
Professor at Large, University of East Anglia

The report was prepared between February and September 1971, during which  
period the Group held three sessions, the first two in New York from  
16-19 February and from 20 May to 3 June, and the third session in Geneva  
from 23 August to 5 September 1971.

I have been requested by the Group of Consultant Experts, as its Chairman,  
to submit its unanimous report to you on its behalf.

Respectfully yours,

(Signed) M.E. CHACKO

Chairman  
Group of Consultant Experts

## INTRODUCTION

1. The discussions and negotiations which have been pursued in the United Nations and elsewhere in order to achieve the basic goal of the maintenance of peace and the elimination of war have led to some initial steps in the field of arms limitation and disarmament. 1/ Nonetheless they have not succeeded in halting, let alone reversing, an arms race which has grown ever more perilous over the years, and ever more wasteful of human and other resources. The resolution of the General Assembly which called for the present report emphasized that world military expenditures have been continuously increasing.
2. In 1961, when the report of the Secretary-General entitled Economic and Social Consequences of Disarmament 2/ was being prepared, the available data indicated that the world was then spending about \$120 billion annually for military purposes, roughly equivalent, at today's values, to \$150 billion. Ten years later we find the figure standing at about \$200 billion. The trend to produce and accumulate ever more sophisticated and ever greater numbers of costly and deadly weapons continues uninterruptedly. More and more States, including a growing number of smaller or developing countries which desperately need to use such resources as they can command for productive social ends, have found themselves impelled along this path.
3. Nuclear weapons constitute the most fearful category of armaments to which military expenditures are devoted, and these pose the greatest threat which mankind now faces. "The threat of the immeasurable disaster which could befall mankind were nuclear war ever to erupt, whether by miscalculation or by mad intent, is so real that informed people the world over understandably become impatient for measures of disarmament additional to the few measures of arms limitation that have already been agreed to." 3/
4. Chemical and bacteriological (biological) weapons have consumed only an insignificant part of total expenditures on arms, but the ominous shadow they cast over the world is totally disproportionate to their cost. The United Nations considers chemical and bacteriological (biological) weapons as belonging to the

---

1/ The Antarctic Treaty (1959); the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water (1963); the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967); the Treaty for the Prohibition of Nuclear Weapons in Latin America (1967); the Treaty on the Non-Proliferation of Nuclear Weapons (1968); and the Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-Bed and the Ocean Floor and in the Subsoil Thereof (1971). For details see The United Nations/and Disarmament, 1945-1970 (United Nations publication, Sales No.: 70.IX.1 and corrigendum).

2/ United Nations publication, Sales No.: 62.IX.1.

3/ Effects of the Possible Use of Nuclear Weapons and the Security and Economic Implications for States of the Acquisition and Further Development of These Weapons: Report of the Secretary-General (United Nations publications, Sales No.: E.68.IX.1), para. 94.

category of weapons of mass destruction, and has insistently called for their elimination. 4/

5. By far the largest part of the total of military expenditures which is devoted to equipment is, however, consumed in the development, production and purchase of conventional weapons such as aircraft, tanks and guns, the weapons which have been used in the wars which have marred this last decade. This generalization applies as much to the nuclear Powers as to the non-nuclear States.

6. The 1962 report of the Secretary-General, Economic and Social Consequences of Disarmament, considered the scale of the resources then being devoted to military purposes, and the peaceful uses to which they might otherwise be put. It dealt with the conversion problems that could arise, and the impact of disarmament on international economic relations and on aid for economic development. It concluded that all the problems and difficulties of transition connected with disarmament could be met by appropriate national and international measures, and that the diversion to peaceful purposes of the resources now in military use could benefit all through the improvement of world economic and social conditions.

7. We have been asked to approach the same general problem from the point of view of the economic and social consequences of the arms race and of military expenditures. We do so with a sense of urgency, in the recognition that until a halt is put to the race, there can be no assurance of international peace, and the threat of war, and particularly of nuclear war, will continue to plague the world; and that the pressing economic and social needs of the world, especially of the developing countries, make it imperative to secure the earliest possible release of resources now pre-empted by the arms race.

---

4/ See The United Nations and Disarmament, 1945-1970, chap. 16.

## I. QUALITATIVE ASPECTS OF THE ARMS RACE

8. The decade of the 1960s was marked by a greater spread and by a more extensive technological elaboration of armaments than any which preceded it. During the period, there were no developments comparable to the emergence of radio or radar, jet engines or rockets, nuclear weapons or electronic computers. Yet the decade will be remembered because over the years which it encompassed, supersonic flight became commonplace, not only in the military forces of the highly industrialized nations, but also in those countries in relatively early stages of economic development; because of the diversification of nuclear weapons in the armouries of a few major Powers, and because their multiplication meant the accumulation of destructive power, only a fraction of which would be enough to eliminate life on earth; because the development of ballistic missiles, and the sophistication of their guidance and control systems, made any point on earth open to precise attack by nuclear warheads; and because space technology added a new dimension to the field of military communications and surveillance. In short, the decade will be remembered because these, as well as other developments too numerous to mention, characterized the arms race of the period.

9. The make-up of military budgets varies from country to country, but it can safely be said that in the major arms-producing countries on average about half goes to personnel costs and the rest to a combination of research and development, purchase of equipment, construction and operations. The estimated total for world military expenditures over the period 1961 to 1970 is \$1,870 billion (at 1970 prices) (see section II, table 1, below), of which it can be reckoned that about \$600 billion was devoted to the purchase of equipment. By far the larger proportion of this sum was spent on conventional arms - guns and ammunition, transport vehicles and tanks, communications and surveillance equipment, aircraft and ships. The outlays on nuclear arms which the nuclear Powers have made over the years, and which are also included in this sum, have resulted in the stockpiling of weapons with a potential destructive power infinitely greater than that of all other armaments put together. The weapon-systems associated with nuclear armaments are not only extremely costly to produce, but as the 1967 report of the Secretary-General entitled Effects of the Possible Use of Nuclear Weapons and the Security and Economic Implications for States of the Acquisition and Further Development of These Weapons indicated, their vast "over-hitting" power makes them, in no conceivable sense, a substitute for conventional arms. As that report also pointed out, "it is highly debatable whether there are any circumstances of land warfare in which such weapons could be used as battlefield weapons or, if they were so used, would confer any military advantage to either side in the zone of contact". <sup>5/</sup> And as the Secretary-General's further report of 1969 <sup>6/</sup> indicated, the same general conclusion applies to chemical and

---

<sup>5/</sup> United Nations publication, Sales No.: E.68.IX.1, para. 86.

<sup>6/</sup> Chemical and Bacteriological (Biological) Weapons and the Effects of Their Possible Use (United Nations publication, Sales No.: E.69.I.24).

bacteriological (biological) weapons. Both of these categories of armament constitute weapons of mass destruction, not weapons in the sense in which the term is normally understood.

10. Of the total of \$1,870 billion which went to military expenditures over the period 1961 to 1970, an estimated 10 per cent - somewhat less than \$200 billion - was devoted to military research and development. This work was highly concentrated in the six countries 7/ which now account for more than four fifths of total military expenditure. Although only a minor part of the total, it is this outlay for research and development which determines the main feature of the modern arms race - the qualitative changes in armaments.

11. On the surface it would seem that the effort to improve the quality of armaments, or to defend against them, follows a logical series of steps in which a new weapon or weapon-system is devised, then a counter-weapon to neutralize the new weapon, and then a counter-counter weapon. But these steps neither usually nor necessarily occur in a rational time sequence. The people who design improvements in weapons are themselves the ones who as a rule envisage the further steps they feel should be taken. They do not wait for a potential enemy to react before they react against their own creations.

12. These features of the arms race show up very clearly in the field of long-range nuclear weapons. First there was a rapid change in the means of delivery, starting with the switch from manned bombers to liquid-fuelled ballistic missiles, beginning with intermediate and moving on to rockets of intercontinental range. Solid-fuelled missiles soon followed, deployed in concrete silos, in order to protect them from attack. In parallel, submarine-launched ballistic missiles were developed and deployed.

13. Not only did the variety, technical complexity, and cost of the means of delivery of strategic nuclear weapons increase during the decade, the number of nations with a nuclear capability also increased by the addition of France and the People's Republic of China.

14. With the introduction of ever more sophisticated and less vulnerable means for the long-range delivery of nuclear warheads, nations turned their efforts in military research and development to the problem of detecting and intercepting ballistic missiles. Special radar networks were set up to give early warning of missile firings, and towards the end of the decade, anti-ballistic missiles were being developed and even deployed. Simultaneously, efforts were directed to the devising of missiles with multiple warheads (MIRVs) capable of being aimed at a number of targets from a single launch, and so, theoretically, of overwhelming anti-ballistic missile (ABM) defences.

15. The research and development effort which has been devoted to nuclear armaments over the sixties has been enormous. It has involved far more than the traditional techniques of the aerospace and electronic industries. It has also penetrated the marine sciences and proved a powerful spur to studies of space technology. Military satellite communications, supplementing more conventional methods of communication, have also been deployed, as have also space surveillance systems.

---

7/ The United States, the Soviet Union, the People's Republic of China, France, the United Kingdom and the Federal Republic of Germany.

16. Vast technological developments have occurred in weapons and weapon-systems designed for air, land and sea warfare. The development and deployment of supersonic aircraft, equipped with air-to-air weapons, has greatly increased the cost and complexity of what are still regarded as conventional fighter aircraft. A modern fighter-bomber costs ten times the aircraft of 10 years ago which it replaced, while a sophisticated interceptor aircraft today could cost more than \$10 million, compared with \$150,000 for the corresponding aircraft of World War II. The vulnerability of such expensive weapons to attack when deployed on airfields, as well as that of their fixed bases, has in turn encouraged the production of vertical take-off aircraft and of the armed helicopter. These developments have widened the range of aircraft in service and the scale of the aeronautical research which has been called upon to support their development.

17. The familiar chain of new weapon, counter-weapon and counter-counter-weapon has also characterized the sphere of land warfare. The dependence of armies on armoured vehicles has intensified, the response to this change being the continued elaboration of sophisticated anti-tank weapons. Helicopters have been brought into greater use, in the effort to increase the mobility of land forces, particularly for the conduct of military operations in areas where communications are poor. This again, has increased the "depth of capitalization" of the armed forces, that is to say, the ratio of equipment costs to total military expenditure. But here, too, a counter-measure has appeared in the shape of the one-man anti-aircraft missile.

18. In the naval sphere nuclear and gas turbine propulsion have added new dimensions to the design of ships' machinery, at the same time as the armament systems of a ship have become a much more important element in its cost. The increasing vulnerability of surface vessels to air attack has been countered by the development and installation of anti-aircraft missiles. Counter-measures have followed, such as the stand-off bomb, which can be launched from beyond the range of the ship-borne missile, and the ship-to-ship guided missile. A whole new range of technologies has been brought into use in naval warfare in the past decade.

19. National inventories of stocks of armaments are never published, but some figures are available which reflect these various qualitative changes. At the outset of the decade, hardly any intercontinental ballistic missiles (ICBMs) had yet been deployed. By the end of the decade the estimated numbers were 2,150. In 1960 the deployment of submarine-launched ballistic missiles was negligible. By the end of the decade, some 55 nuclear-missile submarines were operational, comprising about 800 missiles, capable of delivering about 1,800 warheads. 8/

20. From 1960 to 1968 the world stock of fighting vessels is estimated to have increased from 4,550 to 4,900. This relatively small increase in numbers masks the much larger increase in the value of this stock (at 1968 prices, the value of the stock in 1960 was about \$34 billion, as compared with \$60 billion in 1968, a 75 per cent rise. 9/

---

8/ SIPRI Yearbook of World Armaments and Disarmament, 1969/70, pp. 46 ff.

9/ Id., pp. 307 ff.

21. A much more striking change occurred over the period in the world stock of supersonic fighters. At the opening of the decade their estimated number was 6,000. By the end it had doubled. In 1960 there were 15 production programmes for supersonic aircraft; by 1970 these too had doubled. 10/

22. This brief sketch of the qualitative changes in armaments that have taken place over the decade has been drawn only in bold outline. It does not point to any but a few categories of weapons, any more than it does to the arsenals of the countries in which they are to be found. But what it does show is that while the cost of the arms race in terms of the resources which it consumes is highly alarming, the mounting sophistication and destructiveness of the weapons which result from it are even more so. This stark fact needs to be kept clearly in mind when we come to consider the implications for the arms race of any decrease which nations might make in their military expenditures.

---

10/ Hoagland, John H., World Combat Aircraft Inventories and Production, 1970-75 (Cambridge, Mass., M.I.T. Press, 1970).

## II. THE ARMS RACE IN TERMS OF RESOURCES

23. The scale of the economic burden resulting from the arms race, and which the picture drawn in the previous chapter reflects, can be readily appreciated, even if some of the figures may lack precision.

24. As already noted, military expenditures for the world as a whole added up to an estimated total of \$1,870 billion (at 1970 values) over the period 1961 to 1970 inclusive. During the 10 years from the beginning of the decade, annual expenditures have increased by more than \$50 billion to reach their present level of about \$200 billion. <sup>11/</sup> The latter figure represents between 6 and 6.5 per cent of the total of world gross national product (see table 1). Military expenditures are in fact now running at two and a half times what all Governments are spending on health, one and a half times what they spend on education, and 30 times more than the total of all official economic aid granted by developed to developing countries. <sup>12/</sup> The economic scale of current world military expenditures can be realized even more dramatically when one remembers that they all but equal the combined GNP of the United Kingdom and Italy, or that of the developing countries of South Asia, the Far East and Africa together, with a total population of 1,300 million.

