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

Economic and social consequences of the arms race and of military expenditures

Report of the Secretary-General

1. By paragraph 1 of resolution 35/141 of 12 December 1980, the General Assembly requested the Secretary-General to bring up to date, with the assistance of qualified consultant experts, the report entitled Economic and Social Consequences of the Arms Race and of Military Expenditures. 1/

2. Pursuant to that resolution, the Secretary-General appointed the Group of Consultant Experts on the Economic and Social Consequences of the Arms Race and its Extremely Harmful Effects on World Peace and Security, which met from 20 to 31 July 1981 and from 18 to 29 January and 19 to 30 July 1982.

3. In conformity with paragraph 93 (c) of the Final Document of the Tenth Special Session of the General Assembly (resolution S-10/2), the Secretary-General hereby submits this updated report, taking into account the new developments which are of particular relevance in the present economic and political conditions of the world.

4. By a letter dated 30 July 1982, the Chairman of the Group of Consultant Experts transmitted to the Secretary-General the report which is hereby submitted to the General Assembly.

Notes

1/ A/32/88/Rev.1 (United Nations publication, Sales No. E.78.IX.1).

ANNEX

Study on the economic and social consequences of the arms race and of military expenditures

CONTENTS

FOREWORD BY THE SECRETARY-GENERAL

This report is the third in a series of reports made under the aegis of the United Nations, in which, from time to time, the economic and social consequences of the arms race and its extremely harmful effects on world peace and security are analysed. It has been prepared by the Group of Consultant Experts on that subject which I appointed under the terms of General Assembly resolution 35/141 of 12 December 1980. By that resolution, the General Assembly, noting that, since the preparation of the previous report, there had been new developments of particular relevance in the economic and political conditions of the world, requested the Secretary-General to bring up to date, with the assistance of qualified experts appointed by him, the second in the series of reports entitled Economic and Social Consequences of the Arms Race and of Military Expenditures. 1/

The deadly destructive potential of existing arsenals, particularly nuclear, and the opportunities for socio-economic development that are lost through the continuing use for military purposes of the world's finite resources have always been a major concern of the United Nations. This report articulates that concern in the context of the current deterioration in the international political climate and the weakening of the global economic situation. In doing so, it stresses the increasing interdependence of a world confronted with problems that either cannot be resolved except by joint efforts, or whose solution by national or regional means would be at much higher cost. The report goes beyond merely describing the arms race in terms of national military expenditures and a list of the States involved. It points out that the forces driving the arms race, the purposes it serves, and the various forms of its manifestation, have made it a phenomenon adversely affecting global socio-economic options, because its very continuation presupposes conflict and reinforces confrontation.

This, in brief, is a major message of the present report, which was unanimously adopted by the Group of Consultant Experts on 30 July 1982.

I am further gratified at the high level of competence with which the experts have carried out their difficult and delicate task. I take this opportunity to express to the Group of Consultant Experts my appreciation and thanks. While commending the report for consideration by Governments, agencies and organs of the United Nations system, and by non-governmental organizations, I wish to point out that, in the complex field surveyed by the Group, I am not in a position to pass judgement on all aspects of the work done by them.

In pursuance of paragraph 1 of General Assembly resolution 35/141, I am transmitting this updated report, entitled Economic and Social Consequences of the Arms Race and of Military Expenditures, to the General Assembly at its thirty-seventh session.

LETTER OF TRANSMITTAL

30 July 1982

Sir,

I have the honour to submit herewith the report of the Group of Consultant Experts on the Economic and Social Consequences of the Arms Race and of Military Expenditures, which was appointed by you in pursuance of paragraph 1 of General Assembly resolution 35/141 of 12 December 1980.

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

Mr. Simón Alberto CONSALVI
Former Minister of Venezuela (First Session)

Mr. Dragomir DJOKIC
Special Adviser for Disarmament, Federal Secretariat for Foreign Affairs, Belgrade, Yugoslavia

Mr. Constantin ENE
Ambassador, Ministry for Foreign Affairs, Department of International Organizations, Bucharest, Romania

Mr. Oscar GONZALEZ
Ambassador and Alternate Permanent Representative of Mexico to the United Nations, New York (Final Session)

Mrs. Ifigenia MARTINEZ
Ambassador and Permanent Representative of Mexico to the United Nations, New York (First and Second Sessions)

Mr. Hendrik DE HAAN
Professor of International Economic Relations, University of Groningen, The Netherlands

Mr. Yasunori KIKUCHI
Counsellor, Embassy of Japan, Yugoslavia

His Excellency
Mr. Javier Pérez de Cuéllar
Secretary-General of the United Nations
New York

/...

Mr. Ladislav MATEJKA
Deputy Minister, Presidium of the Government of Czechoslovak Socialist Republic

Mr. Semen N. NADEL
Professor and Head of a Section, Institute of World Economy and International Relations of the Academy of Sciences of the USSR

Mr. Waliur RAHMAN
Deputy Permanent Representative of Bangladesh to the United Nations, New York (First and Second Session)

Mr. Kurt ROTHSCHILD
Professor of Economics, University of Linz, Austria

Mr. Christian SCHMIDT
Directeur du centre d'analyse scientifique des conflits internationaux, Université de Paris, France

The report was prepared between July 1981 and July 1982, during which period the Group held three sessions, the first from 20 to 31 July 1981, the second from 18 to 29 January 1982, and the third from 19 to 30 July 1982. All the sessions were held in New York.

The members of the Group of Consultant Experts wish to express their gratitude for the assistance which they received from members of the Secretariat of the United Nations and of the specialized agencies and other organizations of the United Nations system. They wish, in particular, to thank Mr. Jan Martenson, Assistant Secretary-General, Mr. Abdelkader Bensmail, who served as Secretary of the Group, and to Dr. Swadesh Rana, who served as Consultant to the Secretariat.

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

Respectfully yours,

(Signed) Constantin ENE
Chairman of the
Group of Consultant Experts

INTRODUCTION

1. The arms race is increasingly a world-wide phenomenon and, although its intensity varies markedly between regions, few countries and no major region have stayed out of it.

2. The competition in armaments between the largest military Powers is by far the most important. It involves the greatest diversion of resources, the greatest inherent dangers and constitutes the principal driving force of the world-wide arms race. All significant developments in armaments originate here and spread from here to the rest of the world, with greater or lesser time lags. This competition is even more intense than is suggested by the immense size and the rapid expansion of their arsenals, because it takes place primarily in a qualitative rather than quantitative dimension, each new generation of weapons being more complex and more destructive than the system it replaces.

3. The strong qualitative momentum of the arms race has important consequences for the way it develops, the insecurity it generates and the effect it has on the possibilities for disarmament. In an arms race where the emphasis is on quantity, there is room for saturation levels or for mutually agreed ceilings and reductions; under conditions of rapid military innovation, the decisive factor is not so much the actual military strength of the opponents but rather those technological advances which they may achieve in a decade or so. Military procurement plans of countries in the forefront of the technological arms race seek means of defeating their own most advanced weapons and neutralizing their own latest defences, thus conferring on military technology a momentum and a rate of obsolescence much greater than in comparable civilian applications.

4. The facts about the qualitative character of the arms race - alarming and growing in importance - have to be kept in mind when measures to limit it are discussed. It will not suffice to take cuts in total military expenditure as the sole criterion of progress, unless they are very substantial indeed. Supporting measures to contain the qualitative arms race are imperative.

5. Exacerbated by the population explosion, the food crisis and the devastations of natural disasters and war, the problems of eradicating poverty and of improving standards of health, nutrition, education and housing have reached a stage of crisis in many parts of the world. No less important problems are those of industrialization and growth in developing countries, of combating the degradation of the environment, of developing new sources of energy and raw materials while preserving presently available sources, of halting the degradation of cities, and many others. All of these make claims on investment, research and other resources in direct competition with military claims. The vast benefits which could result from even trifling cuts in military expenditures and the reallocation of the funds thus saved are obvious.

6. The implications of an arms race and of military expenditures on the scale typical of the post-war period are much more pervasive than mere economic

considerations would suggest. Being one of the main factors shaping the international context, the arms race exerts a profound influence on the politics, economy and society of many countries. In some cases, an ever-present risk of interference by outside powers imposes narrow limits on foreign and domestic policies, limits that may run counter to national aspirations. In other cases, the armed forces become a factor of decisive weight in internal politics. Military priorities may also exert considerable influence on the directions taken by the civilian economy.

7. The arms race represents a waste of resources, a diversion of the economy away from its humanitarian purposes, a hindrance to national development efforts and a threat to democratic processes. But its most important feature is that, in effect, it undermines national, regional and international security. It involves the constant risk of war engaging the largest Powers, including nuclear war, and it is accompanied by an endless series of wars at lower levels. It raises an ever greater barrier against the development of an atmosphere in which the role of force in international relations may be downgraded. In addition, it impedes relations between countries, affecting the volume and direction of exchanges, diminishing the role of co-operation among States and obstructing efforts towards establishing a new international economic order on a more equitable basis.

8. Those are some of the major characteristics of the arms race analysed in the second report on the Economic and Social Consequences of the Arms Race and of Military Expenditures, submitted to the General Assembly in 1977. 2/ In describing the arms race as a dynamic phenomenon affecting the social, political, technological and industrial options of all countries, the 1977 report provided demonstrable historical and empirical evidence supporting a major conclusion of the first report on the subject, submitted to the General Assembly in 1971. 3/ Warning that the arms race must be stopped not only because of the immediate peril it holds for everyone, but because, the longer it continues, the more intractable the problems of economic growth, social justice and environment will become, the 1971 report recommended a reduction in military expenditures to promote the goals of socio-economic development. 4/ Both the 1971 and 1977 reports viewed the threat of ultimate self-destruction, resulting from a nuclear war, as the greatest peril facing the world. Both emphasized the urgent need to recognize and accept that effective security cannot be achieved by further armaments.

9. These features of the earlier reports have retained their entire validity. The threat of a nuclear war due to an accident, a miscalculation or an act of strategy continues to persist. The security preoccupations of the major arms race participants, particularly in the nuclear field, have been aggravated by the incremental improvements and radical innovations of existing arsenals. Technological advances in the military sector are running ahead of the process of disarmament negotiations. Strategic considerations are negatively affecting the prospects of mutually advantageous international economic relations among States. And the vast problems of accelerating the process of socio-economic development, particularly of the developing countries, continue to be subordinated to the expanding claims of the arms race on global resources - human and material.

10. But the politico-strategic and socio-economic context in which the 1977 report is being updated is very different from that prevailing during the updating of the 1971 report:

(a) World military spending during the past four years has risen faster than in the four years preceding it. This trend marks a contrast not only in terms of a global increase in real terms, but is also due to an increase in the military spending of the developed world which during the 1970s experienced a levelling off over a rapid rise in military expenditure during the 1960s.

(b) The international political climate is exceptionally grave. The 1980s started with severe setbacks to the process of détente as developed throughout the 1970s. The guarded optimism generated by the successful culmination of the Helsinki Conference on Security and Co-operation in Europe in 1975 did not keep its promise. While the major political backdrop in 1977 was the Helsinki Accords consolidating the process of détente characterizing inter-European relations, a conspicuous feature of the follow-up meetings of the Conference at Madrid, in the early 1980s, was the serious difficulties in maintaining and reviving that policy of détente.

(c) The existing hotbeds of crises in various parts of the world have been exacerbated by the increasing tension and confrontational postures of the leading arms race participants. Strategic calculations to determine, capture and control areas of influence corresponding to economic and military interests, have reinforced the existing conflicts and contributed additional grounds for the creation of new ones. If the mid-1970s had witnessed any discernible trends towards defusing or containing conflicts within regional frameworks, the early 1980s are marked by a grave danger of wider escalations caused by one or more triggering events in the conflict-ridden regions, mostly among the developing countries.

(d) Over two thirds of the way through the Disarmament Decade of the 1970s, a stock-taking of the disarmament negotiations could list the adoption or consideration of a number of partial agreements, bilateral and multilateral, on the limitation of armaments. 5/ The 1980s inherited a situation of virtual stalemate in disarmament negotiations.

(e) The race for qualitative jumps in military technology is running wild. Any prospects of restraining it through the negotiated agreements arrived at during the 1970s have now to be revised radically. The already thin line dividing the tactical from the strategic - and the conventional from the nuclear - arsenals of the major military powers has been further eroded by the technological innovations made and planned by those in the forefront of military technology. The technological leaps planned in the early 1980s have put the problems of arms limitation and disarmament into a very different perspective for the years ahead.

(f) The global economic prospects for the 1980s are more intimately linked with effective progress in the field of disarmament than ever before in recent history. The somber economic performance of the late 1970s provided a sharp contrast to the buoyant 1960s and early 1970s. The downward trends were explained

away, partly by the rather abrupt end of the era of cheap energy, partly by the disequilibria in international monetary and financial arrangements, partly by misconceptions of economic policy, and sometimes by the cyclical nature of global economic factors. These partial explanations did not take full account of the fuller implications of the finite nature of the world's human, natural and material resources. The nature and extent of the resources consumed by the intensified arms race in the 1970s are being increasingly viewed as having negatively affected the global economic prospects for the 1980s. Short- and medium-term economic projections prepared by the United Nations Economic and Social Council in 1981 suggest that substantive progress in the field of disarmament and the new international economic order can significantly improve the global economic prospects (see E/1981/113, para. 3). But a situation of prolonged procrastination in the establishment of a new international economic order and of virtual stalemate in disarmament negotiations presents too foreboding a combination to permit even modestly optimistic economic projections for the 1980s. The basic incompatibility between the stated goals of a new international economic order and a continuing arms race was clearly stressed by the Final Document of the Tenth Special Session of the General Assembly (resolution S-10/2) the first special session devoted to disarmament, held in 1978. Since then it has been reiterated in the Secretary-General's report on the relationship between disarmament and development (A/36/356), which unequivocally states that the world can either continue to indulge in a mindless arms race or move with deliberate speed towards the establishment of a new international economic order: it cannot do both.

11. A major redeeming feature, however, is the growing public awareness of the dangers of war, particularly nuclear war, and the adverse socio-economic consequences of a mindless arms race. Touched by an anxiety over the future and a sense of helplessness over the present, people are coming forward in new combinations, and in ever larger numbers, to secure peace and to advocate alternative strategies for serving the economic, political and military purposes conventionally expected to be served by national military outlays. All over the world, and even more so among the developed countries, people concerned with issues such as employment, economic planning, environment, health and medicine, and several other special interests, are mobilizing citizens and politicizing armament-related issues. 6/ Peace movement activists are increasingly questioning decisions taken within the framework of an intensifying arms race, particularly in the nuclear field.

12. No other aspect of the contemporary arms race has generated a more co-ordinated public reaction than that accompanying the growing application of science and technology to the military sector. Several factors have contributed towards making the issues related to science and technology pertaining to the military sector different from other issues commonly arousing serious public concern. In general, the rapid pace of change in military technology creates misgivings in the public mind about its potentially dangerous side-effects. Some of its irreversible effects may not be immediately visible but may have a long-term social relevance. For example, the cumulative impact of nuclear testing on the ozone layer goes far beyond the present predictive capacity of public understanding of the arms race. Nor is it possible to foresee the implications for personal privacy of the growing security precautions surrounding military installations.

13. Moreover, the horizons of the perceived goals of military technology and the limits of public understanding about its concrete and intangible implications simply do not coincide. Government secrecy about information pertaining to the military sector is mostly upheld on the grounds that only those parties having a special interest and competence should be allowed access to the relevant information. The gap between those sections of society which directly or indirectly contribute to the knowledge that constitutes the information withheld from the public at large, and those whose lives are affected by the application of this knowledge, continues unabated. Public anxiety in this respect is aggravated by an awareness that the full range of political choices available to serve the purpose expected to be pursued by the arms race are not likely to be explored amidst a growing tendency to subordinate broad political problems to narrow technological solutions. Many are seeking disarmament as a prerequisite for a more equitable distribution of the world's finite resources. For others, it also means an attempt to establish public accountability of a process which is surrounded by a complexity that debars a thorough assessment of its socio-economic costs and benefits. Underlying all these considerations is a growing public awareness that the arms race is becoming the largest single obstacle in the maintenance of international peace and security.

14. As was made abundantly clear by the Final Document of the Tenth Special Session of the General Assembly adopted by consensus by all States Members of the United Nations, the nuclear and conventional arms build-up threatens to thwart peace, stall development, become an obstacle in achieving the new international economic order, and hinder the solution of other vital problems facing mankind. The same document also decried the accumulation of weapons, particularly nuclear weapons, as more of a threat than a protection for the future of mankind. In emphasizing the simultaneous need to promote the undiminished security of all parties at a lower level of military build-ups and to free captive resources for social and economic development, the first special session devoted to disarmament clearly portrayed the inherently twinned character of the problems of security and development. Surveying the developments since the first special session, the second special session devoted to disarmament, held in June 1982, categorically stated that military budgets, which have vastly increased since 1978, and the development, production and deployment, especially by the States possessing the largest military arsenals, of new types of weapons systems represent a huge and growing diversion of human and material resources. Apart from the significant capital costs that these military expenditures represent, they have also contributed to current economic problems in certain States. Existing and planned military programmes constitute a colossal waste of precious resources which might otherwise be used to elevate the living standards of all people; furthermore, such waste greatly compounds the problems confronting developing countries in achieving economic and social development.

15. Since the first special session devoted to disarmament, the Secretary-General has conducted a number of studies pertaining to several crucial aspects of the arms race and disarmament, namely, reductions of military expenditures, nuclear weapons, confidence-building measures, international security and disarmament, and the relationship between disarmament and development. 7/ Those studies completed or still under completion, with the help of qualified experts representing a broad

spectrum of different politico-strategic and socio-economic segments of the international community, should be viewed as a step forward in bridging the gap between those who are entrusted with the responsibility of negotiating for disarmament and those whose lives are affected by it.

16. The General Assembly's decision to conduct a periodic regular assessment of the Economic and Social Consequences of the Arms Race and of Military Expenditures had already resulted in two expert reports before the first special session devoted to disarmament, which further endorsed the continuing need for this exercise (see General Assembly resolution 2831 (XXVI)). The Final Document provides that the Secretary-General should periodically submit reports to the General Assembly on the economic and social consequences of the armaments race and its extremely harmful effects on world peace and security. While some of the effects of the arms race may be partly looked into by several sectoral studies, the studies on the economic and social consequences of the arms race and of military expenditures are the only comprehensive and self-contained surveys on the issue, carried out with a view to reveal the most current implications of the arms race. In updating the 1977 report, we have taken into account the emphasis, in its conclusions, on further investigation of some areas in which adequate information was not then available. In doing so, and in accordance with the terms of General Assembly resolution A/35/141 of 12 December 1980, we have also considered the new developments which highlight the extremely harmful effects of the armaments race on world peace and security.

17. Chapter I describes the basic characteristics of the arms race. The main emphasis on its technological thrust has been further elaborated by examining the inertial and the action-reaction features of the dynamics which govern the arms race. The military-strategic implications of the constant drive for technological innovation have been described by taking account of some of the latest changes in military technology and strategic doctrines. The chapter also reiterates the centrality of the nuclear threat and the urgent need to give it priority consideration in the various approaches to disarmament.

18. Chapter II provides an assessment of the natural, human, and material resources consumed by the arms race in a world of finite resources. The concern over resources in a situation of physical constraint and the question of economic access is explored with a view to examine its implications for military outlays and strategic doctrines. The negative consequences of a tendency to contemplate a use of military force to secure unimpeded access to resources located at political and physical distances are contrasted with the positive potentials for a co-operative management of global interdependence.

19. The economic and social costs of national military outlays are analysed in chapter III. The impact of military spending on economic growth is examined against the historical evidence about its short- and long-term consequences for economies at different levels of development.

20. In analysing its international consequences, chapter IV treats the arms race as a major factor adversely affecting crucial aspects of international life. Surveying recent developments pertaining to growing concerns about national and

international security, this chapter scrutinizes the adverse political and economic implications of a continuing arms race, including its pernicious social effects.

21. While reinforcing some of the major recommendations of the 1977 report, the concluding chapter also puts forward some further suggestions to implement the widely supported public demand for first halting and then reversing the arms race.

CHAPTER I

DYNAMICS OF THE ARMS RACE

22. The 1980s started with a grave exacerbation of international tensions and a virtual stalemate in disarmament negotiations. This is an ominous combination for arresting an accelerated arms race poised for a new round of escalation under the twin pressures of an uncontrolled technological momentum and open-ended strategic commitments for attaining a variety of politico-military objectives. The 1970s have produced technological solutions to many of the limitations which, in the past years, had inhibited the use of nuclear weapons as dangerous instruments of political coercion and military power. They have also passed on at least 40 armed conflicts and an equal number of other conflict situations. Some of them could become triggering events for a partial or total use of the existing weapons arsenals, including the deadly nuclear weapons. This danger is more real than ever before partly due to a pronounced emphasis on enlarging the scope and expanding the reach of strategic doctrines. The nature and scope of their politico-economic components have been enlarged to cover the periods of both peace and war; their military objectives have been expanded to cover the entire world as an integrated multilevel strategic scene.

23. Needless to say, those disturbing developments run totally counter to the basic principles and purposes of the Charter of the United Nations relating to the renunciation of the use of force in international relations and mutual non-interference among States. They also represent a demonstrable weakening of the political will evidenced during the first special session of the General Assembly devoted to disarmament.

