



CANBERRA PAPERS ON
STRATEGY AND DEFENCE
NO. 20

RON HUISKEN

The Cruise Missile and Arms Control

**Canberra Papers on
Strategy and Defence No. 20**

SDSC RSPacS

The Cruise Missile and Arms Control

RON HUISKEN

A publication of
The Strategic and Defence Studies Centre
Research School of Pacific Studies
The Australian National University
Canberra 1980

Printed and Published in Australia
at the Australian National University 1980

© Ron Huisken

This book is copyright. Apart from any fair dealing for the purposes of private study, research, criticism, or review as permitted under the Copyright Act, no part may be reproduced by any process without written permission.

National Library of Australia
Cataloguing-in-Publication entry

Huisken, Ronald Herman, 1946-
The Cruise Missile and Arms Control.

(Canberra Papers on Strategy and Defence; No. 20)

Index.

ISBN 0 908160 54 2 ISSN 0069 0104

1. Disarmament.
2. Cruise missiles.
3. Soviet Union – Foreign relations – United States.
4. United States – Foreign relations – Soviet Union. I. Title. (Series).

327.1 '74

Library of Congress Catalogue Card Number: 80-68052

Designed by ANU Graphic Design

Printed by SOCPAC Printery

Published by:

The Strategic and Defence Studies Centre,
Research School of Pacific Studies,
The Australian National University,
Box 4, P.O. Canberra ACT 2600.

Distributed by:

Australian National University Press,
Canberra ACT 2600.

In 1972 the United States made the rather surprising announcement that it would develop a submarine-launched strategic cruise missile. Within a short time the cruise missile was being labelled as one of the most significant weapon developments of the decade with major applications in theatre and tactical as well as strategic roles.

The characteristics of a cruise missile are such that its range and type of warhead – and therefore its role – cannot be reliably deduced by external inspection, monitoring test flights or noting the platform on which it is deployed. Largely because of this ambiguity, the cruise missile became one of the most contentious issues in the negotiations on a second strategic arms limitation treaty (SALT II). More generally, the cruise missile played an instrumental role in widening the scope of these negotiations to include the long-range theatre nuclear systems that occupy the gray area between strategic and battlefield weapons.

In this monograph Mr Huisken makes a detailed examination of the role played by Cruise missiles in SALT II and offers some thoughts on their implications for SALT III.

Robert O'Neill
Editor, *Canberra Papers*
and Head, SDSC

Ron Huisken received the degrees of Bachelor of Economics (Honours) from the University of Western Australia in 1968 and a Masters of Social Science from the University of Stockholm in 1970. He then joined the Stockholm International Peace Research Institute (SIPRI) and subsequently lectured in economics at the University of Malaya during 1970 and 1971. In 1972-76 he again was back at SIPRI, and in 1976-77 held a Visiting Fellowship in the Strategic and Defence Studies Centre, Australian National University. In 1979 he submitted his Ph.D. thesis to the Australian National University and then joined the United Nations Center for Disarmament as a research consultant.

Canberra Papers on Strategy and Defence are a series of monograph publications which arise out of the work of the Strategic and Defence Studies Centre, Research School of Pacific Studies, Australian National University. Previous *Canberra Papers* have covered topics such as the relationships of the superpowers, arms control at both the superpower and South-east Asian regional level, regional strategic relationships and major aspects of Australian defence policy. For a complete list refer to the last page of this volume.

CONTENTS

Introduction	1
US Perspectives on the Cruise Missile	3
Factors shaping Soviet attitudes toward the Cruise Missile	8
The Cruise Missile in SALT	17
An Assessment	46
Implications for SALT III	50
Conclusions	57
Footnotes	59
Annex: Cruise Missile Provisions in SALT II	74
The Strategic and Defence Studies Centre	80
Other Publications	81

Introduction

The cruise missile has been described as the most significant technological development of the 1970s. This assessment does not refer to cruise missiles *per se*; as a weapon type the cruise missile dates back to the latter years of World War II. Rather, it refers quite specifically to a family of long-range, nuclear-armed, land attack weapons now under development in the United States. In the late 1950s, the ballistic missile displaced the cruise in the long-range nuclear delivery role and its supremacy in this role remains essentially unchallenged. However, in 1971/72, American weapon designers re-examined the cruise missile option and concluded that it would be possible to develop a vehicle that improved so dramatically on the earlier models that, although not a competitor for the ICBM or the SLBM, would be a viable weapon in its own right.

The proposals to develop a strategic cruise missile was made in June 1972 and there are now three variants in advanced development, one assigned to the strategic forces and two intended for the European theatre. The original strategic cruise missile was a submarine launched weapon (subsequently designated BGM-109 Tomahawk) but in 1976 it was decided to redirect it toward the theatre role. In 1977, development of a ground launched variant of this weapon was initiated, also for the theatre role. The popular acronyms for these weapons are SLCM and GLCM, for sea-and ground-launched cruise missile respectively. The strategic cruise missile is now the version that will be air-launched (hence ALCM) from B-52 bombers. Two weapons are in competition for the ALCM contract, the AGM-86B and the AGM-109, an air-launched variant of the Tomahawk. All three variants have the same engine and guidance system.

The ALCM and SLCM will also have the same warhead, a device designated W.80, while that for the GLCM is derived from the W.80 and designated W.84. A brief description, say, of the SLCM can therefore give an indication of the capability of all of them. The SLCM (including its rocket booster) is 20 feet 3 inches long and 21 inches in diameter to enable it to be launched from the torpedo tubes of submerged submarines. These dimensions provide one key to the weapons efficacy, a radar cross section of about 0.05 square meters or about the same as that of a seagull.¹ For purposes of comparison, the radar cross section of an F-4 fighter/bomber is about 5 square meters and that of a B-52 strategic bomber about 50 square meters. A second important capability is the

weapons ability to fly at extremely low altitudes, less than 200 feet even over moderately hilly terrain. Taken together, these two characteristics give the SLCM a high probability of penetration despite the fact that it cruises at a mere 530 m.p.h. (Mach 0.7). As regards accuracy, the SLCM, being subsonic, takes a relatively long time to cover major distances and this allows navigational errors to accumulate. However, if developing inaccuracy can be reliably corrected en route then the cruise missile's relatively slow speed becomes an advantage. As the cruise missile project manager once put it, 'you can always hit the bullseye if you can walk slowly over to the wall and put your finger on it'.

The SLCM achieves remarkable accuracies by being able, periodically, to 'recognise' its whereabouts and determine the course changes necessary to 'hit the bullseye'. This system is known as TERCOM-terrain contour matching. Portions of the selected flight path to the target are surveyed to determine variations in ground elevation — a task done by satellites for many years. These surveyed areas are divided into a matrix of squares and each square is given a number representing the average elevation of the ground. The resulting digital contour map is stored in the memory of a small computer installed in the missile. When the missile is en route to its target a radar altimeter starts taking readings before it expects to overfly the surveyed area and stops taking them at an equal distance after it has left that area. The computer compares the information on ground elevation provided by the radar altimeter with the map in its memory and determines how the missile's actual direction of flight differs from that necessary to bring it accurately to the next TERCOM checkpoint and, eventually, to the target. The computer will then issue instructions to bring about the appropriate changes in the missile's direction of flight.

The computer used in the SLCM can store contour maps for up to 20 segments of the route to the target.² This permits considerable flexibility in plotting the route: known defences can be by-passed and terrain features such as mountains can either be avoided or exploited to conceal the weapon from enemy radars.

In between TERCOM checkpoints, the SLCM is maintained on a set course by means of an inertial guidance system. All inertial systems 'drift' over time and the TERCOM system, in addition to correcting for the navigational errors arising from this drift factor, resets the inertial system so that the error does not accumulate. The end result is that the SLCM is expected to achieve operational accuracies in the region of 100-300 feet. A lightweight 200KT warhead is carried and the weapon has achieved ranges in excess of 2,000 miles in tests.

The launching sequence runs as follows. The rocket booster, which ignites after the missile has been ejected from the torpedo tube, propels the weapon to the surface and to an altitude of approximately 1,200 feet. The booster is then jettisoned, the wings and tail surfaces deployed and a gas cartridge fired to start the turbofan sustainer engine.

Cruise missiles were discussed very briefly in SALT I and became a major issue in SALT II from about January 1975 onwards. It is also clear that they will preoccupy SALT III. The following discussion analyses the role of the cruise missile in SALT II and, more briefly, traces developments through the end of 1979 to give some indication of the issues that these weapons raise for SALT III.

US perspectives on the cruise missile

New strategic weapon programmes in the United States are normally preceded by an extended period of debate on the requirement, force size, desired technical parameters and so on. The strategic cruise missile, in contrast, made an abrupt and unheralded debut within a month of the signing of the SALT I agreements in May 1972. The two men primarily responsible for launching this programme were Secretary of Defense Melvin Laird and Director of Defense Research and Engineering John Foster Jr, although neither had a well-defined nor convincing rationale for the weapon.

By 1972 Secretary Laird had become convinced that the Soviet Union sought strategic superiority and he said so quite bluntly in his annual report for that year. It would seem that Laird felt that the situation called for actions to indicate to the Soviets that the US was fully prepared to match the pace of their strategic buildup. To convey this message, Laird recommended that the Trident SLBM programme be accelerated and that a start be made on a strategic cruise missile. Foster's general concern was the potential vulnerability of ballistic re-entry vehicles to sophisticated SAMs and he felt that the certainty of US strategic retaliation would be enhanced if a small, low-altitude weapon were added to the offensive forces.

Subsequently, the strategic debate in the US refocused on the issue of the size and throw-weight of Soviet ICBMs and the threat they represented to the survivability of American ICBMs, an issue that remained pre-eminent throughout

the SALT II process. For several years, however, there was little inclination to view the strategic cruise missile as directly relevant to this central issue except, as we shall see, as a possible lever in the SALT negotiations. It was not until the Carter Administration came into office and the decision taken to cancel the B-1, that a large force of air-launched cruise missiles was presented as an effective counter-weight, at least over the medium term future, to the distinct possibility that the Soviet Union would take the lead in counterforce capability against land-based ICBMs. At the same time, the perceptual impact of deploying a weapon that clearly reflected US superiority in a number of areas of technology was also considered particularly important.

On the negotiating front, there is clear evidence that there was a strong 'bargaining chip' element in the original rationale for the strategic cruise missile. It appears that the Soviet Union, early in SALT I, rejected the inclusion of cruise missiles in the discussions and US officials concluded, that without comparable US weapons, there would be little incentive for the Soviets to change their position. It is difficult to see, on objective grounds, how the strategic threat from Soviet naval cruise missiles can be portrayed as anything but quite marginal but this does not preclude the possibility that decision-makers viewed the threat as a significant one. It is true, after all, that the United States is exposed to the open ocean, that its population is quite heavily concentrated in coastal cities and that its air defences are relatively weak.