25. In a period in which no major nations have been at all-out war with each other, it is a new departure for the world to devote so large a proportion of its resources to military uses. Compared with previous periods in which the more highly industrialized countries were not at war with each other, such as the years before the First World War of 1914-1918, or the early 1930s before the Second World War, there have been two major changes. First, the world's standing armies are much larger than they used to be. Second and more important, the qualitative changes in weaponry described in the previous chapter mean that the weapons with which these armies are equipped have grown immensely in lethal power, in cost and in complexity. Up to now the "second industrial revolution" - for example, the commercial and technological exploitation of computers and electronics - has probably had a much more powerful impact on the

---

<sup>11/</sup> The sources used in this chapter are given in the foot-notes to charts 1 A and 1 B. The statistical study of world military expenditures is still in its infancy and comparatively little research into the question has been encouraged. This is mainly because of the issue of secrecy. Even allowing for this, and for the lack of comparable official data for different countries, a good deal could be done to improve the international comparability of national figures. The margin of error in the figure of \$200 billion for annual world military expenditures at the end of the 1960s is not known, and any figure for total expenditures between \$170 and \$230 billion would be plausible. There is a much smaller margin of error in the calculation of trends. In trend calculations, the main point is that the definition of military expenditure in the main countries should be consistent from year to year.

<sup>12/</sup> It should be noted, however, that in many countries a large proportion of spending on health and education is private.



military than on the civil sector. In consequence, the relative share of world output devoted to military uses in the years since 1949 has been at least double what it was in 1913, when there had already been three years of competitive rearming between the great Powers. It then stood somewhere between 3 and 3 1/2 per cent of world GNP. From 1950 to 1970, in the period following the Second World War, the share of world output going to military uses has been about 7 per cent. In short, if we compare the period after the Second World War with that before the First, world military expenditure has risen about twice as fast as world output. It is a highly disturbing fact that the world has increased the volume of resources which it is devoting to military uses at least twenty-fold during the course of this century.

26. Over the past 20 years, the rise, though rapid, has been irregular (see chart 1 A). It has tended to go up sharply in periods of crisis or war, and then level off for a number of years, but without returning to the pre-crisis figure. Thus, in the short space of the three years between 1949 and 1952, world military expenditure doubled in real terms. It then remained approximately level for nine years. It rose to a new plateau in the early sixties, and then very substantially from 1965 to 1967. It then levelled off.

27. The calculation of any trend depends greatly on the time period included. If one takes the whole period for which estimates are available - that is, from 1949 to 1970 - the long-term average rate of rise in world military expenditure, at 5 per cent a year in real terms, has been roughly in line with the rate of growth of the world national product. But during the post-war years the rate of growth in world national product has been unprecedentedly high. Consequently the absolute level of military spending increased very considerably over this period. Proportionately more of the increase came in the first half - the time of the Korean War - than the second half of the whole period.

28. During the period 1960-1970, the movement of military expenditures, as well as of their share in GNP, was irregular. As shown in table 1, the level of military expenditures increased considerably in real terms, but their share in GNP decreased somewhat by the end of the 1960s.

Table 1. World Military Expenditures and GNP

1960 - 1970<sup>a/</sup>

(Amounts in billions of constant 1970 dollars)

Year	World military expenditures	World GNP	Military expenditures as percentage of GNP
1960	150.5	2,023.5	7.4
1961	156.1	2,116.6	7.4
1962	167.6	2,213.7	7.6
1963	174.2	2,313.7	7.5
1964	174.0	2,462.4	7.1
1965	174.9	2,589.8	6.8
1966	190.5	2,732.0	7.0
1967	206.5	2,842.8	7.3
1968	209.9	2,963.9	7.1
1969	209.6	3,096.0	6.8
1970	202.6	3,204.1	6.3

<sup>a/</sup> Estimates prepared by the United States Arms Control and Disarmament Agency. World totals are based on national data adjusted to uniform definitions of military expenditures and GNP, in so far as available information permits.

29. It is customary, and obviously convenient, to use the share of the national product as a common measure for almost all kinds of expenditure; for example, expenditures on health and education, as well as military expenditures. On the other hand, the latter can hardly be regarded politically in the same category as expenditures on health and education, as a "collective good" which should always and inevitably be accorded a given share of the national output - a claim which is often deployed by the military in discussions about the size of defence budgets. There is another reason why it is misleading to treat military expenditures in this way. People might suppose that were the calculated percentage of the national product devoted to military expenditure by rival States to remain steady, they would not be engaged in an arms race. Equally, a falling percentage of national product could be taken to imply that an arms race was "going into reverse". Neither of these inferences would necessarily be true. Indeed, a steady percentage of a constantly rising world output would imply an unending arms race, at the same time as a falling percentage could conceal an absolute increase in military expenditures. The arms race has both qualitative and quantitative components. A decline in the volume of resources, relative to GNP or even in absolute terms, could be more than offset by the development of more deadly weapons. Economic evidence alone, therefore, cannot demonstrate that the arms race is abating.

30. World military expenditure is highly concentrated in a few large countries. Six countries out of 120 <sup>13/</sup> alone accounted for more than four fifths of the world total for the decade of the sixties. These countries - mainly the major industrial countries of the world which were involved to the limit of their resources in the Second World War - dominate, and indeed largely determine, the world trend. Not only do they account, in parallel with their relatively enormous contribution to world GNP, for the bulk of military expenditure. For a variety of reasons, partly historical, partly political, they also devote to military spending a larger proportion of their resources - about 8 per cent of their output, as an average - than do most other countries.

31. Developing countries play a lesser role in the global arms race. With nearly half of the world's population, they account for only about 6 per cent of world military spending, and their influence on the world trend in expenditure, and on the technological arms race, is consequently minimal. Further, they devote a smaller share of their resources to military purposes than do the major industrialized countries. Over-all only about 3 1/2 per cent of their total national output goes to their armed forces. Averages for the group of developing countries as a whole are, however, misleading. At the top end of the scale, some nine developing countries devote more than 10 per cent of their output to military purposes. At the lower end, there are 11 countries for which the figure is less than 1 per cent.

32. Although military spending in developing countries is very low in relation to that of the advanced countries, it is significant that in the decade of the sixties the rate of growth of military expenditures was appreciably faster in the developing countries than the world average - in contrast to what has happened in the six nations which are the major military spenders. Against a world rise of about 3 to 4 per cent a year, military spending in the developing countries has been increasing at a rate of some 7 per cent a year (see chart 1 B). When the needs of economic development are so pressing, it is a disturbing thought that these countries should have found it necessary to increase their military spending so speedily, particularly when their per capita income is so low. To the citizen of a developing country, with a per capita income of about \$200 a year, even the diversion of a few dollars for military purposes may rob him of one of the necessities of life.

33. The rapid rate of increase in military spending in developing countries should, however, be interpreted with caution. The arms race in the third world can be directly related to the wars in which it has been engaged. But as is fully recognized, some conflicts have not been conducted independently of the great Powers, which have provided considerable supplies of weapons and of finance. In other regions military expenditures have been rising from a very low base. A number of new States have been building up their armed forces virtually from nothing. When stated in terms of percentages, the rates of increase in these countries will obviously appear very high.

---

<sup>13/</sup> The 120 countries cover all the countries in the world with any significant military expenditure. The six major countries are: the United States, the Soviet Union, the People's Republic of China, France, the United Kingdom and the Federal Republic of Germany.

34. In addition to its qualitative aspects, the arms race has been discussed so far in terms of expenditure. This is the right basic measure for a study which is designed to ask what the resources now absorbed for military purposes imply in terms of the sacrifice of other opportunities. There are, however, other measures which may have some contribution to make to the analysis.

35. Theoretically it should be possible to measure the number of men involved in the arms race - that is, the "manpower absorption of military expenditure". Unfortunately, these calculations are difficult in practice. The number of men in the armed forces is known for most countries, <sup>14/</sup> but it is all but impossible to calculate precisely the numbers engaged in the production of goods used by the military - particularly in countries where weapons are only one product of multipurpose firms. Overhead labour has to be allocated between the firm's civil and military production before any useful calculation can be undertaken. On general grounds one would expect that the percentage of a country's total manpower employed directly or indirectly in defence would correspond fairly closely to the percentage of military expenditure in its gross national product. When a country relies heavily on conscription for manning its armed forces, and when it pays its conscripts a relatively low wage, estimates of its military expenditure may, however, give a spuriously low indication of its military outlays, since the labour content of that expenditure has been undervalued. In that case manpower is a better reflection of the country's military effort. On the other hand, where there is no conscription, it is the manpower estimate in some countries which probably gives too low a figure, because it does not allow for the fact that the average technological skills of people employed either directly or indirectly in defence are in general above the average national level.

36. It has been estimated that about 50 million people - more than the whole working population of, say, the United Kingdom and the Federal Republic of Germany - are engaged directly or indirectly for military purposes throughout the world. The available information does not permit a more precise figure, nor can it be said how the numbers have varied over the years. Fairly accurate figures for the armed forces alone are available, but they are not a good substitute for expenditure estimates - partly because the armed forces have become increasingly capital-intensive. Not only is the ratio of equipment costs to total expenditure rising, but in a number of countries the armed forces have been employing an increasing number of civilians to do work which was previously done by servicemen.

37. It is worth noting, however, that the figure for the personnel in the world's armed forces as a whole reached a total of 23 to 24 million by 1970, and that it had been rising at a rate of about 2 per cent a year during the decade of the sixties. Very little of this rise occurred in the six major countries, whose increase in military spending can be accounted for mainly by the elaboration of the weapons they produced or bought. Virtually all of the increase in military manpower occurred in the developing countries, whose share of the over-all total

---

<sup>14/</sup> There are, however, problems of comparability and coverage in estimating world totals. Some countries have paramilitary forces, which could either be classified as part of the armed forces, or as part of a police force. Other countries rely heavily on reservists who serve for a small part of the year.

for the world's armed forces is now about 37 per cent, in contrast to a 6 per cent share in military expenditure. Over the past decade the numbers in their armed forces have been rising by 4 per cent a year.

38. Two other possible measures of the arms race may be briefly mentioned. It would be of some interest if a measure could be provided of changes in the world's stock of weapons - a "depreciated capital stock" estimate. This is, however, more a theoretical than a practical possibility. There is only fragmentary information about existing stocks, and about the proportions of military expenditure which are devoted to weapons procurement. Counts of weapons would be quite inadequate, because of the trend to product improvement which makes, for example, a new combat fighter a very different weapon-system from one built 10 years ago. 15/ The description of the arms race in terms of stocks of weapons has to be largely qualitative.

39. Another conceivable measure - which could help quantify the qualitative aspects of the arms race - would be an estimate of the world stock of lethal power, which of course went up astronomically when nuclear weapons came into being. The figure is now so enormous - some years ago it was equivalent to some 15 tons of TNT per head of the world's population 16/ - that it all but defies the imagination. In any event, estimates of this kind have a greater relevance to a military than to an economic and social analysis of the arms race. For the purpose of this report, measures of expenditure must therefore remain primary. It is on the basis of them that calculations can be made of the real cost of military spending, that is to say, of the alternative uses to which the resources, had they not been claimed for military expenditures, might have been put.

---

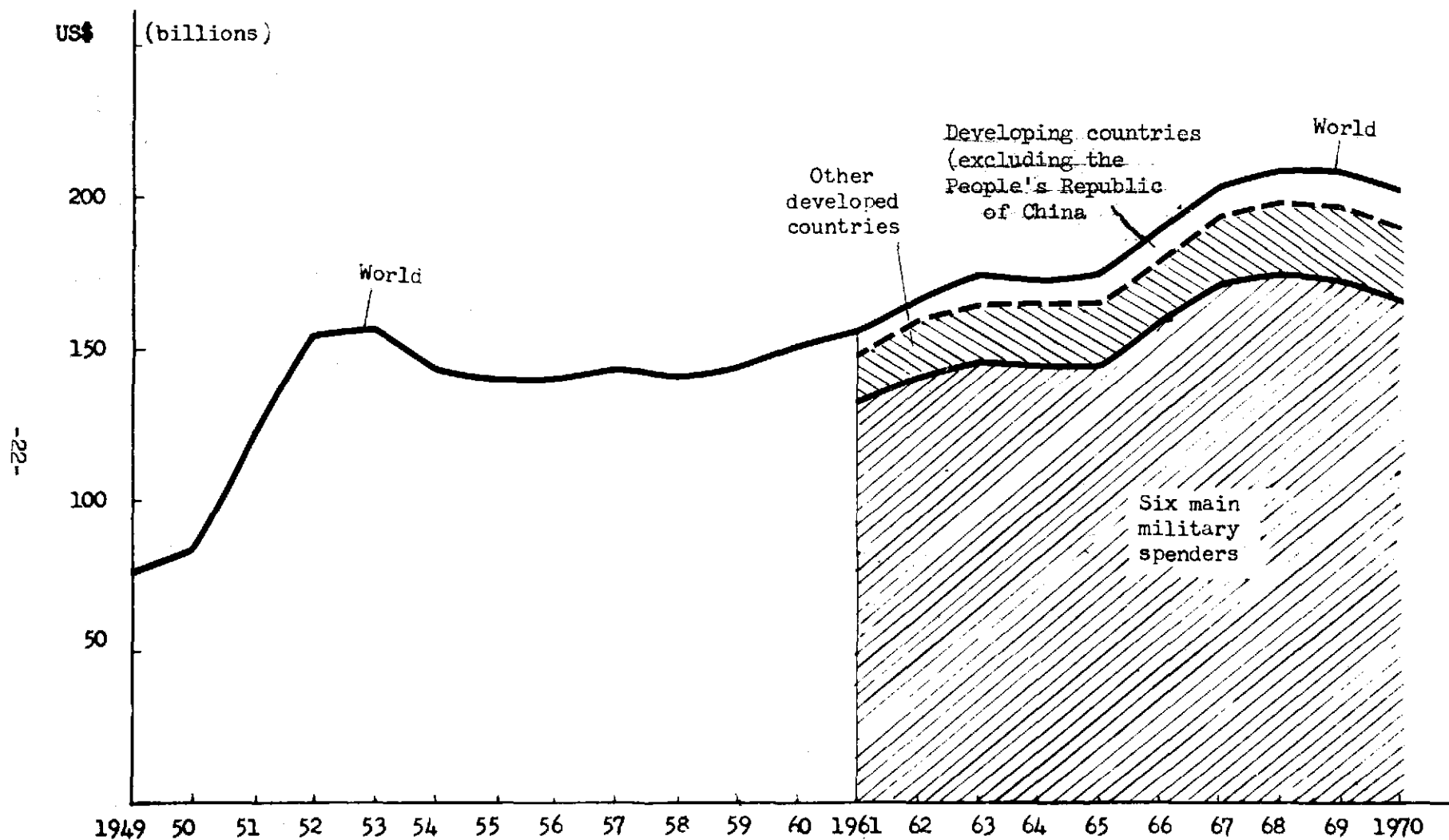
15/ An estimate has been made of the world stock of fighting ships - which suggests that over the period 1950-1968, it rose by some 5 per cent a year (see SIPRI Yearbook of World Armaments and Disarmament, 1969/70, p. 307). There is little doubt that the world stock of small arms has been rising rapidly. Production has remained high, and most such weapons have a very long life, so that some produced at the turn of the century are still in use. But these are only fragmentary contributions towards a calculation which, with the present restricted flow of information, is not possible.