24. In the four years between the first and second special sessions of the General Assembly devoted to disarmament, world military expenditures exceeded 1.6 trillion dollars. 8/ This translates into $1 million being spent on weapons every minute of every hour of every day in 1981. As compared to an annual total of $350 billion in prevailing prices in 1977, annual world military expenditure in 1981 was $550-600 billion in today's prices. 9/ This figure, incomprehensible by itself, represented approximately 6 per cent of the total world output and was equal to 25 per cent of all annual fixed investments in a world faced with a near-universal slow-down of the trends in economic growth (see E/1981/113). Roughly one fifth of the total military outlays are estimated to be going into a growing stockpile of nuclear weapons which already contains over 1 million times the explosive force of the Hiroshima bomb. Between 1977 and 1981, the international trade in arms, including hardware and services, amounted to over $120-140 billion, two thirds of it with the tension-ridden developing countries which have closely witnessed or actually experienced practically all the over 130 armed conflicts since the Second World War.

25. Those statistics, awesome by themselves, become still more numbing when used as a basis for extrapolating trends for the coming decade in a situation of exacerbated tensions and deadlocked disarmament negotiations. If we assume a mere 2 per cent annual increase in global military outlays, which would be a triumph of restraint - by historical standards - of military spending during periods of serious tensions, this will result in a world total of approximately $850 billion, in today's prices, by the turn of the century. Assuming a 3 per cent rate of increase, the corresponding figure would be over $1,020 billion during the same period.

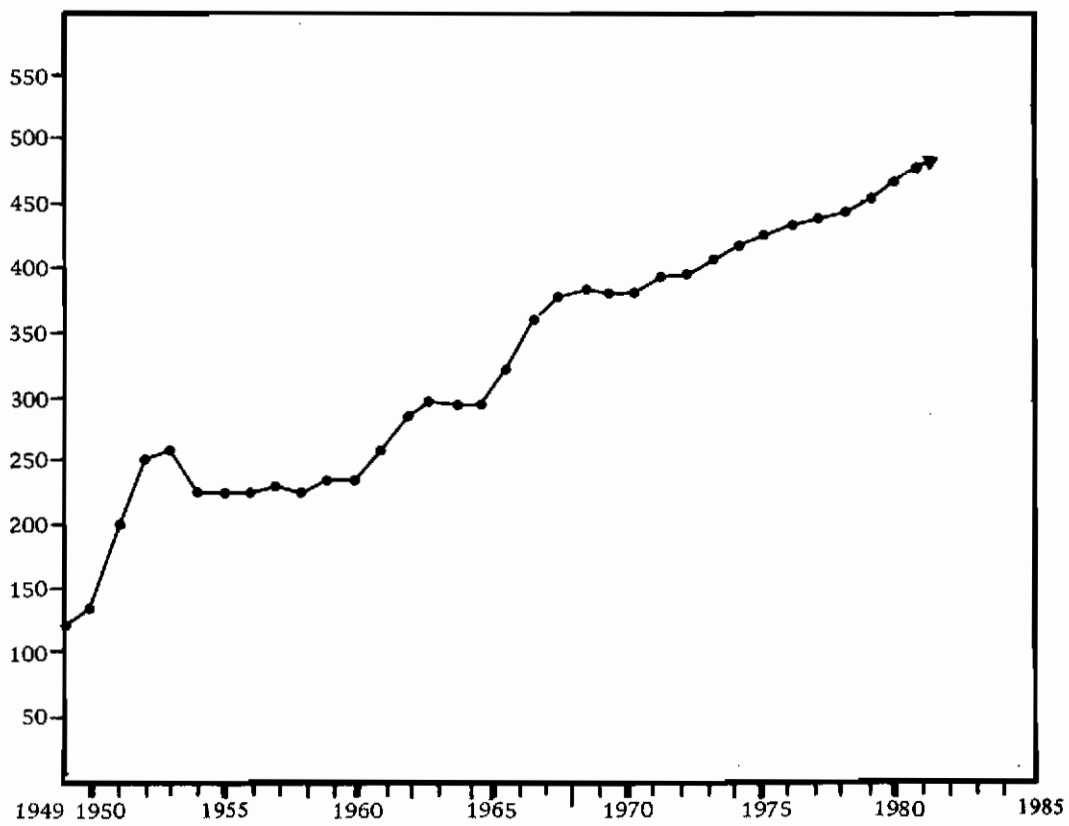
26. In assessing the socio-economic consequences of these trends, the arms race is being viewed as a dynamic process of quantitative accumulation and/or qualitative improvements of various armaments and armed forces. The dynamics of the arms race, however, involve more than a sum total of military expenditures and an updated list of its major and minor participants. The forces that drive it, the purposes it serves, and its various forms of manifestation crucially affect its socio-economic consequences and the nature of measures required to halt and reverse it.

27. With an upward trend at an estimated rate of about 3 per cent per annum (in volume) during the last four years, world military spending has risen rather faster than in the previous four years, in spite of the deteriorating performance of the world economy (chart 1). The economic burden of military spending measured as a share of the world's total output has thus become heavier. Also, its social and political implications are more serious as economic burdens carry within them the seeds of social discontent and political instability which thwarts the process of development and promotes tension within and among nations. While the arms race has various aspects and global consequences, efforts to first halt and then reverse its accelerating momentum need to tackle the problem at its source.

28. As stressed throughout the 1977 report, the primary engine of the world-wide arms race is constituted by the qualitative arms race among the largest military powers; this is due chiefly to the virtual monopoly of these powers in development of advanced military technology, to their overwhelmingly large share of world military production and world exports of advanced weaponry, and to the global character of their interests, politically and militarily. The same report also pointed out that the six main military spenders not only accounted for three fourths of world military spending, but also for virtually all military research and development (R and D) and for practically all exports of weapons and military equipment. 10/ All significant developments in armaments originate here and spread from here to the rest of the world, with greater or lesser time lags. For many types of conventional weaponry, these time lags seem to have diminished in recent years. Meanwhile, as these weapons are being assimilated in the countries at the periphery of the arms race, new generations are under development at the centre to supersede them, preparing the ground for a new round of transfer and emulation. Outside of this small number of producing countries, arms races or competitions are substantially and often wholly dependent on external supplies of arms, technicians and instructors.

CHART 1. WORLD MILITARY EXPENDITURE, 1949-82

$US thousand million, in constant (1978) prices and exchange-rates



Source: Adapted from World Armaments and Disarmament, SIPRI Yearbook, 1981, p. 3.

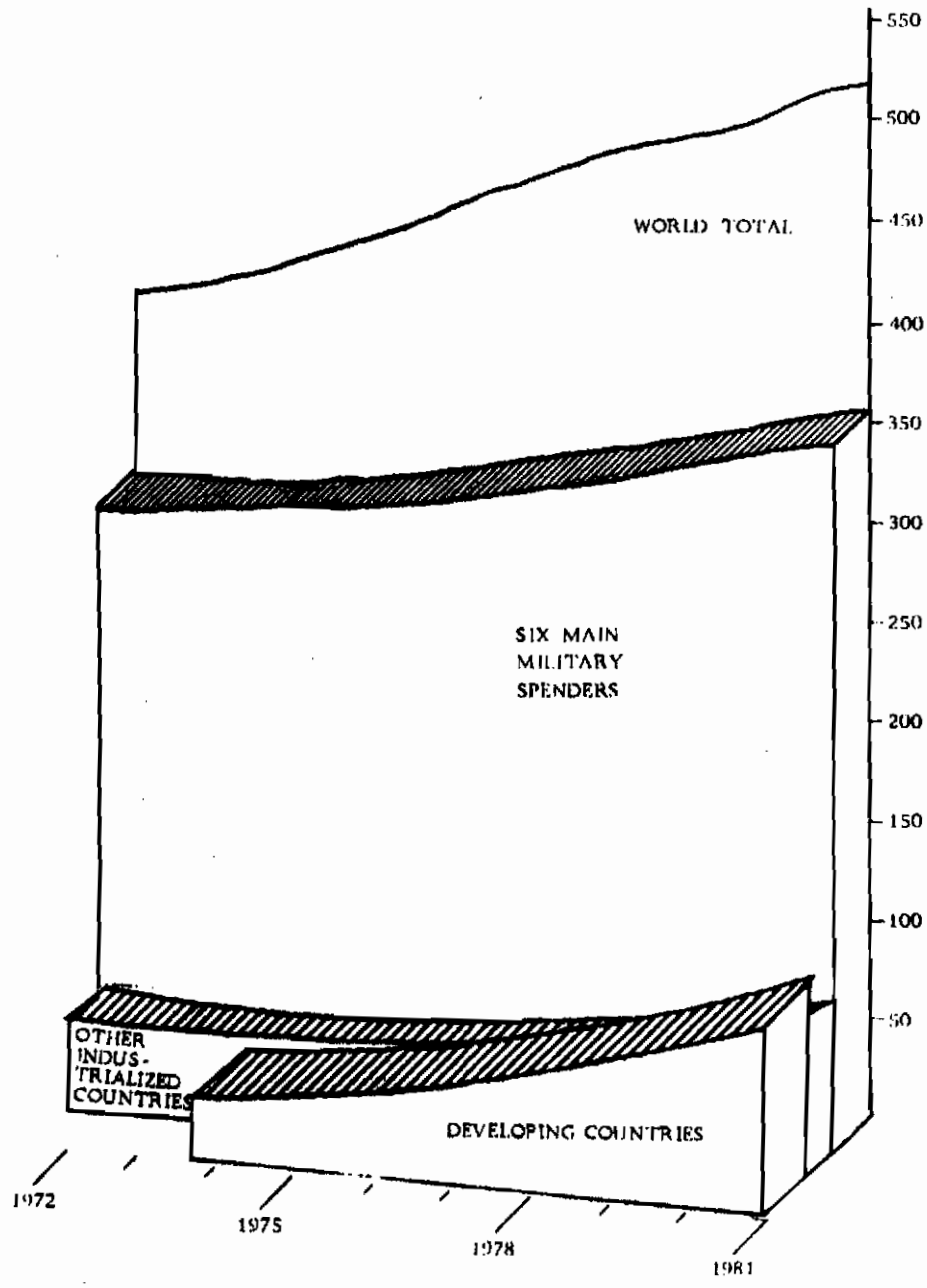
29. The 1977 report also emphasized that, although it is an increasingly world-wide phenomenon, the intensity of the arms race varies markedly between regions. While few countries and no major region have stayed out of the arms race, the term is not equally appropriate to describe the gathering momentum for the process of expanding and modernizing military forces. This process may intensify the wider arms race, particularly in regions where countries are exposed to political, military and other kinds of pressures, where the rivalries of other Powers lead to involvement or interference, where territories are under foreign occupation and where countries feel their sovereignty and independence to be directly threatened. The factors determining the size and volume of national military outlays, the inertial forces which govern their technological and strategic orientation and the reciprocal compulsions thus generated in an action-reaction process differ markedly within and among the various regions and make their consequences felt in different ways within and outside the framework of the major military alliances. While describing the arms race as a world-wide phenomenon, it is, therefore, essential that these various factors be borne in mind so that effective measures to correct its blind momentum are addressed to its characteristic features.

30. The trends in 1981 confirmed the highly concentrated character of three major aspects of the world military outlays identified in 1977, namely, the world military spending, the global expenditure on military R and D, and the international arms trade:

(a) Accurate estimates based upon generally accepted data indicating the share of each country in world-wide military spending were as hard to come by as in 1977. This was due to the non-availability of complete data about all the countries - also because some countries do not provide adequate data on their military expenditures - as well as the problems of international differences with regard to statistical information, definitional problems, exchange rate variation and non-comparability. 11/ Nevertheless, the Stockholm Institute for Peace Research (SIPRI) and other research organizations have published some estimates which give an indication of the orders of magnitude involved. 12/ According to the estimates given by SIPRI, the six main military spenders - mentioned in the 1977 report and referred to earlier (see para. 28) continue to account for roughly 70 per cent of all global military spending. By far, the largest share in the global total comes from the two major military powers. 13/ These estimates also show the two major military alliances, namely, the North Atlantic Treaty Organization (NATO) and the Warsaw Treaty Organization (WTO), as incurring over 70 per cent of world military spending. Approximately 75 per cent of world military spending is concentrated among the developed countries, another 16 per cent being shared by the developing countries.

(b) As regards the data for military R and D, the existing estimates are even more indicative of the high concentration of world military spending wherein over 136 developing countries do not collectively account for even a calculable fraction of the world's total. 14/ As also mentioned in the 1977 report, due to their place in the development of advanced military technology, the two major military powers account for an overwhelming share of global expenditure in military R and D.

CHART 2. MILITARY EXPENDITURES, 1972-1981
World total and selected groups of countries
($US thousand million (1979 prices))



Source: World Armaments and Disarmament, SIPRI Yearbook, 1982, appendix 8B

Table 1. Military expenditures, selected groups of countries, 1972-1981 a/

(Billions of dollars and per cent of world total)

	1972		1975		1978		1981	
	Billions of dollars	per cent	Billions of dollars	per cent	Billions of dollars	per cent	Billions of dollars	per cent
Six main military spenders	325.3	78.1	324.9	72.5	337.2	70.5	359.4	69.3
Other industrialized countries	58.0	13.9	67.5	15.0	74.7	15.6	78.0	15.0
Developing countries b/	33.0	7.9	56.0	12.5	66.1	13.8	81.3	15.7
World total	416.3	100	448.4	100	478.0	100	518.7	100

a/ Source: World Armaments Disarmament, SIPRI Yearbook, 1982, appendix 5B.

b/ Figures for developing countries are not strictly comparable from year to year because the number of countries has increased throughout the period.

Table 2. Rates of growth of military expenditure, 1972-1981 a/

(Percentage average annual increase of real expenditure)

	1972-1975	1975-1978	1978-1981
Six main military spenders	-0.0	1.3	2.2
Other industrialized countries	5.2	3.4	1.5
Developing countries	19.3	5.7	7.1
World total	2.5	2.2	2.8

a/ Derived from the figures in table 1.

/...

(c) The same picture is true for the area of international trade in arms, which by 1981 doubled its volume over the previous five years and remained heavily concentrated both on the supply and demand side. More than 90 per cent of the weapons transferred all over the world were exported by six developed countries, with two major military powers accounting for the largest share.

(d) Large shares of global arms transfers are going to the regions with conflict situations among the developing countries. Thus, the countries in the Middle East region accounted, in 1981, for a little less than one third of the total weapons imports all over the world. They imported more than the combined total value of arms imports by all the other developing regions, that is, the Far East, South America, North Africa, South Asia, sub-Saharan Africa and Central America. The same is true for the situation in southern Africa, where South Africa alone imported more arms than all the other African States combined throughout the 1950s and 1960s. By 1980, South Africa had emerged as the largest single customer of arms exported by Israel, accounting for 35 per cent of Israel's arms exports.

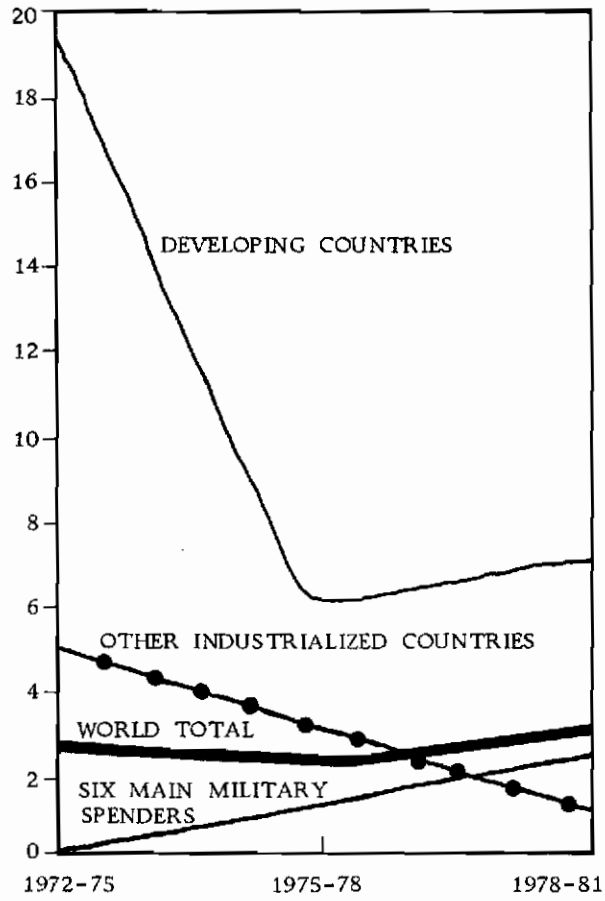
31. As mentioned earlier in this chapter, approximately one fifth of the global military spending is estimated to be going into the growing stockpiles of nuclear weapons which have long since surpassed the lethality to destroy the world many times over. Throughout the 1960s and 1970s, the technological thrust of the nuclear arms race had produced spectacular results in improving the hemispheric reach, the yield, the accuracy, the manoeuvrability and the survivability of nuclear weapons without any significant reductions in their numbers. Some of the more eye-catching aspects of this phenomenon were described in detail in the 1977 report to demonstrate the extent of the destructive potential of the nuclear arms race, besides conveying the magnitude of its purely financial costs and the intractability of the disarmament measures designed to halt and reverse it.

32. The trends for the 1980s have magnified these dangers manifold along with an almost absurd possibility that, without urgent disarmament measures, a part or whole of these deadly arsenals may be actually used. In this respect, the technological and strategic trends for the coming decade are somewhat different from the two preceding it. If a major technological thrust earlier produced innovations that would make a strategy of using nuclear weapons, to a certain extent, unthinkable, there is now a pronounced emphasis to produce technological innovations that would make nuclear weapons usable. Strategic doctrines about a limited nuclear war are accompanying technological innovations, such as the miniaturization of nuclear weapons and development of insertible nuclear components (INCs) which could convert a conventional weapon into a nuclear one. A detailed description of all these developments falls outside the scope of the present report. However, some of its relevant features, which have a direct bearing on the problem areas associated with nuclear disarmament, need to be mentioned.

33. The first is lethality and accuracy through additions to the yield and reductions in the range of circular error probabilities. In the early 1970s, the most sophisticated missiles of the two leading nuclear Powers had a circular error probability of about 500 metres, which could be achieved only from fixed, land-based launching sites; submarine-launched missiles had substantially lower

CHART 3. RATES OF GROWTH OF MILITARY EXPENDITURES, 1972-1981[a/]

Selected groups of countries and world total
(Percentage average annual increase of real expenditure)



[a/] Derived from table 2.

accuracies. At the end of the 1970s, the situation had changed considerably with the installation by the United States of NS-20 guidance systems on Minuteman III, reducing the circular error probability to less than 200 metres. This increase in accuracy, coupled with design improvements which more than doubled the yield of the warhead, increased the probability of a single-shot kill against a hardened missile site several thousand miles away to 80 per cent. Evidence on the accuracy of Soviet missiles is available only from non-Soviet sources but a circular error probability comparable to that of Minuteman III has been attributed to the Soviet SS-18 and the question of whether or not it is accurate is less important than the evidence that the Soviet Union has significantly improved the accuracy of its missiles (see A/35/392, annex).

34. Technological advances in accuracy and lethality have a direct bearing on the spatial orientation and the quantitative aspects of the nuclear arms race. Assuming that its ultimate objective is to ensure that any target that can be seen should be accurately hit and totally destroyed, the race for accuracy demands constant improvements in the communications, command and control systems, on the one hand, and an expansion of existing arsenals, on the other. The growing militarization of space, for example, can be easily seen as reflecting the expanding reach of the technological thrust for improvements in communication, command and control systems. Between 1958 and 1981, over 1,917 satellites are estimated to have been launched, over 1,900 by the United States and the Soviet Union. 15/ The types that have been launched so far, and those in the experimental stage or on the drawing board, are reported to be related to precision mapping of both missiles and launching sites and targets; sophisticated guidance technology benefitting from the accurate mapping of Earth's gravitational field; improvements in re-entry vehicles designed to overcome meteorological disturbances; and terminal guidance systems intended for the next generation of improved warheads.

35. Many of these military developments have come out of civilian space programmes and, essentially, the two are not readily separable. In technical terms, MIRV was a direct descendant of multiple satellite launching systems, much as manoeuvring and docking techniques are at once ancestors and offspring of antisatellite weapons being developed and tested. But, in the public mind, the civilian space exploits in fields such as communication, meteorology, cartography and navigation are being overshadowed by the substantial superiority conferred on the major military powers through the decisive impact of satellite technology in at least three fields: target identification, navigation and damage assessment in connexion with counterforce strategies in nuclear warfare; surveillance, target identification and navigation in "conventional warfare"; and world-wide intelligence and surveillance of the military programmes of other countries and of wars in which the major Powers are not directly involved.

36. Potentially, the consequences of this latter capability could be both positive and negative: verification of agreements on arms limitations or disengagement, on the one hand, and area policing and assistance in aggression, on the other. As suggested by the United Nations study on the possibility of setting up an International Satellite Monitoring Agency (ISMA), space technology can be effectively used for verifying compliance with international agreements on arms limitation as well as for monitoring crisis areas at an annual cost of much less

than one per cent of the current annual expenditure on the world-wide arms race (see A/AC.206/14). But, in a situation of mutual reservations characterizing the periods of exacerbated international tensions, potentially beneficial aspects of space technology remain unexplored, particularly in the field of independent monitoring and surveillance systems.