In any event, to whatever extent the United States viewed its long range cruise missile as a means simply to bring the 'equivalent' Soviet weapons into the purview of SALT, it soon became apparent that the weapon would play a far more important role in the negotiations. Perhaps during the latter half of 1974, and certainly early in 1975, it became clear that the Soviet Union was deeply concerned about the long-range cruise missile. The United States, for its part, was still unclear as to what role or roles to assign to cruise missiles, a state of affairs clearly advantageous to the Russians in the negotiations. This advantage evaporated, however, as regard for the versatility of the cruise missile rose in the United States and its NATO allies. At the same time, of course, the developing enthusiasm for the cruise missile placed progressively tighter restrictions on US negotiators at SALT as far as limitations on these weapons were concerned.

An interesting question is the extent to which US officials examined the long-term implications of introducing strategic cruise missiles, particularly an evaluation of the strategic balance when both sides possessed such weapons. As implied above, the official position was that the United States was not taking the initiative in this area of weapons technology. This position was partially contradicted by the claims, also official, that the US had a 10-year technological

lead in cruise missiles but, in any case, the experience with MIRV would seem to suggest strongly that some such evaluation was made. There is no evidence, however, that US decision-making on cruise missiles was influenced by considerations of this kind. It was readily admitted that the Soviet Union would probably develop similar weapons but even the most obvious implication – the adequacy of air defences for the continental United States – played no visible role in the internal debate on strategic cruise missiles until the latter half of 1978.

In the early 1970s, the US began to capitalise on the fact that the threat from Soviet bombers was minimal by cutting back air defences. Immediately after the Vladivostok summit, Henry Kissinger predicted that the Soviets would probably give up their bombers altogether in complying with the ceiling of 2,400 on strategic delivery vehicles. By 1978, the situation looked very different. The deployment of the Backfire medium bomber was creating pressure to improve US air defences. Similarly, the counting rules proposed for SALT II from September 1977 onwards – 1,320 MIRVed vehicles of which only 1,200 could be ballistic missiles – virtually assured that the Soviet Union would modernise its strategic bombers and eventually equip them with long-range cruise missiles. The first indications that this was in fact happening came in February 1979 when US officials revealed that the Soviets had been testing an ALCM over ranges of about 750 miles. The launching aircraft was the Backfire.³ Although there was no evidence that this weapon had the range, accuracy and low-level capability of the American ALCM⁴ the tests indicated that the Soviets had made the commitment to develop new cruise missiles much earlier, probably 1975 or 1976.

A further, and very important, dimension to the US attitude toward the cruise missile at SALT was its potential as a tactical and theatre nuclear weapons system, particularly in the European arena. Throughout the post war period, NATO's conventional military forces in Europe have been quantitatively smaller than those of the Warsaw Pact. The qualitative superiority of NATO's weaponry has always been regarded as a partial equalizer but, since the early 1950s, the major gap-filling role has been assigned to nuclear weapons. In the 1950s, under the doctrine of massive retaliation, the American strategic nuclear forces could with some assurance be viewed as a direct substitute for NATO's conventional inferiority. In addition, from 1954 onwards, large numbers of American tactical nuclear weapons were deployed to Europe.⁵ In general, the NATO posture reflected an almost exclusive reliance on deterrence in preference to the far more costly option (at least for the European members of the Alliance) of fielding the forces required to defend their territory.

The Soviets were also busy in this area, deploying a steadily growing variety of short and medium range nuclear ballistic missile and rocket systems from about 1954 onwards.⁶ The two weapons of particular relevance to the present discussion are the 1,200-mile range SS-4 Sandal first deployed in 1959 and the 2,300-mile range SS-5 Slean first deployed in 1961. Both these weapons carry single warheads in the megaton range. For a brief period NATO possessed ballistic missiles of comparable range; the Thor, deployed in the United Kingdom and the Jupiter, deployed in Italy and Turkey. However, both these weapons were withdrawn, without replacement, beginning in 1963.

With the acquisition by the Soviet Union of a secure ability to bombard the continental United States with nuclear weapons the credibility of the US threat to retaliate massively in the event of Soviet aggression in Europe evaporated rapidly. In response, under the Kennedy and Johnson Administrations, the United States endeavoured to persuade its NATO allies to endorse a more flexible doctrine, one that would to some extent divorce war in Europe from all-out strategic war between the two superpowers. The new doctrine, spelled out in NATO Document 14/3 adopted in December 1967, called for a conventional defence against a conventional attack and therefore implied a considerable strengthening of NATO's conventional force posture. Only in the event of impending defeat at the conventional level would the Alliance resort to graduated escalation employing tactical nuclear weapons. The third escalatory option, strategic nuclear warfare, was very much a last resort. The Schlesinger doctrine of limited strategic options, although portrayed as a means of recoupling US strategic forces with the defence of Europe, clearly also had the intent of further reducing the risk of *general* strategic war in the event of a major conflict in Europe.

The strengthening in NATO's conventional force posture called for by the doctrine of flexible response came slowly and reluctantly. Although some notable increases were achieved they were, in general, matched, and in some areas more than matched, by growth in Warsaw Pact capabilities. Accordingly, the predominant assessment throughout the 1970s was that the military balance in Europe was 'increasingly precarious', to use Secretary of Defense Harold Brown's phrase. And this, in turn, effectively left tactical nuclear weapons as the equalizers despite the huge risks of escalation to strategic war involved and despite an intense and continuing controversy within NATO over whether these weapons had any credible rationale beyond deterring first use by the Warsaw Pact.

In numerical terms, the tactical nuclear weapons scene in Europe has been stable since the mid-1960s with roughly 7,000 on the NATO side and 3,500 on the Warsaw Pact side. These figures, however, excluded the Soviet SS-4 and SS-5 missiles, some 600 of which had been deployed. In addition, the Soviet Union possessed several hundred medium-range bombers (TU-16 Badgers and TU-22 Blinders). It is widely accepted in the West that this large theatre (as distinct from tactical) nuclear force was deployed in the late 1950s and early 1960s because the Soviet Union lacked the weapons to attack the United States directly; posing a massive nuclear threat to Western Europe was the next best thing. What was regarded as disturbing within NATO was that, long after the Soviet Union had achieved full strategic parity with the United States, this theatre nuclear force remained intact. This assessment was reflected in statements by Schlesinger and his successors, Rumsfeld and Brown, to the effect that these forces bear no apparent relationship to the British and French nuclear forces nor to any urban target system in Western Europe. With 600 SS-4/5s the Soviet Union can allocate at least four one-megaton warheads to every city in Western Europe with a population over 200,000.

Far from reducing the size of these theatre nuclear forces now that their rationale was no longer valid (in the West's view at least), the Soviet Union proceeded to modernise them in an extremely impressive fashion. The Backfire medium bomber, which began to enter operational service toward the end of 1974, was in all respects much superior to the aircraft it was replacing. To NATO, however, it seems that the Backfire was less disturbing than the weapon developed to replace the SS-4 and SS-5 missiles, namely, the SS-20. The existence of the SS-20, a scaled-down version of the SS-16 ICBM, was formally disclosed in July 1976 in a report President Ford made to the Congress⁷ and the first units became operational in the following year. As a theatre nuclear weapon the SS-20 established two firsts. Despite being a large weapon, with a range upward of 3,000 miles, it is fully mobile on its own wheeled transporter/launcher. Secondly, it carries a MIRVed warhead with three re-entry vehicles each with a yield variously estimated at 150-500 kt. Thus 200 SS-20s would provide the same target coverage as the 600 SS-4/5s and by the end of 1979 approximately 140 SS-20 launchers were estimated to be operational with production continuing at an estimated 3-5 systems per month.⁸ Many officials in the US and other NATO countries saw the long-range ground-launched cruise missile as an effective and relatively inexpensive counter to the SS-20. More generally, many analysts saw the cruise missile as a particularly versatile embodiment of the West's technological superiority and a very promising means of correcting several of the perceived deficiencies in NATO's defence posture.⁹

In sum, from 1975 onwards, the United States came under increasingly intense pressure not to strike a bargain in SALT II that would compromise exploitation of the cruise missiles' utility for the defence of NATO. At various stages in the talks the US negotiators seemed to be on the verge of doing just this and the clause in the protocol to the draft SALT II treaty which limits the range of deployed ground and sea-launched cruise missiles to 600 km remains a source of considerable worry. Although the protocol will be binding for only two years many Europeans were concerned that political and psychological pressures would induce the Americans to make the restrictions permanent. Similarly, some feel that the mere fact that SLCM and GLCM are in the protocol, and therefore have an uncertain future, will inhibit their technological development.¹⁰

Factors shaping Soviet attitudes toward the cruise missile

A useful point of departure is to give some brief comments on Soviet decision-making for defence. A point on which all analysts agree is that decision-making in the Soviet Union is highly centralised and that this centralisation is, of course, especially true in such key areas as defence and foreign policy.¹¹ The bureaucratic structure, and the procedures and practices within that structure, reflect the fact that responsibility for initiating policy actions resides at the top levels of the party hierarchy. While a great many departments, agencies and institutes (and sub-groups within these) can be identified that would have an interest in defence and that presumably try to influence decisions it is not the case '... that the weapons decision process in the Soviet Union is wide open to the play of pluralistic pressures upon the top leadership from such competing interest groups'.¹²

A second point on which there is little dissent is that in the highest decision-making bodies — the Politburo and the Central Committee — the military wields substantial influence. Marshal D.F. Ustinov, who became Minister of Defence in April 1976 after the death of Marshall A.A. Grechko, was made a full member of the Politburo a relatively short time after his appointment, a move widely interpreted as consolidating and enhancing the influence of the military. More-

over, the military's ability to exploit its presence in the top decision-making bodies is facilitated by the fact that it speaks with one voice, at least to a far greater extent than is the case in the United States. 'The unified structure of the Ministry of Defense, plus the combined arms' tradition . . . tends to make branch-of-service rivalry a less important factor in the Soviet decision-making process . . .'¹³

Thirdly, the professional military in the Soviet Union enjoys a substantial measure of autonomy and authority on questions of strategy and operational military matters. There are no civilian officials within the defence establishment with statutory authority over the uniformed military. And while there are a few 'think tanks' staffed with civilian specialists on military affairs, they do not seem to provide any real competition for the professional military. In regard to SALT, this monopoly on military expertise bestows on the Soviet Ministry of Defence the prime responsibility for preparing Soviet positions and evaluating American proposals. Not surprisingly, this privileged position is jealously guarded and, it seems, even civilian members of the Soviet SALT delegation were regarded as potential inroads insofar as exposure to strategic concepts and to the details of strategic weapons would turn them into rival experts.¹⁴ It is probably well known by now that during the early negotiations on SALT I the American negotiators found their Soviet civilian counterparts surprisingly uninformed on strategic weaponry. More to the point, a military member of the Soviet delegation urged the Americans not to divulge too much of their knowledge of Soviet weapons to the Soviet civilian negotiators. Furthermore, one Soviet observer, a former chief of the disarmament section of the Institute of World Economy and International Relations, charges that the formal and informal 'rules of the game' within the Soviet bureaucracy ensure that only relatively 'hawkish' views get a hearing in the decision-making process.¹⁵

These observations suggest that there is much to be said for the view that the Soviet Union sees the problem of limiting strategic arms primarily as a military problem rather than as a problem of arms control or disarmament *per se*. That is to say, the Soviet Union will strive for SALT arrangements that will assuage their principle security concerns and provide for a balance of forces consistent with Soviet political objectives. The alternative view is presumably that which regards SALT as a means (a) of minimising the risk of nuclear war, (b) reducing the destructiveness of nuclear war should it break out and (c) generally endeavouring to neutralise strategic weapons as a factor permeating international politics. These different perspectives on SALT, insofar as they are held, respectively, by the Soviet Union and the United States, need not in themselves

prevent useful agreements. However, if, as Paul Nitze and many others believe, the Soviet Union is ' . . . intent on strategic arms arrangements calculated to afford the Soviet Union a strategic preponderance on the basis of which they can aspire to lay down the direction of world events to Soviet advantage . . . ' the prospects for useful and enduring agreements will be much diminished.¹⁶ Thomas Wolfe, approaching much the same question from an entirely different perspective, is similarly pessimistic that the Soviet Union would, in the near future, subscribe to strategic arms arrangements that would satisfy the canons of arms control. Specifically, he concludes ' . . . that [the Soviets] are very apt to go on declining American proposals that would in effect call for dismantling substantial portions of the military machine they are still in the process of building'.¹⁷ Given the fact that the uniformed military play a pre-eminent role in shaping Soviet attitudes toward SALT, and in preparing Soviet positions and evaluating American proposals, it should also be mentioned that the Soviet military is acutely preoccupied, even at the level of strategic nuclear war, with the physical defence of the homeland. This attitude, widely observed and by no means disguised by the Soviets themselves, is, the product of Soviet culture, traditions and, above all, experience in the more or less recent past.