16/ SIPRI Yearbook of World Armaments and Disarmament, 1969/70, p. 381.

CHART 1 A

POST WAR TRENDS IN WORLD MILITARY EXPENDITURE:

(absolute figures in constant (1970.) dollars,

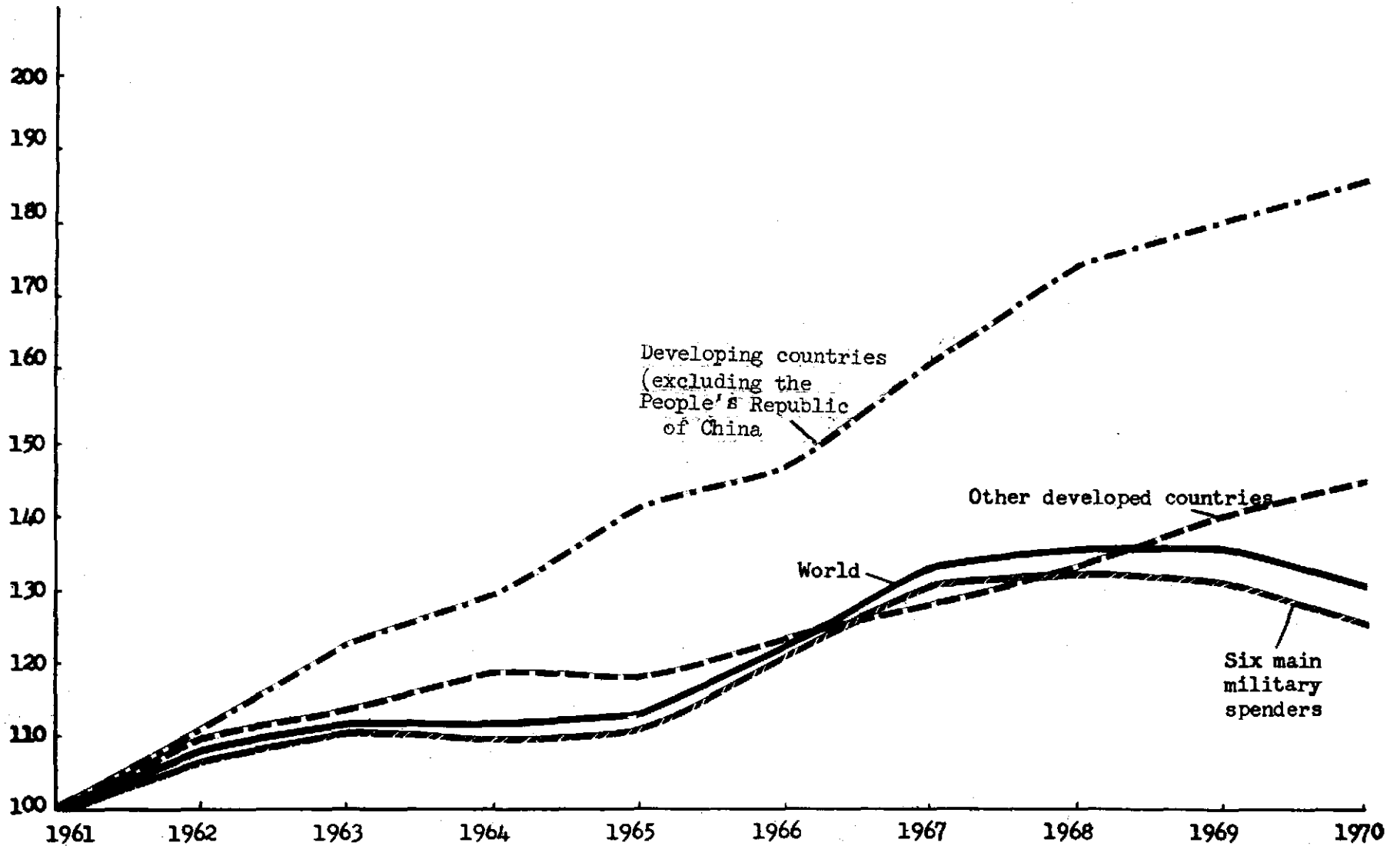


Sources for Charts 1 A and 1 B: SIPRI for data of years 1949-1959 and USACDA for data of years 1960-1970.

CHART 1 B

PERCENTAGE CHANGES IN MILITARY EXPENDITURE FROM 1961:  
(index numbers based on constant price figures 1961=100)

-23-



### III. THE DYNAMICS OF MILITARY RESEARCH AND DEVELOPMENT

40. The extent to which military expenditures affect other fields of public and private spending becomes clearer when the dynamics of the race, as reflected in the continuing elaboration of armaments, are understood. Many complicated factors are involved, and they seldom appear the same either to the nations which for one reason or another are caught up in the race, or to those which remain on the sidelines as spectators. Obviously the scale of the resources which are provided for the maintenance of armed forces and for the acquisition of armaments is determined by political decision. When they so decide, Governments do change the level of their military expenditures upwards or downwards. Moreover, it does not necessarily follow that the process of action and reaction which characterizes the arms race, certainly the arms race in sophisticated weapons, means that security is increased as more is spent on armaments. Indeed in the field of nuclear weaponry the reverse appears to be the case. Each new step in the elaboration of such armaments usually ushers in a more perilous stage of uncertainty and insecurity. Furthermore, every new generation of weapons and weapon systems inevitably demands more and more resources which could be used for different economic and social purposes. By encouraging the development of certain areas of technology, and by providing resources for basic fields of science which might bear upon the development of sophisticated weapons, the arms race also inevitably affects the direction and tempo of a country's scientific and technological development. In its time its effect has been to encourage work in certain fields of knowledge and to retard progress in others. It stimulates a demand for certain classes of specialist and for certain kinds of specialized information, without which desired military projects could not be achieved. Short of powerful political decision in a contrary direction, this process, particularly so far as it concerns sophisticated modern weapons, could go on indefinitely.

41. The basic reason for the momentum of the arms race is very simple. It is laid bare in the brief account which was given in section I of some developments that have occurred over the past decade. Countries usually try to keep their military forces up to date and to improve their arsenals of weapons. The soldier does not wish to be outnumbered or "out-gunned" by a potential enemy, or potentially out-maneuvred because of his greater mobility, or neutralized by his better defences. This applies as much to the developing countries which import their weapons as it does to the most powerful industrial nations which develop and manufacture them.

42. It is the latter - not the former - which are the pace-setters of the arms race. They too are the ones which, partly as a result of the development of technology for military purposes during the Second World War and the succeeding cold war, have also had a considerable impact on the development of science-based industries in the civil field which are complementary to those which provide military matériel, for example aircraft. The military technologist is urged relentlessly to work at the frontiers of applied scientific knowledge, and to incorporate in the design of new weapons or weapon systems the most advanced engineering techniques.



43. The arms race of the major Powers is now a competition to achieve an advantage not just in quantity but even more in quality - in the speed of aircraft, in the range and accuracy of ballistic missiles, in the manoeuvrability of tanks, in the efficiency of radar systems, and so on. The arms race has in fact become essentially a technological race, the achievements of one side spurring the other to improve on the technological advances which it might have made itself. Sometimes the spur comes not from some clearly-defined threat but from an imagined technical advance made by the other side. Secrecy in military affairs makes it inevitable that a potential enemy will usually be suspected of being stronger than he actually is. Consequently both sides strive continuously to improve the quantity and quality of their arms. So it is that the arms race becomes based on the "hypothesis of the worst case", that is to say, one of two sides designs its programme of development on the assumption that its rival could, if it so decided, be the stronger.

44. That is one aspect of the force behind the race. There is another. Before a new Weapon is completed, the military designer is as a rule already designing a more effective model which - he hopes - will not only be more effective in performance, but also less vulnerable to defences which the other side might introduce in response to a new threat. Obsolescence thus also becomes a characteristic of the technological arms race. What one has is never good enough. This is where the criteria which govern military and civil industry diverge. In civil industry the amount of money spent on development projects is determined mainly by social, economic and commercial considerations - by considerations of cost, markets, competition and potential profit. In the sphere of defence, research and development projects are limited only by the extremes to which scientific and technical knowledge can be mobilized and pushed, and by the extent to which nations are capable of, and are willing to divert resources from, other social, economic and political ends.

45. Over the period of the 1960s, the degree of this diversion was considerable, not only, and not surprisingly, in those States which at one time or another were engaged in active hostilities, but also in those which were spurred to arm in the climate of the cold war. Moreover, the effect of the increasing sophistication of military equipment was far greater than would be implied merely by a numerical statement of the economic resources involved. The process was inevitably associated with a very focused research and development effort, which depended on the services of a disproportionate number of professional scientific and engineering personnel. Although their ratio to the total professional labour force has fallen in some countries since the early sixties, it still remains impressive. Probably at least a quarter of the world total of scientists and engineers who are engaged in research and development are in fact still employed on military work, and military research and development probably absorbs some \$25 billion of an <sup>17/</sup> estimated world total research and development expenditure of some \$60 billion. Considerable managerial talent and technical skill is also absorbed by the armed forces, and in many cases military personnel go through long and extremely expensive courses of training in special educational establishments. The increasing sophistication of weapons always means that whatever the percentage of a national budget which goes to military expenditures, the corresponding percentage in terms of the use of professional scientific manpower will be higher. It is usual to find that in countries with developed military industries, the proportion of the labour

---

<sup>17/</sup> Estimate derived from the Organization for Economic Co-operation and Development, The Research and Development Effort in Western Europe, North America and the Soviet Union (Paris 1965) and SIPRI Yearbook of World Armaments and Disarmament, 1969/70, pp. 288 ff.

force of the engineering industry which is absorbed in the production of military equipment is far greater than the percentage of GNP which goes to military expenditures, and that the percentage of all qualified scientists and engineers employed on military research and development is even higher.

46. In addition to the heavy demands for scientific and technological manpower which occur during the period of development of new weapons, qualitative changes in armaments also generate quantitative and qualitative changes in manpower within the armed services. The numbers of skilled technicians required for the maintenance of ever more sophisticated equipment have to increase, and higher standards of skill and training on the part of operating personnel also become essential. As complex armaments began to spread to the developing countries during the past decade, those countries have also been diverting more of their scarce technical manpower to military purposes, paying for them to be trained abroad, or employing foreign technicians, all to the detriment of a more fruitful use of national resources.

47. It would be an exaggeration to claim that military research and development, and the derived technological and educational demands which it generates, still attracts the "best brains" to be found in the pool of scientific and engineering manpower of the major industrial Powers. But since the "best" are always scarce, there can be little doubt that military research and development, by "bidding" for a share of the best, can have an inflationary effect in the scientific market.

48. The record of advanced weapons programmes in the sixties provides many illustrations of the abandonment of costly projects before their completion, and after hundreds of millions of dollars had been poured into them. Examples of this are only too easy to find in the records which have been published by Western countries. The advanced United Kingdom fighter-bomber TSR2; the United States anti-aircraft system Mauler; the air-launched nuclear missile Skybolt of the United States, as well as various kinds of land-based missiles of several countries, all came to an end in the course of development, after an enormous expenditure of resources. Sometimes the work was stopped because of the impossibility of overcoming a technological or scientific hurdle. Sometimes it came to an end because the conception on which it was based changed owing to a new military appreciation of the "need", or because of development in a potential enemy's armoury. More usually, projects have been abandoned because they have run up against a barrier set by the absolute size of the economy of the country concerned. New weapons always cost more, sometimes several times more, than their predecessors. Since abandoned projects are likely to be replaced by other projects, the process of abandonment increases the economic waste caused by the arms race.