37. The technological thrust of the arms race, of which its spatial orientation is only one example, has serious implications for both its quantitative and qualitative aspects. The destabilizing impact of technology on the process of disarmament negotiations was described in detail in the 1977 report. In a stock-taking of the world's strategic arsenals since the signing of the first agreement on the limitation of strategic arms between the United States and the Soviet Union (SALT I) in 1972, that report had emphasized that:

(a) The agreed ceilings of the number of ICBM and SLBM launchers had been almost approached by 1976;

(b) The halting of ABM deployment systems had not deterred vigorous R and D programmes to improve them and the agreement had almost no discernible impact on the extent of MIRV deployment;

(c) The number of ICBM and SLBM launchers had remained relatively constant but the numbers of deliverable nuclear warheads had been rising by about 1,000 every year.

38. During the negotiations on SALT II, the United States and the Soviet Union have exchanged data on the strategic nuclear forces of both sides. The forces in question are those with capability to threaten their homelands, that is, what is sometimes referred to as "central strategic systems". In the "Memorandum of Understanding Regarding Establishment of a Data Base", the two countries for the first time declared their possession of the following numbers of such strategic arms as at 18 June 1979 (A/35/392, annex):

	United States	USSR
Launchers of ICBMs	1,054	1,398
Fixed launchers of ICBMs	1,054	1,398
Launchers of ICBMs equipped with MIRVs	550	608
Launchers of SLBMs	656	950
Launchers of SLBMs equipped with MIRVs	496	144
Heavy bombers	573	156
Heavy bombers equipped for cruise missiles capable of range in excess of 600 km	3	0
ASBMs (air-to-surface ballistic missiles)	0	0

39. The power and number of these strategic weapons is difficult to grasp. Consider that a single Poseidon submarine with its 16 MIRVed missiles can deliver warheads to 160 separate targets; these warheads have a total explosive yield of 6.4 Mt., a larger explosive power than that of all the munitions fired in the Second World War; still, this megatonnage is of the order of one or a few thousandths of the megatonnage in the strategic arsenal of either the United States or the Soviet Union. If to these are added the tactical nuclear weapons and their destructive potential, then the basic irrationality of acquiring further nuclear arsenals becomes still more evident. Both the Soviet Union and the United States, for example, have separately provided detailed assessments of each other's existing and planned arsenals. The Soviet assessment, entitled Whence the Threat to Peace, describes the United States strategic triad in terms of its intercontinental ballistic missiles, strategic aircraft and nuclear-powered submarines. The United States assessment, entitled Soviet Military Power, provides details of the Soviet strategic nuclear forces, ground forces, air forces, air defence forces and naval forces. 16/ Together, these two publications provide a fairly clear idea of the intractability of matching launchers with warheads; warheads with speed, accuracy and damage potential; and of placing all these factors in a geo-political context with a view to arrive at mutually acceptable agreements about limiting the nuclear arms race.

40. The distinction between tactical and strategic nuclear weapons, for example, had always depended more on assumptions about intended uses rather than on any inherent operational characteristics of the weapons themselves. 17/ As a result of another set of technological developments, the distinction has become even less meaningful, least of all for Europe, which falls into the trajectory of both. The development of medium-range missile systems has never stopped. All nuclear-weapon States in the period under review have been advancing, though at different paces, in the modernization of their missile forces. But the main technological developments are considered to be embodied in the new sophisticated Soviet and United States missiles actually deployed or planned for deployment in Europe. 18/

41. The importance of the changes now under way in the field of nuclear armaments and their carriers is not that their performance in missions traditionally assigned to them is improving year by year, but that essentially new types of missions are becoming possible. In this respect, the enhanced radiation neutron weapons are particularly relevant; their performance characteristics emphasize that most of the energy released is in the form of ionizing rays rather than blast or heat. The peculiarity of these weapons is sometimes described as being more damaging to human life rather than property. But, precisely due to this feature, the psychological threshold against their deployment may be low - a characteristic generally associated with many tactical weapons designed to reduce collateral damage.

42. The combined effect of these developments is a circular relationship between technology and doctrine, which makes the disarmament process increasingly complex and intractable. New technologies open the way for new doctrines which in turn provide starting-points for new technological changes creating new situations for strategic rethinking. This vicious causation between technology and doctrine makes nuclear disarmament efforts go in circles where restraints in one area are accompanied by renewed vigour in another. There has been no downward trend in

nuclear testing, for example, since the Partial Test-Ban Treaty was signed in 1963. On the contrary, the rate of testing in the past four years - at around 50 a year - was significantly higher than the previous four years (1974-1977) when the average was only 37 tests. In 1981 alone, a total of 49 nuclear tests were conducted, with the United States and the Soviet Union accounting for most of them. 19/

43. Indeed, the history of arms limitation negotiations and their meagre outcome in arms limitation agreements prove that such agreements have always left open doors for new qualitative developments and that they did not have a direct effect on restraining the nuclear arms race. Partial limitations on nuclear testing are paralleled by developments of technologies which would make nuclear tests unnecessary. Agreed ceilings on launchers are accompanied by increases in nuclear warheads. Limitations on the numbers of anti-ballistic missiles have been followed by considerable advances in ballistic missiles defence technology (BMD), which may result in a new round of escalation of the nuclear arms race unless the Anti-Ballistic Missile Systems Agreement, signed in 1972, is extended beyond 1982, when it is due for review. Reductions in nuclear warheads coexist with the designing and stockpiling of other weapons of mass destruction including chemical weapons. The arms race over oceans and space is becoming an additional factor undermining the disarmament process. Lack of progress towards disarmament in one or more of these areas reinforces deadlocks, while in others it creates a virtual stalemate in the entire disarmament negotiating process.

44. The 1980s started with a serious questioning of the SALT II agreement signed in June 1979. The planned negotiations on SALT III did not begin. Bilateral and trilateral negotiations among the nuclear powers, including negotiations on chemical weapons, a comprehensive test-ban treaty, and conventional-arms transfers were suspended. Negotiations at Vienna on the mutual reduction of armed forces and armaments in Central Europe continued to remain bogged down for several years. In the framework of the continuing process of the Helsinki Conference on Security and Co-operation and security in Europe, the question of convening a conference on confidence-building and security measures and disarmament in Europe was also considered with as yet no conclusive outcome. One set of negotiations did get under way in November 1981, namely, on medium-range nuclear armaments in Europe, but it was too early to assess their outcome without complementary negotiations about limitations and reductions of strategic nuclear weaponry, the latter having started only in June 1982. The Committee on Disarmament, the single multilateral negotiating body in the field of disarmament, has been unable to even commence negotiations on the top-priority items of disarmament, particularly nuclear disarmament. On the items that have been a subject of negotiations, the Committee has yet to achieve concrete results.

45. As regards conventional weapons developments, the 1977 report mentioned the fact that these were far-reaching. Conventional weapons systems underwent continual and rapid refinement in terms of size, speed, propulsion, fire-power, accuracy and so forth. Sophisticated weaponry, including supersonic aircraft, became commonplace in the armories of developed, as well as less developed, countries. These developments continued unabated through the period under review. The only achievement in the field of limiting conventional weapons was the

adoption, in 1980, of the Convention on Prohibition or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to be Excessively Injurious or to Have Indiscriminate Effects, which, in view of its limited scope, has some humanitarian value rather than being a measure of disarmament. Even after adjusting for inflation, the unit costs of sophisticated weaponry have continued to soar. Between 1977 and 1980, the research, development, testing and evaluation costs of sophisticated missile guided-weapon systems responding to the heat and sound of their targets, in some cases, increased by 30 to 50 per cent. The unit cost per ton of some types of tanks, after adjusting for inflation, had shown an increase by a factor of 2 to 3 between 1960 and 1980. In addition, technological advances in several areas were combined to produce new types of conventional weapons with potentially far-reaching military and political implications. The technological thrust on conventional-weapons production field throughout the 1960s and 1970s has been to produce "generations" and "families" of weapons which move perilously close to blurring the borderline between conventional and nuclear weapons, both in terms of their lethality and accuracy and the multi-mission roles assigned to them. The technological change originates in a few countries but it readily spreads to the rest of the world through the transfer of arms.

46. In the absence of meaningful measures of disarmament, particularly of nuclear disarmament, the arms race will go on, along with the attendant risk that, voluntarily or involuntarily, one or more of the major arms race participants may get directly or indirectly involved in regional conflicts. Practically all the military conflicts since the Second World War have occurred in the developing countries and the number of persons killed has been estimated to be anywhere between those dead in the Second World War alone and those who died during both world wars. 20/ Of the 90 developing countries that have either actually experienced these conflicts or have been close to them, not more than 12 are known to possess any significant capabilities to produce the weapons used in these conflicts, and even they have imported weapons or technological know-how from the developed world in general and the major military powers in particular. Whatever be the immediate cause of each local war in the developing countries, this fact itself has contributed much to the circularity of the technological and strategic aspects of the arms race and the fragility of détente, unless it is applied on a non-selective basis to all the regions of the world.

47. The phenomenon of international arms transfers, large and growing both in volume and coverage, has become a chief instrument of linking the arms race among its major participants with the widely varied military outlays among the developing countries. Roughly one third of the international trade in arms is confined to the developed countries, wherein a majority of both the suppliers and recipients of weaponry also belong to one or the other major military alliance. On the other hand, an estimated two thirds of this trade is conducted between the developed and the developing countries, with a virtual monopoly of the supply side by the former. Few among the recipients of arms in the developing countries belong to a major military alliance system. But a host of political and strategic, besides purely commercial, considerations affect supplier-recipient relationships between the developed and developing countries in the area of arms trade, as different from their other trade contacts. No precise summation of this phenomenon is possible. The actual terms of arms transfer deals are rarely made public; these include

concessional modes of payment, periods of delivery, supply of spare parts and supportive equipment, arrangements for co-licensing and co-production and training facilities for handling the equipment by the clients. But more than two thirds of the 82 importers of weapons among the developing countries are known to have arrangements with the exporters which go beyond the purely physical services associated with an act of arms transfer; for example, military assistance programmes, direct and indirect transfers of hardware, training courses for military personnel, provisions for military bases, naval facilities and listening posts, and tacit and explicit understandings for political or military support in situations of internal unrest in or external threats to the recipient country. 21/

48. Incidence of arms supplier involvement in the conflict situations and conflicts in recipient countries rose steadily rising throughout the 1970s. Demonstrable evidence of this is the hardest to provide but, as an indication of trends, it has been suggested that, in roughly two out of three cases of all major weapons transfers, supplier involvement in an actual conflict has been a factor in its eventual outcome. 22/ Few major conflicts have yielded outcomes which were not resented by one or the other adversary and the aggrieved recipient country has either stepped up its weapons imports from the same supplier or turned to different one, both to gain better and additional equipment and more favourable terms of transfer. In several cases, concessionary arms deals have been concluded with those recipient countries that were strategically important to the supplier either as a source of minerals and raw materials, or as a choke-point in the planning of military operations, or as a potential and informal junior partner in a major military alliance system, or as a combination of one or more of these factors. The changes in the nature and volume of arms transfers to the Middle East, South Asia and the Far East between 1975 and 1980 indicate this feature all too clearly.

49. Not all conflicts among the developing countries are equally relevant to the strategies of the leading weapons exporters and, by and large, many of them fall into the category of what may be described as areas of marginal strategic significance. But, to the extent that they continue to occur in some areas that are less marginal than others, their eventual outcome has a relevance for the strategic calculations of the major arms suppliers. In this sense, as in several others, the world has become an integrated strategic scene. The risk of one or more triggering events in the developing countries resulting in a wider conflagration has imparted a geographic dimension to the strategy of preventing war among the developed countries. The conflict situations in the developing countries need to be resolved not only because of the suffering and the destruction they inflict upon the people directly affected by them and the risks of wider escalations they entail, but also because they continue to provide a strong stimulus for increases in military outlays of the countries actually experiencing these conflicts. It is not a mere coincidence that practically all the developing countries generally included among the list of domestic arms producers have either actually experienced one or more conflicts or are producing the types of weapons particularly well suited to meet the demands of other developing countries that are involved in conflict situations but do not have the industrial infrastructure to produce those weapons domestically. 23/ The phenomenon of domestic arms production in the developing countries, driven mainly by the requirements of the conflicts actually experienced and perceived, may also be seen as reflecting a growing

reluctance by the recipient countries about being sucked into the strategic considerations of the suppliers when such considerations do not correspond to their immediate security concerns.

50. Throughout the 1970s, international arms transfers, confined entirely to conventional weaponry, were characterized by two major features. First, an increasing portion of military production among the leading supplier countries consisted of weapons for export, partly, it is believed, to recover at least a share of the soaring costs of research, development, testing and evaluation. Secondly, the nature of equipment transferred incorporated an increased variety of weapons of greater technological sophistication. The export outlets for the exotic weaponry manufactured in the developed world have become increasingly attractive avenues for recovering some of the exhorbitant costs of production. Also, since, as was shown earlier, some of the missions traditionally assigned to tactical nuclear weapons could well be performed by precision-delivered weapons with a conventional warhead, it may mean that nuclear weapons could be more readily dispensed with in a regional conflict. This could well have the effect of blurring the distinction between the use of nuclear and non-nuclear weapons, thus enhancing the risk that an armed conflict may develop into a nuclear war.

51. The risks of a nuclear war by accident, miscalculation or an act of strategy have become more serious due to the developments during the period under review and have thereby firmly placed the centrality of the nuclear threat at the forefront of the priority items in the disarmament agenda. The dangers posed by the stocks of nuclear weapons and the continuation of the arms race can be removed only by outlawing and halting the production of such weapons and by proceeding to destroy them. The longer this process is delayed, the graver are the risks of a nuclear holocaust. The 1977 report repeatedly stressed that the lack of progress in halting the vertical proliferation of nuclear weapons and the continuation of the nuclear arms race are factors which encourage the horizontal proliferation of such weapons. As far as most developed and several developing countries are concerned, there are no longer any serious technological or economic barriers against initiating a nuclear weapons programme. The only barriers to horizontal proliferation are now political: obligations voluntarily assumed, the good sense of Governments and the example to be set by the nuclear-weapon States in agreeing to reduce their own nuclear arsenals with clear commitments for their eventual elimination. In this respect, the proceedings and the outcome of the Second Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, concluded in September 1980, were a forceful reminder to the nuclear-weapon States of their lack of diligence in the pursuit of nuclear disarmament. An overwhelming majority of the signatories to that treaty insisted that the nuclear-weapon States should agree to a package of arms limitation measures, including a declaration that they would abide by SALT II while awaiting its ratification and that they would impose on themselves a moratorium on nuclear testing and carry on the negotiations for a comprehensive test ban treaty (conducted up to now between three nuclear powers signatories to the non-proliferation treaty, which neither France nor China have signed) within the enlarged Committee on Disarmament. 24/ The conference ended without a joint communiqué, raising serious misgivings about its future deliberations and their eventual outcome in strengthening the prospects of overcoming the dangers of

further horizontal and vertical proliferation of nuclear weapons. One of the developments provoking growing concern pertains to persistent reports throughout the mid-1970s - and confirmed recently by two United Nations expert studies - which show that both Israel and South Africa have come within announcement distance of a nuclear-weapon capability without it being recorded in a nuclear explosion. 25/

52. The Second Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons reflected only one of the several instances of recurring deadlocks in other deliberative and negotiating forums for disarmament. The resulting impasse of the early 1980s could become the basis not only for another major round of escalation in the arms race, but also for the mounting evidence that both those in the forefront of its technological and strategic momentum and those emulating it on the peripheries are increasingly confronting socio-economic pressures to reverse course. The forces that drive the arms race along, the purposes it serves and its various forms of manifestation are being seriously questioned by an unprecedented number of well-informed people all over the world. A co-ordinated movement effective enough to become an irresistible pressure on decision-makers is beginning to emerge. Even in its infancy, it has amassed very convincing evidence of the social perversity and the economic burdens of the arms race.

53. Driven by a vicious circularity between its technological and strategic momentum, the arms race is not only becoming more dangerous, but also more complex and more firmly entrenched. There are evidently great differences between the countries at the technological forefront of the arms race and the countries which are gradually being drawn along. Since the dynamics of the arms race are being sustained by a variety of forces acting together, it is evident that to remove one of them is not sufficient to reverse its course. It is not one or a few single factors but precisely their multiplicity which has rendered the arms race so intractable that any limited successes in one field tend to be quickly offset by developments in other sectors of the arms race.

54. The deadly destructive potential amassed in the growing arms arsenals, particularly in the nuclear field, and the enormous misallocation of resources consumed by the arms race make it a threat both to human survival and socio-economic well-being. Heavier and still heavier military outlays will not broaden the range of options for resolving national and international socio-economic problems. The following chapters of this report attempt to strengthen the socio-economic case for disarmament through a portrayal of the arms race as a self-defeating choice both for the world as a whole and for the economic prospects of those who are incurring huge military outlays.

CHAPTER II

RESOURCES AND THE ARMS RACE

55. For generations resource-related issues have been a significant factor in determining the pace of socio-economic development, the nature of conflicts among nations, and the forms of response to conflict situations. But never before has

humanity confronted so many resource-related tensions, manifesting themselves in such varied forms, in so many places at the same time. The 35 years since the Second World War have witnessed a quantum leap in the levels of resource consumption and the costs of their utilization. Those years have also demonstrated that the historical pattern of substituting the scarce by the plentiful, through geographic expansion and technological advancement, is no longer always an option. Resources - whether they be natural (fuel and non-fuel minerals and raw materials), human (labour), and material (capital and technology) - are unevenly distributed among States, and these States vary widely in their technological capabilities to overcome the physical constraints on resources. To the extent that political considerations related to the arms race constitute an obstacle in an international interchange of unevenly distributed resources, the arms race certainly narrows down the global opportunities for socio-economic development throught the most productive utilization of its far-from-infinite resources.

56. Resources used for military purposes compete for resources which could have been otherwise available for socio-economic development. They also affect priorities in the allocation of resources not claimed directly. They aggravate the conflict situations related to resource constraints. And they carry the non-negligible risk of creating conflict situations which by themsleves may become a factor in further escalations of the arms race, making additional claims on resources. In all these respects, purely financial outlays do not provide an adequate picture of the magnitude of the human and material resources consumed by the arms race. Nor do they sufficiently indicate the range of options which would be available if only a part of the resources claimed by the arms race were diverted to non-military purposes.

57. In characterizing the arms race as a major factor in narrowing the global socio-economic options, this chapter describes the present day utilization of resources for military purposes; it also indicates the nature and range of options affected by the arms race in defining the geographic and technological limits on resource constraints. Finally, it stresses the dangers of resource-related conflict situations that lead to a further escalation of the arms race, making additional claims on resources.

58. A recent comprehensive survey of the resources consumed by world-wide military activities is provided by the study on the relationship between disarmament and development (A/36/356). Besides recounting some of the more familiar aspects of financial outlays, the study also conveys the magnitude of human and material resources claimed by the arms race. Although the global aggregates provided by this study conceal signifcant regional and national variations and, in several cases, were prepared on the basis of data available for only a few countries, they do portray the enormity of resources consumed, as shown by the following:

(a) By 1982, the world military expenditure represented a nearly fourfold escalation over the post-war period and was in excess of a twenty-five-fold escalation since the beginning of this century. In current prices, it amounted to an expenditure of roughly $110 for every man, woman and child; it was comparable to the combined gross national products of all the countries of Africa and Latin America and was nearly 19 times as large as the official development assistance

provided by the Organisation for Economic Co-operation and Development (OECD), to the poorer countries. Per capita, the military expenditures of the developed countries were of a much higher magnitude than those of the developing countries. At the same time, it needs to be noted that the real burden of military expenditures in different countries cannot be measured entirely on the basis of per capita outlays.

(b) An important part of world industrial production is pre-empted by military requirements. According to a careful estimate, 26/ approximately 28 to 32 per cent of world military expenditure represents the value of industrial production given over to military use. For 1982, this represents an industrial output (at current prices) of roughly 180 billion dollars. This output is concentrated in the developed countries where - again, according to the estimates quoted above - military-related output fell between 1.1 and 7.5 per cent of the total industrial output in 1977.

(c) In 1981, anywhere between 3 to 12 per cent of a selected group of 14 minerals was claimed for military consumption. In the case of aluminium, copper, nickel and platinum, estimated global military consumption was greater than the demand for these minerals for all purposes in Africa, Asia (including China) and Latin America combined. The military consumption of petroleum came close to 5 to 6 per cent of the total world consumption; this is close to one half of the entire consumption by all the developing contries (excluding China).

(d) World expenditure on military R and D constituted the largest single objective of scientific inquiry and development. Estimated to be in excess of over $35 billion in 1980, military R and D accounted for roughly one fourth of the entire world expenditure in R and D for all purposes. 27/ As compared with this, the world military R and D 20 years earlier was $13,000 million in current prices.

(e) Over 70 million people are estimated to be directly or indirectly engaged in military activities world-wide. This figure includes, inter alia, some 25 million persons in the world's regular armed forces and, if to these were added those in para-military forces or reserves, the number might well be almost twice as high; approximately 4 million civilians employed in defence departments world-wide; over 3 million scientists and engineers engaged in military R and D world-wide, with the scientists alone numbering over 500,000; and at least 5 million workers directly engaged in the production of weapons and other specialized military equipment.