It can reasonably be assumed, therefore, that at whatever point the Soviet military became convinced that the long-range cruise missile was going to become an important component of the US strategic arsenal, they began to lobby for the resources needed to mount a defence against these new weapons. From this point on, the military and political leadership in the Soviet Union would presumably have been exposed to detailed assessments of how great an additional threat an American air and/or sea-based strategic cruise missile force would pose and how costly it would be to mount a respectable defence against these weapons. These assessments, together with judgements on the strength of the support for strategic cruise missiles in the United States, will clearly have determined how strenuously the Soviet Union would act to ban or limit these weapons under SALT and the concession they would be prepared to make in order to do this.

On the first dimension — how great a potential threat did the Soviet Union see in the cruise missile — one can say the following. It is entirely plausible that as early as 1974 the more enthusiastic 'worst case' analysts in the Soviet Union were arguing that the cruise missile was a very grave threat indeed. In fact, they could probably have argued that if the United States were to move ahead on all the cruise missile variants mentioned — air, submarine, surface

ship and land-based – this would result in a greater net increase in the number of nuclear weapons capable of striking Soviet territory than the B-1, Trident and MX programmes put together. In 1974/75 US officials occasionally mentioned the figures 10,000-11,000 for the air-launched cruise missile alone!

On the second dimension, it is unfortunately the case that the only information on the capabilities of cruise missiles and the costs of defending against them come from US sources. But before we examine this material it is of some interest to consider the perceptual dimension of these weapons. The United States attaches great importance to the fact that US strategic forces must be perceived the world over to be at least as powerful as those of the Soviet Union. Furthermore, it is recognised that perceptions are probably shaped by gross force characteristics – numbers, diversity of type and so on – rather than by less apparent features such as accuracy or reliability.

As far as one can judge, the Soviet Union is every bit as concerned with perceptions as the United States and it has strongly resisted any attempts to prevent it from assembling a strategic arsenal as large and as varied as the American one. For many years in the 1960s, the Soviet Union did not have long-range ballistic missiles that could be launched from submerged submarines. This was rectified early in 1968. For a shorter but still considerable period in the 1970s it did not have MIRVed ballistic missiles. This was rectified early in 1975. The point to be made is that, if the long-range cruise missile becomes a major component of the US strategic arsenal and if it has the hoped for perceptual impact, then the Soviet Union will feel obliged to acquire similar weapons for the sake of appearances. In other words strategic cruise missiles will become a 'must' for a superpower in the same way as SSBNs and MIRVed missiles in the past.

Turning now to the question of threat and countermeasures, there has been extensive commentary in the United States on the magnitude and character of the threat that the long-range cruise missile will pose for the Soviet Union. In a nutshell, the cruise missiles' small radar cross section and low-altitude capability would, as one Department of Defense official described it, ' . . . drive them [the Soviets] crazy and that's what they fear most because this big air defence system of theirs can't handle the cruise missile threat'.¹⁸ The second major dimension to the American argument was that the Soviet Union could be depended on to try to counter the cruise missile and that this endeavour would cost them a great deal more than the cost to the US of developing and deploying these weapons. In the jargon, the cruise missile would be a high leverage investment.

It is of some interest to examine these judgements. That is, what might have been the judgement on the part of the Soviet military on the measures that would have to be taken, or taken more quickly, exclusively or predominantly as a result of the US long-range cruise missile programmes? On the question of air defence it is important to remember, first of all, that the Soviet Union has faced a massive and sophisticated threat from US strategic bombers since the late 1940s. Thus, just as aviation has been the forte of American technology, air defence has been one of the few areas in which the Soviet Union has long been its equal. At the present time the Soviet air defence system consists of some 12,000 SAM launchers, 2,600 interceptor aircraft and about 10,000 radars, some of which can detect aircraft at long ranges.

To detect and track an object penetrating at very low altitude is very difficult, particularly over land. And this difficulty is greatly increased if the object possesses a small radar image or employs active electronic countermeasures to prevent defensive radars from determining its range and/or bearing with any precision. None of these attributes – low altitude, small radar cross section or ECM – represent new problems for Soviet air defence planners. The Strategic Air Command adopted low-level penetration as an optional mode of attack as early as 1957 and since the cancellation of the B-70 in 1962 USAF thinking on strategic bombers – the AMSA (Advanced Manned Strategic Aircraft) and the FB-III – has placed a high premium on low-altitude capability. Further, since 1969-70, the Soviets have had two reasonably well-defined weapons – the B-I and the SCAD (Subsonic Cruise Armed Decoy) – to help them determine the requirements for their air defence systems in the late 1970s and 1980s. Somewhat before the B-I and the SCAD, there was the SRAM (Short Range Attack Missile) which, being very small and fast (Mach 3-4), presented the most difficult defence problem of all.

The point being made, of course, is that the air defence community in the Soviet Union has not lacked challenges and challenges of a kind not markedly dissimilar from the cruise missile. Accordingly, one cannot say categorically that the American strategic cruise missile initiative will push the Soviet air defence effort in totally new directions and that certain costs can be identified as having been provoked exclusively by this new threat. To illustrate this point, it can be pointed out that the SA-10, expected to be deployed in 1979, is regarded as the biggest threat to the efficacy of the long-range cruise missile because of its high speed, manoeuvrability and active radar homing yet US sources all agree that this weapon was a response to the development of the B-1, not the cruise missile. The cruise missile, by virtue of its small radar image and low

altitude capability, undoubtedly presents the Soviet Union with a difficult and different air defence problem but the difference is one of degree, not of kind. Thus US assessments of what cruise missile defence measures will cost the Soviet Union are probably overstated because no allowance is made for the measures that are planned or underway in any case.

In the US view, an air defence system that is to have any chance of significantly blunting an attack by several thousand cruise missiles must have three components: (a) a SAM system such as the SA-10 deployed around all key targets to serve as terminal defence, (b) a large aircraft carrying a powerful radar that can detect objects flying at low altitudes and direct fighter aircraft to intercept them and (c) fighter aircraft that also have radars capable of picking up low flying objects plus air-to-air missiles capable of intercepting such objects. The costing of these systems is facilitated by the fact that the US has equivalent systems available or at an advanced stage of development, respectively, Patriot and Improved Hawk SAMs, the E-3A AWACS and the F-14 Tomcat with its Phoenix missile. American officials estimate that between 500 and 1,000 SA-10 batteries would be required at a cost of some \$30 billion. The number of AWACS aircraft required would fall between 50 and 100 costing \$5 billion and \$10 billion respectively for procurement alone. And finally, a force of more than 1,000 F-14-type aircraft would be needed at a cost of at least \$25 billion.¹⁹ Another Soviet air defence measure apparently related to the cruise missile is the tower-mounted radars observed under construction along the Soviet borders with Poland and Romania in 1977. More recently still, it was reported that similar radars were being tested in a mobile mode.²⁰ No cost estimates are available for this activity but, taking all these 'requirements' together and assuming the cost is spread over 10 years, it could be claimed that a dedicated Soviet defensive response to the cruise missile could absorb \$6-7 billion a year.

So much for the threat from bomber-launched cruise missiles. But what of the SLCM? Although it has slipped from the limelight and is currently depicted as a theatre rather than a strategic weapon it is still an active programme. Since September 1977 there has been broad agreement to the effect that deployed SLCMs would be limited to a range of 600 km during the two-year protocol to the SALT II treaty. As mentioned earlier, many believe it will be politically difficult for the United States to subsequently deploy the weapon in its full 2,000 n.m. range configuration, but if any group is acting on the assumption that this is in fact what will happen it is the Soviet defence community.

US defence officials have made much of the fact that the deployment of a few SLCMs on some SSNs would force the Soviet Union into a dispro-

portionate response because the fact of this limited deployment could not be established. Despite an abundance of openly available information on the US Navy's plans for the nuclear SLCM – two or three weapons per SSN – Soviet planners could never discount entirely the possibility that a significant fraction of the SSN force carried a full load of these weapons, that is, 20-plus per boat.²¹ Thus the question that was raised with respect to the ALCM can be asked again for the SLCM: what new defensive measures might the Soviet authorities feel compelled to undertake?

To develop a full answer to this question would entail an analysis of Soviet naval strategy. This is a subject that has attracted a great deal of attention in the last decade or so and one on which there are several competing schools of thought.²² For our purposes we can simply note the fact – accepted to varying degrees by virtually all observers – that the Soviet Union has shown a determination to mount a defence against the strategic threat posed by US sea-borne forces. In the 1950s this threat consisted of carrier-borne aircraft equipped with nuclear weapons in response to which the Soviet Union built a fleet of submarines and surface ships equipped with cruise missiles. During the 1960s the US replaced the carriers in this role with SLBMs, the range of which progressed rapidly from 1,200 n.m. for the Polaris A-1 to 2,500 n.m. for the Polaris A-3 and Poseidon missiles. In response, the Soviet Union moved to larger surface ASW platforms capable of sustained operations in distant waters and to nuclear-powered hunter-killer submarines. In 1979 the United States began the deployment of the 4,000 n.m. range Trident 1 missile but the Poseidon is also programmed to remain in the force at least through the 1980s.

In the US view, an increase in the range of SLBMs is valuable because it will vastly increase the ocean area relevant to the Soviet strategic ASW effort. In this regard, one of the first objections raised to the strategic SLCM proposal was that it contradicted the logic behind the multi-billion dollar Trident programme since the SLCM would, at best, have half the range of the Trident I. The official response was that adding the SLCM would make ocean areas both close to and distant from the Soviet Union relevant to their strategic ASW efforts but this rationale is not particularly forceful in view of the fact that Poseidon will continue to be deployed. In other words, as far as influencing the ocean areas in which the Soviet Union would have to look for US strategic submarines, deployment of the SLCM would not add materially to the Soviet problem. Another consideration that points in the same direction is that since the principle targets of American SSNs are the Soviet SSBNs the former have always been a priority objective of Soviet strategic ASW.