49. Because of their inherent tendency to rise, research and development expenditures always stand to consume more and more of any defence budget. Their growth has therefore to be restrained. If these expenditures are not kept down, and if projects are not cancelled, the proportion of GNP allocated to military spending will have to increase. It is not only that new technology always costs more to achieve than the "state of the art" which it succeeds, or that, once it has been developed, a generation of weapons, designed to replace another, inevitably turns out to be much more costly to manufacture. There is the further point that personnel costs usually go on rising during the period of years that separates the conception of a new project from its completion - a period rarely less than from seven to ten years. New weapon-systems continuously require more highly qualified personnel, and therefore personnel costs tend to rise faster than in the civil side of the economy.

50. The economic implication of the rising tendency of research and development costs, together with the rise in personnel costs, is that more and more countries are compelled to opt out of some sectors of the technological arms race. The countries concerned might then concentrate their defence efforts on producing traditional armaments and importing other weapons from abroad. As a consequence, richer countries are enabled to continue longer in the technological arms race, as they can export modern weapons and so produce them on a larger scale, with reduced unit costs.

51. To be in the arms race costs more each year. No country, however, can achieve greater security by devoting to the arms race more and more of its resources. Security is unobtainable because already the race has resulted in the stockpiling of more destructive power than has any conceivable military purpose. Meanwhile, the arms race has caused economic damage by encouraging the continuation of vast and prohibitively costly military research and development projects, which many informed people believe to be incapable of completion because they have long since passed the point of rational technological ambition.

52. The arms race is thus a hindrance to development both because it draws heavily on available material and human resources, and because it adds to the threat to peace. In its essence, it is incompatible with normal economic and social development.

#### IV. THE NATIONAL CONSEQUENCES OF THE ARMS RACE AND MILITARY EXPENDITURE

53. The resources which are allocated for military purposes are a broad indication of what is denied other avenues of public and private expenditure. If countries had not expended their means for military purposes, they could obviously have put the resources so consumed to many other uses.

54. Whatever their nature, and however much they interact, the alternatives which have to be sacrificed in order to maintain a military establishment can, for convenience, be classified under the general headings of the goals of immediate consumption, whether private or public, and those which serve the purpose of future economic growth. It is the former category which is in general epitomized in the well-known catchword "the choice is between guns and butter".

55. Poverty and slums exist even in the richest countries. Housing is still an unsatisfied demand; in every country, including the richer ones, its improvement calls for an immense amount of investment both in urban and rural areas. Housing investment, together with slum clearance and urban renewal, represents only about 3-3 1/2 per cent of the world's total national product, 18/ although if one considers all "housing services" the percentage is somewhat higher. But in the world as a whole far fewer resources were devoted to new housing during the sixties than to military expenditures. This is particularly true of the major countries.

56. Health services, like education, which is dealt with below, constitute a major demand which is less than adequately satisfied, even in the richest countries; and in the poorer countries, with high death-rates from preventable diseases, with large numbers suffering from chronic sickness, and with high infant mortality, there is a crying need for more resources. The comparison of world expenditure on health and military expenditure is a difficult one, since health services in some countries are entirely publicly financed, and in others are mainly privately financed. But, as already noted, for the world as a whole, military expenditure is about two and a half times the estimated total of publicly financed health expenditure. 19/ A rough calculation suggests that all medical research in the world consumes only about \$4 billion. This compares with some \$25 billion which it is estimated is now spent on military research and development (see foot-note 17 above).

57. Then there is the major problem of protecting the environment, which is only now beginning to be understood. Military operations obviously have their polluting effects, and can bring about major environmental devastation. The vast destruction which is associated with modern war is the extreme case. Nuclear tests result in radio-active contamination, which affects far more than the territories where the tests are made. They are an isolated illustration of the environmental damage that can be caused by armaments. The use of defoliants is another proven environmental hazard. These represent some direct aspects of the environmental picture associated with military activities.

---

18/ Estimate derived from United Nations national accounts statistics.

19/ United States Arms Control and Disarmament Agency, World Military Expenditures, 1970, p. 10.

58. The indirect aspect is the diversion to military purposes of the resources required for the major task of repairing the environmental ravages of the past, and of preventing the further depredations which could become increasingly urgent as population multiplies. There is no need in this report to spell out the environmental threat. But what needs to be said here is that the cost of correcting and preventing environmental damage is certain to prove enormous, and that a vast amount of field study, laboratory research and development work will be called for if solutions to problems of environmental pollution, whether national or international in nature, are to be dealt with on a realistic basis. The same general observation applies to the problem of using the earth's physical resources in a way which does not endanger the likely needs of future generations. Processes to prevent pollution, including the recycling of waste, are however very costly because they demand either plant modifications or new plant, or such things as new sewage systems. Resources are hardly likely to be made freely available to tackle all the problems which are entailed in this field; and obviously resources for the protection of the environment are bound to be taken from other fields of public expenditure, including military expenditure.

59. Another important aspect of military expenditures is their effect upon economic growth. To the extent that the arms race inhibits growth, this economic effect reinforces all that has been said about its impact upon consumption, whether private or public.

60. A fast rate of economic expansion is, of course, one of the central economic objectives of most countries. In economic theory, relationships are postulated between growth in the stock of capital and the size and quality of the labour force on the one hand, 20/ and the rise in output on the other. The social factors which are involved in this relationship, and which can be regarded as the educational and technological factors that affect the labour force, are usually treated under the heading "investment in man" - investment in order to increase the health, well-being, education and physical and organizational potentialities of a country's citizens. Needless to say, many of these types of social investment are ends in themselves. But they are obviously also very potent factors in the rate of economic growth. Military expenditures undoubtedly absorb resources which are substantial enough to make a considerable difference both in the level of investment for civil purposes and in the volume of resources which can be devoted to improving man's lot through social and other services.

61. There is no doubt that a transfer of resources from military to civil uses would provide further possibilities for an increase in the rate of economic growth. Whether a reduction in military spending increases the rate of growth through its impact on investment depends on various considerations. Since the investment required to support a given volume of military outlays may be of the same general order of magnitude as the investment requirements for the same level of civil expenditure, a decline in military expenditure would not, without active government intervention, necessarily lead to an over-all increase in investment. The impact on the rate of growth also depends upon the magnitude of the additional output resulting from this investment, that is, on the so-called capital/output

---

20/ The rate of technological change can be regarded either as a component of these two or treated as a separate factor.

ratio. While these considerations would not permit precise quantitative predictions about the effect of a reduction in the share of military expenditure on the over-all rate of growth, it is certain that there would be a once-and-for-all increase in the amount of goods available for civil purposes and that from then on the economy would grow at permanently higher levels.

62. Governments have the ability, within limits, to redirect resources in the economy. They are not bound to follow previous patterns; if they wish to use resources freed from the arms race to increase the level of investment, they can do so. It is government funds which would be released as a consequence of an abatement of the arms race, and it is for Governments to decide how the resources so released are to be allocated.

63. It is entirely reasonable to compare fixed investment with military expenditure, and to see whether a reduction in military expenditure could make a significant difference to the investment level. For the world as a whole, military expenditure - at 6-6 1/2 per cent of world national product - is about a third as large as fixed capital formation - 20 per cent of world national product. Clearly, therefore, given a conscious decision to this effect, the investment level could be given a significant upward shift.

64. There is no lack of investment opportunities in the world. Most countries have waiting lists of investment projects, particularly in the public sector, which they are unable to start through lack of resources. Calculations have been made for several developed countries of the increase in output which might result from given increases in capital expenditure. It appears that the marginal capital/output ratio is between three and four, which means that on average one could expect an additional unit of output for every three to four units of additional investment. A ratio of this kind is, of course, only a very rough guide, but it suggests that if a country which for instance had previously been devoting 6 per cent of its national output to military uses transferred half of this expenditure to increasing its investment in the civil sector, it would experience a perceptible effect on the growth rate of its economy. 21/

65. Many developing countries do not have an industrial sector capable of arms production, and so import most of their arms from abroad. A reduction in their arms spending would produce savings and, therefore, free foreign exchanges resources which could be used for the import of more investment goods, thus facilitating a higher rate of growth.

66. For these countries, the need for adequate investment is particularly acute. At their present level of investment the gap between their standard of living and

---

21/ The simple use of a marginal capital/output ratio of 3 would suggest that such a transfer would accelerate the growth rate by 1 per cent. This is clearly an overstatement, since there are few examples of relatively sudden increases in the level of investment of this magnitude. But even if the effect on the growth rate were only half as big as that suggested by the normal capital/output ratio, it would still yield a very considerable increase in output over time.

that of the industrialized countries is not likely to be satisfactorily narrowed for years to come. One of the basic problems of growth in many developing countries is to find the resources for the creation of new productive sectors which are now more or less entirely lacking and for a massive expansion of infrastructure, in transportation for example, and in agriculture. This huge unsatisfied requirement for capital was recognized in formulating an International Development Strategy for the Second United Nations Development Decade. General Assembly resolution 2626 (XXV) stated that in order to attain a 6 per cent growth rate in developing countries - corresponding to a 3.5 per cent growth rate per head - the ratio of gross domestic savings to national product should rise by 0.5 per cent a year, until it attained the level of about 20 per cent by 1980. For this to be accomplished, as the resolution points out, the developing countries must "keep the increase in their current public expenditure under close scrutiny with a view to releasing maximum resources for investment". Yet one of the largest items in current public expenditure in many of these countries is military expenditure.

67. What all this means in terms of the denial of alternative opportunities is revealed clearly in an economic study of 44 developing countries over the period 1951 to 1965. 22/ This indicated that that part of their military expenditures which went to procurement diverted domestic and foreign resources equivalent to about 4 per cent of their gross capital formation. A reduction in military expenditure would permit at least part of this to serve the purposes of investment.

68. The level of education is a social factor of particular importance to economic growth. Far more is involved here than just the scientific and engineering knowledge which goes into research and development and which leads to new techniques and new technology. The managerial ability and experience necessary to organize and control production processes, and the skill and adaptability of the workers on the shop-floor, are just as important, if not more so. There are, however, broader educational needs than this. In many countries there is still a great deal to be done in raising the literacy rate; one of the requirements of faster economic growth in these countries is an increase in the number of workers who can read and write. Over and above this, there are the demands for education, not just for the purpose of accelerating economic growth but, as an end in itself, widening people's range of experience and broadening their minds.

69. "Research and development" has been institutionalized in modern industrial societies, so that innovation is no longer so haphazard a process as it was in the period of the isolated inventor, although its results still remain uncertain. In consequence, research and development's share in the national product of industrial countries has risen fast. For example, research and development consumed only an estimated 0.3 per cent of the national product of the United States before the Second World War. The figure was about 1 per cent at the start of the 1950s. In 1969 it was 3 per cent. 23/ There has been a similar upward trend in the Soviet Union, with the share of research and development expenditure in net material product rising from 1 per cent in 1940 to 3.7 per cent in 1966. 24/ Other highly industrialized countries have not lagged far behind.

---

22/ Emile Benoit et al. Effects of Defense on Developing Economies (study prepared by the Massachusetts Institute of Technology for the United States Arms Control and Disarmament Agency, forthcoming).

23/ United States Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1957 (Washington, D.C., 1960); Statistical Abstract of the United States, 1970, 91st ed. (Washington, D.C., 1970).

24/ Strana Sovetov za 50 Let (Moscow, 1967), pp. 242 and 244.

70. This illustrates another way in which reduced military spending may affect the rate of growth. As was said in the previous chapter, the arms race has been associated with a sharply focused research and development effort and has absorbed a high proportion of the total professional manpower and the limited resources which the countries involved have available for all research and development. A reduction in arms spending is likely to result in a decline in the total amount spent on research and development. None the less, concentration of the remaining research and development outlays on production exclusively for civil purposes would lead to an improvement in the efficiency with which capital and other resources are utilized and hence would accelerate the rate of growth.

71. In most countries more is still devoted to military purposes than is spent on education generally, and overwhelmingly more than goes to research and development for the civil sector of the economy. Obviously the situation would be different if a sizable part of the financial resources now devoted to military uses were directed to improving the facilities for education and for expanding civil research and development in order to enlarge and improve the base for further economic and social development. But, as has already been pointed out, at least as important is the fact that the armed forces in industrialized countries absorb a disproportionately large share of the available technically skilled personnel. Modern armies are equipped with highly sophisticated armaments whose development, maintenance and operation demand the use of highly skilled manpower all along the line. The "opportunity costs" of military expenditures (by which are meant the alternatives of spending which the latter pre-empt) have therefore to be thought of not just in terms of a financial measure. The qualitative human aspect is at least as critical.

72. Private consumption, as well as provision for such social services as education, health, housing and transportation, together with the cost of protecting our physical environment, is clearly in direct competition with military expenditures. Rising standards of living - in the context of the world in which we now live - mean more expenditure on all these things. Were military expenditures to fall it would assuredly be expected in some, if not all countries, that more resources would be released for personal spending. The majority of a population would hardly agree to forgo entirely this advantage of a reduction in military expenditure.

73. The effects of military expenditure on the economy are not limited to the diversion of resources from other uses. Military expenditures also tend to disturb and destabilize the course of the economy in general, particularly when they fluctuate sharply. The size of defence appropriations is decided primarily on political and military grounds, and military expenditures do not easily accommodate to changes in the economic situation of a country. The rest of the economy has only too often had to be adjusted, to fit in with military exigencies and with the time-cycle of military developments.

74. This consideration becomes obvious when, for some reason or other, the authorities decide that military expenditure has to be sharply increased, as has happened on more than one occasion in the post-war period (chart 1 A). In developed market economies, the authorities are faced with a number of unpalatable alternatives in raising the necessary additional resources. First, they can acquire these resources through increased taxation or borrowing, thereby slowing the growth in personal consumption or private investment. Alternatively, spending on such programmes as welfare services or education could be reduced relatively or even absolutely. This would mean that military expenditures



dislocate long-term social policies. There is also the possibility that the authorities might fail to make sufficient adjustments either by way of increased taxation or by way of reduced social expenditure, and so allow excess demand to force up prices and cause inflation or accelerate its pace. An inflationary process, once generated, is difficult and costly to stop. Experience shows that a sharp upswing in military expenditure can have effects which will be felt for many years.