(f) While it is negligible as an absolute share of world-wide land utilization and vast areas of land in the world are of no more interest to the military than to other land users, the military use of land is not without consequence. Moreover, as an indication of trends, military requirements for land have risen steadily over the course of this century due to increases in the size of standing armed forces and, more particularly, the rapid pace of technological advances in weaponry. Despite its relatively small share in the use of land, the military can, and often does, compete directly with civilian demands, be they urban, industrial, agricultural, recreational or based on environmental concerns.

59. These and similar statistics are being constantly used to underline the striking contrast between the current outlays for military purposes and the relatively modest resources required to cover the basic unmet needs of millions of people all over the world. In 1981 alone, the world spent more per minute for military purposes than the sum required to feed over 2,000 children for one year in the developing countries. Over 1,200 million people all over the world - living on incomes of less than $150 a year - remain undernourished; yet less than one half of one per cent of the global military spending in 1980 alone would have been sufficient to pay for all the farm equipment needed to increase food production and approach self-sufficiency in food-deficit, low-income countries by 1990. An additional allocation of a mere $200 million - the price of two strategic bombers of the latest type - to the annual budget of the United Nations Educational, Scientific and Cultural Organization (UNESCO), would enable it to free the world of illiteracy in less than a decade, and an allocation of $500 million - equivalent to the cost of a single aircraft carrier - to the World Health Organization (WHO), would be more than adequate to eradicate debilitating and disabling diseases, such as malaria, trachoma, leprosy and yaws, from the developing countries. An estimated sum of $14 billion, spread over eight years, would be sufficient to cover the financial requirements for supporting actions and pre-investment activities for the development of new and renewable sources of energy in developing countries; this sum is equivalent to roughly one eighth of what the world is currently spending per year on improving its already massive nuclear arsenals (see A/AC.215/4).

60. Of all the human and material resources consumed by military activities, none can match the enormity and the distorted orientation of the world-wide expenditure on R and D. The global military R and D expenditures in 1980 were equal to the combined R and D investments for basic research, energy, health, transportation, information-processing, pollution control, agriculture and other similar civilian areas. For space research alone, which accounted for 8 per cent of world-wide R and D expenditures, over 90 per cent was geared to military purposes. Out of the three million scientists and engineers employed world-wide in scientific laboratories, approximately half a million were specifically engaged in the development of new weapons systems. By 1981, those in the forefront of space technology were believed to have acquired the ability to survey virtually every square metre of each other's territory, but the world-wide pool of scientific and engineering resources had barely begun to survey the complex ecosystems of fast-disappearing tropical rain forests or the menacing spread of the world's deserts. 28/

61. Several scientists concerned with the impact of technology on socio-economic development believe that, if the multibillion-dollar global expenditures on military R and D since the Second World War had been expended in those areas of science and technology promising the most economic progress, the world would be today where it may not find itself, as far as technology is concerned, in the year 2000. If one adds to the number of scientists engaged in military R and D the global pool of educated people directly and indirectly contributing to military-related activites, then the enormity of the current misallocation of human resources becomes still more alarming. In 1981 almost one half of the world's adult population could not afford literacy, yet over 70 million adults who had

received some degree of technical training and formal education were directly or indirectly engaged in military activities. If a basic purpose of education is to equip human beings with an ability to understand their environment with a view to overcoming its inherent constraints, it is more than ironic that so many of those equipped to do so are contributing towards making the world less, rather than more, amenable to socially productive purposes.

62. The list of alternative civilian uses for the human and material resources currently claimed by military activities is getting longer every day. If this list covered not only those civilian areas which could and would benefit from a release and reallocation of military-related resources but also the choice of socio-economic priorities exercised by military-oriented political structures, it might cover a whole range of problems confronting several parts of the world and manifesting themselves in different forms. A fuller analysis of this latter observation may be found in the next chapter, which describes the negative consequences of present military allocations in the national context. In regard to the global aspects, what needs to be emphasized is that resources, however defined, are far from infinite, and no socio-economic structure, however resourceful it may be, can indefinitely sustain patterns of consumption and utilization which do not conform to their inherent geographic and technological constraints. It is here that a very strong socio-economic case for a reallocation of military-related resources, among both the developed and the developing countries, can be made. Most relevant in this respect are current assessments of global resources and their availability for civilian utilization under comparative situations of an intensified or reduced claim by military-related activities.

63. Sobering assessments suggest that, by the year 2000, all the four biological systems, namely, forests, grasslands, croplands and fisheries, which supply all our food and virtually all the raw materials for industry except minerals and petroleum-derived synthetics, will face unprecedented strains to sustain the present levels of consumption among the developed countries, as well as the projected levels of demands by the developing countries. Between the years 1975 and 2000, nearly 1,000 billion barrels of world's original petroleum resources of approximately 2,000 billion barrels are likely to be consumed. 29/ Also the atmospheric concentration of carbon dioxide may be nearly one third higher than pre-industrial levels, in addition to the incalculably enormous pollution problems arising out of the unresolved problem of disposing nuclear and chemical waste.

64. While foreseeing no problems of physical constraints - on a world-wide scale - for at least eight minerals, namely, iron, aluminium, titanium, chromium, columbium, manganese, vandium and platinum, projections of OECD on 20 important minerals indicate that the situation is more serious for silver, bismuth, mercury, and asbestos than for copper, lead, tin, zinc, molybdenum, tantalum or tungsten. These estimates suggest that, in the unlikely event of a complete disappearance of some scarce minerals such as asbestos, bismuth, barium, fluorine, germanium, graphite, gypsum, indium and mica, it would be possible to do without them, eventually, through a reliance on new technology. 30/ Similar conclusions have been reached by those who make a distinction between the known global reserves and the global resource base of each mineral, the last named being defined as its total estimated amount in the earth's crust, which is a measure of the amount available

on the planet. The difference in the known reserves and the resource base of 21 important minerals varies by a factor of 10 to 20, but the life expectancy in each case is estimated to alter substantially under a 2 to 10 per cent increase in the present levels of production (see table 3).

65. Both those who see no constraints in the near future and those who warn that the world is running out of its resources agree that the life expectancy of several strategic minerals - crucial both for civilian and military uses - depends upon the present and future patterns of consumption and utilization of those minerals. They also admit that an absence of physical limits on global reserves does not preclude conditions of economic scarcity and steeply rising costs for some parts of the world due to their geographic distribution and the fact that patterns of consumption do not correspond to the geographic location of reserves. Finally, neither optimist nor pessismists rule out the possibility of a severe economic dislocation which may occur in the event of a major war, serious political rifts between the centres of consumption and geographic reserves. social upheavals and civil unrest mainly in the oil- or other minerals-producing regions. 31/

66. In the absence of reliable data, it is difficult to estimate the magnitude of claims which future increases in military consumption will have on the life expectancy of global fuel and non-fuel mineral resources. But it does not require meticulous details of the present patterns of consumption to conclude that mineral resource shares would be consumed in greater proportions if the arms race were to escalate further. The increasing emphasis on the qualitative aspects of sophisticated weaponry implied a gradual decrease in consumption of such basic minerals as iron and steel in some proportion to the added consumption of more exotic ones such as silver, aluminium and titanium. A quantum jump of the arms race would make additional claims on the former and a qualitative leap would pre-empt larger shares of the latter. Both the quantitative and qualitative escalations would consume much larger proportions of energy for which the averase rate of consumption is much heavier for most of the military sector than that generally applicable to civil industry. At a consumption of 1.9 gallons per mile, the spohisticated tanks of the the 1980s consume, for example, 10 times more gasoline than their predecessors 20 years earlier. Approximately 20 to 30 per cent of the weight of modern sophisticated combat aircraft is made up of titanium, compared to 8 to 10 per cent for the models produced in the 1950s. Titanium is also a preferred metal for the hulls of certain types of submarines. Modern naval vessels make extensive use of aluminium. The range of materials required to build and deploy 200 land-based mobile intercontinental ballistic missiles, for example, include an estimated 10,000 tons of aluminium, 2,500 tons of chromium, 150 tons of titanium, 20 tons of beryllium, 890,000 tons of steel and 2.4 million tons of cement. 32/ An increase in the annual growth rate of consumption by 2 to 5 per cent of many of these stragegic minerals can reduce the life span of their global reserves by 10 to 15 years, (see table 4). The physical availability of an abundant resource base in each case, however, does not ensure that their subsequent utilization will not entail additional economic costs involved in extraction and downstream processing. 33/ Future generations will, thus, not only face depleted resources but also heavier economic costs of consumption.

67. Bearing in mind the fact that global military production remains heavily concentrated in the developed countries, a rather unfair implication of an escalated arms race would be that faster rates of mineral depletion will either deprive the developing countries of their future civilian use or make it much more expensive for them. In this context, it is relevant to recount that the present patterns of global mineral consumption do not correspond to their geographic location: most developed countries are dependent upon imports to sustain or accelerate their present levels of consumption. More important still, the levels of mineral consumption in almost all the developing contries endowed with mineral reserves are far from commensurate with their present or future requirements for socio-economic development. An overwhelming majority of them lack either the capital or the technology to fully utilize their resources, for which they depend upon imports from the developed world.

Table 3. Life expectancies of resource bases for selected mineral commodities

Mineral commodity	Life expectancy in years at four growth rates				Average annual production growth 1947-74
	0%	2%	5%	10%	(%)
Aluminum	166.0 x 10	1 107	468	247	9.8
Antimony	214.0 x 10	771	332	177	2.4
Barium	4.0 x 10	918	392	208	4.1
Chromium	1.3 x 10	861	368	196	5.3
Cobalt	23.8 x 10	1 009	428	227	5.8
Copper	216.0 x 10	772	332	177	4.8
Gold	62.8 x 10	709	307	164	2.4
Iron	2.6 x 10	898	383	203	7.0
Lead	83.5 x 10	724	313	167	3.8
Magnesium	131.5 x 10	1 095	463	244	7.7
Manganese	3.1 x 10	906	386	205	6.5

Table 3. (continued)

Mineral commodity	Life expectancy in years at four growth rates				Average annual production growth 1947-74
	0%	2%	5%	10%	(%)
Mercury	223.5 x 10	773	333	178	2.0
Molybdenum	436.0 x 10	607	346	185	7.3
Nickel	3.2 x 10	559	246	133	6.9
Platinum	6.7 x 10	944	402	213	9.7
Silver	194.2 x 10	766	330	176	2.2
Tin	172.2 x 10	760	327	175	2.7
Titanium	124.0 x 10	1 092	462	244	9.5
Tungsten	677.2 x 10	829	355	189	3.8
Vanadium	213.8 x 10	1 120	473	250	11.1
Zinc	398.6 x 10	1 151	486	256	4.7

Source: The data on the resource base are based on the information in Donald A. Bruest and Walden P. Pratt, eds., "United States Mineral Resources". Geological Survey professional paper 820 (Washington D.C. U.S. Government Printing Office, 1973), pp. 22-23; Tan Lee and Chi-Lang Yao, "Abundance of Chemical Elements in the Earth's Crust and Its Major Tectonic Units", International Geology Review [July 1970], pp. 778-85. The figures for the 1972-1974 average the annual percentage growth in production for 1947-1974. The entire table is based upon John E. Tilton, The Future of Non-fuel Minerals (Washington D.C., The Brookings Institution, 1977), pp. 12-13.

68. The juridically accepted and politically important right of national sovereignty over natural resources, on the one hand, and the increasing claims for several of those resources by the arms race have yielded several patterns of mutual denial which carry the risk that resource-related conflicts may further aggravate the arms race. In this respect, developments throughout the 1970s have underlined growing tensions among the suppliers and recipients of fuel and non-fuel minerals

in international trade. The recurring political rifts and social upheavals among the mineral-exporting developing countries have imparted an element of uncertainty about uninterrupted supplies among several importing countries. Although energy-related imports have generally been considered most dramatic, there are at least a dozen other minerals for which the import-dependency is more or less critical (table 5). A 15 to 20 per cent cut in their supplies could have serious effects on the importing economies by creating stagnation or reducing production. After comparing the degree of dependency of seven major countries, namely, the United States, the Soviet Union, France, the Federal Republic of Germany, the United Kingdom, Japan and China, a recent study covering the years 1973 to 1978 listed the following minerals as most likely to reduce the gross national products of the importing countries in conditions of shortage: non-metallic titanium, platinum, cobalt, tin, chromium, aluminium, copper, silver, nickel and tungsten. 34/

69. In drawing inferences from such selected surveys, however, it is important to remember that the degree of dependence varies even among the above-mentioned countries to the extent that their national reserves and technology provide relief through substitution, recycling and stockpiling; it also varies with the degree to which the demand can be controlled to offset the supply constraints. Both these features provide the United States, the Soviet Union and China with a certain degree of immunity against sudden interruptions of supplies in the immediate future. Neither, however, mitigates the centrality of import-dependency for Western Europe and Japan. Japan's very low military expenditure per capita and its total absence from the supply side of international arms transfers puts it in a category by itself. But the demand side of mineral exports and the supply side of arms imports in the 1970s have produced a strong parallelism. In several cases, the recipients of exotic military hardware among the developing countries also happen to be the suppliers of important strategic minerals to the developed countries. Sheer coincidence cannot explain the increasing sophistication, the total volume, or the concessional terms of transfer given to weapons importers among those developing regions which also happen to either possess sizeable deposits of known strategic mineral reserves or are geographically contiguous to them.

70. Of all the resource-related aspects of the arms race virtually none can be compared to the strategic significance of oil for military consumption and its high degree of geographic concentration in a conflict-prone region. 35/ At a relatively low basic production cost per barrel, easily transportable, low in pollution, the oil resources of the Middle East constitute more than half of the known and prospective world reserves. The region around the Persian Gulf is dotted with gigantic oil fields, each containing more oil than the combined total of the fields in most other major oil-producing regions and provinces. A single field in Saudi Arabia, for example, produces more oil - five million barrels a day - than any other country except the United States and the Soviet Union, each of which produces twice that amount. Only about 15 per cent of the world's geologic oil provinces accessible with present technology remain relatively unexplored, and initial surveys indicate that not many can be compared to the promise of the Middle East oil: the wealth of its deposits - at $30 per barrel - is estimated to amount to $270 trillion which, it seems, equals the total economic output of a major industrialized country for 100 years, at current prices. 36/

Table 4. Life expectancies of world reserves for selected mineral commodities

Mineral commodity	Life expectancy in years at four growth rates				Average annual production growth 1947-74 (%)
	0%	2%	5%	10%	
Antimony	60	40	28	20	2.4
Barite	42	31	23	17	4.1
Bauxite	226	86	51	33	9.8
Chromium	263	93	54	35	5.3
Cobalt	97	54	36	25	5.8
Copper	56	38	27	20	4.3
Diamond	22	18	15	12	5.4
Gold	30	24	19	15	2.4
Ilmenite	150	70	44	29	9.5
Iron	167	74	46	30	7.0
Lead	42	31	23	17	3.8
Magnesium	...	...	...	...	7.7
Manganese	190	79	48	31	6.5
Mercury	19	17	14	11	2.0
Molybdenum	70	44	31	22	7.3
Nickel	67	43	30	22	6.9
Platinum group	117	61	39	27	9.7
Silver	20	17	14	12	2.2
Tin	42	31	23	17	2.7
Tungsten	42	31	23	17	3.8
Vanadium	462	131	71	43	11.1
Zinc	21	18	15	12	4.7

Source: U.S. Bureau of Mines. Commodity Data Summaries, 1972, 1973, 1974, 1975, 1976; Donald A. Brobst and Walden P. Pratt, eds., "United States Mineral Resources", Geological Survey professional paper 820 (Washington D.C.; U.S. Government Printing Office, 1973); U.S. Bureau of Mines, Minerals Yearbook 1948 and 1974 (Washington D.C.: U.S. Government Printing Office, 1950, 1976)

The entire table is based upon The Future of Non-Fuel Minerals (Washington, D.C., The Brookings Institution, 1977), pp. 6-7.

71. Oil is an incomparable source of petroleum, which is widely believed to be more crucial for the military sector than the economy as a whole. It has been estimated that petroleum accounts for three fourths of military energy consumption, and it cannot be easily substituted by some of the other sources of energy which can relieve oil-dependency for several civilian sectors of the economy. In order for coal to substitute for oil it must first be converted into petroleum-type fuels, the so-called synthetic fuels, which require billions of dollars of investment and enormous inputs of coal. Estimates prepared in the United States indicate that to produce 4 per cent of the present oil consumption by the developed world would require the construction of 90 coal liquification plants, which would take 10 years, and a coal import equal to one half of the entire United States' coal industry in 1978. Nuclear power plants, it is estimated, would take more than 10 years from conception to operation. Nuclear power's ability to substitute for oil is considered small; it can only be a source of electricity, which appears to account for less than 15 per cent of the industrialized world's total energy requirements. Solar energy, although of great long-term potential, can be introduced only very slowly, and its largest near-term use - for heating - can be realized only after the construction of new dwellings. It has been estimated that even after reducing their energy consumption by over 10 per cent over the next decade, the developed world's capacity to stay even on the supply side through measures of energy substitution will not be easy.

72. The importance of energy for industry as a whole, and the crucial role of oil, both as a source of energy and its consumption for military purposes, seems to have pushed energy-related issues to the forefront of security concerns, both for supplier and recipient countries. Contemplation of the use or threat of force to retain uninterrupted access, among some recipients, and increasing military outlays to deter seizure through coercion, among several suppliers, have been witnessed throughout the middle to the late 1970s. It has been estimated that between 1970 and 1980, there were as many as 366 incidents of domestic and external acts causing major to severe damage of energy-related targets all over the world. 37/ Among the energy-related facilities so damaged were power lines, power stations and substations, pipelines, storage places, refineries, oil-wells, wires, coal-trains, oil-tankers, hydroelectric mills and nuclear power plants.

73. For most developing countries, and particularly those whose capability for a more productive utilization of their human and natural resources is affected by their imports of material resources, that is, capital and technology, the continuing arms race has accentuated the need to preserve their resource underpinnings. Sizeable shares of global reserves of strategic minerals, such as bauxite, cobalt, chromite, copper, mica, lithium, manganese, nickel, tin and ilmenite - belonging to the titanium group - are located in those countries (table 6). Most of these minerals are equally important for meeting the chemical, engineering, mechanical and metallurgical requirements of both the civilian and military sectors of the economy. An expansion of the military production among the developed countries, many of which depend heavily on imports of these minerals, will not only negatively affect their life expectancy but also increase their subsequent costs of production by the developing countries. In this respect, it needs to be mentioned that the costs of upper crust mining and extraction, and of downstream processing of minerals buried in the global resource base are substantially higher as compared to similar costs of current global reserves. As mentioned earlier, the amount of current global reserves is determined by the amounts of minerals available in the global resource base.

Table 5. Net import dependence 1977-1978

(in percentages)

	Total European Community	United States
Aluminium (allowing for bauxite and alumina imports)	57	85
Asbestos	83	84
Barytes	Net exports	40
Cadmium (allowing for raw material imports)	100	66
Chromium	100 (85 with scrap)	92
Cobalt	100	97
Copper	85	19
Fluorspar	15	82
Germanium	100	n.a.
Iron Ore (fe content):	84	29
Lead	55	11
Lithium	100	net exports
Manganese	100	98
Molybdenum	100	net exports
Nickel	100	77
Niobium	100	100
Phosphate	100	net exports
Platinum Group	100	91
Selenium (allowing for raw material imports)	100	61
Sulphur (all forms):	60	10
Tantalum	100	97
Tin	86	81
Titanium	100	39 (ilmenite only)
Tungsten	84	50
Zinc	52	62

Source: Non-Fuel Mineral Data Base (London), Royal Institute of International Affairs, 1980.

For the Total European Community, the figures generally refer to domestic production as a percentage of domestic apparent consumption - 1977-1978 averages. For the United States, figures cover net import reliance (imports less exports plus adjustments for Government and industry stock change) as a percentage of apparent consumption.

74. For the developing countries, their strategic mineral resources have become somewhat of a dilemma in their current and future plans for socio-economic development. They cannot easily withhold them to pre-empt their possible military consumption by the developed world without affecting their own development programmes, since it is also the export of such resources that enables them to import the capital and technology required for their domestic utilization for civilian purposes. On the other hand, the prevailing economic and political costs of the import of capital and technology in an international situation dominated by strategic considerations related to the arms race are such that several of the developing countries are becoming increasingly restive about their short- and long-term implications. As pointed out in the 1977 report, the arms race fosters concerns about the political and social options chosen by other countries, particularly those that are deemed to have strategic significance. The nature of economic concessions associated with transfers of capital and technology to the developing countries thus tends to become increasingly affected by their strategic significance to the major suppliers and, in several cases, the purely financial costs of such concessions provide little clue to their economic, political and social implications.

75. Take the example of the short- and long-term implications of the transfer of technology, which by now has become a major factor in the development prospects of the developing countries. An act of technology transfer invariably involves two kinds of costs, namely, the domestic resources, which have to be initially utilized to accomplish the successful transfer of a manufacturing technology, including transmission costs; and the subsequent costs of successive application, including research and development. Depending upon their technical and managerial competence, the size of the industry, the nature of R and D activity and the level of development, many developing countries incur much heavier costs for importing technological know-how as compared to the initial and absorptive costs of technological transfers among countries with roughly similar levels of development. 38/ In principle, the more sophisticated the technology, the greater are the economic transformations implicit in its transfer process, from introduction to its successful application. Another obvious aspect of the technology transfer scene between the developed and the developing countries is also easily identifiable, namely, the role of the dual-purpose technology and the manifest unwillingness among the suppliers about its transfer to those recipients whose strategic interests do not coincide with their own.