All this suggests that the SLCM threat will not cause the Soviet Union to do anything in the naval defence area that it is not already doing.²³ At the same time, however, the fact that nearly 100 US SSNs might become platforms for offensive strategic weapons can certainly be expected to generate strong pressures for ASW forces over and above those already planned. This expectation, strengthened by the fact that US claims that SSNs armed with nuclear land-attack SLCMs would not, in that role, be an alert force, is most unlikely to be of any comfort to the Soviet Union. The reason for this is as follows. The Soviet Union has moved even faster than the United States toward long-range SLBMs but, in contrast to the US philosophy, the objective is to permit these weapons to be deployed relatively close to the Soviet Union and thus facilitate the task of creating protected sanctuaries for them.²⁴ American SSNs, in fulfilling their primary mission of ASW are thus being drawn closer to the Soviet Union and are therefore more likely to be within striking range with their SLCMs at any given time.

The emphasis that US officials place on the cost of defending against the strategic cruise missile is generally made in the context of diverting Soviet military resources away from offensive capabilities. At the broader level, however, this relates to the question of the extent to which Soviet interest in arms control derives from economic considerations. It has long been apparent that with an economy some 50-60 per cent as large as the US the Soviet determination to match US military capabilities across the board would necessitate the diversion of a larger fraction of G.N.P. to defence. It is not possible, however, to be much more specific than this, at least not with a high degree of credibility. Determining the magnitude and composition of Soviet military expenditure has proved far more elusive than determining the number and characteristics of their weapons.²⁵ The degree of ignorance was quite dramatically illustrated early in 1976 when the Central Intelligence Agency, on the basis of evidence accumulated over a period of years, changed its assumption on the costs incurred in the Soviet Union to acquire and deploy sophisticated weapons and official US estimates of Soviet military expenditure (in roubles) doubled.²⁶ Whether or not in arms control negotiations the United States can or should exploit the fact that military activities are relatively more burdensome for the Soviet economy is a subject of dispute. Those who believe it can and should be cite this as one reason why the United States can negotiate on the premise that time is on its side. The opposing view, and the one that apparently prevails, is that the Soviet economy, by virtue of the fact that it is rigorously controlled and highly compartmentalised, is quite capable of sustaining the current level and rate of growth of military ex-

penditure; in short there are no compelling reasons to suppose that the Soviet Union is any more likely than the United States to compromise its ambitions because the associated military effort is too costly.

A final consideration that must be mentioned in this section is the Soviet attitude toward the possibility that long-range cruise missiles would be deployed as part of the NATO tactical nuclear deterrent. A ground-launched variant of the SLCM had been mooted at least since 1974 although its development was not initiated until early in 1977. Also, several European NATO countries expressed particular interest in such a weapon as early as 1975.

The Soviet attitude toward this dimension of the cruise missile threat is probably shaped predominantly by two considerations. The less important of the two – but still highly influential – is the fact that the GLCM would be a tactical nuclear weapon (TNW) capable of striking targets deep within the Soviet Union. Existing NATO TNWs, with the partial exception of the F-111s, have a rather marginal capability in this regard. The second factor, of far greater concern in the Soviet Union, is the prospect of the acquisition by the Federal Republic of Germany of long range striking power. For reasons that are not difficult to understand, Germany is reserved a special place in Soviet threat perceptions and one does not have to strain the imagination to visualise the Soviet Ministry of Defence presenting the following argument:

- (a) so long as the GLCM is deployed as a nuclear system the warheads will remain in U.S. custody,
- (b) but the Americans are already convinced that the GLCM can be made sufficiently accurate to be usable with a conventional warhead.
- (c) there is nothing to prevent the Germans developing and having exclusive control over a long-range cruise missile with a conventional warhead. If they receive technical assistance from the Americans this possibility may materialise in the not-too-distant future.²⁷
- (d) If the Germans decide to acquire nuclear weapons, possibly in secrecy, they will then have available an accurate long-range delivery system.

As we shall see, there is considerable evidence to suggest that the Soviet attitude toward the cruise missile in SALT was increasingly influenced by this proliferation factor rather than the strategic threat from US cruise missiles.

The Cruise missile in SALT

The question of limiting cruise missiles was raised briefly in SALT I. This is clear from the following exchange in the U.S. Congressional hearings on the defence budget for FY 1974:

Senator Hughes: Is it correct that the United States proposed and the Soviet Union tentatively accepted, approximately at the time of the third session of the SALT negotiations, a mutual ban on the development of strategic cruise missiles?

Defense Department: The US and the USSR in SALT I discussed cruise missiles of intercontinental range.²⁸

There is no information in the open literature on the context in which this issue arose. It is known that, at this third session in November-December 1970, the Soviet Union first insisted on the inclusion of US forward-based systems (FBS) and thereby opened a wide rift between the negotiating positions.²⁹ The Americans were pressing for limits on both anti-ballistic missile (ABM) systems and offensive weapons. The Soviet Union wanted to confine the negotiations to ABMs and indicated that they would only countenance limits on offensive weapons if the FBS were counted in the US total. It is possible that the Americans argued that the Soviet naval cruise missiles, particularly the SS-N-3 Shaddock, could be viewed as the equivalent of the longer-range US tactical nuclear systems deployed in and around Europe. This is sheer speculation however. As far as one can tell from the public record, cruise missiles did not again figure in the SALT discussions until October 1974 during Henry Kissinger's visit to Moscow to prepare for the Vladivostok summit. This is somewhat surprising in view of the visibility of the SLCM programme from June 1972 and its quite explicit orientation toward SALT. But although the pre-Vladivostok phase of SALT II can also be described as the pre-cruise missile phase, the subject matter of the negotiations during this period remain relevant to the present discussion. More important, perhaps, was the emergence in the United States of a notably more sceptical attitude toward SALT. Both these factors had a quite direct impact on the nature and intensity of the controversy over the cruise missile when this controversy surfaced early in 1975.

On the question of US attitudes towards SALT, it is clear that many Americans were troubled by the fact that SALT I permitted the Soviet Union some 40 per cent more ICBMs and SLBMs than the United States. In response, a Congressional amendment to the declaration authorising the President to approve the interim agreement on offensive weapons stipulated that future agreements must provide for equality between the United States and the Soviet Union in levels of inter-continental strategic forces. Further, a series of developments in 1972-1974 served to reinforce the impression in the minds of many people that the United States had been out-negotiated in SALT I and that the Soviet Union would exploit to the maximum the gaps and ambiguities in the language of the treaty.

An early development concerned whether the Soviet Union had 42 or 48 SSBNs in existence and under construction at the time SALT I was signed. The lower figure was the US intelligence estimate but President Nixon, at the last minute and over the objections of his chief negotiator, agreed to accept the higher number claimed by the Soviet Union. In August 1972 Senator Jackson disclosed that the US had confirmed the accuracy of its intelligence estimate.³⁰ Other developments interpreted by some as tests of US resolve and by others as indicative of Soviet disrespect for the spirit of SALT, included the following:

- (a) the construction of additional silos in 1973. It was explained that these were intended as launch control centres but not before the US had brought the matter up formally before the Standing Consultative Commission,
- (b) employing concealment measures to impede US verification efforts,
- (c) employing an air defence radar in an ABM mode.³¹

Beyond question, however, the development that most disturbed the Americans was the size of the Soviet Union's third-generation ICBMs. Throughout SALT I a major focus of US concern was the mammoth SS-9 Scarp ICBM. When the treaties were signed it was established that 313 silos for this weapon were completed or under construction and a clause in the agreement prohibited the replacement of 'light' ICBMs with 'heavy' ICBMs. It was also agreed that, in the process of replacement and modernization, the dimensions of ICBM silos would not be 'significantly increased'. Unfortunately, despite persistent US efforts, the Soviet Union refused to agree to a precise definition of 'light' and 'heavy' ICBMs and to what, exactly, would constitute a 'significant' increase in silo dimensions. On the latter issue there was a 'common understanding' that the dimensions of existing silos would not be increased by more than 10-15 per cent but it was not specified whether this was the permissible increase in depth, diameter or volume.³²

In response to this situation the US delegation opted to issue a unilateral declaration to the effect that 'the United States would consider any ICBM having a volume significantly greater than that of the largest light ICBM now operational on either side to be a heavy ICBM'.³³ Subsequently, the United States indicated that it understood the clause on the permissible increase in missile size to mean that '... the maximum volumetric increase in missile size ... cannot exceed approximately 32 per cent'.³⁴ As it happened, the Soviet Union violated this unilateral understanding but the US chose not to regard it as a breach of the terms of the interim agreement. The Soviet Union's SS-19 ICBM, one of four new ICBMs of which the United States became aware in the latter half of 1973, has an estimated volume of 100 cubic metres compared to 69 cubic metres for the weapon it would replace (the SS-11), a volumetric increase of some 45 per cent.³⁵

Quite apart from its significant military implication (the SS-11 accounted for some 60 per cent of the Soviet ICBM force) this development had a quite profound psychological impact. For most people it became clear why the Soviet Union had been so adamant in its refusal to specifically define light and heavy ICBMs.³⁶ This development confirmed the view, already well established, that while the Soviet Union would abide by the *letter* of agreements on arms limitation it was naive to assume that it was imbued with the spirit of this endeavour.³⁷

On the pre-Vladivostok SALT II negotiations themselves, it is now well known that the two sides took extreme positions at the outset and that two years of negotiations produced little in the way of reconciliation. It was mutually agreed that the objective for SALT II was a permanent agreement and one that covered weapons not included in SALT I, notably bombers and MIRVed missiles. But, as Paul Nitze described it, the two sides approached SALT II with markedly different interpretations of the meaning of the interim agreement.³⁸ The interim agreement specifically provided that its provisions were not to prejudice the scope or terms of a permanent agreement. The United States therefore presumed that a comprehensive agreement would be based on the principles of equality or essential equivalence. The Soviet view, on the other hand, was that the unequal missile launcher numbers in the interim agreement, having been granted to compensate for certain geographic and other (primarily technological) inequalities between the two sides, should be carried over essentially unchanged into the permanent agreement.³⁹

In addition to this quite fundamental divergence, the Soviet Union insisted, as it had indicated in 1971 that it would, that now a comprehensive treaty was

under negotiation the 700-odd US nuclear-capable aircraft deployed in Europe and on aircraft carriers in the European theatre should be counted against the US total. The pre-eminent US concern was quite different, namely, the Soviet lead in ICBM launchers and throw-weight and the counterforce potential therein once the Soviet Union acquired a deployable MIRV. This concern understandably increased markedly as the intelligence information came in on the throw-weight of the new ICBMs and when the Soviet Union tested its first MIRV in August 1973.