75. In the centrally planned economies, military expenditures also set considerable constraints on the flexibility with which the economy can be planned. Military adjustments undertaken on the grounds of political considerations tend to disturb the economic proportions in the civil sector, and the problem of preserving proper equilibrium between supply and demand for various industries and sectors becomes appreciably more difficult.

76. In developing countries, the tax-base is limited. The pay of civil servants and the cost of military forces often take up much of a central Government's revenue. Further, since in many such countries much of the finance for investment comes from the Government, there is a direct conflict between military expenditure and development. Equally, military spending often represents a heavy burden on the balance of payments for the purchase of arms from abroad. And even when weapons are provided as "aid", they not only tend to absorb a large part of the country's skills, but at the same time mean the diversion of a significant part of the country's limited funds to the development of the necessary military infrastructure, such as airfields or roads, for which there may be comparatively little civil use.

77. Apart from general destabilizing effects on the economy, the disturbing effects of the fluctuations which so often characterize military programmes tend to be concentrated in the particular regions and particular industries where military procurement takes place. Furthermore, as has been noted earlier, the technological arms race makes for rapid obsolescence, and often, as was indicated in section III, for the abandonment of major industrial projects in which tens of thousands of men may be employed. Sudden changes of direction have in the past led to considerable local disruption, great waste of capital and, at least in some countries, high regional unemployment. We agree, none the less, with the findings of the Secretary-General's 1962 report, Economic and Social Consequences of Disarmament, to the effect that no major instability need result from disarmament.

78. In terms of balance of payments, it is usually the developing countries which stand to lose most from their military expenditures. The reasons are not far to seek. As weapons become more sophisticated and more expensive to develop, fewer countries are able to produce them; for as is becoming increasingly obvious, advanced military technology is now the prerogative of the powerful industrialized countries. If therefore a developing country wishes to acquire sophisticated weapons, and if none of the countries manufacturing them wishes to provide them by way of military aid, the developing country could incur a considerable balance-of-payments cost in acquiring either the weapons or the background technology (or both). The credits from the arms trade go to countries with highly developed defence industries; the debits go to countries without them.

79. Against this, it is sometimes argued that developing countries gain from the sale of strategic materials, and that they would consequently suffer if there were substantial reductions in military expenditures by the industrialized Powers.

However, calculations made by Professor Leontieff for the year 1967, on the hypothesis that total military demand was transferred proportionately to the various categories of civil demand, show that for a selected group of strategic materials, there was no commodity, except perhaps bauxite, where the impact on sales would have been significant (see annex III).

80. Military expenditures have also had the effect of increasing the disequilibrium in countries' balance of payments - and that is both a national and international consequence of military expenditure. The United Kingdom, and recently more particularly the United States, have incurred substantial military expenditures in maintaining troops outside their own borders. These factors have contributed to the difficulties both of sterling and of the dollar. Such disequilibria in world payments undoubtedly have slowed, and at times even threatened to reverse, world progress towards further relaxation of restrictions on trade and payments.

81. Against the long catalogue of harmful effects of the arms race and military expenditure, one benefit which has been claimed is the spur given to technological progress. Obviously, if there is such a benefit, if war is the mother of invention, the cost in human lives and misery has been far too high a price to pay for it.

82. During the Second World War certain scientific and technological advances were accelerated, such as the development of atomic power, of computers, of air transport and radar, and of electronics in general. Vast research and development organizations were set up to implement precise technological programmes. The adoption of this new organizational approach was due to the need to accelerate the steps from fundamental research to practical applications, and this has undoubtedly left its mark on all advanced technologically based industry today. But, if countries are prepared to set the right priorities and if the right motivation is generated, they ought to be able to achieve even more rapid technological progress without war or an arms race. Moreover, it has to be borne in mind that, while during the war some forms of technical advance were accelerated, others of equal or perhaps greater importance for mankind were retarded, and the same is true of the arms race.

83. Particularly important in the contemporary setting is the fact that military and space technology appears to be becoming more and more specialized, and less and less adaptable to civilian use. <sup>25/</sup> Moreover, military secrecy always retards the pace at which civil benefits can be extracted from military developments.

84. More important than this, the specialized features which have been imparted by military demands to the pattern of research and development were clearly not designed to solve the world's present social and economic problems, and far less those which population growth and environmental protection pose for tomorrow. Moreover, relative to what has been spent on military research and development,

---

<sup>25/</sup> An OECD report has commented that "the technological requirements of defence and space are diverging from those of civilian industry, which means that the possibility of such direct transfer will tend to diminish". OECD, "The Effects of Military and Space Research on Civilian Technology", Government and Technical Innovation (Paris, 1966), p. 31.

medical and biological research, research into the environment, and research particularly directed to the needs of developing countries, have consumed few resources. If even a fraction of what has gone into military research and development were provided for a frontal attack on some of the main economic and social problems of the world, one ought to expect much larger benefits in the peaceful uses of science than have come from the spin-off from military research and development, given a powerful sense of purpose and the same institutionalized techniques of organization and management which military research and development has stimulated.

85. Whereas it is possible to consider the economic consequences of the arms race and of military expenditures in quantitative terms, their social consequences can only be discussed qualitatively. It stands to reason that military expenditures also have profound social consequences, and the shadow of possible disaster which modern armaments cast over the world is clearly the most ominous. An armed world which is always adding to its potential not only in conventional armaments but also in weapons of mass destruction; a world which is spanned by the surveillance systems that new military technology has made possible; and a world that knows that no part of it can be protected any longer from direct attack by nuclear missiles, is a fearful place for hundreds and hundreds of millions who strive to better their lot. The fear and tension which this situation induces is a factor which serves to inflame conflicts both between groups and between nations.

86. Against the background of the Second World War, the fear engendered by the nuclear arms race was one of the factors which stimulated the post-war disillusion of the youth in many countries, whatever the level of their military spending. Every child learned that he lived in a world in which violence had become commonplace, and which was now stocked with sufficient lethal power to wipe out all human life. He learned that weapons infinitely more destructive than the bombs which were dropped on Hiroshima and Nagasaki were in a state of constant readiness, and that a military or human or even a technical error could have devastating consequences. This awareness has undoubtedly helped to create a psychological background of uncertainty, of fear and anxiety, and sometimes of social rejection or disillusion. Some Western social psychologists tend to ascribe to the arms race and to the horrors of war a belief which prevails in some of the younger generation that the world is an irrational place in which the improvement of society, through economic growth, is a hopeless cause. There are, of course, other major contributing factors, such as the problems which the multiplying populations of the world will have to face if they are to find the resources with which to exist; or the rapid spoliation of our physical environment. Whatever the importance of these other major problems, there can be no question but that the continuing arms race and the growth of violence in the world add to the disaffection of millions of people.

87. The arms race also tends to change traditional relationships between the civilian and military sectors of the economy. The military sector means more than the military forces themselves. It includes the firms and industries which serve them, the scientific institutions where their research is done, and the political establishments and ministries that owe their power to the arms race - a combination which has come to be called the "military-industrial complex". President Eisenhower commented on the American situation in these words: "The conjunction of an immense military establishment and a large arms industry is new in the American experience. The total influence - economic, political, even spiritual is felt in every city, every Statehouse, every office of the Federal

Government". But it should be emphasized that this is in no sense an exclusively American phenomenon. The military-industrial complexes everywhere become concerned to preserve themselves, and consequently to maintain the circumstances which gave birth to them. Only political decision can break the circle. Fear of a potential enemy leads a country to set up a military establishment, and this establishment in turn acts to keep the fear alive. It will suspect and question the sincerity of any conciliatory moves from the other side, and in general act to preserve a political image of the world as one which will always require a high state of military preparedness. That is a further social consequence of the arms race.

88. Yet another is the threat to democratic processes which can arise. The spirit of militarism is opposed to the spirit of democracy and peaceful progress in the world.

89. Whatever the varied and numerous considerations which keep the arms race alive, they therefore not only entail heavy economic sacrifices, but also weaken those processes of social evolution which provide our only real hope for the future of the human species.

V. THE INTERNATIONAL CONSEQUENCES OF THE ARMS RACE  
AND MILITARY EXPENDITURES

90. Regardless of the impact that a country's military expenditures may have on the attitudes of its people and on the implementation of national policies in the civil field, the purposes which these expenditures are meant to serve are by definition international in character. Periods of international tension are usually associated with an acceleration in the arms race; and in turn a speeding-up of the race exacerbates international tension. We live in an era of opposing blocs, with powerful armies poised against each other, and an era in which the reaction time of automated nuclear missiles is immeasurably swifter than the pace at which diplomacy normally works. It is an atmosphere which generates fear and a sense of insecurity.

91. The massing of armaments and the continued development of new weapon-systems cannot but generate more suspicion and greater tension than exists at the start, and by so doing provoke hostile reactions - ranging from a stepping-up of military expenditures to talk of war - on the part of those who feel threatened. This applies to all armaments, whether they come into the category called conventional, or that designated "weapons of mass destruction". The accumulation of weapons also increases the possibility that force might be resorted to as a means of dealing with international problems. The competition in nuclear weapons obviously overshadows all other aspects of the arms race, since a nuclear war would put the future of the entire world at risk.

92. Regional arms races in conventional weapons, which reflect divergent international interests, whether political or economic, and which in turn are sustained by supplies of arms from arms-producing Powers, are also immensely important in the exacerbation of international tensions. The importance of trade in modern weapons for the countries which produce them has been referred to in section III. Moreover, the rate of obsolescence in modern armaments is such that considerable quantities of surplus war material become available each year, the resale value of which greatly exceeds its scrap value. There is consequently a strong economic motive to search for markets for such material. Equally, the build-up of weapons and of armed forces may well tempt some countries to seek a military solution to disputes with their neighbours. Quite apart from the severe sacrifices in life and resources which conflicts in the developing areas of the world entail, these at the same time carry the risk that they might spread to neighbouring countries, and inevitably they imply the additional danger that the military forces of some other countries, especially major Powers, could become directly involved, with consequences which it would be impossible to predict.

93. The arms race inevitably exacerbates international tensions and inevitably undermines the purposes and principles of the United Nations Charter. The efforts both within and outside the framework of the United Nations to encourage measures toward disarmament have had, as said earlier, valuable results. The treaties that have been negotiated so far are important first steps, which have helped to prevent the state of international tension in the world from becoming more serious than it still remains.

94. The foregoing considerations underline the necessity for all States to pursue their efforts toward disarmament, in particular nuclear disarmament. Therefore, the present negotiations of the United States and the Soviet Union to stem the arms race, as well as all other international efforts of both nuclear and non-nuclear States, must be regarded as being in the interest of all countries.

95. International suspicions and fears, however, do far more than poison relations in the political sphere. They also damage the economic and social well-being of the world by impeding exchanges between peoples whether these be of trade and the flow of capital, or of knowledge and technological "know-how". If there were no arms race, trade and other exchanges would almost certainly be easier. A halt to the arms race could by itself be an important stimulus toward the relaxation of other existing barriers, and in this way could have a beneficial effect on international trade.

96. International trade has grown at a very high rate over the past few decades, and has by far surpassed the rate of growth of world output. However, the arms race, together with other important and related factors, has imposed a serious constraint on the expansion of exchanges between peoples.

97. Military considerations have limited trade in so-called strategic commodities and have led to the creation of rival trade groupings involving, inter alia, restrictions on trade in some of the products of advanced technology. During the 1950s there was heavy stress on the prevention of any trade which would help a potential adversary's economic or military development. Since then some liberalization has taken place and world trade has moved further towards more normal patterns. But the restrictions which still remain are of considerable importance in the case of a number of commodities, many of which are of key importance in modern industrial and engineering development.

98. The same strategic considerations also inhibit technological and scientific exchanges between countries. This can be regarded as an extension of the strategic embargo on international trade. Obviously, military interests are not the only limiting factor here; there are property rights in technological development, and nations quite naturally will wish to profit from the technological advances for which they themselves are responsible. The effects of the prevailing arms race are not felt equally over all fields where unimpeded exchanges between peoples would be to the benefit of all. For example, there are few impediments to academic exchanges in the basic sciences. But if the arms race continues, and weapon-systems become more and more elaborate, an increasing number of technological developments would tend to be guarded by the nations responsible for them. In so far as these new developments have civil applications, this is a hindrance to the international spread of new technologies - and indeed a hindrance to their spread to the civil sector all over the world.

99. Military considerations also influence the pattern of world trade in a more general way, although often these defence considerations are outdated. Countries are concerned about their dependence on foreign trade for vital supplies in time of war. This is one of the reasons some industrial countries advance in order to justify the protection they afford their agriculture and some categories of their manufacturing industry. In a disarmed world, they would at least not be able to advance this reason for their protectionism.

100. Stockpiling of raw materials as a consequence of the arms race is also a factor which in the past has distorted world trade. The tendency towards stockpiling seems to be declining, but there is still the possibility that the reduction of stockpiles can create market distortions. Some nations are so concerned about this possibility that international machinery has been proposed to deal with the problem. 26/

101. Trade between the centrally planned and the developed market economies has clearly been affected by the arms race and by the tensions between the two systems. Even if the latter did not exist, there would still be problems in increasing trade between countries with basically different economic systems. But, in a disarmed world, trade between market and centrally planned economies could hardly fail to rise. At the moment, it accounts for only 5 per cent of world trade. The developed market economies, however, account for 62 per cent of world manufacturing output and the centrally planned economies for 31 per cent. 27/ Although these figures cannot by themselves provide an indication of what level of trade it would be reasonable to expect, the figure of 5 per cent is by any account extraordinarily small. It is therefore bound to rise, and significantly, the faster the arms race comes to a halt.