76. Resource-related issues are continually resurfacing in several international forums dealing with their various aspects, namely, finances, labour, technology, trade, minerals and energy. 39/ The apparent clash of interests between suppliers and recipients would seem increasingly unreal, as it is accepted that, in the global context of uneven geographic distribution of resources, these roles are interchangeable. Escalations in the arms race would not only add to the gravity of existing resource constraints but also heighten the dangers of resource-related tensions erupting into open conflicts. Apprehensions in this respect cannot be easily dismissed because the post-Second World War period has already witnessed several military conflicts involving resources, whether they be minerals, ore, water or fish. The potentials for conflict over fresh water alone are underscored

Table 6. Reserves by main groupings

(percentage shares in world total)

	Reserves		
	Developed	Less developed	Centrally planned
Bauxite	28	68	4
Aluminium	-	-	-
Antimony	24	19	57
Asbestos	56	11	33
Barytes	47	35	18
Cadmium	63	24	13
Chromium	68	31	1
Cobalt	7	72	21
Copper	30	58	12
Fluorspar	52	38	10
Germanium	n.a.	n.a.	n.a.
Gold	64	14	22
Industrial Diamonds	7	89	4
Iron Ore	35	31	34
Lead	60	19	21
Lithium	24	68	7
Manganese	52	9	39
Mercury	58	13	29
Molybdenum	51	37	12
Nickel	32	53	15
Niobium (Columbium)	7	87	6
Phosphate	19	75	6
Platinum Group			
Palladium	86	..	14
Platinum	55	..	45
Rhodium	86	..	16
Potash	80	3	17
Selenium	29	52	19
Silicon	n.a.	n.a.	n.a.
Silver	40	27	33
Sulphur	33	37	30
Tantalum	6	87	7
Tin	8	70	22
Titanium			
Ilmenite	78	20	2
Rutile:	11	86	3
Tungsten	27	10	63
Vanadium	22	5	73
Zinc	68	21	11
Zirconium	70	16	14

Source: Non-Fuel Mineral Data Base, (London, Royal Institute of International Affairs 1980).

Note: Developed includes all OECD countries and South Africa; Centrally planned includes Council for Mutual Economic Assistance (CMEA), China, Cuba, Albania, Viet Nam, Democratic People's Republic of Korea, and Mongolia; Less developed covers the remainder.

by the fact that out of 200 of the world's major river basins, 148 are shared by two or more countries. 40/ The prolonged negotiations over seabed resources in the recently concluded conference on the law of the sea provided another recent instance of the tensions related to the issue of resources.

77. Developing countries' reactions to what most of them see as the unaffordable cost of capital and technology transfers have taken several forms: some developing countries are insisting on more favourable terms from present suppliers; others are trying to promote such transfers among themselves with greater reliance on intermediate technology; still others are inclined towards postponing plans for further utilization of their reserves till they can have more autonomous control over all its phases. But, by and large, most of them view the present patterns of resource consumption and utilization as inconsistent with the objectives of the new international economic order and consider the existing arrangements for capital and technological transfers as both unsatisfactory and inadequate for their developmental targets. The stepping up of economic aid by the Organization of Petroleum Exporting Countries (OPEC) and the transfer of intermediate technology from the newly industrialized to the less industrialized developing countries are some indications of a trend which may eventually supplement the movement towards translating the ideal of global economic interdependence into a reality.

78. Past patterns of military consumption of resources have already started manifesting themselves in their accumulated effects on economic growth and socio-economic development. The next chapter attempts to demonstrate that neither economies at an advanced stage of development nor those lagging far behind can indefinitely sustain the socio-economic burdens of the military outlays they are currently incurring.

CHAPTER III

MILITARY OUTLAYS AND SOCIO-ECONOMIC DEVELOPMENT

79. As described in the preceding two chapters, world military outlays in 1981, in purely financial terms, had reached $550-600 billion representing, after adjustment for inflation, a fourfold increase since the Second World War. For over three and a half decades, covering periods of economic buoyancy and stagnation, the global military sector has continued to consume approximately 5 to 8 per cent of the world economic output. Neither the situations of resource abundance nor of resource constraints have so far affected the military consumption of strategic minerals, which persists in claiming an estimated 3 to 12 per cent of global production. The quadrupling of oil prices in the 1970s has had no perceptible effect on the relative energy consumption by the military industry which, it seems, singly consumes, in some cases, one to three quarters of the total national petroleum consumption. Nor has the exotic cost of sophisticated military innovations deterred roughly one third of global R and D from being continuously poured into military R and D. The slackening of international trade in the 1970s has not been reflected in international arms transfers which, in 1981 alone, accounted for over $120 billion. These and several other similar trends have pushed the costs of military outlays into the forefront of public concern and led to several questions

being asked by different national and international forums. Emanating from a whole range of concerns pertaining to the manpower, resources, and ecological aspects of military outlays, the focus of public inquiry for the 1980s appears to be the same: what is the bedrock of commitments to military outlays? Has the world reached or is it approaching a watershed on the other side of which further escalations in military outlays, or the ground rules determining them, will be quite different from what they have been up to now? 41/

80. One such major watershed has been approached apparently in terms of a near universal weakening in the process of economic growth as reflected in the rates of increase in the gross national product (GNP). In assessing the State's capability to perform its security function as a part of its welfare commitment, the most relevant economic measure is that of the GNP, that is, the total amount of goods and services its economy can produce and direct towards meeting a war situation. A logical corollary of this in peace-time, therefore, is a sustained if not accelerating rate of growth of GNP because no economy, however it is managed, can ultimately outspend its GNP for military outlays. This may, in principle, happen if the rates of increase in military outlays are constantly higher than the rates of increase in the GNP.

81. For several years, the world economy has experienced a continuous process of slow or declining growth. The events of 1980 and 1981 marked a second major setback. The growth of world output, which had declined from 4.6 per cent in 1978 to 3.8 per cent in 1979, dropped to 2.2 per cent in 1980. This slow-down in the rate of growth, though different in various major groups of countries and geographic areas, was a world-wide phenomenon. The general deterioration in growth performance was accompanied by a very marked decrease in the expansion of world trade, by growing balance-of-payments problems and by high inflation rates in most countries. The rate of increase in the volume of world exports, in fact, fell to 1.5 per cent in 1980 from a rate of some 5 to 7 per cent over recent years. In 1981, the value of world exports declined in absolute terms. The recession is particularly costly in terms of human resources: in the developed market economies more than 24 million members of the labour force were unemployed at the end of 1981. Although some recovery in economic performance may be anticipated in the near future, the pace of advance is not expected to be vigorous. The poorer medium-term trend that has been in evidence since the mid-1970s is thus likely to continue.

82. In assessing the impact of the current and future military outlays on these sobering economic prospects, a familiar problem pertains to the relevance of past experience, which indicates a coincidence of high military spending and high rates of economic growth for some of the developed countries. However, several economists have by now stressed that a coincidence of high military spending and high rates of economic growth does not provide evidence of a positive relationship between the two. Indeed, if there is a relationship, then the causality was probably reversed, that is, higher military spending was made possible due to high rates of growth, and not vice versa. The fundamental reason for the negative effect of military outlays can be described simply: although military production is a part of the gross national product, it differs from other forms of output in that, by itself, it neither serves present consumption nor adds to productive

capacity. 42/ The real burden of military expenditures are the civilian goods and services which could have been produced instead. Simply stated, the opportunity costs of the production of military goods and services are the forgone opportunities to produce civilian goods with the productive capacity (manpower, capital, technology, and so forth) claimed by the military sector.

83. When factors of production are lying idle, or when the degree of their utilization does not correspond to their productive capacity, military outlays may stimulate the economy in the short run through a multiplier effect, that is, by providing additional national product and by creating additional demand. This explains why some societies with unutilized or underutilized resources may not experience any immediately negative economic consequences from initial military outlays. 43/ But this does not prove the uniqueness of military outlays in stimulating economic growth even in underutilized economies, because it does not prove that an increase in autonomous civilian outlays of similar magnitude would not have yielded an equally, if not more, stimulating effect on the economy. More recently, several studies of the employment effects of alternate civilian and military expenditures in developed countries have shown that $1 billion spent on the former will, in general, create two to four times larger job opportunities as compared to a similar allocation for the latter. These conclusions are drawn from the specific characteristics of the armaments industry, namely, its research and technology intensity, its capital intensity and its high degree of concentration in some geographical regions. 44/

84. When the factors of production are fully utilized, total output cannot be expanded but military outlays will create additional inflationary pressures and/or lower production of civilian goods by creating supply-side constraints and bottle-necks. The supply side of economic growth is generally viewed as depending on three factors: the size of the labour force, which is determined largely by demographic trends; the capital formation, which is determined primarily by the share of investment in the gross domestic product; and the factor of productivity, which depends heavily on the technological impetus related to R and D efforts. Although the size of the labour force is apparently an autonomous function of the demographic trends, namely, absolute rates of growth and the ratio of the working-age population, military manpower requirements do create or aggravate situations of labour shortage both through their claims on the number of people and the specific skills which are in themselves an attribute of the resource allocations on educational and vocational training. In most countries, those employed directly or indirectly by the military have a substantially higher level of technical skills than the average population and would have had higher-than-average productivity if they had been employed in the civilian sector. Military and military-related activities everywhere absorb a proportion of the most qualified categories of persons, which is much higher than what the share of the military budget in the gross national product might lead one to expect. This is obviously true of research personnel, engineers and technicians. It is also true in the field of administrative and managerial skills.

85. With regard to capital formation and the rate of investment in the gross domestic product, the effect of military outlays on supplies is even more direct than on manpower. Both the military and non-military investment demands are

directed roughly at the same set of industries such as, for example, electronics, industrial machinery, metallurgy, chemicals and energy. The military and civilian technologies of some industries such as electronics and aerospace are intrinsically interdependent. An expansion of military outlays will be associated with a relatively lower share for civilian investment by causing supply bottle-necks. By displacing civilian investment and diverting capital formation, military outlays constitute a severe constraint on the improvement of civilian productivity with predictably adverse consequences for the general economic performance, which depends heavily on capital formation and technological impetus.

86. The importance of the technological factor in economic growth has gained unprecedented pre-eminence almost in proportion to a growing awareness that military purposes claim a disproportionately large share of the global scientific and technological endeavour. 45/ It is beyond the scope of the present report to describe all the aspects of the technological impetus for economic growth, and it is not possible to disentangle all the available data to provide an accurate and up-to-date assessment of the sectoral pre-emption of the world's pool of scientific and technological talent for military purposes. Nevertheless, it is patently obvious that:

(a) Civilian technological progress embodied in civilian investment is the keystone of productivity improvement and economic growth;

(b) The current slow-down of the process of economic growth all over the world and the down-turn in the rates of productivity increases in the developed countries do not reflect a failure of technology per se. Rather, it may be partly seen as a long-term consequence of the decades-long diversion of an enormously large share of the crucial scientific and technological efforts from civilian to military-oriented developments. 46/

87. Civilian technological progress is that which is oriented to the development of knowledge leading to improved consumer and producer products and to more efficient ways of producing. These two aspects, that is, new and better products and improved production methods, are not so distinct as it might seem, since a major source of increase in productive efficiency is the employment of new machinery and equipment embodying superior technology. Civilian technological progress contributes to the growth of labour productivity by encouraging increases in the quantity of capital per worker and to the growth of both labout and capital productivity through the development of production techniques enabling the more efficient use of productive resources in general. Accordingly, the role of civilian technology can be seen as reflected in both the historical patterns of economic performance of the industrialized countries and the wide, and ever-widening, gap between them and the developing countries.

88. Historical comparisons of some major industrialized countries yield a pattern of economic performance that corresponds quite closely to the relative civilian and military orientation of their technological effort. Thus, several recent studies have shown that those concentrating highly on military technology experienced slower rates of growth than those who were not leading developers in this field. 47/ The crucial issue of technological diversion, however, is more relevant to the

historical experience of the industrialized countries, because the developing countries so far do not account for even a calculable fraction of the global military R and D effort - which can be considered fairly indicative of their technological orientation.

89. A major lesson to be learnt from the past is that the importance of civilian spin-offs from military technology has been either grossly exaggerated and/or highly misplaced. A basic problem here, as indeed elsewhere, is a comparison between a situation that exists with a condition that did not prevail. To be sure, many civilian sectors of modern industry owe their existence and development to the technological impetus of the military sector. Metallurgy, for instance, and the production techniques of high-quality metal thrived on manufacturing processes producing cannon barrels and armour plates. The transport industry is to some extent linked with the technological inventions applied to armoured vehicles. Merchant shipbuilding processes are sustained by techniques for naval technology producing sophisticated military carriers, and civil aviation is closely connected with the production of combat aircraft. But it is extremely difficult to identify where the transfer from military to civilian sectors, and vice versa, occurs, at least intellectually, if not historically.

90. Take the most widely known sectors of civilian industry which are commonly believed to have benefited directly from the most advanced results of military technology, namely, aerospace and electronics. Restricting the origins of the process to its mathematical aspect only, two of the rather familiar illustrations would be the technology for the atom bomb and the cruise missile. The major mathematical problem of the atomic bomb concerned the internal ballistics, that is, roughly speaking, the appropriate timing and dimensioning of the constituents of the fission process. The appropriate mathematical model had been found already in the late 1920s in convolution equations over the half-axis of the Weiner-Hopf type for modelling the equibalance of radiation on the surface of stars. Thus, the truly indigenous model originated from quantum mechanics investigations within astrophysics. The major mathematical problem of cruise-missile technology is the digitalization of terrain surfaces for the terrain contour matching deployed. Here the challenging problem for geodesy was already formulated 20 years ago by civil engineers for computing the amount of earth movement needed for alternative routes in road building. The methods of pattern recognition involved are, among other sources, inspired by the practical needs of mass medical care, for example, in precaution against uterine cancer. 48/

91. In the field of electronics, too, military technology provides more of an illustration of its application rather than the pure side of theoretical abstractions, although the ambivalence between these two aspects cannot be finally resolved. Nevertheless, engineers and scientists concerned with it know that modern developments in electronics have undergone a two-sided change within the last decades. The first change was in the material basis, from the extensive use of iron and glass in radio tubes in the first half of this century to the more intensive use of selenium and germanium in transistors, which have been under constant development since 1948. Besides a change in the material basis and a slight increase in the intensity of material exploitation, this gave a noteworthy increase in energy utilization. The second change was the development, since 1960,

of integrated microcircuits based on the same elements as transistors, but with a much more and still increasing intensity in exploitation. An electronic device, which, with tube technology, weighs one kilogram, would, with transistor technology, only need 10 to 100 grams of material, while microcircuits with the same or better qualities weigh only a few micrograms. 49/

92. These examples provide only an illustrative - rather than a completely historical - description of how the orientation of technology cannot be considered an entirely autonomous process. This perspective is extremely important in determining the resilience of economies to any attempts at reversing the present trends which apparently run counter to the requirements of socio-economic development. The longer they persist, the heavier would be their socio-economic costs and the more overbearing would be the apparent problems of their reversal. In this respect, the military orientation of world-wide R and D cannot be overstressed, even at the cost of repetition of the earlier chapters. In particular, it needs to be emphasized that:

(a) Military R and D is making the industry technologically more complex. The fact that some of the advanced military technologies in aerospace and electronics can also be applied to the civilian sectors is no argument in favour of the exotic technologies which, in several cases, are already too complex to meet the immediate socio-economic needs, particularly of the developing countries. Only 20 per cent of the results of the military R and D, for example, are known to be used in any notable way for civilian purposes. 50/

(b) Partly due to the relatively long gestation periods of sophisticated weapons systems, varying from 7 to 10 years, which contribute to their rapid obsolescense, and also because each incremental innovation tends to be more capital- and research-intensive than its predecessor, military R and D efforts do not generally conform to the more familiar criteria of performance and costs in the civilian sectors. 51/

(c) Since military R and D, like all military outlays, is essentially a government undertaking, high concentration on this field also tends to bias the total R and D effort in favour of sectors of primary interest to the military.

(d) Programmes for sophisticated military technologies tend to be associated with habits, skills and attitudes towards research, development, production and marketing that sometimes create apparently formidable subjective barriers to their adaption to the civilian sectors. 52/

93. If their stimulating effect on economic growth has been misplaced and their contribution to civilian spin-offs exaggerated, then the social benefits attributed to military outlays are still more circumspect. The 1977 report had already emphasized that military outlays aggravate inflationary tendencies, generate lesser employment than comparable civilian outlays of similar magnitude and add to the existing balance-of-payments problems. Together, inflation, unemployment, and balance-of-payments problems represent an interrelated economic phenomenon of serious social dimensions. Balance-of-payments problems cannot be easily resolved by raising the levels of exports over imports, not least because of the different

degrees of inflation among the trading partners. When the degrees of inflation among the trading partners are different and their trade contacts cover a large spectrum of commercial transactions, as seems to be increasingly the case, the partial rectification of over-all balance-of-payments problems through additional arms exports cannot be regarded as a satisfactory long-term solution. Indeed, several among the weapon-exporting countries are also known to have accumulated sizeable balance-of-payments deficits. The fact that, throughout the 1970s, at least half of both major weapons-exporting and importing countries also experienced negative trade balances should exert a sobering influence on the policies of viewing arms transfers as an outlet for the rectification of trade imbalances.

94. Problems such as inflation and unemployment, discussed in detail in the 1977 report, are not only closely related but also have more serious social consequences in the sense that they affect the common man in a direct day-to-day fashion. Policy decisions pertaining to each reflect a basic judgement on their social ranking whereby it can be concluded that, historically, out of inflation and unemployment, the former has sometimes been considered a lesser social evil than the latter. But, in a situation of stagflation, that is, simultaneous unemployment and inflation, the latter cannot be explained away entirely as a deliberate policy option of choosing the lesser of social evils. Societies are more or less vulnerable to inflationary pressures, depending on their control over the price mechanism or their capability to expand their supplies to meet their demands. Military outlays generate price increases to the extent that they diminish the productive capacity for civilian goods without affecting the demand for them. They also exert an upward pressure on prices by aggravating the supply-side constraints when restraints on the costs of their inputs are less severe than in other sectors of the economy. When the inflationary pressures emanating from military outlays are related to the phenomenon of international trade contacts, it can be easily seen that even economies controlling the price mechanism of their domestic products remain vulnerable to the global consequences of a phenomenon extraneous to their indigenous environment.

95. High military expenditures sustained over a long period of time are likely to aggravate upward pressures on the price level in several ways. First, military expenditures are inflationary in that purchasing power and effective demand is created without an offsetting increase in immediately consumable output or in productive capacity to meet future consumption requirements. This excess demand creates an upward pressure on prices throughout the economy. Where military expenditure contributes to the creation of money for deficit financing of central government expenditure, inflationary pressures are generated by the resultant increase in the stock of money. Similarly, if military activities contribute to the emergence of deficits in the balance of payments in reserve-currency countries, then the stock of money and, thus, inflationary pressures grow in other countries. Second, there are reasons to believe that the arms industry offers less resistance to increases in the cost of labour and of the other factors of production than do most other industries partly because of its highly capital- and technology-intensive character, and partly because cost increases in this sector can more readily be passed on to the customers, which, in almost all the cases, are Governments. These increases in the cost of the other factors of production then spread to other sectors of the economy, including sectors where the rate of growth

of productivity is lower, forcing up their prices as well. Finally, and more generally, the diversion of substantial capital and R and D resources away from the civilian sector impedes the long-term growth of productivity and thereby renders the economy more vulnerable to inflationary pressures. 53/

96. Altogether it is clear that some of the major economic problems of recent years - rapid inflation, trade imbalances and the disequilibria in international payments - have been aggravated by the maintenance of large military efforts, even if the contribution of the arms race to these problems cannot be indicated in quantitative terms. In particular, there can be little doubt that the effects of sustaining large military expenditures over a long period has contributed to current inflation and its persistence in times of economic recession and high unemployment. 54/

97. Since, as the preceding analysis shows, military outlays have no long-term positive effects on economic growth, they are not necessary either to sustain the technological base of indigenous industry or to rectify trade imbalances and they aggravate rather than resolve the problems of inflation and unemployment, it is reasonable to conclude that the economic adjustments required for their reallocation will be no more strenuous than those needed for other sectoral reallocations constantly necessitated by a reordering of socio-economic priorities. In this respect, at least, past experience should provide a promise for the future. The technological and economic feasibility of disarmament has been already stressed several times in previous United Nations studies, including the 1972 and 1977 reports. 55/ A recent study of 11 industrialized market economies showed that they would not only have additional employment opportunities but also improve their balance of payments if they carried out substantial reductions of 4 to 8 per cent in their current military outlays, which were estimated to be close to $110 billion in 1981. Also, their problems of economic adjustments would be substantially reduced if they were to factor in the element of expanded trade contracts with the developing countries, which can contribute towards lifting the demand-side constraints on their economies. 56/

98. Recently published five-year plans of the various centrally planned economies also provide long lists of the socio-economic priorities pertaining, for example, to child care, health services, urban housing and sectoral reallocations within industry which would gain significantly through a relief from the economic burdens of their current military expenditures. 57/

99. For the developing countries, the 1981 issue of World Development Report shows that virtually all those who reduced their military expenditures as a percentage of their GNP period, the period 1972-1978 invariably showed an increase in their percentage outlays on health and education. 58/ The socio-economic problems of the developing countries have by now emerged as central to any international forum dealing with developmental issues, and for good reasons, too. By the end of the year 2000, these countries will have about 5.0 billion of an estimated world population of 6.4 billion. They will be adding at least 500 million people to their labour force between 1975 and the end of the century, and virtually 95 per cent of an estimated total of some 630 million absolutely poor people in the world will be living in these countries. The social tensions inherent in providing

gainful employment to the additional labour force and satisfying the basic needs of a growing number of the poor cannot be entirely resolved by looking for a single or determinant cause explanations like those implicit in relating their developmental performance to their military outlays. As pointed out by the United Nations 1981 study on international economic and social policy:

> "The interface between people, resources and the environment has given rise to a growing class of developmental problems which originate in vicious-circle types of causations, can lead to increasing social and economic vulnerability and environmental instability, and are not, in the main, amenable to simple analysis or solution. Many of these problems, because they are regional or global in extent, or because they affect the common international realm, will require extensive co-operation among nations, and action by international organizations in the common interest." (E/1981/65).