In the latter months of 1973 the US negotiating position on SALT was in some disarray. There were differences of opinion on whether 'equality' necessitated strict numerical parity in strategic forces.⁴⁰ There were also divisions on the question of comparing bombers with ballistic missiles. Some felt that the two delivery systems could be viewed as equivalent on a one-for-one basis and that equality in aggregate force levels should be the negotiating target. Others emphasised the differences between strategic delivery vehicles and argued for equality within types, especially ICBMs.⁴¹ Moreover, the two key persons on the US side were heavily pre-occupied with other matters, President Nixon with Watergate and Henry Kissinger with Vietnam and the Middle East.

Generally speaking, however, from about the third regular session of SALT II, which began in Geneva on 25 September 1973, the United States endeavoured to persuade the Soviet Union to address specifically the question of ICBM throw-weight, particularly that of MIRVed ICBMs. For its part, the Soviet Union professed not to see, or at least refused to concede, that ICBM throw-weight or the number of warheads of ICBMs was in any sense significantly different from other systems. Thus, on throw-weight they pointed to the US lead in bomber payload and on warheads they pointed to the US lead in MIRVed SLBMs. In addition they persisted both on the inclusion of FBS on the US side, and on general compensation for their geographic and technological disadvantages.

In March 1974 Kissinger went to Moscow to seek new parameters for the negotiations and overcome the deadlock in the regular sessions in Geneva. He is reported to have made two basic suggestions; first, to negotiate equal aggregate ceilings for the strategic forces with each side free to determine the mix or, second, to develop equality in ICBM throw-weight.⁴² Two variations on the latter theme were also offered; the United States would halt its MIRV deployment programme if the Soviet Union would limit the number of high throw-weight MIRVed ICBMs that it deployed and equal ICBM throw-weight could be confined to MIRVed systems with no limits on single-warhead missiles.⁴³ The Soviets objected to both proposals. They regarded equal aggregate ceilings as unfair in view of the US FBS and the fact that the UK, France

and China possessed nuclear forces directed against the Soviet Union. The suggestion to develop equal ICBM throw-weight was resisted on the grounds that it ignored the US lead on bomber payload. The only counter proposal was an offer by Brezhnev to extend the 1972 interim agreement plus limits on the number of MIRVed missiles that each could deploy. The latter proposal – reported to have been 1,000 MIRVed launchers for the Soviet Union and 1,100 for the United States⁴⁴ – reflected the Soviet view that MIRVed missiles should be controlled by number rather than throw-weight. But, for the United States, 100 additional launchers was inadequate compensation for the prospective magnitude of the gap in ICBM throw-weight.

At the July 1974 summit in Moscow the two sides agreed to abandon the ambition of negotiating a permanent agreement in favour of a 10-year (1975-1985) agreement. But this lower goal did little to reduce the distance between the two sides. President Nixon's proposal included the following:⁴⁵

- (a) mutual limits on the number of MIRVed ICBMs and SLBMs with the US granted a higher ceiling to compensate for the greater throw-weight of Soviet missiles. The proposed figures were 1,050 for the US and between 550 and 700 for the Soviet Union.⁴⁶
- (b) some reductions in the number of single warhead ICBMs as a move toward greater reliance on SLBMs on grounds that this would reduce mutual concern about a first-strike counterforce threat and
- (c) no restrictions on bombers and SLBMs.

The Soviet counter-proposal was a familiar one:⁴⁷

- (a) an equal number of MIRVed missiles on each side. Brezhnev reportedly indicated again that the minimum number the Soviet Union would entertain was around 1,000,⁴⁸
- (b) the Soviet Union would be permitted to retain its overall lead in numbers of missiles,
- (c) the Trident and B-1 programmes, being new systems not yet in production, should be stopped,
- (d) FBS should be counted in the US total.

In these circumstances it is scarcely surprising that the fifth regular session of the negotiations – September 18 to November 5, 1974 – was quite unproductive. The first movement came in October. Kissinger journeyed to Moscow again with

a revised set of SALT proposals and with the knowledge that the impending summit at Vladivostok would achieve nothing if existing differences were not substantially narrowed. Kissinger is reported to have offered the Russians two broad choices. The first provided for an equal aggregate number of 2,000 central strategic delivery vehicles, including an equal ceiling of 1,000 MIRVed missiles plus sublimits on Soviet heavy ICBMs and American bomber-launched missiles. The second was to offer the Soviets a greater number of non-MIRVed delivery vehicles offset by more MIRVed launchers for the United States.⁴⁹ Kissinger found the Soviet posture on SALT a good deal less intractable than in July and, as the negotiations progressed, they expressed interest in the first alternative above.

There has been considerable speculation on the reasons for the flexibility in the Soviet position that emerged between July and October 1974. Some suggest that the Soviets had had their own internal controversy on what sort of SALT II treaty was acceptable and that one faction had prevailed or some consensus was reached. Others were inclined to stress the possibility that the Russians became convinced that continued stalemate in SALT would threaten detente and that they were willing to bend on the former in order to preserve the latter.⁵⁰ Our particular interest is whether the cruise missile played any part in this process.

The reference to bomber-launched missiles in Kissinger's first proposal was the first US attempt to meet (or perhaps to test) the Soviet argument that its lead in ICBM throw-weight was matched by the US lead in bomber payload. The question is whether the suggested trade-off between Soviet heavy ICBMs and US bomber-launched missiles was a significant factor in the Soviet 'interest' in the proposal as a whole. It is impossible to offer more than a speculative answer but it is worth mentioning that the first Soviet reaction to the strategic cruise missile programmes came in an article in *Krasnaya Zvezda* on May 30, 1974. That article, devoted primarily to the Harpoon and SLCM missiles, concluded that the US plans for the latter weapon were ' . . . by no means just talk'.⁵¹ One could tentatively hypothesise that, until about mid-1974, the Soviet Union viewed the strategic cruise missile programmes as SALT 'bargaining chips' – a quite reasonable view – and refused to be drawn. But as these programmes took hold in the United States the Soviets began to seriously assess their military implications and concluded that they could pose a major new threat. One can also reason in the other direction, namely, that the United States, during the latter half of 1974, received signals from the Soviet Union that led it to believe that strategic cruise missiles could prove to be more powerful negotiating instruments than had been presumed up to that time.

In any event there was a good deal of optimism that a bargain could be struck at Vladivostok in November 1974. The Soviets had not subscribed to Kissinger's first proposal in its entirety. They indicated a preference for higher ceilings than those proposed by the United States and continued to insist on some compensation for American FBS and for the British and French nuclear forces.⁵² But compared to the situation earlier in 1974 the improvement was little short of dramatic.

The broad details of the accord that emerged from the Vladivostok summit are well known. In effect it was a statement on what a 10-year SALT II treaty was intended to look like. As of this date (December 1979) the text of the accord has not been made public but Thomas Wolfe has pieced together a list of the items agreed upon:⁵³

1. An equal overall ceiling of 2400 strategic delivery vehicles for each side, to include ICBM's, SLBM's, and bombers.
2. An equal number of 1320 MIRVed missile launchers for each side, with no limit on throw-weight.
3. The counting of any missile tested with MIRV against the MIRV ceiling, if the missile should be deployed.
4. Freedom to mix within the agreed aggregate of 2400 delivery vehicles.
5. A sub-limit of 313 on heavy missiles and no new silo construction, provisions to be carried over the Interim Agreement of May 1972.
6. Deployment of land-mobile missiles and some types of bomber-launched missiles permitted, but to be included in the overall ceiling of 2400 delivery vehicles.
7. Apparent dropping of the long-standing Soviet demand to account for FBS in any agreed aggregate of central strategic delivery systems.
8. No constraints on modernization to preclude such measures as improvements in accuracy and deployment of new systems still under development, e.g. the B-1 bomber and Trident submarine.
9. Duration of the new agreement to be from 1975 to 1985, with relevant provisions of the Interim Agreement remaining in force until entry into effect of the new agreement in October 1977.
10. Following conclusion of the new agreement, further negotiations on 'possible reductions of strategic arms in the period after 1985' to begin 'no later than 1980-1981'.

It became apparent very quickly that several key details had been agreed upon only in the broadest terms and it was acknowledged that substantial negotiations would be required to convert the accord into a formal treaty. However, on the question of bomber-launched missiles (item 6 above) the two sides had conflicting interpretations of what had been agreed. The Soviet view was that this item covered both ballistic and cruise bomber-launched missiles while the Americans said that it only covered the ballistic variety. As I shall argue in a moment, the weight of the evidence supports the Soviet view. The point to be stressed here is that largely because of the cruise missile issue the Soviet Union entered the post-Vladivostok SALT negotiations in a rather bitter frame of mind. The SALT negotiations are clearly influenced as much by atmosphere and attitudes as by substantive matters and, in my judgement, the resentment caused by the split on cruise missiles was a major factor in delaying SALT II, both in itself and because the delay allowed evolving weapons technology to create new obstacles to an agreement.

It had been agreed at Vladivostok that the Soviet Union would draft the memorandum on the accord and submit it to the United States for approval. Early in December 1974 there were rumours that the United States was seeking some changes in the Soviet draft and it can be presumed that these changes included the cruise missile question.⁵⁴ In his December 3 background briefing on the accord, Kissinger listed as one of its 'essential elements' that fact that '... airborne missiles of a range of more than 600 [kilometers] will be counted as individual missiles, though not as MIRV's'.⁵⁵ At no point did he specify the type or types of missiles involved, a curious oversight in view of the fact that both countries actually possessed ALCMs with a range in excess of 600 km – the Soviets the AS-3 Kangaroo and the Americans the AGM-28B Hound Dog. In an editorial on the following day the *New York Times* cited what it regarded as essentially a ban on long-range air-launched *ballistic* missiles as the single virtue of the accord.⁵⁶

The basis on which this presumption was made is far from clear. There is no question that air-launched cruise missiles were discussed at Vladivostok. Malcolm Currie, the Director of Defense Research and Engineering at the time, was quite explicit on this: 'I can ... assert that the Soviet Union is aware of these programmes and has some deep concerns as expressed to people that were at Vladivostok'.⁵⁷ Moreover, the ALCM was the *only* long-range bomber-launched missile under development in the United States. No long-range bomber-launched ballistic missile was even being contemplated at the time. The one piece of evidence that supported the American position was that the original offer to

limit bomber-launched missiles was made in relation to limits on Soviet heavy ICBMs⁵⁸ and no limitations on these weapons beyond those imposed in SALT I were agreed to at Vladivostok. Nevertheless, since the ALCM was discussed at Vladivostok and since it was the only new long-range bomber weapon in sight, the Soviet interpretation seems entirely justified. And what undoubtedly added to the Soviet ire was their perception that they had made very substantial concessions indeed to make the Vladivostok accord possible, above all, in agreeing to forego compensation for the British and French nuclear forces and for the US forward-based nuclear weapons.