102. The developing countries, in which more than two thirds of the world's population live, which account for about 15 per cent of the world output and whose share of world exports was about 18 per cent in 1969 (down from about 27 per cent in 1953), would also benefit immediately from a cessation of the arms race. As was pointed out in section IV, the arms they import lead to distortions in their trade. Whether a developing country pays for imported armaments in cash or through the export of primary products, its growth potential is adversely affected at a particularly vulnerable point, through the consequential pre-empting of scarce foreign exchange resources.

103. In a world free of tensions, and increasingly disarmed, the level of trade could well be higher simply because world output might have reached a higher level. It has already been pointed out that in certain circumstances the resources now devoted to military use could lead to greater economic growth. In the past the general experience has been that, for every 1 per cent added to world output, about 2 per cent is added to the volume of world trade. Any stimulus to world output, therefore, is likely to have a more than proportional effect on the development of trade.

104. An increase in world output clearly could also have a powerful impact on the volume of aid provided by the richer to the poorer countries. One major effect of the arms race and military expenditure has been to reduce the priority given to aid in the policies of donor countries. It is true that in the post-war world, nations have recognized that world economic development is a common problem, about which they have been ready to take common action, but such action has, in fact, been limited. When countries are devoting a large part of their resources to

---

26/ See International Development Strategy for the Second United Nations Development Decade (General Assembly resolution 2626 (XXV)), para. 30.

27/ The Growth of World Industry, Vol. I, Statistical Papers, Series P. No. 7, published by the Statistical Office of the United Nations.

military preparations against each other, the suspicion of tension which this creates tends to spread through all their relations. It inhibits co-operation and prevents countries from combining their forces in a united effort to deal effectively with the development problem on the scale required. Some aid becomes viewed not exclusively or even primarily in terms of a solution of the problems of the third world, but as a means of acquiring influence in a particular region, or of denying influence to some other country.

105. As already noted, total world military expenditures are some 30 times the level of official development assistance, which now adds up to some \$7 billion. The sum has fallen steadily throughout the 1960s not only in relation to the gross national product of the donor countries, but also to that of the developing countries; in 1970 such assistance was equivalent to only one third of 1 per cent of the combined GNP of the donor countries. Official aid now contributes resources equivalent to 10 per cent of investment in developing countries, but this falls far short of United Nations objectives. Additional external resources are obtained from the private sector, notably in the form of suppliers' credits, as well as portfolio and direct investment. Funds of this kind do not fall within the definition of aid since they usually require a high return, often including a substantial risk premium. But clearly they contribute to the volume of investment in the developing countries. A slowing of the arms race would make more such funds available both by increasing the supply of resources and by reducing the risk premium.

106. The General Assembly has set targets both for the total flow of capital - which it is proposed should reach 1 per cent of the gross national product of the developed countries by 1975 - and for the flow of official development assistance alone, which should reach 0.7 per cent of gross national product. <sup>28/</sup> While a number of countries have made progress towards these targets in recent years, the over-all tendency has been for the share of aid in the gross national product of the developed countries to fall rather than rise.

107. It would take only a 5 per cent shift of current expenditures on arms to development to make it possible to approach the official targets for aid. A more substantial curtailment of the arms race would permit for the first time the kind of massive transfer of resources which could make a fundamental change in the prospects for social and economic development. The volume of fixed investment in the developing countries is estimated to have been around \$65 billion in 1969. A shift of 10 per cent from world military expenditure to investment would provide enough resources to raise the figure by almost a third.

108. Obviously, if the "disarmament dividend" were to become a reality, there would be many other claimants besides aid for the resources freed in developed countries. Many of these, whether in the public or private sector, have already been referred to. None the less, any wise assessment of world problems could not fail to give additional aid a very high priority.

---

<sup>28/</sup> See General Assembly resolution 2626 (XXV), paras, 42 and 43.



109. Given a "disarmament dividend", there are reasons for being optimistic that developed countries would be prepared to budget for some increase in aid. Donor countries, when pressed by demands for more aid, often urge that they cannot do more because of competing domestic demand for public resources and, in some cases, because of balance-of-payments difficulties. Consequently, lower levels of military expenditure would remove an important obstacle to the expansion of aid. In 1953, in General Assembly resolution 724 A (VIII), Member Governments were urged: "when sufficient progress has been made in internationally supervised world-wide disarmament, to devote a portion of the savings achieved through such disarmament to an international fund, within the framework of the United Nations, to assist development and reconstruction in underdeveloped countries". The complementary objectives of the Disarmament Decade and the Second United Nations Development Decade illustrate the same point.

110. The way the resources made available for aid are utilized makes all the difference to the effectiveness of their impact on the growth of the developing countries. Priorities have to be set, problems properly explored, and the best available measures used for their solution. Here much help could be provided to the developing countries by scientists and technologists of the industrialized countries, which have already developed the institutional framework for carrying out such work. The Pearson Commission thought that a realistic target for the developed countries would be to earmark, by 1972, 5 per cent of their public research and development resources for developing countries, of which at least a half should be spent in the developing countries themselves. 29/ It was the view of the United Nations Advisory Committee on the Application of Science and Technology to Development that developed countries should devote an increasing proportion of their research and development expenditure to specific problems of developing countries, selected in consultation with those countries, and for this purpose aim at reaching, by the end of the current decade, a desirable target of 5 per cent of their non-military research and development expenditure. 30/ It must be remembered, however, that the scientists, engineers and industrialists who would be "released" if military expenditures fell in the donor countries are highly specialized in the skills they have been using, and that they are not necessarily the people who could help in raising the yields of crops or in developing water supplies. It will take time before the resources which were devoted to their training and employment produce a generation of men competent to handle what are called the "research and development problems of development". Hopes in the research and development field should be high, but they should not be raised too high.

111. On the other hand, hopes should be high when the question of aid is considered in its entirety. More and more resources are clearly required, and these could become far more readily available as the weight of military expenditures decreases. To that extent aid and the arms race are linked. But whereas the latter adds to our burdens and perils, the former can only help in bringing about, and in maintaining, a peaceful world.

---

29/ Partners in Development: Report of the Commission on International Development, (New York, Praeger Publishers, 1969), p. 205.

30/ Science and Technology for Development, Proposals for the Second United Nations Development Decade: Report of the Advisory Committee on the Application of Science and Technology to Development (United Nations publication, Sales No.: E.70.I.23), p. 14.

## VI. CONCLUSIONS

112. From time immemorial States have relied on military forces to further their interests and to enhance their security. Today is no exception. But with the acceleration of technological change, the perils which military expenditures have brought in their wake have become so acute that it is no exaggeration to say that the arms race has finally provided man with the means of putting an end to his species. That is the most obvious of its consequences. Political wisdom has so far averted his final disaster. It cannot, however, insure against military miscalculation or against human or technical error, both of which could lead to the same fearful end. This is the first thing that must be concluded about the consequences of the arms race. The threat of ultimate disaster it has generated is by far the most dangerous single peril the world faces today - far more dangerous than poverty or disease, far more dangerous than either the population explosion or pollution - and it far outweighs whatever short-term advantage armaments may have achieved in providing peoples with a sense of national security.

113. More than this. The arms race makes more acute the very international strains to which it relates. Political differences become sharpened by the fear and suspicion which the amassing of armaments generates. International trade, already impeded by other factors, is slowed, particularly in the products of advanced technological industry. Military expenditures contribute to acute imbalances in the international payments. Cultural exchanges stagnate. In short, armaments, which are supposed to provide security, provoke the very political differences which nations may assume they will help dissipate.

114. As this report has made clear, the cost of the arms race is enormous, and because of it, resources have been denied almost every other field of social activity. In total, it consumed nearly \$1,900 billion from 1961 to 1970. If annual military expenditures continue to absorb their present percentage of world GNP, they could well reach the level of \$300-350 billion (at 1970 prices) by the end of the decade, with a total outlay for the decade of some \$750 billion more than was spent from 1961 to 1970.

115. The military expenditures which cast the greatest shadow over the world are those of the major Powers, which between them account for the bulk of all such spending. Arms races between the developing countries are, however, no less dangerous. There is the risk of conflicts spilling over to third countries, or indeed to the major Powers. The military expenditures of these countries deplete the resources which could otherwise be used for development. In particular, the military forces of the developing countries are immensely costly in terms of scarce trained manpower, which would otherwise be available to help in the enormous task of development. Many of these countries have started on their paths of national independence under conditions in which the allocation of their resources is grossly distorted.

116. This report has considered the opportunities lost as a result of the arms race. Economic aid has suffered. Enormous social problems lie ahead for all countries. Public services, health, education, housing, and now the protection of the environment - a task which becomes ever more urgent, and one which has to be faced not only on a national but on an international scale if a tolerable physical environment is to be assured for tomorrow - all need the resources which the arms race consumes.

117. If men can combine under the threat of war to solve problems which might have been left unformulated in the slower pace of peace, they should be able to do so in facing the challenge of the future. The Second World War began at a climactic moment in the development of modern science, and was a critical influence in the mobilization of national talents. New scientific knowledge was only too ready for exploitation in the prosecution of war. Whatever "spillover" effects there may have been from the resulting military technology, we could hope today that they could have been generated without the competitive challenge of militarism. New measures of technological concentration and of industrial organization have been learnt in the past few decades. All these lessons can be used in the interests of peace.

118. As was stated in the preamble to General Assembly resolution 2667 (XXV), a halt in the arms race would contribute effectively to the improvement of international relations and the maintenance of world peace and security. Every effort to retard the race would help, for any retardation would make it possible to release resources for peaceful uses, including aid. We share both the conviction and the hope that increased aid to developing countries would be a natural consequence of substantially reduced military expenditures.

119. The enormous cost of the arms race in human and other resources will become even clearer than it is today when the pace of the race is slackened as a result of concerted international political decision. War, whether between the developed or developing Powers, is not an answer to any of man's imminent problems. While we live under its threat, we are even held back from agreeing on the priorities of the social problems that beset us all. We can see some of the dangers that the future holds - dangers arising from the disharmony between rapid population growth on the one hand, and the possible exhaustion of resources on the other, dangers arising from the spoliation of our physical environment. These are the big problems whose solution is impeded by the diversion of resources to military expenditures. These are the problems which only become more insoluble in the climate of the arms race. The arms race must be stopped not only because of the immediate perils it holds for us all, but because the longer it continues, the more intractable the problems of economic growth, social justice and the environment will become.

120. It is our unanimous conclusion that:

(1) A substantial reduction in the military expenditures of all countries, particularly of those whose military expenditures are highest, should be brought about as soon as possible. The sooner concrete measures of disarmament, particularly of nuclear disarmament, are achieved, and the arms race is thereby halted and reversed, the faster will be the progress towards the goal of general and complete disarmament.

(2) Regardless of their size or their stage of development, all countries share the responsibility of taking steps which will help achieve this goal.

(3) A halt in the arms race and a significant reduction in military expenditures would help the social and economic development of all countries and would increase the possibilities of providing additional aid to developing countries.

(4) In order to draw the attention of the Governments and peoples of the world to the direction the arms race is taking, the Secretary-General should keep the facts under periodic review.

ANNEX I

GENERAL ASSEMBLY RESOLUTION 2667 (XXV)

2667 (XXV). Economic and social consequences of the armaments race and its extremely harmful effects on world peace and security

The General Assembly,

Conscious of the threat to mankind posed by the ever spiralling arms race, especially in view of the existing large stockpiles of, and impending new qualitative advances in, nuclear armaments,

Aware that world military expenditures have been continuously increasing, in spite of the achievements in the field of arms limitation and disarmament during the 1960s,

Convinced that unless vigorous measures are taken without delay to stop the arms race and to make concrete progress towards disarmament, giving the highest priority to nuclear disarmament, military expenditure is likely to increase at an even greater rate during the 1970s,

Deeply concerned that the arms race, nuclear and conventional, constitutes one of the heaviest burdens which peoples everywhere have to bear and that it absorbs immense material wealth, human energy and intellectual resources,

Deeply convinced that the elimination of the enormous waste of wealth and talent on the arms race, which is detrimental to the economic and social life of all States, would have a positive impact, especially on the developing countries, where the need for skilled personnel and the lack of material and financial resources are most keenly felt,

Convinced that a halt in the arms race, a reduction of military expenditures and concrete progress towards disarmament would greatly facilitate the achievement by nations of their economic and social goals and would contribute effectively to the improvement of international relations and the maintenance of world peace and security,

Conscious that it is the fundamental task of the United Nations to promote, in accordance with the Charter, the establishment and maintenance of international peace and security with the least diversion for armaments of the world's human and economic resources,

Determined to take appropriate steps to bring the arms race to a halt and to make progress towards general and complete disarmament, which is the most important question facing the world today,

Wishing to promote the elaboration and implementation of a comprehensive programme for disarmament, which would also facilitate the United Nations development programmes during the 1970s,

Believing that thorough consideration of the main aspects of the arms race would facilitate a better understanding and evaluation of its negative consequences and of the great dangers with which it is fraught,

1. Calls upon all States to take effective steps for the cessation and reversal of the arms race and for the achievement of steady progress in the field of disarmament;

2. Requests the Conference of the Committee on Disarmament to continue to pay urgent attention to all questions meant to put an end to the arms race, particularly in the nuclear field;

3. Requests the Secretary-General to prepare, with the assistance of qualified consultant experts appointed by him, a report on the economic and social consequences of the arms race and of military expenditures;

4. Calls upon all Governments to extend their full co-operation to the Secretary-General to ensure that the study is carried out in the most effective way;

5. Calls upon non-governmental organizations and international institutions and organizations to co-operate with the Secretary-General in the preparation of the report;

6. Requests that the report be transmitted to the General Assembly in time to permit its consideration at the twenty-sixth session.