100. While it is easy to predict that most developing countries will face growing economic and social tensions arising from the interactions of population growth, resource constraints and environmental feedbacks, and still easier to suggest that they need a fuller mobilization of all their internal resources, it would be almost simplistic to conclude that a civilian reallocation of their military outlays will be adequate. Accounting for less that 16 per cent of the global financial outlays for military purposes, the 120 non-oil developing countries collectively do not account for more than 5 per cent of the world's military production and a negligible fraction of the world's total military R and D. It is in their one-third share on the demand-side of the global trade in arms that the non-oil developing countries figure conspicuously, another similar share going to the oil-producing ones. Most of it is highly concentrated in some conflict-ridden regions and national variations within the regions range from less than 1 to over 15 per cent of their entire imports.

101. Besides opening a constant leak in their foreign exchange reserves which, in principle, would be otherwise available to import capital and technology, the arms imports complicate the socio-political environment of the developing countries. Depending upon the terms of transfer and the supportive equipment and services entailed, arms imports have demonstrably made most of their recipients extremely vulnerable to their external environment. Political threat perceptions external to the recipient countries' social structures, dependency patterns militating against the nationalistic urge for self-reliance, and technological choices marginally relevant to the predominantly agricultural economies constitute some of the costs of arms imports which cannot be easily documented or reduced to statistics. As a broad indication, however, it is possible to point to the constant frictions in supplier-recipient relations becoming a factor in the domestic politics of either or both.

102. More pertinent still is the finding of several recent studies that political structures heavily dependent upon weapons imports have proved generally more brittle than those whose internal tensions are confined to the problems of growth and development. A most instructive phenomenon witnessed throughout the 1970s is that several arms importers involved in adversary relationships with geographic neighbours have experienced a less frequent outbreak of conflict if their initial

weapons imports have not undergone a subsequent change in the terms of transfer with the supplier. 59/ The repeatedly stated apprehensions about the threats of supplier interference in the domestic and external affairs of the recipients and the subsequent demands for more weaponry by the latter can be interpreted as reflecting a phenomenon of "induced militarization". 60/ Even those recipients whose balance-of-payments problems are not aggravated do not seem immune to the other and more socially relevant costs of weapons imports, more so when the sophisticated nature of the hardware purchased requires supportive equipment and services alien to the socio-cultural environment of the recipients.

103. The growing evidence of domestic armament production ventures among the developing countries can be partly attributed to an increasing reluctance on their part to get sucked into the politico-strategic environment of the suppliers. 61/ Similar factors are also evident when several recipients either change suppliers or some look for terms of transfer strictly confined to commercial agreements. The economic costs of setting up domestic armament industries and the additional social costs of reliance upon arms imports make the military outlays of the developing countries highly sensitive to reallocation proposals. 62/ Their involvement in conflict situations of their own environment and their vulnerability to those of their suppliers make it imperative that proposals for restraining arms transfers to the recipients be urgently related to a resolution of the conflicts surrounding them. Superimposing the suppliers' views of mutually deterrent arms build-ups upon the adversary relationships among the recipients will only expand rather than limit the international arms trade, which has become a major vehicle of transporting the central arms race to the periphery. 63/

104. Even outside the arena of international arms transfers, the socio-economic problems of the developing countries cannot be overcome in isolation from the international economic context. 64/ The goals of the international development strategy had assumed that the industrialized world would move along a relatively inflation-free, nearly full-employment path of sustained acceleration of economic growth. The task of international development strategy was to devise measures to integrate the developing countries into a world economy moving ahead at a relatively stable and predictable rate. Present conditions, however, are quite different: increased instability in world output and prices, accompanied by a downward shift in the long-term trend of economic growth for the industrialized countries, have rendered the external involvement less predictable and less favourable. One reaction to this change has been to suggest a lowering of the developmental objectives. But a lowering of the developmental objectives may render the international economic system itself more unstable because accelerated economic growth in the developing countries may significantly raise the levels of both the demand- and supply-side constraints on the economic growth of the industrialized countries. 65/ Concerted action in pursuit of this line of thought may also overcome the present paradoxical situation whereby low growth for the developing countries is unsustainable from the viewpoint of their own social dynamics, while high growth for them is not feasible in the context of the existing international economic situation.

105. Although the negative economic impact of high military spending is widely recognized, in some cases the military forces are seen as having a cohesive effect

on a society with pervasive dividing factors. But essentially, military outlays are generally considered as necessary to the social welfare of the State whereby its role is to add to the civilian output an immeasurable variable, namely, security. The last named is widely believed to be so crucial to the social welfare role of the State that, at least according to some, its claim on national resources have to be met regardless of cost. But even those who believe so do not insist that military outlays are a costless activity. Nor do they deny that the full implications of its socio-economic costs may not become evident for several years, whether they be in terms of finances, manpower, minerals, R and D or for that matter, the political structures which they expected to uphold against a variety of internal and external threats.

106. In the three decades and a half since the Second World War, global military outlays have increased their claims on human, material and natural resources by a factor of 4 to 10 times. As long as high military outlays co-existed with high rates of economic growth in the developed world, they were perhaps not always seen as an enormous economic burden. But the 1970s have brought a weakening in the process of economic growth and the social tolerance of military outlays is getting increasing low. The emphasis on economic growth has been supplemented by warnings about mistaking the economic means for the social ends.

107. Institutionalization of military outlays has gone hand in hand with social tension and any benefits of their cohesive effect on fragmented structures have proved largely illusory. In most cases, one may assume that the military institution and the armed forces have a double role. They are at once an ultimate recourse in external affairs and an ultimate arbiter in internal affairs. These roles are not always unrelated. In an environment of external confrontation, the limits of tolerated dissension get narrowed down and a real or supposed external threat could become an argument for increased repression. Conversely, when internal dissension transgresses these limits, and when means for satisfying basic needs and aspirations are scarce, there could be temptation to seek temporary refuge in domestic repression or in the escalation of foreign confrontation. Here Governments can get trapped in an impossible situation where an increasing burden of military expenditures further delays economic and social progress, freezes social structures and exacerbates social tension, while other policies seem to be precluded by the context of confrontation and the arms race with neighbouring countries. The conjunction of external and domestic confrontation, both of them temporarily stabilized through military build-up but ultimately exacerbated by it, can give rise to a particularly precarious situation. 66/

108. With much larger demands on Governments for civilian outlays, and especially for redistribution, military outlays are increasingly reducing these possibilities. They may be socially tolerable if they are perceived to be effective in providing real security. But as an increasing number of civilians become alienated from the process of decision-making about military outlays, and as more and more of them see themselves to be merely captives of a situation over which they have no control, there will be stronger public pressures to arrest the trends. The demand for substantial reductions of these outlays will grow not only because they are a socio-economic burden but also because they have not provided the security that they are supposed to.

CHAPTER IV

INTERNATIONAL CONSEQUENCES OF THE ARMS RACE

109. In an increasing perception of its costs and a decreasing perception of its benefits, security-based reasoning has become central to the case for an early termination of the arms race. Real or perceived threats to the national security concerns of nations, big and small, have clearly become the single most stubborn obstacle to attaining the goal of disarmament, which the Charter of the United Nations upholds as a means of promoting international security. 67/ Ample empirical and historical evidence has by now been collected to show unequivocally that the arms race, particularly in the nuclear field, respresents the largest known instance in history of a massive diversion of resources which could and would otherwise be available for socio-economic development. Nevertheless, both the militarily most powerful States and the main political-military alliances, in the forefront of the arms race, and others indirectly and, perhaps, involuntarily emulating it in the conventionl field elsewhere, continue to bear the socio-economic burdens of their military outlays as if these were the inevitable costs of purchasing national security. The political intolerance of these so-called inevitable socio-economic costs, however, has not only increased by also reached unprecendented levels of public participation as more and more among the well-informed and concerned people all over the world have become aware that the arms race constitutes more of a threat than a protection for the future of mankind.

110. On the basis of the trends and their implications surveyed earlier in this report, this chapter addresses itself to four interrelated and major consequences of the arms race: aggravated threats to international security, including the danger of a nuclear war; a worsening of the international political climate, making it more tension-prone and more resistant to change; a distortion of international economic relations, further hampering the attempts at the establishment of a new international economic order; and, finally, the combined effect of all these on the social values.

111. Anything except the roughest description of what constitutes security falls outside the scope of the present report. In the 25 or more direct references to the term, the Final Document of the Tenth Special Session of the General Assembly, the first special session devoted to disarmament, for example, relates security to the threat of external aggression. Strategic analyses of the subject uses the term specifically, in relation to explicit threats of damage to life and property, and, more broadly, in relation to implicit or explicit threats of coercion and conquest. However it is defined, the notion of security is basically related to the perception of a threat, and it is a historical fact that one country's idea of immunity from a real or perceived threat has often constituted the threat for another country. It is in this broad sense that the first special session devoted to disarmament emphasized (a) that enduring international peace and security cannot be built on the accumulation of weaponry by military alliances nor be sustained by a precarious balance of deterrence or doctrines of strategic superiority; (b) that mankind today is confronted with an unprecendented threat of self-destruction arising from the massive and competitive accumulation of the most destructive weapons ever produced, and the existing nuclear arsenals alone are more than

sufficient to destroy all life on earth; and (c) that, along with negotiations on nuclear disarmament measures, negotiations should be carried out on the balanced reduction of armed forces and conventional armaments, based on the principle of undiminished security of all parties with a view to promoting or enhancing stability at a lower level of military build-ups taking into account the need of all States to protect their security. More important still, the first special session apparently resolved the persistently familiar dilemma over whether nations are armed because they are insecure or insecure because they are armed, by stating unequivocally that the continued arms race means a growing threat to international security (see A/S-1012).

112. To say that the programme of action adopted in pursuance of this clearly negative verdict on the arms race has not even been partially implemented will be to understate the obvious. The simple fact is that, more than ever before, the attempts of the major military powers who bear the main responsibility for negotiating agreements to arrest and reverse the arms race, particularly in the nuclear field, have acquired an element of Sisyphean elusiveness. Technological improvements in nuclear weaponry and strategic rethinking accompanying these have made it extremely difficult to negotiate mutually acceptable measures for lowering military build-ups in conformity with the principles of undiminished security (see A/36/597, para. 19). The ingenuity shown in past proposals for achieving a breakthrough in the nuclear escalation ladder through a comprehensive test ban has been virtually ignored as the positions of the major negotiating parties about when testing should stop and to what extent it requires verification never coincided (A/35/257, para. 6). Nothing has been done in recent years to implement measures such as a unilateral and agreed moratorium on testing, a "threshold" beyond which all underground tests would be banned with or without a moratorium, a progressive lowering of the threshold as verification techniques improved, and interim measures to reduce the number and magnitude of tests and to phase them out. The tremendous potential for verification offered by historically unprecendented achievements in space technology through satellite monitoring remains unexplored (see A/AC.206/14). Non-military confidence-building measures assiduously designed to produce the mutual trust necessary for political determination have clearly become inextricably dependent on confidence-building measures of a military character, especially in some regions where the military factor has undeniable priority (see A/36/474, annex, para. 15).

113. In the meanwhile, the world is moving perilously closer to the danger of another world war, to avoid the occurrence of which the United Nations was established over three and a half decades ago. In the intervening period, all the major elements constituting threats to international security, namely, situations of bloc politics confrontation, colonialism, racism and continuing economic gaps between the developed and the developing countries have acquired a certain degree of predictability. The underlying causes of these threats and the possible consequences of leaving them unresolved are fairly obvious. These situations, on the one hand, demand a translation of the principles of self-determination and sovereign equality of States contained in the Charter of the United Nations, into policies and behaviour of renunciation of the use of force and non-interference in the internal affairs of States. On the other hand, these very situations also provide the breeding grounds for the triggering events which may exacerbate the

danger of another world war. The immediate events preceding such a war, the course it would take and its eventual outcome cannot be comprehended on the basis of the historical understanding of the two world wars.

114. The conclusion that another war must never occur has been arrived at due to several concerns, the most overriding being the grave risk that it may involve a partial or overwhelming use of the existing nuclear weapons. Sheer experience shows that once a weapon has been developed, the chances are that it will be used. The two world wars were preceded by a totally conventional arms race and, by the very end of the Second World War, only one of its participants had nuclear weapons. The nuclear aresenals amassed by more than one participant in the post-war arms race are not just bigger and more sophisticated versions of conventional armaments. The magnitude of their destructive capabilities is so different in its scope and nature that they have, at least two hitherto unknown implications, namely, the endangerment of a nation's own security by its own weapons, and the growing infeasibility of defense against an attack by a nuclear adversary in any meaningful sense of the term. Disclosures about some of the simulated war exercises, for example, indicate human and material casualties inflicted upon the belligerent nation's own or allies' population by its own weapons. In some cases, several of the weapons destroyed in combat situations were the targets of the allies' rather than the adversary's weaponry. 68/ Neither the reduction in the circular error probabilities nor the standardization of allies' weapons arsenals can competely overcome the non-negligible risk of human fallibility in an actual war situation, and even a less than one per cent margin of error can have a devastating effect, given the extremely dangerous potential of the new weapons of mass destruction. Even if a small fraction of the massive nuclear arsenals were to remain with the adversary after a pre-emptive first strike, the damage they can cause would, for all practical purposes, obliterate any strategic advantage gained. Each of the warheads contained in a present-day strategic missile armed with three warheads, for example, has the explosive power of more than 10 simultaneously detonated Hiroshima-type bombs. Single weapons with more than 10 times the explosive power of these warheads (equivalent to 100 Hiroshima bombs) have been routinely flown on modern strategic bombers.

115. In calculating the immediate human and physical destruction likely to result from a nuclear war, and its socio-economic and political consequences for both the active belligerents and the rest of the world, the United Nations comprehensive study on nuclear weapons (A/35/392) has categorically stated that, however estimated, their nature and extent are virtually incomprehensible. In most situations of the actual use of nuclear weapons by any of the nuclear Powers, the civilian casualties would outnumber the military ones; millions could die and a similar number be subjected to severe biological, physical and psychological damage which may make those surviving envy the dead. A one-megaton nuclear explosion on a city with a population of one million could kill 310,000 and leave another 380,000 in need of medical aid. 69/ Some specialists have warned that even a highly advance country like the United States, for example, may not have nation-wide facilities to treat more than 200 victims of nuclear explosion in an hour. And the roughest estimates suggest that anywhere between 50,000 to 100,000 people could be severely injured by one single-shot, medium-yield tactical nuclear weapon in a matter of few minutes.

116. Nor would the consequences of a major nuclear war be restricted to the nuclear-weapon States alone. Even if there were no direct nuclear attack against any non-nuclear-weapon State, fallout radiation after a large nuclear war would affect the whole world, although predominantly the hemisphere in which the war was fought. For example, global fall-out from a total explosive yield of 10,000 Mt., that is, well over half of what now exists in the world's nuclear stockpiles, would cause on the order of 5 to 10 million additional deaths from cancer within the next 40 years, besides genetic damage of equal magnitude for both the present and future generations. Ionizing radiation could also cause many mutations in plants and animals. There has been speculation that some of these mutations might change the ecosystem in unpredictable ways. A large nuclear war would partially destroy the ozone layer in a few months (a period of about five years is believed to be required to restore the layer again), which in turn may cause possible changes at the earth's surface (see A/35/392, annex).

117. The world-wide economic and social disruption that would be an unavoidable consequence of a large nuclear war is more difficult to examine. In this context, it seems particularly prudent to state that the effects of nuclear war that cannot be calculated are at least as important as those for which calculations are attempted. The consequence for world trade in general and the supply of essential commodities in particular would have to take into account both decreasing production volumes and the breakdown of the organization of world commerce and communications. Most critical would be the world food supply: in many developing countries, famine is an ever-present threat even under stable and peaceful conditions, and a large and continuous international grains trade is needed to prevent starvation. This would be even more pronounced after a large nuclear war. All countries in the world would suffer a drastic reduction of foreign trade, entailing difficulties and economic losses. The annihilation of the major financial and trading centres of the world, would inevitably lead to the destruction of the elaborate system of international finance and trade as it is now constituted, thus eliminating the orderly transfer of goods and services.

118. A major difference in comparing the effects of another world war with those in the past is the impossibility of heavy relief programmes for the devastated countries, as the surviving developed countries would not possess the capability for such a task. This would be an aggravating circumstance which could rule out any chance of international economic recovery for a long time. Furthermore, many of the non-belligerents would be developing countries which had been suppliers of raw materials and agricultural products of less immediate importance after a large nuclear war. These might expect an almost total cessation of foreign trade and probably a complete breakdown in the miltilateral system of payments. The global disaster would be further aggravated by the scarcity of transport equipment, pharmaceuticals and pesticides, which would increase the horror and the plagues (see A/35/392, annex).

119. These shocking details about the possible international consequences of a nuclear war need to be brought to the attention of the general public because it is precisely these kinds of details which also go into the cruel logic of nuclear deterrence, namely, the more horrendous their consequences, the less will be the likelihood of the actual use of nuclear weapons. A fundamentally questionable

assumption in the nuclear-deterrent logic, however, is that, in the post-war context, the fact that nuclear weapons have not been used so far provides no guarantee against their future use. Strategic calculations about the situations for their actual use have been mostly based upon surprise-free scenarios. But no serious observer of the global strategic scene in the 1980s is willing to assert that the next decade will be surprise-free. Events with a triggering potential, major failures of communication, nuclear accidents and severe international crises have all occurred more than once, and sometimes in pairs, during the last three and a half decades - but never simultaneously. Should there be such a simultaneity, and it cannot be ruled out as unlikely, then it would be rather unrealistic to assume that the logic of nuclear deterrence will hold as well in the future as it is sometimes believed to have held in the past.

120. Two relatively recent disclosures need to be mentioned in this context. In the first place, although it is reasonable to assume that every accident involving a weapon of mass destruction, and particuarly the nuclear weapon systems, that could have been kept secret would have been covered from public knowledge, it is now generally known that, between 1950 and 1975 alone, at least 68 serious accidents occurred. At least in a few cases, such accidents involving a computer malfunction did result in false alerts demanding a graduated escalation to a fuller war. Secondly, it is also by now widely known that, out of the 130 conflicts experienced by the developing countries since the Second World War, at least 80 were reported to have been viewed by one or the other of the nuclear Powers as affecting their global interest, although not necessarily considered as fundamental to their security concerns, either due to the physical or political distances involved. If they do, as in situations combining a conflict of interest over resources, strategic locations and political proximity, then the allegedly iron logic of nuclear deterrence may lose its inexorability in a climate of tension.

121. Whether in calculating the possible nature of triggering events, the number of actors whose decisions would govern its course or the decision time available, the doctrine of nuclear deterrence places a very high premium on rational behaviour, which, to say the least, ignores the elementary insights of psychological and other research on decision-making of individuals and collective entities under situations of grave threat, extreme stress, intense insecurity and close proximity to total annihilation. Some of the studies about governmental decisions leading to the major wars in this century suggest that about 60 per cent turned out to be based upon wrong estimates of the capabilities and intentions of the major Powers when the wars began, as well as wrong assessment of the actual course of the war and its consequences. Stress, threats, insecurity and time pressure reduce the capabilities for a rational processing and evaluation of information. Deterrence policy not only strains the rationality of the individual systems and their decision-making processes, it also results in a continuous competition for security with its attendant risks for international stability.

122. Irrespective of whether they are used or not, the production and testing of weapons of mass destruction has both short and long-term consequences on the ecosystem of both the nations indulging in them and those elsewhere. After making a detailed investigation of the high-explosive incendiary, chemical, biological and nuclear weapon production processes, a recent study by the United Nations Institute

for Training and Research (UNITAR) emphasized the vulnerability of the ecosystems to those in arid, tropical, arctic, insular and temperate regions. Among their extrememly harmful and sometimes irreversible effects are the dangers of soil damage, desertification, biological disturbances for human beings and livestock, and ozone depletion. 70/ It has been estimated, for example, that, by the year 2000, the continuing nuclear tests would have already dispersed over 120 millirads of radiation world-wide. Simply stated, it means that these tests have contaminated the biosphere enough to cause one death for each kiloton fission exploded, and could result in about 150,000 premature deaths world-wide. Approximately 90 per cent of these deaths would be expected to occur in the northern hemisphere. However, it should be noted not only that this figure is based on an estimate of the risks associated with low radiation doses, which in itself is a matter of scientific controversy, but also that, even if that estimate is correct, there is no way of identifying these cases among the many millions of other cancer deaths during the same period of time (see A/35/392, annex).