In the United States, the ALCM had acquired some strong supporters by this time, though mostly from anti-B-1 factions. At a DSARC (Defense Select Acquisition Review Council) meeting on cruise missiles in December 1974, an attempt was made to cancel the Air Force's short-range ALCM and replace it with an air-launched version of the longer-range SLCM. The attempt failed largely because the differing constraints on the dimensions of the two weapons were held to justify separate development. In addition, as Malcolm Currie indicated, it was decided that, in the context of bargaining in SALT, it would be advantageous to have two visible strategic cruise missile programmes.⁵⁹

The regular SALT negotiations resumed in Geneva on 31 January, 1975. By mid-year, if not sooner, the talks were again essentially deadlocked. The Soviets insisted on their interpretation of Vladivostok on the cruise missile while the Americans became progressively more adamant in their view that the new Soviet medium bomber – the Backfire – be counted as a strategic delivery vehicle. Each side argued that unless its position prevailed the Vladivostok ceiling of 2,400 strategic delivery vehicles would become meaningless. The third area of contention, originally thought to have been in the zone of agreement of Vladivostok, was the verification of MIRVed missiles. Prior to Vladivostok, the US had determined that none of the new Soviet ICBMs could be deployed without verifiable modifications to the existing silos. Therefore, provided only MIRVed versions of the new weapons were deployed, the verification of MIRV limits was possible. The Soviet Union, however, opted, in the first instance, to deploy a single-warhead version of its large SS-18 ICBM.

In this situation, with Kissinger rumoured to be flexible on the cruise missile/Backfire impasse, there was intensive lobbying to prevent US concessions. Senator Jackson and his supporters argued that the United States could not afford to agree to any restrictions on the cruise missile so long as the throw-weight of Soviet missiles remained unrestrained. In October 1975 Secretary of Defense Schlesinger reported that 'refined' intelligence on the Backfire confirmed

its strategic capability and thus its accountability under the Vladivostok ceilings.⁶⁰ On cruise missiles, Schlesinger resisted concessions at SALT because he saw a major role for these weapons in conventional applications and did not want this potential to be inhibited.⁶¹ For its part, the Soviet Union was linking any accommodation on MIRV verification and even restraints on MIRV deployment to US concessions on the cruise missile.⁶²

The first attempt to break the deadlock came with a US proposal handed to Foreign Minister Gromyko in New York on 21 September, 1975. It was suggested that an equal number of cruise missiles and Backfires be permitted *above* the Vladivostok ceilings.⁶³ In addition, the US proposed that the cut-off point for cruise missile range be in the region of 950-1,250 miles rather than the 375 miles (600 kilometers) the Soviets preferred.⁶⁴ The Soviet response to this proposal – an outright rejection – came on 5 November 1975.⁶⁵ Three days earlier President Ford had dismissed Schlesinger from his post as Secretary of Defense. Schlesinger and Kissinger had clashed frequently on US negotiating strategy in SALT and their conflicting opinions on how to handle the cruise missile issue probably contributed to Ford's determination that one of them had to go.

The next attempt to bring about some movement in the negotiations came in January 1976. The Soviets had discreetly encouraged the Americans to suggest some new ideas and supported a Kissinger visit to Moscow to talk about them. Accordingly, on 14 January 1976, the Soviet Ambassador in Washington was given a set of proposals to permit the Soviet leadership to study them before Kissinger arrived. The US proposals were essentially similar to those made on 21 September 1975 – and which the Soviet Union rejected – but with additional constraints on numbers and range for cruise missiles. Specifically, the US would be permitted (a) GLCMs with a maximum range of 300 miles, (b) SLCMs with a maximum range of 1,200 miles, (c) ALCMs with a maximum range of 1,500 miles, (d) a maximum of 200 ships and 250 long-range bombers as cruise missile platforms and (e) 75 FB-111-class bombers over and above the Vladivostok ceiling of 2,400. The Soviet Union would be permitted 275 Backfires over the Vladivostok ceiling provided they were not armed with cruise missiles.⁶⁶

Clearly, there was very little in this proposal that would give satisfaction to the Soviets. First of all, they insisted that the Backfire was not a strategic weapon and therefore refused, on principle, to limit the aircraft in the SALT context. Secondly, the details of the US proposal on cruise missiles could not be verified. It was, at the time, quite conceivable that all three variants would look exactly the same even under close examination. Moreover, while it might

be possible to monitor very roughly the number of ALCMs and GLCMs deployed, the deployment of cruise missiles on platforms as large as major warships would introduce an intolerable margin of error.

When Kissinger arrived in Moscow the negotiating atmosphere was somewhat clouded by the Soviet-Cuban involvement in Angola. In addition, his negotiating freedom had been reduced by stiffening opposition in the United States to major restrictions on cruise missile ranges.⁶⁷ Although, during the course of 1975, the cruise missile and Backfire issues came to be seen as linked — a strategy favoured by Schlesinger and F. Charles Ikle, then director of the US Arms Control and Disarmament Agency — the developing appreciation for the flexibility of the cruise missile in the US (and in NATO generally) led to the view that these weapons were 'worth' far more than restrictions on the Backfire.

The counter-proposal that awaited Kissinger in Moscow reflected a significant change in Soviet negotiating strategy. One component was familiar, a ban on land- and sea-launched cruise missiles with a range in excess of 600 kilometers. One source suggests that the Soviets also insisted that no submarines should be armed with cruise missiles and that only 25 US surface ships could carry them.⁶⁸ Two other suggestions, however, were distinctly new. First, the Soviets proposed to permit air-launched cruise missiles with ranges up to 2,500 kilometers (approximately 1,500 miles), provided the carrier aircraft was counted as a MIRVed system. Second, they proposed to reduce the Vladivostok ceilings to about 2,200 but to leave the Backfire unaccountable. It was also reported that the Soviets offered to forego an air-refuelling capability for the Backfire and not to base the aircraft in parts of the Soviet Union closest to the United States.⁶⁹

During the negotiations Kissinger is reported to have held out for 25 surface ships with 10 launchers each for cruise missiles with a range in excess of 600 kilometers.⁷⁰ The Soviets rejected this but it is also surprising that Kissinger chose to haggle over the surface ships because these had always been the least favoured platforms for strategic or theatre nuclear land-attack cruise missiles. Logically, he should have pushed for higher range limits for the submarine and land-based versions.

It is interesting to note that, in these January 1976 negotiations and to some extent even in September 1975, SALT was looking further ahead on the ALCM than was the Pentagon, or at least the Air Force. From mid-1973, when the ALCM originated, to January 1977, the Air Force was developing the 1,300 km-range ALCM-A with the longer-range ALCM-B a fairly distant prospect in the unlikely event that the B-1 would prove incapable of handling future Soviet air defences. In the SALT context, however, it appears to have been decided in

principle by the end of 1975 that the United States would have an air-launched cruise missile with a genuine standoff range capability.

In the immediate aftermath of Kissinger's Moscow visit there was substantial confusion as to what, if anything, had been firmly agreed. In an editorial early in February 1976 the *New York Times* claimed that the United States had agreed to limit ALCM range to 2,500 kilometers and to count ALCM carriers as MIRVed systems.⁷¹ Two weeks later Leslie Gelb reported that the following issues had been 'virtually resolved'.

- (a) the verification of MIRV limits on the principle established at Vladivostok,
- (b) any missile with a larger silo or more throw-weight than the SS-19 would be considered a 'heavy' missile,
- (c) sea-launched cruise missiles with a range exceeding 600 kilometers to be banned,
- (d) ALCM to be limited to 2,500 kilometers and ALCM carriers to be counted as MIRVs,
- (e) The United States would deploy cruise missiles with a range greater than 600 kilometers *only* on strategic bombers.⁷²

It soon transpired that even the phrase 'virtually resolved' was too strong. It seems that Kissinger was handed a revised Soviet proposal just prior to his departure from Moscow. The contents of this proposal are not openly available but the US reply, delivered on 16 February 1976, suggested that a SALT II treaty be limited to what was already agreed and that the Backfire and cruise missiles be deferred to SALT III.⁷³ The Soviet response came in March: all cruise missiles with a range in excess of 600 kilometers deployed on submarines or surface ships must be counted against the Vladivostok ceilings.⁷⁴

It will be recalled that the nuclear-armed SLCM was reclassified as a theatre land-attack weapon at about this time. If the Soviets were advised of this move, and it is reasonable to suppose that they were, they were obviously unimpressed.

What appears to have happened is that, in Moscow, Kissinger agreed to the package deal listed above subject to it being approved when he got home. And, as ex-President Ford described it much later, several factions in Washington, notably the Department of Defense, were highly critical of the deal.⁷⁵

Thus, by April 1976, SALT was again deadlocked. The Presidential election process was well underway and Ronald Reagan, Ford's most serious opponent until the late emergence of Jimmy Carter, was using the issues of national

security and the Soviet threat to good effect. Ford had earlier hoped for a SALT II treaty in 1976 and had generally supported Kissinger in the latter's inclination to be flexible on the cruise missile and the Backfire. Now he was persuaded by those who argued that the United States had done all it could to push SALT forward. To continue to take the initiative with further new proposals would look bad politically and probably encourage the Soviets to stall until an even more advantageous proposal was put to them.

The regular SALT sessions in Geneva – which consumed about 8 months of 1976 – produced nothing in the way of new proposals. Moreover, a number of developments during this year combined to make the prospects for SALT II increasingly bleak. The expanding Soviet-Cuban activities in Africa were widely viewed in the United States as a violation of the spirit of detente. The deployment of MIRVed ICBMs in the Soviet Union was in full swing and the argument that a SALT II treaty along Vladivostok lines would not prevent them from acquiring a theoretical first-strike capability against US ICBMs gathered strength. Similarly, the Soviet Union was steadily building up its SLBM force to the limits established under SALT I. By late 1975 the Soviets had deployed more than 740 SLBMs on modern SSBNs and early in 1976 there was a short-lived controversy over the fact that the dismantling of older ICBMs and SLBMs was proceeding more slowly than the deployment of new SLBMs. Then, in July, as noted earlier, President Ford revealed that the Soviet Union had deployed or was about to deploy the SS-20, a mobile, MIRVed IRBM. Although US officials were concerned primarily because the SS-20 appeared to be a scaled-down version of the SS-16 ICBM they were also responsive to intensified pressure from other NATO countries to the effect that the long-range ground-launched cruise missile was now even more vital for the preservation of a military balance in Europe. These, and many other developments, might be said to have coalesced into President Ford's unprecedented decision to adopt the Team A/Team B approach for the production of the National Intelligence Estimates for 1977. The resulting assessment of the Soviet threat was the most sombre in a decade.

In January 1977, a DSARC meeting on cruise missiles approved continued development of all existing variants. The meeting also approved development of the GLCM and gave the long-range ALCM-B priority over the ALCM-A. The Carter Administration transition team apparently expressed some concern over these decisions in that they might prejudice the rapid conclusion of a SALT II treaty.⁷⁶ On the other hand, there were several indications that the cruise missile was now recognised as the United States' most powerful negotiating instrument. This being the case, the appropriate *quid pro quo* for limitations on the cruise missile would be limitations on Soviet ICBM throw-weight since, to the United States, this was by far the most disturbing feature of the Soviet

strategic forces. Paul Warnke, President Carter's nominee for the post of chief US negotiator at SALT, indicated that he would strive for such a bargain and other administration officials acknowledged that this was a key element of US strategy at SALT.⁷⁷

At his first formal press conference as President, Carter indicated that he would be willing to go for a quick SALT II treaty that excluded cruise missiles and the Backfire⁷⁸ but it was already known that additional proposals were being drawn up.⁷⁹ A team headed by Secretary of State Vance and Paul Warnke submitted these proposals to the Soviets in Moscow in March 1977. The broad substance of the main proposal — a comprehensive package providing for major reductions in the ceiling and sub-limits established in Vladivostok — had been made public by President Carter prior to Vance's departure for Moscow. As revealed subsequently, the philosophy behind this move was to expose the Soviet political leadership directly to the main thrust of the proposal without the intervention of the Ministry of Defence.