1919th plenary meeting,  
7 December 1970.

## ANNEX II

### MILITARY BUDGET EXPENDITURE COMPARED WITH OTHER STATISTICS, ANNUAL AVERAGES, 1967-1969

The table below is presented in three parts: A. Developed market economies, B. Developing market economies, and C. Centrally planned economies. These data have been extracted from various issues of the United Nations Statistical Yearbook and Yearbook of National Accounts Statistics, and wherever possible have been supplemented by data taken from replies of Governments to the questionnaire of the Secretary-General dated 1 March 1971. a/

Information concerning military expenditure is contained in the official public accounts of central Governments. Countries differ, however, in their definitions of military expenditure, and information concerning their methods of classification is commonly not available. It is therefore impossible in many instances to determine the content of the official statistics from an economic and social point of view. Some expenditures that would be considered as military from this viewpoint may be excluded from the official data, while others that would be considered as non-military may be included. In addition, there are commonly differences within countries in the basis of pricing of military output as compared with that of the output of the rest of the economy. These differences alone, even if the coverage of the expenditure statistics were appropriate, would make it impossible to indicate with any precision the proportion of resources devoted to military purposes. Furthermore, different countries have different economic structures and patterns of prices, so that in comparing countries one would obtain different ratios of military expenditure to domestic product and its components merely from using the different price patterns. For all these reasons, official statistics of military expenditure have only limited value as a basis for measuring the economic burden imposed by the armaments race.

This table includes the most readily available official statistics on military expenditure and compares these with domestic product, fixed capital investment, and central government expenditures on education and health. In accordance with usual statistical practice, the concept of domestic product in parts A and B is different from that in part C. In parts A and B domestic product includes output originating in both "material production" and services. In part C domestic product includes output originating in material production only. A further difference is that domestic product in parts A and B is gross, depreciation not having been deducted from gross investment, while material product in part C is net of depreciation. Accordingly, military expenditure is compared with a more broadly defined measure of product in parts A and B than in part C. For more detailed definitions, reference should be made to the United Nations publications, A System of National Accounts.

---

a/ To be issued under the symbol A/8469/Add.1.

Data on central government expenditures on education and health shown in the table have somewhat limited value for international comparisons owing to the fact that expenditures of regional governments and private institutions in the market economies are not covered, while in the centrally planned economies the national Governments are largely responsible for education and health, so that such expenditures tend to be much more fully covered. Even among the market economies the figures are not strictly comparable for reasons of diverse definitions and coverage.



## A. DEVELOPED MARKET ECONOMIES: MILITARY BUDGET EXPENDITURE COMPARED WITH OTHER STATISTICS

ANNUAL AVERAGES 1967-1969

Country	Currency unit	Military budget expenditure	Gross domestic product at market prices	Gross domestic fixed investment	Military budget expenditure as percentage of: GDP	Gross domestic fixed investment	Central government expenditure as a percentage of GDP for: Education	Health
AFRICA								
South Africa	million rand	235.9 <sup>1/</sup>	10,316.7 <sup>2/</sup>	2,385.0 <sup>2/</sup>	2.3	9.9	0.7 <sup>1/</sup>	0.5 <sup>1/</sup>
NORTH AMERICA								
Canada	million C. dollars	1,807.6	72,652.6	16,168.0	2.5	11.2	5.8 <sup>7/</sup> , <sup>13/</sup>	8.2 <sup>7/</sup> , <sup>13/</sup>
United States	billion dollars	77.2 <sup>4/</sup>	874.2	146.1	8.8	52.8	6.1 <sup>22/</sup>	6.1 <sup>22/</sup>
ASIA								
-64- Japan	billion yen	415.9 <sup>1/</sup>	53,032.7	18,318.6	0.8	2.3	1.2 <sup>1/</sup>	0.8 <sup>1/</sup>
EUROPE								
Austria	billion schillings	3.8	299.1	71.4	1.3	5.3	3.2	0.1
Belgium	billion francs	29.9	1,045.2	226.4	2.9	13.2	5.6	0.5
Denmark	million kroner	2,259.0 <sup>1/</sup>	94,051.0	20,085.6	2.4	11.2	3.5 <sup>1/</sup>	2.7 <sup>1/</sup>
Finland	million markkas	536.3	34,327.3	8,081.6	1.6	6.6	4.4	1.9
France	billion francs	23.6	649.7	161.7	3.6	14.6	...	4.1 <sup>7/</sup> , <sup>23/</sup>
Germany, Fed. Rep. of	million DM	18,000.0	545,950.0	128,470.0	3.3	14.0	2.6 <sup>5/</sup> , <sup>7/</sup>	3.8 <sup>5/</sup> , <sup>7/</sup>

A. DEVELOPED MARKET ECONOMIES: MILITARY BUDGET EXPENDITURE COMPARED WITH OTHER STATISTICS

ANNUAL AVERAGES 1967-1969 (continued)

Country	Currency unit	Military budget expenditure	Gross domestic product at market prices	Gross domestic fixed investment	Military budget expenditure as percentage of: GDP	percentage of: Gross domestic fixed investment	Central government expenditure as a percentage of GDP for: Education	Health
EUROPE (continued)								
Greece	billion drachmas	11.0	225.7	61.8	4.9	17.8	2.0	1.3
Ireland	million pounds	14.6 <sup>1/</sup>	1,241.7	262.6	1.2	5.6	4.0 <sup>1/</sup>	1.8 <sup>1/</sup>
Italy	billion lire	1,043.3	47,151.3	9,343.6	2.2	11.2	3.4	0.2 <sup>6/</sup>
Netherlands	million guilders	3,389.0	91,854.0	23,861.6	3.7	14.2	6.6	0.2
Norway	million kroner	2,503.0	65,582.0	17,756.6	3.8	14.1	3.2	0.9
Portugal <sup>5/</sup>	billion escudos	8.7	130.8	25.0	6.7	34.8	1.3	0.7
Spain	billion pesetas	36.5	1,824.0	389.3	2.0	9.4	1.3	...
Sweden	million kronor	5,133.0 <sup>4/</sup>	135,646.0	31,787.3	3.8	16.1	3.9 <sup>4/</sup>	1.2 <sup>4/</sup>
Switzerland	million Swiss francs	1,795.0	73,118.3	18,886.6	2.5	9.5	0.7	---
United Kingdom	million pounds	2,398.6	42,462.6	7,685.0	5.6	31.2	5.6 <sup>7/</sup>	4.0 <sup>7/</sup>
OCEANIA								
Australia <sup>9/</sup>	million A. dollars	1,002.3	27,070.7	7,183.3	3.7	14.0	0.2	4.6 <sup>6/</sup>
New Zealand <sup>10/</sup>	million NZ dollars	93.6	4,473.0	931.3	2.1	10.1	3.4	1.8

B. DEVELOPING MARKET ECONOMIES: MILITARY BUDGET EXPENDITURE COMPARED WITH OTHER STATISTICS

ANNUAL AVERAGES 1967-1969

Country	Currency unit	Military budget expenditure	Gross domestic product at market prices	Gross domestic fixed investment	Military budget expenditure as percentage of: GDP	Gross domestic fixed investment	Central government expenditure as a percentage of GDP for: Education	Health
AFRICA								
Egypt <sup>5/,9/</sup>	million E. pounds	222.0	2,567.3	328.1	8.6	67.7	4.8	1.8
Ethiopia <sup>11/</sup>	million E. dollars	104.3 <sup>12/</sup>	3,573.3	453.0	2.9	23.0	1.6	0.8
Ghana	million new cedis	42.7	2,057.7	226.3	2.1	18.9	3.5	1.0
Ivory Coast	billion CFA francs	1.9	321.4	54.4	0.6	3.5	...	...
Kenya	million pounds	5.7	477.3	90.9	1.2	6.3	2.1	1.1
Liberia <sup>5/</sup>	million U.S. dollars	3.0	332.9	...	0.9	...	2.3	1.4
Malawi	million M. pounds	0.6	108.0	16.5	0.5	3.6	3.8	1.4
Morocco	billion dirhams	0.4	14.9	2.0	2.7	20.0	...	...
Nigeria <sup>10/,13/</sup>	million N. pounds	12.3	1,567.7	202.0	0.8	6.0	0.5	0.4
Southern Rhodesia <sup>5/</sup>	million R. dollars	12.2	790.0	106.7	1.5	11.4	1.6	0.8
Sudan <sup>5/</sup>	million pounds	16.6 <sup>4/</sup>	539.0 <sup>9/</sup>	70.8 <sup>2/</sup>	3.1	23.4	1.9 <sup>4/</sup>	1.0 <sup>4/</sup>
Togo <sup>8/</sup>	million CFA francs	648.0	44,996.7	7,106.3	1.4	9.1	1.8	1.0
Uganda	million shillings	128.2 <sup>4/</sup>	7,406.3	1,018.7	1.7	12.6	2.7 <sup>4/</sup>	1.8 <sup>4/</sup>

B. DEVELOPING MARKET ECONOMIES: MILITARY BUDGET EXPENDITURE COMPARED WITH OTHER STATISTICS

ANNUAL AVERAGES 1967-1969 (continued)

Country	Currency unit	Military budget expenditure	Gross domestic product at market prices	Gross domestic fixed investment	Military budget expenditure as percentage of: GDP	Gross domestic fixed investment	Central government expenditure as a percentage of GDP for: Education	Health
AFRICA (continued)								
United Republic of Tanzania <sup>11/</sup>	million pounds	9.0 <sup>9/</sup>	266.8 <sup>15/</sup>	44.9	3.4	20.0	3.4 <sup>9/</sup>	1.3 <sup>9/</sup>
Zambia <sup>11/</sup>	million kwacha	13.1	774.3	173.8	1.7	7.5	5.0	1.5
CARIBBEAN AND LATIN AMERICA								
Argentina	billion pesos	135.7	6,142.0	1,266.0	2.2	10.7	2.1	1.6
Bolivia <sup>13/</sup>	million pesos	93.7	6,459.7	977.7	1.4	9.6	2.5	...
Brazil <sup>5/</sup>	million new cruzeiros	1,932.3	74,826.3	11,678.3	2.6	16.5	0.8	0.3
Chile <sup>5/</sup>	million escudos	713.2	34,044.3	5,080.0	2.1	14.0	3.6	...
Colombia	million pesos	2,070.3	96,819.3	18,258.0	2.1	11.3	1.5	0.5
Costa Rica <sup>5/</sup>	million colones	47.4	4,632.7	929.5	1.0	5.1	4.3	0.6
Dominican Republic <sup>5/</sup>	million pesos	32.0	1,118.3	155.7	2.9	20.5	2.5	1.5
Ecuador	million sucres	516.3	27,621.3	3,245.6	1.9	15.9	2.7	0.4
El Salvador	million colones	24.3	2,296.6	279.3	1.0	8.7	2.6	1.3

B. DEVELOPING MARKET ECONOMIES: MILITARY BUDGET EXPENDITURE COMPARED WITH OTHER STATISTICS

ANNUAL AVERAGES 1967-1969 (continued)

Country	Currency unit	Military budget expenditure	Gross domestic product at market prices	Gross domestic fixed investment	Military budget expenditure as percentage of: GDP	Gross domestic fixed investment	Central government expenditure as a percentage of GDP for: Education	Health
CARIBBEAN AND LATIN AMERICA (continued)								
Guatemala	million quetzales	15.8	1,566.3	217.7	1.0	7.2	...	...
Honduras	million lempiras	13.1	1,262.3	220.7	1.0	5.9	2.7	1.1
Mexico <sup>5/</sup>	billion pesos	2.0	307.9	52.9	0.6	3.8	1.7	0.4
Nicaragua <sup>16/</sup>	million cordobas	48.1	2,851.0	377.7	1.7	12.7	1.3	0.5
Peru <sup>11/</sup>	billion soles	4.0	136.4	22.8	2.9	17.5	3.9	0.9
Venezuela <sup>5/</sup>	million bolivares	860.0	41,794.6	8,398.0	2.1	10.2	2.8	2.5
ASIA								
Ceylon	million rupees	75.3 <sup>17/</sup>	10,492.0	1,703.4	0.7	4.4	4.0 <sup>17/</sup>	2.0 <sup>17/</sup>
India <sup>10/, 11/</sup>	billion rupees	8.3	280.0	...	3.0	...	1.6 <sup>3/</sup>	0.6 <sup>3/</sup>
Indonesia <sup>13/</sup>	billion new rupiahs	0.2	11.3	0.9	1.8	22.2	0.1	...
Iran <sup>19/</sup>	million rials	34,867.3	683,504.0	135,252.0	5.1	25.8	2.4	0.8
Iraq <sup>5/</sup>	million dinars	86.3 <sup>1/</sup>	920.2 <sup>15/</sup>	149.6	9.4	57.7	5.5 <sup>1/</sup>	1.1 <sup>1/</sup>

B. DEVELOPING MARKET ECONOMIES: MILITARY BUDGET EXPENDITURE COMPARED WITH OTHER STATISTICS

ANNUAL AVERAGES 1967-1969 (continued)