123. An international climate dominated by the arms race promotes adversary political relationships wherein the threat perceptions of various countries always tend to have a lurking element of misinterpretation. Fear of being defeated in an ongoing conflict and mutual suspicions among nations have had one predominant reason, namely, the military spending of rival nations, and one predictable response, that is, increases in a nation's own military spending. Attempts to interpret information about each other's military capabilities always runs the risk of inflated or deflated projections; inflated for intimidating the adversary and deflated for meeting domestic pressures to make resource allocations corresponding with the needs for socio-economic development. Similarly, evidence of aggressive intentions continues to be sought over a whole field of military and non-military behaviour. Mutual suspicions tend to prejudice the real implications of non-military events with a view to accentuating or eliminting uncertainty among allies and adversaries. It is this environment which leads to the creation of spheres of influence, in which local conflicts tend to become linked to regional or global confrontations, and in which social and political developments are likely to be resisted if they seem to call existing alignments into question. The frictions arising from this rigidity, at a time when the relative economic, political and military weight of countries are changing more rapidly than ever, are themselves possible sources of conflict.

124. A political climate held captive to military preparedness is hardly conducive to détente. Indeed, a most disturbing feature of the period under review has been the fragility of détente. Not only the health but the very survival of détente depends increasingly on meaningful steps towards disarmament, particularly in the nuclear field. Also, détente confined to the developed countries alone is extremely vulnerable and it needs to be universally applicable. Détente and military build-ups cannot go hand in hand. Heavier, rather than lower military build-ups among the various conflict-ridden regions in the world will heighten the risks of military escalation and reduce the possibilties of détente among the developing countries. The great preponderance of military power as possessed by some of the major industrialized countries, and as is perhaps emerging in some regional contexts, may lead countries to adopt ultimative and rigid policies vis-à-vis other countries or to the use of force, the threat of force or simply an

ostensible display of force. As a result of the arms race, fear and suspicion are generated among some axes, but along others, special favoured relationships develop. In some cases, these are no less conflict-promoting and no less dangerous. There may occur, on the one hand, a transfer of the conflicts of the central powers to peripheral powers and, on the other hand, an involvement of central powers in local conflicts. This is one of the mechanisms through which central and peripheral confrontations may become linked in such a way as to increase the dangers of both.

125. The arms race tends to render the international politico-economic environment more rigid and more resistant to change. It fosters concern for the political and social options chosen by other countries, in particular by those countries that are deemed to have strategic importance, and it promotes a pattern of alliance and alignments that may reinforce confrontation and, in some cases, domination. Under such conditions, processes of social transformation or emancipation are likely to be resisted in many cases. They become painful processes, postponed for too long, and they may end in protracted and destructive conflict, as several of the longest and most painful wars of the recent past have shown. The external powers' interest in influencing socio-economic options in other countries has generally amounted to slamming an artifical lid on a volatile situation whereby internal tensions have been more frequently suffocated rather than resolved. The social implications of this phenomenon rarely obtain serious attention but its consequences are much too evident. This can be partly seen in the changing nature of the military hardware being transferred, particularly to the developing countries. Along with sophisticated aircraft and modern armoured vehicles supposed to deter direct threats to national security have been added a growing list of equipment meant for paramilitary purposes, for example, sawn-off shotguns, automatic weapons, hand-grenades, armoured personnel carriers, light artillery, tear-gas shells, and so forth. Included also are some of the more modern instruments of social surveillance and eavesdropping, euphemistically labelled as soft and gentle instruments for controlling insurgency. 71/ Each such transfer basically reflects a degree of transfer of political power, since it will be used to determine which of the political realities in an unstable situation is allowed to prevail in a given State without the harassment of frequent challenge. To the extent that it alienates those in charge from those who challenge them, it not only interferes with the process of democratization but also perpetuates the inherent problems of the developing countries, namely, of providing socio-economic content to their political freedom in a peaceful manner. 72/

126. The socio-economic development of the developing countries will not only benefit from a reversal of the arms race but also contribute towards its stabilization at a lower level of military build-ups. As pointed out by the study on the relationship between disarmament and development:

> "The development of a more stable South capable of sustaining its independence through a better economic performance is likely to reduce the areas of political conflicts among the East and West ... this will put détente on a more stable basis than it has been during the last few years of its constant re-examination. Viewed in this context, any additional investment in the development of the developing countries may become an indirect

contribution to détente. Greater flows of external assistance to the developing countries will further the prospects for development but relating this process to military restraint among the major military spenders is likely to create a new political climate which by itself may become a catalyst for military restraint. The amount of financial resources released for development through military restraint will be a major benefit for development, but the awareness that it is a conscious attempt at viewing development as an integral part of détente will be a major bonus for East-West relations." 73/

127. Another development decade has gone by, leaving behind unfulfilled targets set by the international development strategy which had called upon each developed country to make available 0.7 per cent of its GNP as official aid to the developing countries. The figures about the developmental assistance provided by the Council for Mutual Economic Assistance (CMEA) countries are not available. As a percentage of the collective GNP of the developed market economies (DAC), the official developmental assistance (ODA), which had reached 0.34 of GNP already in 1970, has since then fluctuated around this value without any tendency to approach the given target. A very relevant indication of the performance of the DAC countries in concessional assistance is that virtually all of those exceeding their ODA targets and improving their average performance during 1970-1980 are countries with stable or lower military expenditures during the same period.

128. While no firm conclusions can be drawn from the given volumes of developmental assistance and the variations in the military outlays of the major developed countries, it can be seen that the enormous global military spending does constitute the largest untapped source of possible international transfers to the benefit of the developing countries whether these be in the areas of finance, capital or technology (chart 4). Over the years, the United Nations has seen several initiatives asking for institutional arrangements whereby military-related resources could be rechannelled for developmental purposes. Basically, all these proposals are symbolic of the sporadic urge among the Member States for penalizing excess, encouraging restraint and rewarding abstinence when it comes to prorating global military outlays. As long as developmental assistance programmes and policies remain tied to politico-military considerations, it would be difficult to arrive at any universally acceptable arrangements. Nevertheless, there are at least two areas where some concrete action can be pursued.

129. In the first place, priority consideration needs to be given to the developmental needs of the most seriously affected developing countries. Since most of them do not incur any significant military spending anyway, this could also amount to putting a symbolic premium on military abstinence. Also, since most of them also do not command geostrategic locations, making them coveted arenas for political patronage, some agreement among the major developed countries may be possible. Secondly, there is an urgent need to divert even a part of the current military R and D world-wide to develop technologies and capital goods of relevance to the economic circumstances of the developing countries as a whole. For many of them, several of the sophisticated technologies available from the industrialized world are either exorbitantly expensive or simply irrelevant. The benefits accruing from such a diversion will, however, not remain confined to the developing

countries alone. As described earlier, many of these countries are rich in both human and natural resources. Accelerating their developmental performance could go a long way in lifting both the supply- and demand-side constraints on the economic prospects of the developed countries. In this sense, as in several others, international economic interdependence is a reality that needs to be accepted an progressively put on a more equitable footing in future.

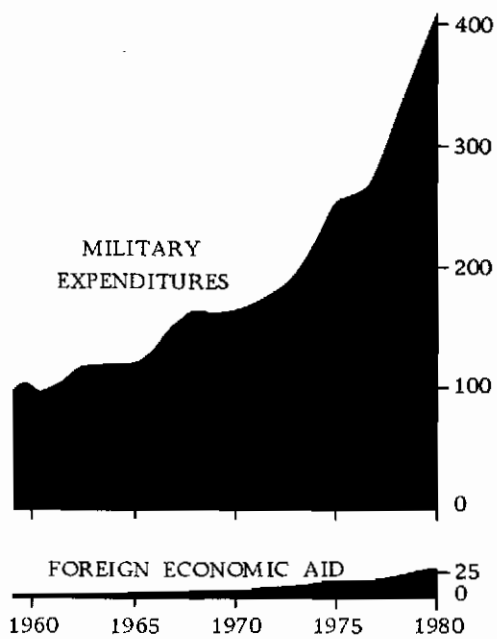
130. The growing awareness of the physical and economic constraints on human and material resources available within and among countries makes the demands for a new international economic order as another way of coming to terms with the global economic realities. Even without describing it as a strategy of non-war between different political entities, the establishment of a new international economic order will be a signifcant step towards seeking common solutions to problems which either cannot be resolved in any other way than by joint efforts (for example, radioactive pollution by atomic tests, accumulation of metereological information) or because these problems can be solved on a national or regional basis only at higher costs, for example, the development of new sources of energy. 74/ The global nature of many problems arising out of physical and economic constraints on human and material resources makes their solution within national and political boundaries increasingly difficult. The arms race, therefore, amounts to a counterproductive choice since it presupposes the existence of a conflict and reinforces the attitudes of confrontation in a situation calling for co-operation.

131. The negative effects of the arms race on various international economic transactions such as trade and the monetary system were emphasized in the 1977 report. As already noted in the previous chapter, the large national military expenditures have adversely affected economic growth and employment and are, therefore, one of the causes for stagnation in the world economy. The 1971 and 1977 reports also stressed that the arms race and its politico-military implications constitute a severe hindrance to a smooth exchange of commodities, services, capital and technology. Although several other factors have always contributed to the economic discrimination, such as import restrictions, protectionism and other more or less technical policy measures, it can be seen, particularly in the most recent period, that the ongoing arms race increasingly constitutes an important distortion of international economic, scientific and technological exchange. This is particularly true for the so-called strategic commodities which may be anything from raw materials to advanced technology. In some cases, important, although few in number, embargoes have been carried so far that they almost amounted to attemtps at strangulation. Military-related embargoes on the exchange of advanced technology are particularly important between countries with different levels of development. When these countries are heavily dependent on foreign trade or on technical assistance these embargoes seriously impede their development.

132. The same is true for private and official capital transactions. With regard to the former, it is important to mention that many developing countries already have little access to the international private money and capital markets. Private investors rarely invest their money in regions with political and military tensions. Moreover, in general, private capital flows primarily to those countries which enjoy the political support of the donor country. This is obviously true for

CHART 4. MILITARY EXPENDITURES AND FOREIGN ECONOMIC AID OF THE DEVELOPED COUNTRIES

($US billions)



Source: Ruth L. Sivard, World Military and Social Expenditures 1981.

official development aid, its flows being predominantly governed by considerations of political and military ties between the recipient and the donor countries. For some donor countries there is little apparent relation between the urgency of the development needs of recipient countries, on the one hand, and the flow of bilateral aid to them, on the other. Instead, there have been cases when the provision of aid served an ulterior purpose: to acquire influence or deny it to others, or to help obtain base facilities or other military-strategic advantages. This greatly diminishes the usefulness of the aid provided, not least because the poorest countries, the land-locked and otherwise disfavoured, are rarely those whose politico-strategic importance is greatest. In addition, when aid flows are distorted in this way by political considerations related to the over-all arms race it may, in some cases, encourage recipient countries to get involved in the confrontations of outside Powers, thus adding more fuel to the arms race.

133. Regrettably, the social implications of the arms race still do not constitute a major area of inquiry about disarmament-related issues, although much has been said in a general way about the basic perversity of the arms race. But if a deliberate act of political determination is needed to first halt and then reverse the arms race, then it is essential that the vision of a world without it should, at least, be conceivable. To live under the constant fear of a war which no rational human being wants, and yet to be constantly fed by enemy images which need to be sustained for continuously indulging in the arms race, inhibits the common people from reaching across physical and cultural barriers to human understanding. It also generates negative psychological reactions, such as tension, fear and anxiety, which, as some recent disclosures about the behaviour of those close to the sites of major nuclear accidents show, result in symptoms of physical ill health, too. Some pioneering work, encouraged by the UNESCO, in the field of disarmament education reveals that the fear of the unknown constitutes a severe psychological obstacle to disarmament. 75/ To overcome this all-pervading sense of fear, the common people need to be able to imagine a disarmed world, which apparently they cannot do as long as the arms race continues.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

134. Driven by an uncontrolled technological momentum and open-ended strategic commitments for attaining a variety of politico-military objectives, the arms race, particularly in the nuclear field, is poised for a new round of escalation in the 1980s. A major legacy of the 1970s is several unresolved conflicts and other conflict situations all over the world, and there is a real danger that some of them may become triggering events for a possible use of the existing weapons arsenals, including the deadly nuclear weapons. The risks of a nuclear war by accident, miscalculation or an act of strategy have increased due to several developments during the period under review. There has also been a reiterated emphasis on enlarging the scope and expanding the reach of strategic doctrines which view the entire world as an integrated multilevel strategic scene.

135. In a deteriorating international climate, the vicious causation between the technological and strategic aspects of the nuclear arms race, confined essentially to the major military powers, produced a virtual stalemate in the process of nuclear disarmament negotiations. The period under review also underlined the fragility of détente unless it is accompanied by political action in the field of confidence-building and security and meaningful reductions in the massive military build-ups in accordance with the principle of undiminished security as stressed by the Final Document of the Tenth Special Session of the General Assembly (resolution S-10/2). The developments since then represent a step backwards from the international consensus on a disarmament strategy, the immediate goal of which was the elimination of the danger of nuclear war and implementation of measures to halt and reverse the arms race, with a view to achieve general and complete disarmament under effective international control. The inability of the second special session devoted to disarmament held in 1982, to agree on a comprehensive programme of disarmament and on the causes of the failure to implement the decision and recommendations of the first special session largely reflected a spill-over of the distinctly deteriorating international climate, which by now is under unprecedented threats emanating from the deadly destructive potential of an unabated arms race.

136. With an upward trend at an estimated rate of about 3 per cent per annum (in volume) during the past four years, world military spending has risen faster than in the previous four years, despite the deteriorating performance of the world economy. The economic burden of military spending measured as a share of the world's total output has thus become heavier due to an undiminished consumption of the world's finite resources, which would and could be otherwise available for socio-economic development, particularly of the developing countries. Also, its social and political implications have become more serious, since economic burdens carry the seeds of social discontent and political tensions within and among nations.

137. The dynamics of the arms race involve more than a sum total of military expenditures and an updated list of its major and minor participants. The forces driving it, the purposes it serves and its various forms of manifestation have transformed the arms race into a political phenomenon adversely affecting global socio-economic options. By rendering the international politico-economic environment more rigid and more resistant to change, the arms race is fostering concerns for the political and social options chosen by other countries, in particular by those that are deemed to have strategic importance, and it is promoting a pattern of alliances and alignments which reinforce attitudes of confrontation in a situation demanding co-operation, both in international political and economic relations. During the period under review, a prominent feature of international relations was growing interdependence, which manifested itself in several areas. The world has become increasingly interdependent as it is confronted with problems which either cannot be resolved in any other way than by joint efforts (for example, radioactive pollution by atomic tests, sharing of meteorological information) or because these problems can be solved on national or regional levels only at higher costs, for example, the development of new sources of energy. The global nature of many problems arising out of physical and economic constraints on human and material resources, makes their solution within regional and political boundaries increasingly difficult. The arms race, therefore, amounts

to a counterproductive choice since it presupposes the existence of conflict in a situation demanding co-operation. Thus, while several other factors have contributed to economic discrimination, such as import restrictions, protectionism and other more or less technical policy measures, it is evident that, particularly in the most recent period, the ongoing arms race increasingly constitutes an important distortion of international economic, scientific and technological exchange.

138. An estimated 3 to 12 per cent of the global production of several strategic minerals, which are equally important for both the civilian and military sectors of industry, are being currently consumed for military purposes and, in some cases as that of oil consumption, the military industry singly consumes from one fourth to one third of the total national petroleum consumption for all purposes. Military consumption of resources, whether these be human (labour), natural (fuel and non-fuel minerals) or material (capital and technology), is directly competing for resources which could be otherwise available for socio-economic development and it is indirectly affecting the priorities for their allocation. Bearing in mind the uneven geographic distribution of these resources among States with varying technological capabilities to overcome the physical constraints on resources, as well as the differences in the present levels of resource consumption among the developed and developing countries, the period under review witnessed recurrent resource-related conflicts surfacing in several international forums dealing with their various aspects namely, finances, labour, technology, trade, minerals and energy. Escalations in the arms race, resulting in a larger resource consumption for military purposes, would not only add to the gravity of existing resource-related conflicts, but also entail the non-negligible risk of becoming an additional factor for larger military outlays and the further escalation of the arms race. Apprehensions in this respect cannot be easily dismissed because, as compared to the period under review, the post-war world has never confronted so many resource-related tensions manifesting themselves in such varied forms, in so many places and at the same time.

139. Emanating from a whole range of concerns pertaining to the intensifying threats to international peace and security embodied in an escalating arms race, making additional claims on global resources, the focus of public concern in the 1980s appears to be the same. What is the utmost limit of commitments to military outlays? Has the world reached or is it approaching a watershed beyond which further escalations of the arms race or the ground rules determining them will be quite different from what they have been up to now? One such major watershed has been apparently reached in terms of a universal weakening in the process of economic growth as reflected in the rates of increase in the GNP. For several years, the world economy has experienced a continuous process of slow or declining growth, which appears set to continue, although some economic recovery may be anticipated. As long as high military outlays coexisted with high rates of economic growth in the developed world, they were perhaps not always seen as an enormous economic burden. But the 1970s have brought out trend changes in the pace and process of economic growth and the social tolerance of military outlays is getting increasingly low.

140. Historical comparisons of some major industrialized countries yield a pattern of economic performance that corresponds quite closely to the relative civilian and

military orientation of their technological effort; their experience largely indicates that those concentrating highly on military technology and slower rates of growth than those who were not leading developers in the military field. A major lesson to be learnt from their experience, therefore, is that the importance of civilian spin-offs from military technology has been either grossly exaggerated and/or highly misplaced.

141. Although the arms race phenomenon, whether in its technological momentum or in its strategic orientation, emanates essentially from a few major military powers among the developed world, its consequences have become manifestly global in character. In the absence of meaningful measures of disarmament, particularly of nuclear disarmament, the arms race has become not only more complex, but also more firmly entrenched along with the attendant risk that, voluntarily or involuntarily, one or more of the major arms race participants may get directly or indirectly involved in regional conflicts. Practically all the estimated 130 military conflicts since the Second World War have occurred in the developing countries. Not more than 12 among the 90 countries that have actually experienced them or been close to them are known to possess any significant capabilities to produce the weapons used in these conflicts, and even they have imported weapons and the technological know-how from the developed world in general and the major military powers in particular. Whatever be the immediate causes of each local war in the developing countries, this fact by itself has turned the phenomenon of international arms transfers, large and growing in both volume and coverage, into a chief instrument of linking the arms race among its major participants with the widely varied military outlays among the developing countries. Incidence of supplier involvement in conflict situations and conflicts among the recipient countries rose steadily throughout the 1970s and, in several cases of major arms transfers, this factor has affected the actual outcome of these conflicts. The conflicts and conflict situations surrounding the developing countries need to be resolved not only because of the human destruction they cause for those affected by them directly and the risks of wider escalation they entail, but also because they provide a strong stimulus for increases in military outlays of the countries experiencing them. The phenomenon of domestic arms production in the developing countries, so far confined to a few and driven mainly by the conflicts actually experienced, can also be seen as reflecting a growing reluctance by most of them to get sucked into the strategic considerations of their weapons suppliers which do not correspond to their immediate security concerns.

142. In reaching the conclusions mentioned above, the present report has juxtaposed the socio-economic consequences of the arms race in the context of its adverse implications for international peace and security. This is what its mandate had required in accordance with the stipulations laid down in General Assembly resolution 35/141. Despite ample empirical and historical evidence showing that the arms race, particularly in the nuclear field, represents the largest known instance in history of a massive diversion of resources which could and would otherwise be available for socio-economic development, both the militarily most powerful States and the main political-military alliances in the forefront of the arms race, and other indirectly and, perhaps, involuntarily emulating it in the conventional field elsewhere, have continued to bear the socio-economic burdens of their military outlays as if these were the inevitable costs of purchasing national

security. The political intolerance of these so-called inevitable socio-economic costs, however, has not only increased but also reached unprecedented levels of public participation as more and more among well-informed and concerned people all over the world have become aware that the arms race constitutes more of a threat than a protection for the future of mankind.

143. Since the nuclear arms race constitutes the gravest threat to international security, the nuclear powers owe it as much to themselves as to the rest of the world to take effective measures to first halt and then reverse its course. Controlling the nuclear arms race without negotiated agreements to lower the levels of military build-ups is like erecting walls around a bottomless pit. The escalatory spiral of the nuclear arms race cannot be broken without effective measures to stop the testing, stockpiling, production and deployment of nuclear arsenals. If political confidence is a precondition for lowering the levels of military build-ups, then measures of military confidence-building will serve the purpose of both détente and disarmament. For promoting a general lowering of the levels of military build-ups in accordance with the principle of undiminished security, it needs to be remembered that the security of the smallest country is as important for its national well-being as that of the largest military power. International agreements for reducing military build-ups, therefore, require the participation of all countries and a peaceful resolution of all conflict situations. A growing consensus among the non-aligned and neutral countries as expressed in their submissions to the second special session of the General Assembly devoted to disarmament is clearly emerging. This includes a strong emphasis on confining national security concerns to concrete threats of aggression across frontiers; security guarantees against the threat or use of nuclear weapons against a non-nuclear-weapon State; and urgent measures to resolve the surviving conflict situations arising out of the policies of colonialism and racism. Disarmament cannot progress if use of force continues to remain a prevailing factor in present international relations. An international climate should be built in which the existing conflicting situations would be solved solely by peaceful means and in which refraining from the threat or use of force would become the basic norm of international life. To that end, the mechanisms of the United Nations for the peaceful settlement of disputes should be strengthened and adjusted to present needs, and all States should be encouraged to make full use of them.