President Carter's national security advisor, Zbigniew Brzezinski claimed that the comprehensive proposal was designed to achieve 'parity in the first instance, stability in the second instance'.⁸⁰ The main elements of the proposal were as follows:⁸¹

- (a) the ceiling on strategic delivery vehicles would be reduced from 2,400 to 1,800-2,000,
- (b) the ceiling on MIRVed missiles would be cut from 1,320 to 1,100-1,200 of which only 550 could be ICBMs and of which again only 150 could be 'heavy' ICBMs. Reportedly the US did not propose to count bombers armed with cruise missiles as MIRVed systems,⁸²
- (c) both sides would forego mobile ICBMs, the SS-16 for the Soviet Union and the MX for the United States. In addition the US would seek special arrangements to prevent rapid or covert conversion of SS-20 IRBMs to ICBMs,
- (d) cruise missiles with a range not usually considered strategic would be allowed without restrictions,⁸³
- (e) if the lowest ceiling on strategic delivery vehicles (1,800) was accepted then the Backfire, if the number deployed exceeded about 100, would become significant and the US would seek special arrangements to inhibit its strategic capabilities,
- (f) the flight testing of ICBMs and SLBMs would be limited to six per year for each type.⁸⁴

The second US proposal, indicated to be a distinctly second-best solution, was to stay with the Vladivostok ceilings and defer the Backfire and cruise missiles to SALT III. The Soviet Union angrily rejected both proposals, primarily on the grounds that they appeared to have been drawn up in ignorance of what had been agreed at Vladivostok and in the negotiations in 1975 and 1976. Foreign Minister Gromyko, provoked into a rare press conference, insisted again that long-range cruise missiles had been stopped at Vladivostok. He also warned that any significant reductions in the Vladivostok ceilings would, as far as the Soviet Union was concerned, re-open the issues of US forward based systems and the nuclear forces of the UK and France.⁸⁵ Commentary in *Pravda* reiterated these points and also referred to a formula that had been agreed to in 1976 whereby bombers armed with long-range cruise missiles (i.e. more than 600 km) would be counted as MIRVs.⁸⁶ President Carter, in a press conference after the Soviet rejection of his proposals, felt obliged to make the following remarks:

Both President Ford and Secretary Kissinger have maintained publicly, and to me privately, that there was never any agreement on the part of the United States to contain or to prohibit the deployment or development of cruise missiles . . .

Two and a half years ago or so, when [the Vladivostok talks] took place, the cruise missile capability was not well-understood and there was no detailed discussion at all of the cruise missile. The Soviets claim that when they did discuss air-launched missiles they were talking about cruise missiles. Secretary Kissinger said that he was not talking about cruise missiles.⁸⁷

Apart from these issues, it is not difficult to see reasons for the Soviet objection to Carter's comprehensive proposal. Most particularly, this proposal would have penalised the Soviets most severely in the area where they are strongest, namely, ICBMs. Nor should it be forgotten that the Strategic Rocket Forces are a separate service in the Soviet Union with land-based ballistic missiles as the sole rationale for their existence. Moreover, the US proposal would have pushed both sides to a far greater dependence on sea-based strategic forces. The United States regards this as stabilising but the Soviet Union is even further behind technologically in this area than in ICBMs and has geographic disadvantages as well.

In May 1977, at the regular SALT sessions in Geneva supplemented by three days of talks between Vance and Gromyko, the two sides agreed on a new framework for a SALT II accord, essentially an amalgam of the Soviet preference for Vladivostok and the US proposals for more comprehensive restrictions:

- (a) a treaty lasting through 31 December 1985 based on the Vladivostok ceilings or slightly lower ceilings.
- (b) a protocol which, for a period of three years, would provide for some constraints on the more contentious issues, that is, cruise missiles, the Backfire, mobile ICBMs and ICBM throw-weight.
- (c) a statement of principles to guide the negotiation of SALT III.

A proposal along these lines advanced by the United States provided, under the treaty, for a 10 per cent cut in the Vladivostok ceilings, and, under the protocol, for a limit of 600 km on tests for the sea- and ground-launched cruise missile, a freeze on the replacement of SS-9 ICBMs with SS-18s,⁸⁸ limits on the production rate of the Backfire and a ceiling of 250 on US aircraft armed with cruise missiles but these were not to be counted as MIRVs.⁸⁹ Prior to these talks, Soviet sources had indicated that a 10 per cent cut in the Vladivostok ceilings and limits on the Backfire were negotiable but that the Soviet Union would not compromise on the sea and ground-launched cruise missiles.⁹⁰ In addition the Soviets insisted that cruise missile limitations be included in the treaty rather than in the protocol.

Congress continued to pressure the administration for greater involvement in the SALT process. The acrimonious debate in February 1977 on Paul Warnke's nomination and the 58-40 vote confirming his appointment reflected the Senate's determination to play a visible and independent role in shaping SALT II. Now, in May 1977, Senator Jackson announced the administration's agreement to use the Arms Control Subcommittee, of which he was chairman, as the principle medium for Executive-Congressional deliberations on SALT. Shortly afterwards Vice President Mondale announced the appointment of 39 senators and congressmen as advisors to the US SALT delegation. The Soviet Union, predictably enough, objected strongly to these arrangements. Their preference had always been to keep the details of the negotiations confined to as small a number of people as possible.

The next major event in the SALT saga was the cancellation of the B-1. Administration officials had indicated earlier that the B-1 decision was tied to SALT at least to the extent that if the range of the ALCM was to be limited to

2,500 km it could not reach some 20-30 per cent of the targets in the Soviet Union and the 'requirement' for the B-1 was thus strengthened.⁹¹ Accordingly, shortly after the decision was taken, the Joint Chiefs of Staff formally requested that the range limit on cruise missiles be raised to 3,500 km.⁹² On the political front the B-1 decision was predictably controversial. Although the aircraft had become increasingly unpopular and Carter was justifiably confident that the Congress would uphold his decision it still had powerful supporters. The most bitter criticism, however, was not so much that the B-1 was vital and that there were no equally effective alternatives but that the weapon had been dropped unilaterally rather than bargained away in SALT. At the press conference announcing his decision, Carter denied any hopes that it would make the Soviets more conciliatory in SALT.⁹³ It was just as well that he did because the Soviets saw nothing reassuring in the demise of the B-1. Rather, they saw the decision as the point of no return for the long-range cruise missile, the weapon they felt had been banned in November 1974.

As a counterpoise to the cancellation of the B-1, Carter was reassuring on the ALCM, particularly that the weapon's effectiveness would be protected in SALT. In what almost amounts to Freudian slip he said; 'We have a fairly compatible position with the Soviets on maximum range of air-launched cruise missiles carried over from the Vladivostok discussions'.⁹⁴ He also reiterated that the United States did not believe that bombers armed with cruise missiles should be counted as MIRVs.⁹⁵

Despite the fact that the more contentious issues could now be relegated to the 3-year protocol, the two sides were still too far apart to permit the regular SALT sessions to make any headway. The next movement came in September 1977 during talks in New York and Washington between Gromyko and Vance. Gromyko also met with President Carter. These talks produced some important new figures on ceilings and sub-limits for the treaty and some new elements for the protocol. According to one account the outcome was as follows:

For the treaty:

- (a) a ceiling for strategic delivery vehicles of 2,160-2,250,
- (b) the ceiling on MIRVs (1,320) would include missiles *and* bombers armed with cruise missiles. Of this total a maximum of 1,200-1,250 could be missiles and only 800-850 could be ICBMs. Further, the Soviet Union would be permitted to replace *all* its SS-9s with SS-18s.

For the protocol:

- (a) the 2,500 km range limit for the ALCM was made temporary by putting it here rather than in the treaty,
- (b) the 600 km range limit on SLCM and GLCM would apply only to deployment. Development and testing to longer ranges would be permitted,
- (c) the deployment of new weapons would be prohibited during the protocol except for SLBMs that had already been tested. The Soviet Union had two of the latter (the SS-NX-17 and SS-NX-18) and the United States one (Trident I).⁹⁶

On the other hand, it seems that two major issues cropped up and were left unresolved. One of these was the question of what is a 'new' weapon and the other was the Soviet insistence that precise language be written into the treaty to prohibit the transfer of strategic weapon technology to third parties.⁹⁷ Very clearly this addressed the transfer of cruise missile technology to European NATO countries.

In any event, these new negotiating parameters were taken up at the regular sessions in Geneva and, for one thing, the permissible number of MIRVed ICBMs was fixed at 820.⁹⁸ This piece of information was supplied by the Department of Defense in a statement intended to counter the severe criticism directed at the arrangements arrived at in September. In particular, Paul Nitze had charged that SALT II, as it was shaping up, could leave the Soviets with a 10-to-1 lead in ICBM throw-weight and that the ban on new weapons in the protocol made it additionally doubtful whether the MX ICBM would ever be developed. The basis for this criticism is easily illustrated. The Carter Administration's original comprehensive proposal in March 1977 was clearly designed to avert, or at least defer for a considerable time, the point at which US ICBMs would become highly vulnerable. The key numbers arrived at to achieve this objective were 550 MIRVed ICBMs of which only 150 could be heavy ICBMs. The limits now envisaged were 820 MIRVed ICBMs of which 313 could be heavy ICBMs. To support its case that SALT II would be a balanced agreement, the Department of Defense listed the concessions made by the Soviet Union in September-October 1977. One of these had not previously been made public, namely, that the United States could deploy up to 120 bombers armed with cruise missiles without counting them under the 1,320 limit on MIRVed systems.⁹⁹ In the September talks, Vance had continued to push for 250 bombers armed with cruise missiles outside the MIRV limit so this seems to have been a simple compromise on a 50:50 basis.¹⁰⁰

In Geneva during October-November 1977, the two sides also continued to haggle over the technology transfer issue. Although these discussions were not conclusive Defense Secretary Brown told a meeting of NATO defence ministers in December 1977 that there was nothing in the proposed treaty that would prevent the eventual deployment of long-range cruise missiles in Europe if the Alliance thought this desirable.¹⁰¹ Moreover, Brown asserted that 'the U.S. has made no commitment not to transfer cruise missile technology to its European allies during [the protocol] period'.¹⁰²

Early in the new year it became apparent that SALT II was still a distant prospect. If anything the number of issues dividing the two sides had grown rather than diminished. Early in February 1978 a major statement on SALT in *Pravda* indicated that the September 1977 arrangements were coming unstuck as had the Vladivostok accord three years earlier.¹⁰³ Although each side said the other was responsible for the continuing delay the evidence suggests that it was the United States that had become the more intransigent of the two. By this time it had become a distinct possibility that if a SALT II treaty, as then envisaged, was submitted to the Senate for ratification the requisite two-thirds majority would not be available.¹⁰⁴ The Carter Administration was therefore obliged to display an inflexible attitude on the existing unresolved issues and to propose new limitations on the Soviet Union that would alleviate the principal objections to the SALT II treaty as it was then framed. The initiatives taken in the latter area were the pursuit of tighter controls on the permissible modernisation of existing strategic weapons and treaty language that would in no way inhibit the development and deployment of the MX as a mobile ICBM.