Country	Currency unit	Military budget expenditure	Gross domestic product at market prices	Gross domestic fixed investment	Military budget expenditure as percentage of: GDP	Military budget expenditure as percentage of: Gross domestic fixed investment	Central government expenditure as a percentage of GDP for: Education Health	
ASIA (continued)								
Israel	million I. pounds	1,425.0 <sup>1/</sup>	14,539.0	2,859.0	9.8	49.8	3.3 <sup>1/</sup>	1.2 <sup>1/</sup>
Jordan <sup>5/</sup>	million dinars	29.1 <sup>1/</sup>	184.0	28.1	15.8	103.6	2.5 <sup>1/</sup>	1.1 <sup>1/</sup>
Korea, Rep. of	billion won	66.5	1,598.3	404.5	4.2	16.4	2.9	0.2
Lebanon <sup>5/</sup>	million L. pounds	121.2	3,986.6	811.6	3.0	14.9	2.3	0.5
Malaysia <sup>18/</sup>	million M. dollars	371.1	8,807.0	1,238.3	4.2	30.0	6.2	2.2
Pakistan <sup>9/, 11/</sup>	million rupees	2,445.4	60,500.0	8,489.3	4.0	28.8	0.1	
Philippines	million pesos	320.6 <sup>4/</sup>	30,066.6	5,698.0	1.1	5.6	3.0 <sup>4/</sup>	...
Syrian Arab Republic <sup>13/</sup>	million S. pounds	385.6	3,767.0	631.0	10.2	61.1	3.3	0.6
Thailand	million baht	3,021.6 <sup>17/</sup>	119,636.6	27,821.0	2.5	10.9	2.7 <sup>17/</sup>	0.5 <sup>17/</sup>
Turkey	million T. liras	4,072.0 <sup>20/</sup>	115,220.6	20,355.6	3.5	20.0	2.4 <sup>20/</sup>	0.7 <sup>20/</sup>

## C. CENTRALLY PLANNED ECONOMIES: MILITARY BUDGET EXPENDITURE COMPARED WITH OTHER STATISTICS

ANNUAL AVERAGES 1967-1969

Country	Currency unit	Military budget expenditure	Net material product	Gross fixed investment	Military budget expenditure as percentage of:		Central government expenditure as a percentage of NMP for:	
					NMP	Gross fixed investment	Education	Health
Bulgaria	million leva	749.6 <sup>21/</sup>	8,586.3	3,167.2	8.7	23.7	15.1 <sup>14/</sup>	...
Czechoslovakia <sup>5/</sup>	million korunas	12,066.6	226,541.0	74,127.0	5.3	16.3	...	...
Hungary	billion forints	6.5	228.4	65.5	2.8	9.9	3.8	3.3
Poland	billion zlotys	30.0	656.8	167.1	4.6	17.9	5.0	4.2
Romania	million lei	5,738.7	...	...	3.1	...	...	...
U.S.S.R.	billion roubles	16.3	243.8	64.4	6.7	25.3	8.9	3.3
Yugoslavia <sup>5/</sup>	billion new dinars	5.6	95.9	26.9	5.8	20.8	...	1.3

Foot-notes:

... Not available

--- Nil

- 1/ Years ending 31 March.
- 2/ Including Namibia.
- 3/ Data refer to state government expenditures.
- 4/ Years ending 30 June.
- 5/ Data relate to 1966-1968 average.
- 6/ Health, labour and welfare.
- 7/ Data relate to combined public sector.
- 8/ Data relate to 1964-1966 average.
- 9/ Years beginning 1 July.
- 10/ Years beginning 1 April.
- 11/ Data relate to 1965-1967 average.
- 12/ Years ending 7 July.
- 13/ Data relate to 1963-1965 average.
- 14/ Including social security.
- 15/ Gross domestic product at factor cost.
- 16/ Data relate to 1960-1962 average.
- 17/ Years ending 30 September.
- 18/ Data refer to West Malaysia only (formerly Malaya).
- 19/ Years beginning 21 March.
- 20/ Years ending 28 February.
- 21/ Including other current expenditure.
- 22/ Including expenditures by all levels of government and by private institutions.
- 23/ Data relate to 1969 only.



### ANNEX III

#### IMPACT OF DISARMAMENT ON THE DEMAND FOR RAW MATERIALS

The table below presents the estimated impact of complete disarmament on world-wide demand for some 11 raw materials. The first three columns show in detail how estimates were constructed for disarmament in the United States. The last column extends the analysis to include all industrial countries.

Column 1 shows how elimination of all United States military expenditures, without compensating increases in civilian expenditure, would reduce total demand for the raw materials studied. Column 2 shows increases in total demand for these materials that would be brought about by the full reallocation of military funds to peaceful ends. Column 3 displays the net effect of the offsetting influences shown in the first two columns. Column 4 presents crude estimates of net changes due to the reallocation of armament expenditures in all industrial countries. These estimates are based on the assumption that military spending in industrial countries as a whole is approximately twice United States military spending, and that the reallocation of military funds to peaceful ends has the same effect in other industrial countries as in the United States.

Input-output methodology was employed in computing the indirect as well as direct effects of final military and non-military expenditures on the demand for strategic raw materials. The latest available United States input-output table (1963), supplemented by full technical information, provided the statistical basis for the computations.

CHANGE IN WORLD DEMAND FOR SELECTED RAW MATERIALS AFTER PROPORTIONAL  
REALLOCATION OF MILITARY PURCHASES TO OTHER DEMAND CATEGORIES  
(AS PERCENTAGE OF WORLD SUPPLY, 1967)\*

Raw material	United States			All industrial countries
	Decreases in demand due to disarmament	Increases in demand due to reallocation of military expenditures to peaceful ends	Net demand changes after reallocation of military expenditures	Net demand changes after reallocation of military expenditures <u>a/</u>
Bauxite	-5.22	+2.92	-2.30	-4.60
Chromite	-2.73	+2.77	+0.04	+0.08
Copper	-3.99	+2.82	-1.17	-2.35
Iron ore	-1.93	+2.02	+0.09	+0.18
Lead	-3.96	+2.55	-1.41	-2.83
Manganese	-1.02	+1.10	+0.08	+0.16
Molybdenum	-5.45	+4.13	-1.32	-2.64
Nickel	-3.18	+2.34	-0.84	-1.68
Tin	-3.64	+2.79	-0.85	-1.69
Zinc	-3.58	+2.71	-0.87	-1.73
Petroleum, crude	-2.00	+2.81	+0.81	+1.63

\* Source: Estimates by Wassily W. Leontief and Peter A. Petri of Harvard University, prepared at the request of the Secretary-General.

a/ Assumed equal to twice the net changes for the United States (see text).

ANNEX IV  
BIBLIOGRAPHY

- Ackley, G. Report of the Committee on the Economic Impact of Defense and Disarmament. July 1965. Washington, United States Government Printing Office, 1965.
- Bacskai, Tamas. The armament race and the developing countries. Afro-Asian and world affairs (New Delhi) 3:297-305, winter 1966.
- Baldwin, J. The economics of peace and war; a simulation. Journal of conflict resolution (Ann Arbor, Mich.) 11:383-397, December 1967.
- Barnet, Richard J. The economy of death. New York, Atheneum, 1969.
- Bassir, Olumbe. Arms control and the developing nations. Arms control and disarmament (Washington, D.C.) 1:1-25, 1968.
- Becziewicz, Z. Problemy ekonomiki wojennej. Warszawa, Akademia Sztabu Generalnego, Katedra Ekonomii Politycznej i Ekonomiki Wojennej, 1965.
- Benoit, Emile. The monetary and real costs of national defense. In Papers and proceedings of the eightieth annual meeting of the American Economic Association, 1967. Washington, D.C., 1968, p. 398-416.
- Benoit, Emile and others. Effects of defense on developing economies (study prepared for USACDA, forthcoming).
- Benoit, E. and H. Lubell. World defense expenditures. Journal of peace research (Oslo) 2:97-113, 1966.
- Benoit, Emile, Harold Lubell and Sylvia Schuman. Le coût mondial de la défense nationale. Tiers-monde (Paris) 7:691-716, octobre-décembre 1966.
- Bogaert, K.A.M. Aspects économiques des dépenses militaires. Reflets et perspectives de la vie économiques (Bruxelles): 31-42, janvier 1966.
- Boulding, K.E. and others. National priorities; military, economic and social. Washington, D.C. Public Affairs Press, 1969.
- Clark, J.J. The new economics of national defense. New York, Random House, 1966.
- Commission on International Development. Partners in Development; Report. Chairman: L.B. Pearson. New York, Praeger, 1969.
- Copps, John A., ed. The cost of conflict; lectures given at Western Michigan University under the sponsorship of the Department of Economics. Winter semester, 1968. Ann Arbor, Michigan, Bureau of business research, University of Michigan, 1969.

Dresden. Kriegsakademie "Friedrich Engels". Probleme der Militärökonomie.  
Berlin, Deutscher Militärverlag, 1967.

The effects of military and space research on civilian technology. In Government and technical innovation. Paris, Organisation for Economic Co-operation and Development, 1966. p. 29-34.

Feld, B.T. and others. Impact of new technologies on the arms race.  
Cambridge, Mass., M.I.T. Press, 1971.

Galbraith, John Kenneth. The cold war and the corporations. Progressive  
(Madison, Wis.) 31:14-18, July 1967.

Gromov, L. and E. Cetyrkin. Kapitalisticeskoe vosproizvodstvo i militarizacija ekonomiki. Mirovaja ekonomika i mezhdunarodny otnosenija (Moscow): 75-84, août 1966.

Hitch, Charles J. and R.N. McKean. The economics of defense in the nuclear age.  
Cambridge, Harvard U.P., 1960.

Hoagland, J.H. World combat aircraft inventories and production, 1970-75.  
Cambridge, Mass., M.I.T. Press. 1970.

Hoffman, W.G. The share of defence expenditure in gross national product (GNP); an international and diachronic comparison. German economic review (Stuttgart) 7:295-307, 1969.

Javits, Jacob K., C.J. Hitch and A.F. Burns. The defense sector and the American economy. N.Y., New York University Press, 1968. (New York University School of Commerce. Charles C. Moskowitz lectures).

Kalecki, M. Gospodarcze aspekty militaryzacji Niemiec Zachodnich. Ekonomista (Warszawa) no. 6:1245-1250, 1961.

Leontief, W. Alternatives to armament expenditures. Bulletin of the atomic scientists (Chicago) 20:19-21, June 1964.

Long, M. L'incidence des dépenses des armées sur l'économie. Revue de défense nationale (Paris) 24:987-1000, juin-juillet 1968.

McKean, R.N., ed. Issues in defense economics. New York, Columbia University Press, 1967.

Melman, S. Economic alternatives to arms prosperity. Annals of the American Academy of Political and Social Science (Philadelphia) 351:121-131, January 1964.

Melman, S. The economics of armament and disarmament. New university thought (Chicago) 2:79-92, spring 1962.

Melman, Seymour. The defense economy; conversion of industries and occupations to civilian needs. Edited by S. Melman. N.Y., Praeger (1970).

Melman, Seymour. Our depleted society. N.Y., Holt, Rinehart and Winston, 1965.

- Melman, Seymour. The war economy of the United States; readings on military industry and economy. N.Y., St. Martin's Press, 1971.
- The military balance. London, The Institute for Strategic Studies. Published annually.
- Mosbaek, E.J. Information on the impact of reductions in defense expenditures on the economy. Quarterly review of economics and business (Champaign, Ill.): 47-67, autumn 1965.
- Nadler, E. Some economic disadvantages of the arms race. Journal of arms control (Ann Arbor) 1:597-603, October 1963.
- Nilsson, B. Försvar och ekonomi. Ekonomisk revy (Stockholm) 24:443-449, October 1967.
- Organisation for Economic Co-operation and Development. The Research and Development Effort in Western Europe, North America and the Soviet Union. Paris, 1965.
- Russett, Bruce M. Making defense defensible. Virginia quarterly review (Charlottesville, Va.) 46:529-551, autumn 1970.
- Russett, Bruce. What price vigilance? the burdens of national defense. New Haven, Conn., Yale University Press, 1970.
- Russett, Bruce, M. Who pays for defense? American political science review (Menasha, Wis.) 63:412-426, June 1969.
- Schlesinger, J.R. Economic growth and national security. Orbis (Philadelphia) 5:453-469, winter 1962.
- Shepler, C.E. and L.G. Campbell. United States defense expenditures abroad. Survey of current business (Washington, D.C.) 49:40-47, December 1969.
- SIPRI yearbook of world armaments and disarmament. Stockholm, Sweden, Stockholm International Peace Research Institute. Published annually.
- Tadashi, Kawata. Economic implications of nuclear armament. Japan quarterly (Tokyo) 15:180-186, April-June 1968.
- U.S.S.R. Tsentral'noe Statisticheskoe Upravlenie. Strana Sovetov Za 50 let, Moscow, 1967.
- United States Arms Control and Disarmament Agency. The timing of the impact of government expenditures. Prepared by E.W. Adams and M.H. Spiro. Washington, 1970. (Its: ACDA/E-157).
- United States Arms Control and Disarmament Agency. World military expenditures. Washington, D.C. Published annually.
- Vander Eycken, Henri. Aspects économiques des dépenses de défense. Socialisme (Bruxelles) 12:138-148, mars 1965.

Weidenbaum, Murray L. Measurements of the economic impact of defense and space programs. American journal of economics and sociology (New York) 25:415-426, October 1966.

Weidenbaum, Murray L. The military-industrial complex; an economic analysis. A paper to be presented to the Fourteenth Annual Institute of World Affairs, Washington State University, Pullman, Washington, March 21, 1969. St. Louis (1969).

Witmann, W. Militärausgaben und wirtschaftliche Entwicklung. Zeitschrift für die gesamte Staatswissenschaft (Tübingen): 109-129, janvier 1966.

Zuckerman, Solly. Scientists and war; the impact of science on military and civil affairs. London, Hamish Hamilton (1966).