144. While describing the arms race as a major factor adversely affecting the social, economic, political, industrial and technological options of all countries the 1977 report also indicated the need for further analyses of how these consequences make themselves felt in countries at different levels of development. This report attempts to show that the current economic downswing is more than a cyclical phenomenon and that military expenditures, even the present rates of growth of military spending, constitute a heavier economic burden, not to speak of the additional socio-economic penalties likely to accompany still higher levels of military consumption. For the market economies, problems like inflation and unemployment have been exacerbated by large military outlays. Also, a strong coincidence between huge allocations to military R and D and lower rates of productivity in the civilian sectors has become all too evident. In the centrally planned economies, supply-side constraints on economic growth, whether due to labour shortage or bottle-necks on capital formation have, to a certain extent,

been aggravated by military outlays. Besides being adversely affected by the extent of their own military spending, the development process among the developing countries is also suffering from a slow-down in the process of economic growth in the developed world. The goals of the international development strategy, based upon assumptions of a stable economic performance by the developed world, face the painful prospects of being revised downwards at a time when their accelerated attainment is crucial for the national well-being of the developing countries. A striking feature of the period under review is the growing evidence that underdevelopment, lack of development or maldevelopment constitute a major source of insecurity for the developing countries. Many of them are facing greater tensions emanating from the challenge of providing socio-economic content to political independence, as compared to the initial post-colonial period when the conventional threats to their security concerns were largely concentrated on external situations like unresolved frontier problems and historical differences with neighbouring countries.

145. The relationship between the phenomenon of armament, on the one hand, and development, on the other, was singled out in the 1977 report as requiring urgent consideration. The study on the relationship between disarmament and development (A/36/356) has emphatically stressed that the arms race and development are in a competitive relationship not only in terms of their respective claims on the world's finite resources, but also as regards attitudes and perceptions. Taking a global perspective, this study views development as a universal requirement including the need for sustained and stimulated economic growth for the developed countries and accelerated socio-economic performance by the developing countries. By viewing the arms race as a major threat to international security and by describing arrested or stagnant development as a non-military source of insecurity, a triangular relationship between disarmament, security and development has been established. This perspective needs to be incorporated into the various international forums dealing separately with the problems of disarmament and development. To pre-empt the world's finite resources from being claimed for military consumption, to convert the resources already so consumed to non-military purposes, and to divert them towards socio-economic development are the essential requisites for a strategy for disarmament. From a global perspective, these are also major pre-requisites for the speedy establishment of a new international economic order which, as described earlier, is another way of coming to terms with the international economic realities. Particularly rewarding in this context would be a further exploration of the benefits which would accrue from major measures of disarmament, whether these pertain to reductions in military budgets, to redeployment of capital from the military to the civilian sectors of economy or to a diversion of a part of the huge global military R and D effort towards developing appropriate technologies of economic relevance to the developing countries. Resolute international action with a view to freezing and gradually reducing the military budgets is required. The activities now being undertaken to that end within the United Nations should be continued and intensified and, until appropriate international agreements are negotiated, policies of self-restraint in the field of military expenditures should be encouraged. Besides giving concrete effect to the direct relationship existing between disarmament and development, the reduction of military budgets, first of all of the budgets of the largest and most heavily armed countries, would constitute an important disarmament measure. It

would contribute to lowering the level of all military activities and not only of specific armaments. It would strengthen and increase confidence among States, and contribute to the improvement of the international climate.

146. A necessary condition for vigilant and critical public accountability for the socio-economic penalties of the arms race involves more openness of information about the magnitude of military spending, the nature, size and purposes of military outlays and deadly weapons arsenals, particularly in the nuclear field. It also involves a continuous and well-informed scrutiny of the lost opportunities and the foreclosed options. Through a number of studies conducted with the help of qualified experts and the insights provided by various research institutes, non-governmental organizations and other concerned groups, the United Nations has become a clearing house of constructive ideas pertaining to the various aspects of the arms race and the imperative for disarmament. Its role as a co-ordinator and processor of the information and analysis provided by the world-wide community of concerned people needs to be further strengthened. In reaching out to the public and alerting it to the increasingly menacing socio-economic consequences of the arms race, exercises like the present one not only assist in providing an updated analysis of major new developments but also gain from public assessment of the phenomenon. After all, it is in the growing public resentment of the arms race and its near universal character that the present report finds a major watershed beyond which each further round in its escalation will confront a stronger social rejection.

147. While reiterating the need for continuity in the analysis of the socio-economic consequences of the arms race, the Group specifically recommends further action by the United Nations in such areas as improvement of the statistical data base regarding military budgets, a better understanding of the economic and technological feasibility of conversion among countries at different levels of development, in-depth research on the role of the dual-purpose technology in the context of a new international economic order, international co-operative endeavour to reveal the adverse implications of military R and D on civilian sectors of the industry in particular and on economic performance in general, and pre-emptive measures by the United Nations to prevent the militarization of outer space.

148. The vital interest taken by all countries in the cessation of the arms race and in disarmament provides the United Nations with a unique role in organizing a powerful international action for disarmament. The present stagnation of disarmament negotiations, combined with the failure of the second special session of the General Assembly devoted to disarmament to adopt a comprehensive programme of disarmament (to which the 1977 report referred as a coherent strategy in the field of disarmament), underlines the imperative need that the United Nations should act with determination during the period ahead so that the negotiations with the view to realizing this important objective are resolutely pursued. It is also essential for the United Nations to further strengthen and develop its activities aimed at the mobilization of world public opinion in support of disarmament. As seen during the second special session, the non-governmental organizations, disarmament research institutes and organizations of scientists could play an important role in promoting the objectives of disarmament, and they should be given

full opportunity to be listened to. Therefore, consideration should be given to the ways in which the contributions of such organizations are further encouraged. The launching of the World Disarmament Campaign by the second special session opens new perspectives for United Nations activities aimed at developing an international conscience and educating world public opinion in favour of disarmament. The present report on the economic and social consequences of the arms race and its extremely harmful effects on world peace and security is the first report to be completed after the conclusion of the second special session and should be considered a contribution to promoting the objectives of the World Disarmament Campaign, namely, to inform, to educate and to mobilize world public opinion in favour of disarmament.

Notes

1/ A/32/88/Rev.1 (United Nations Publication, Sales No. E.78.IX.1).

2/ A/32/88/Rev.1 (United Nations publication, Sales No. E.78.IX.1) (hereafter referred to as the 1977 report).

3/ A/8469/Rev.1 (United Nations publication, Sales No. E.72.IX.16) (hereafter referred to as the 1971 report).

4/ Ibid.

5/ A/32/88/Rev.1 (United Nations publication, Sales No. E.78.IX.1), para. 9.

6/ See Technology on Trial: Public Participation in Decision-making related to Science and Technology (Paris, Organisation for Economic Co-operation and Development, 1979), pp. 11-17.

7/ For a brief summary of the studies, see Official Records of the Preparatory Committee for the second special session of the General Assembly devoted to disarmament (A/AC.206/9).

8/ See Ruth Leger Sivard, World Military and Social Expenditures 1981 (World Priorities Inc., Leesburg, Va.), p. 6.

9/ See World Armaments and Disarmament, SIPRI Yearbook, 1982, (London, Taylor and Francis Ltd.), p. XXIV.

10/ The six main military spenders are the United States of America, the Union of Soviet Socialist Republics, China, France, the United Kingdom of Great Britain and Northern Ireland, and the Federal Republic of Germany. Reference to the "six main military spenders" should not be allowed to conceal the very large differences within this group. Not all of these countries are leading in the process of arms innovation or in the production and export of arms; military expenditure (even more so, military expenditure per capita) differs widely within this group of countries; and not all of them have military capabilities that give them a global military-strategic importance.

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11/ For these reasons, the experts were not able to agree on specific figures concerning the military spending, the military R and D expenditures and the value of arms transfers for individual countries. There are considerable difficulties in devising meaningful yet operative and internationally comparable definitions of military expenditures, in converting national currency figures into a common currency, and in deciding how to correct for price changes in the civilian and the military sectors of the economy, respectively. During the last several years, important efforts have been made within the United Nations to improve comparability in these respects and to better understand and measure the consequences of the arms race in terms of resources (see "Reduction of the military budgets of States permanent members of the Security Council by 10 per cent and utilization of part of the funds thus saved to provide assistance to developing countries" (A/9770/Rev.1; United Nations publication, Sales No. E.75.1.10), and the report of the Secretary-General on the reduction of military budgets (A/S-12/7).

12/ Estimates of world military expenditure come mainly from the Stockholm International Peace Research Institute (SIPRI) and the United States Arms Control and Disarmament Agency (ACDA). The figures supplied by these two sources differ considerably in some cases, but not enough to affect conclusions substantially. ACDA figures are generally higher. Thus the ACDA estimate of world military expenditure for 1979 was $521 billion - 6 per cent higher than the SIPRI estimate of $492 billion. To ensure comparability between chapters and sections, we have chosen to use SIPRI figures throughout this report. Anyway, the margin of error in the figures is probably larger than the differences between figures from different sources. The data on which they base themselves are uneven in quality and some are quite uncertain. For world military expenditure, figures 10 per cent higher or lower than those given would still be plausible. In the trend figures given subsequently, the margin of error is generally much smaller, since this is mostly a question of consistency in definitions. Over long time spans, the use of other, equally plausible coefficients to correct for price changes could, of course, have a noticeable effect.

13/ Official military budget figures for the Soviet Union were rather stable in the second half of the 1970s. In 1977, the figure was 17.2 billion roubles and went down into a reported 17 billion roubles in 1980. Owing to differences in coverage and difficulties with conversion rates, these figures are not directly comparable to military budget figures elsewhere in the report. For the United States, these military expenditures decreased in the mid-1970s. The figure in 1977 was 120.8 billion dollars. In the late 1970s, there was an increase resulting in 126 billion dollars in 1980. Both United States figures are in 1979 prices and based on SIPRI estimates.

14/ See Collin Norman, The God that Limps: Science and Technology in the Eighties (New York, W. W. Norton and Company, 1981).

15/ SIPRI Yearbook 1982, pp. 304-305.

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16/ See Whence the Threat to Peace (Moscow, Military Publishing House, USSR Ministry of Defence, 1982); also see Soviet Military Power (Washington, D.C., United States Government Printing Office, 1982).

17/ Nuclear missiles are generally classified as tactical or strategic either on considerations related to military doctrines or their technical characteristics, or both. The most commonly known classification distinguishes long-range missiles (more than 5,000 km), medium-range missiles (between 1,000 and 5,000 km) and short-range missiles (up to 1,000 km).

18/ The Soviet two-stage SS-20 with three MIRVed warheads was created to replace SS-4 and SS-5 missiles with single warheads. The SS-20, the deployment of which started in 1976, has been credited with high accuracy, rapid-reload capability and high mobility.

The Pershing II is a product of a number of technological advances, including more rapid means of targeting and launching and a highly accurate, terminally guided warhead. The latter also possesses an earth-penetrator capability making it useful for attacks on hardened targets while minimizing collateral damage.

In the long-range cruise missile in its various forms (air-, sea-, and ground-launched), at least three strands of technological development have come together to produce a system which can greatly enhance the counterforce and war-fighting capabilities of any nation which possesses it. Advances in jet engine technology produced small, light-weight and highly efficient engines. More energetic liquid fuels allowed for more payload and longer range in a small missile. And solid-state electronics led to new guidance and control systems which substantially increased the accuracy, reliability and versatility of the missile (see SIPRI Yearbook, 1981, and document A/35/392, annex).

19/ SIPRI Yearbook, 1982.

20/ See Political Détente and the Arms Race, (Berlin, German Democratic Republic, First-Hand Information Department, 1976).

21/ See "The Myths of the Arms Restraint", International Policy Report, vol. V (May 1979); Lawrence B. Ekpebu, "An African Perspective on the US/USSR/China Arms Policies", Alternatives, vol. VI (1980), pp. 93-129; Edward A. Kolodzicy and Robert E. Harkway, "Developing Countries and the International Security System", Journal of International Affairs, vol. 34 (Spring/Summer 1980), pp. 59-88; "Arming the World", Time (26 October 1981), pp. 28-41.

22/ See Istvan Kende, "Wars of Ten Years: 1967-1976" Journal of Peace Research, vol. XV (1978), pp. 227-237.

23/ See Istvan Kende, op. cit. See also Miles D. Wolpin, Military Aid and Counterrevolution in the Third World (London, Lexington Books, 1972); James Schlesinger, "Third World Conflict and International Security", Survival (November 1980), pp. 274-281; Warren Weinstein and Thomas Henriksen, Soviet and Chinese Aid to African Nations (New York, Praeger Publishers, 1980).

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24/ See The Non-Proliferation Treaty: The Main Political Barrier to Nuclear Weapon Proliferation, SIPRI, 1980. See also "The NPT Review Conference", Arms Control Today (February 1981), pp. 3-9; "Non-Proliferation Treaty Review Conference: No Declaration", Nature, vol. 287 (11 September 1980), pp. 97-98.

25/ See South Africa's Plan and Capability in the Nuclear Field (United Nations Publication, Sales No. E.81.1.10). See also A/36/431, annex.

26/ See The Relationship between Disarmament and Development, (United Nations publication, Sales No. E.82.IX).

27/ See Collin Norman, op. cit.

28/ Collin Norman, op. cit.

29/ See Antony Dolman, Disarmament, Development, Environment: Three Worlds in One, (Geneva, NGO Liasion Service, 1980).

30/ For the various civilian uses of these minerals, see Mineral Resources of Asia, United Nations Economic and Social Commission for Asia and the Pacific, 1979.

31/ See "Facing the Future", Interfutures (Paris, Organisation for Economic Co-operation and Development, 1979), pp. 65-96.

32/ See E.E. Hughes, et. al., Stragtegic Resources and National Security: An Initial Assessment (NATO, 1976).

33/ See Michael Tanzer, Race for Resources (New York, Monthly Review Press, 1980).

34/ See Helge Hveem, "Militarization of Nature: Conflict and Control over Strategic Resources and Some Implications for Peace Policies", Journal of Peace Research, vol. XVI (1979), pp. 1-25.

35/ See Tong Whan Park and Michael Don Ward, "Petroleum-related Foreign Policy: Analytic and Empirical Analysis of Iranian and Saudi Behaviour (1966-74)". The Journal of Conflict Resolution, vol. XXIII (September 1979), pp. 481-507.

36/ See Vince Taylor, "The End of the Oil Age", The Ecologist, No. 8/9 (October/November 1980), pp. 303-311.

37/ See Wilson Clark and Jake Page, Energy, Vulnerability and War, W. W. Norton, New York, 1980, p. 57.

38/ "Technology Transfers by Multinational Firms: The Resource Cost of Transferering Technological Know-How", The Economic Journal, No. 87 (June 1977), pages 242-261.

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39/ See Report of the Third General Conference of the United Nations Industrial Development Organization, chap. VI: New Delhi Declaration and Plan of Action on Industrialization of Developing Countries and International Co-operation for their Industrial Development (ID/CONF.4/22).

40/ See The Global 2000 Report to the President: Entering the Twenty-First Century, vol. 1 United States Government Printing Office, (Washington D.C., 1980).

41/ See The Economy and Defense Spending: Projections and Choices in Challenges for U.S. National Security: A Preliminary Report (New York, Carnegie Endowment for International Peace, 1981).

42/ In the national accounts of many countries, expenditures on durable military goods are included under the heading of investments. This is done primarily for statistical reasons. Nevertheless, one has to keep in mind that the production of those products do not add to the productive capacity, so in that sense they cannot be called investments. The methodological aspects are largely discussed in Military Expenditures: Growth and Fluctuations (Paris, International Economic Association Meeting, June 1982).

43/ See Emile Benoit, "Growth and Defence in Developing Countries", Economic Development and Change, vol. 26 (January 1978), pp. 271-280.

44/ Alf Kirk, "Disarmament and Economics", address delivered at the New Zealand National Consultative Committee on Disarmament, 27 June 1981.

45/ See Collin Norman, op. cit.

46/ See Lloyd J. Dumas, "The Impact of the Military Budget on the Domestic Economy", Current Research on Peace and Violence (2/1980), pp. 73-83.

47/ See David Greenwood, "The Adequacy and Appropriateness of Western Military Expenditures", The Ditchley Journal (Spring 1978), pp. 74-85. See also "Military Spending: Effects on the Economy", Coalition for a New Foreign Policy and Military Policy (Washington, D. C., March 1981).

48/ These examples are given in Bernhelm Booss and Rasmus Ole Rasmussen, "Challenging Scientific and Technological Problems for a Better Use of Earth's Resources", Peace and the Sciences (2/79) (Vienna, International Institute for Peace), pp. 75-78.

49/ Ibid.

50/ See Alf Kirk, op. cit.

51/ See David Carlton and Casto Schaef (eds.), Arms Control and Technological Innovation (London, 1977).

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52/ See Daniels S. Greenburg, "Will R+D Hog It All?", The Washington Post (18 November 1980). See also Harvey Brooks, "Technology, Evolution and Purpose", Daedalus (Winter 1980), pp. 79-80.

53/ A/32/88/Rev.1 (United Nations publication, Sales No. E.78.IX.1), para. 88.

54/ Ibid., para 89.

55 For different national perspectives on the technological and economic feasibility of conversion from military to civilian production, see Peace and Sciences, op. cit.

56/ See David Greenwood, op. cit. See also British Foreign Policy to 1985, (London, The Royal Institute of International Affairs, 1978).

57/ Replies received from the Governments of Romania and Czechoslovakia to the questionnaire sent by the Secretary-General to all Governments for the preparation of this report.

58/ World Development Report 1981, the World Bank (August 1981), pp. 180-181.

59/ See Istvan Kende, "Dynamics of Wars, of Arms Trade and of Military Expenditures", Instant Research on Peace and Violence" (2/1977), pp. 59-68.

60/ See Peter Lock, "The New International Economic Order and Armaments", Economics, vol. 22 (1980), pp. 56-85; Michael T. Klare, "Militarism: The Issues Today", Bulletin of Peace Proposals, vol. 2 (1978), pp. 121-129; W. Mallmann, "Arms Transfers to the Third World", Bulletin of Peace Proposals, vol. 3 (1979), pp. 297-301.

61/ See "The Arab Organization of Industrialization: A Case Study in the Multinational Production of Arms", Peace and Violence (2/1979).

62/ Military Expenditures, Growth and Fluctuations, op. cit.

63/ See Swadesh Rana, "Security Issues in the Third World: A Strategic Perspective", paper presented to Common Security: A Program for Disarmament (Report of the Independent Commission on Disarmament and Security Issues under the chairmanship of Olof Palme; Pan Books Ltd., 1982).

64/ See Implementation of the Lima Declaration and Plan of Action: The Country Situation and Contribution of International Organizations, United Nations publication ID/238 (ID/CONF.4/4).

65/ See Employment, Trade and North-South Cooperation: An Overview (Paper presented at the World Employment Programme Symposium of the International Labour Office, Geneva, 19-22 May 1980).

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66/ A/32/88/Rev.1 (United Nations publication, Sales No. E.78.IX.1), paras. 120-122.

67/ The Charter of the United Nations twice refers to the goal of disarmament. In its Article 11 it states that the General Assembly may consider the general principles of co-operation in the maintenance of international peace and security, including the principles governing disarmament and the regulation of armaments. Article 47 mentions the questions on which the Military Staff Committee is to advise and to assist the Security Council namely, "the regulation of armaments" and "possible disarmament". Furthermore, Article 26 refers to a system for the regulation of armaments, plans for which are to be submitted to the Members of the United Nations by the Security Council. See also A/36/474, annex, para. 138.

68/ Several critiques of war games seriously question their scope and importance, including their political and operational assumptions and their costs and benefits. See, for example, Garry D. Brewer and Martin Shubik. The War Game: A Critique of Military Problem Solving, (London, Harvard University Press, 1979).

69/ The Dangers of Nuclear War: Soviet Physicians Viewpoint, (Moscow, Novosti Press Agency Publishing House, 1982), pp. 61-62.

70/ J. P. Robinson, The Effect of Weapons on Ecosystems, (New York, United Nations Institute for Training and Research, 1979).

71/ Steve Wright, "New Police Technologies: An Exploration of the Social Implications and Unforeseen Impacts of Some Recent Developments", Journal of Peace Research, vol. XV, No. 4 (1978), pp. 305-320.

72/ Yoshikazu Sakamoto and Richard Falk, "Demilitarized: A Basic Human Need", Alternatives, vol. VI (1980), pp. 1-16.

73/ The Relationship between Disarmament and Development (United Nations publication, Sales No. E.82.IX.1), p. 98.

74/ Egbert John, "The Revival of Functionalist Theory in East-West Co-operation", Bulletin of Peace Proposals, vol. 10, No. 1 (1979), pp. 73-77.

75/ See Betty Reardon, "Obstacles to Disarmament Education", in Obstacles to Disarmament, Paris, UNESCO, 1981.