The talks in Geneva in January 1978 revealed major differences on two old issues – cruise missiles and the Backfire – and on the permissible modernisation of existing weapons. On modernisation, the Soviet Union proposed a 3-year ban on new MIRVed ICBMs and SLBMs while the US sought to ban all new ICBMs (MIRVed and single-warhead) while leaving SLBMs, bombers and cruise missiles unrestricted.¹⁰⁵ On the Backfire, it seems that the United States was not prepared to accept informal pledges regarding rates of production and areas of deployment. Warnke made it clear that the US wanted arrangements that would be legally binding.¹⁰⁶ On cruise missiles, the Soviet Union continued its campaign against the SLCM and GLCM by insisting on tight language to prevent the US transferring cruise missile technology and, in addition, now proposed that the deployment of these weapons close to Soviet borders be banned.¹⁰⁷ The United States, for its part, was seeking language that would permit the deployment of ALCMs on heavy bombers *and* other types of

aircraft, particularly, of course, wide-bodied transports. That is, the United States wanted to be free to unilaterally declare any aircraft to be a heavy bomber for the purposes of SALT. *Pravda* argued that if this were allowed SALT II would be reduced to a 'scrap of paper' which the Soviet Union would not sign.¹⁰⁸ The Soviet position, apparently, was that ALCMs could be deployed only on heavy bombers or other aircraft *specifically designed* for the purpose. Moreover, if the US opted to develop a high-capacity cruise missile carrier, the Soviets argued that each such aircraft should count as more than one MIRVed system. If a B-52 with 20 ALCMs counted as one MIRV, a carrier with 60 ALCMs would count as 3 MIRVs.¹⁰⁹

In addition, the US had, apparently since September 1977, re-opened the question of the 2,500 km range limit on the ALCM. The US sought to make it clear that the 2,500 km referred to the shortest distance between launch point and target, not to the total distance that the ALCM could fly. It will be remembered that an important feature of the TERCOM guidance system was that it permitted cruise missiles to be programmed to fly around defences or natural obstacles. Thus, the optimal flight to a target 2,500 km from the launching aircraft may require the missile to fly a somewhat greater distance. Reportedly, the Department of Defense sought an upper limit on the range capability of the ALCM of 3,750 km while ACDA felt that 3,250 km was adequate.¹¹⁰

In an effort to break the new deadlock, Secretary Vance journeyed to Moscow again in April 1978. The principal outstanding issues were identified as the exemptions regarding new ICBMs and SLBMs, the Backfire and the transfer of cruise missile technology. The Soviets had already made it clear that they would insist on the right to deploy one new ICBM and two new SLBMs during the protocol period and Vance had been instructed that he could be flexible to this extent if the Soviets continued to object to a complete deployment ban on new ballistic missiles during the 3-year period.¹¹¹ Vance also offered a new variant of the special arrangements for the Backfire that would accompany SALT II, namely, a limit on the total number that could be produced plus a requirement that one-half of this number remain committed to the anti-ship role.¹¹²

One source reports that Vance made little substantive progress on the modernisation question and none at all on the Backfire which the Soviet Union still insisted had no strategic application.¹¹³ The main achievement of his three days in Moscow was a tentative Soviet offer to drop its demand that SALT II specifically ban the US from transferring strategic weapons technology to its European allies.¹¹⁴ The compromise was that NATO's access to weapons banned or limited under SALT II would be constrained by a general clause on

'non-circumvention' in the treaty. This compromise may be attributable in part to the fact that the US came halfway on the Soviet demand to ban the deployment of cruise missiles from Western Europe; Vance had reportedly been instructed to insist only that cruise missiles with *conventional* warheads be permitted to be deployed in Europe.¹¹⁵ By implication nuclear-armed GLCMs for Europe were negotiable.

In the ensuing discussions in Geneva in April/May 1978, the United States indicated that it would accept the Soviet preference for a higher overall ceiling on numbers of strategic forces (2,250) provided they accepted the lower figure for MIRVed missiles (1,200). In response to the Soviet objections to the concept of wide-bodied cruise missile carriers, the US suggested that some minor modifications to such aircraft could make them distinguishable from civilian airliners with 'national technical means' of verification.¹¹⁶ There was also an agreement in principle that the range limit on the ALCM would be raised but no firm figure had been decided upon.¹¹⁷

Late in May 1978, Gromyko was in the US to address the UN Special Session on Disarmament. Despite the aggravation of the invasion of Zaire by Katangan rebels — President Carter said publicly that the US believed that Cuba (and, indirectly the Soviet Union) trained and equipped the Katangans and knew of the invasion plan — both sides were optimistic that the planned discussion between Gromyko, Vance and Carter would produce further progress on SALT. The major issues were now judged to be what new weapons would be allowed, how far the modernisation of existing weapons could go and, of course, the Backfire. According to one source, among the other issues was the question of how many warheads could be carried on a single MIRVed missile.¹¹⁸ This was a new dimension to the MIRV issue, one that closely paralleled the Soviet view that aircraft armed with cruise missiles should be counted as more than one MIRV if they carried more than 20 ALCMs.¹¹⁹

American expectations of how the discussions would proceed were upset by a surprise Soviet proposal to ban the testing and deployment of *all* new ICBMs through 1985. The US opted to reject this proposal, reportedly on the basis of the judgement that unless the MX option was kept open, the Senate would be most unlikely to ratify the treaty. In addition, if new ICBMs were totally banned, much more would rest on the restrictions regarding modernisation and the Soviet Union, with several active ICBM production lines and four new ICBMs in development, was in a far better position to augment its capabilities.¹²⁰

The United States pursued this judgement vigorously in July 1978 when Vance and Gromyko met again, this time in Geneva. Vance was instructed to tell the Soviets that SALT II must leave open the option of deploying a new mobile-based ICBM in the 1980s.¹²¹ While it had long been implicit that mobile ICBMs would be permitted after the protocol expired, the explicit demand for this option was, qualitatively speaking, a new issue. Moreover, thinking in the Pentagon was swinging in favour of the multiple-aim-point (MAP) deployment mode. Such a system, because it required the construction of several thousand new silos, implied a fundamental re-thinking of verification procedures and counting rules. Up to this time, ceilings on ICBMs, and the verification thereof, rested on counting the number of silos with 'national technical means'. The existing draft text of SALT II, like SALT I, banned the construction of new fixed ICBM launchers. The Vance-Gromyko talks were inconclusive but the issues were pursued at the regular SALT sessions.¹²² US-Soviet relations were again more strained than usual, the immediate cause this time being the trials of dissidents in the Soviet Union and President Carter's major speech on 7 June 1978 in which he accused the Soviets of gross violations of basic human rights and made the provocative statement that: 'The Soviet Union can choose either confrontation or cooperation. The United States is adequately prepared to meet either choice'.¹²³

Reports on the Soviet reaction to the US demand for the MX/MAP option ranged from constrained objection¹²⁴ to categorical rejection.¹²⁵ The latter reaction apparently stemmed from differing interpretations of the existing draft text of the SALT II treaty. In the US view this text placed restrictions on strategic missile launchers, not silos or launch points. As Warnke put it, 'each of the superpowers is entitled to verify what the other side has and how many — but not where they are'.¹²⁶ The Soviet interpretation was that silos or launch points were limited.¹²⁷

The one bright spot in this generally bleak picture was the Soviet agreement — apparently around the middle of 1978 — to participate in the construction of a data base against which to measure the reductions to the new agreed upon ceilings.¹²⁸ A constant irritant for the American negotiators throughout SALT — and a major source of misunderstanding and ill-feeling — has been the Soviet Union's adamant refusal to furnish detailed information on its strategic forces. All this information has been provided by the United States and even then the Soviets have refused to confirm or deny the data. Several people close to SALT have offered illustrations of how a typical negotiating session would proceed under these circumstances. The following version is offered by Fred Charles Ilke:

. . . the American negotiators might argue that if a treaty limits 'heavy' missiles to a fixed number, it should spell out this number and also be clear about the difference between a 'heavy' and 'light' missile. The Russian negotiators would counter that both sides are agreed on the number and both sides know what a 'heavy' missile is; ergo, writing this down is totally unnecessary. So the Americans would ask: 'If we are agreed, why don't we record our agreement to avoid future misunderstanding?'

The Russians would simply repeat their argument. Then the Americans might try another tack, by asking directly: 'Do you agree that your side can have no more than X missiles and that any missile wider than Y meters will count as a heavy missile?' At this point, the Russians would not answer yes or no, but instead shift to the familiar tactic of impugning the other side's motives. They would accuse the Americans of casting doubt on the preliminary agreements already reached and of undermining the negotiations by raising diversionary questions.¹²⁹

Even if this account is somewhat exaggerated it seems to me to be very much to the credit of the Americans that they have continued to negotiate at all. In any event, from May 1977 onwards, the Carter Administration insisted on Soviet cooperation with the data base and the agreement on this matter was extremely encouraging. The past Soviet commitment to almost total secrecy in dealings with foreign governments and the evidence that existing internal political processes are built on equally tight controls over the dissemination of information suggests that an abundance of detail on the actual and intended Soviet military posture will not soon be available. But to the extent that agreement on the data base is given practical fulfilment, future SALT negotiations should be much facilitated.

In July, Vance and Gromyko had agreed to meet again in September 1978 in New York or Washington. By this time the feeling of urgency, almost desperation, regarding the conclusion of a SALT II treaty had reached major proportions. The cycle of US-Soviet relations never seemed to last for more than a few months and each new shock threatened to undo the results of more than 5 years of negotiation. SALT I had expired on 3 October 1977, and although both sides had indicated that they would not breach the terms of this agreement while negotiations continued it remained a fact that no SALT agreement had been in effect since 4 October 1977. The Soviet Union, in particular, faced some awkward scheduling problems because, by mid 1978,

it was very close to the SALT I ceiling of 950 SLBMs with new SSBNs continuing to come off the production line.¹³⁰ Hopes were high that Vance and Gromyko could reduce the outstanding differences to the point where the remainder could be resolved at a Brezhnev-Carter summit to sign the new agreement.

In a conspicuous reversal of the tactics used in March 1977, Warnke journeyed to Moscow early in September 1978 to brief the Soviets on the proposals that the US would table at the Vance-Gromyko talks later in the month. The content of these proposals was not revealed but there were earlier reports that the US was considering adding yet another new item to the agenda, namely, a ban on the testing and deployment of depressed-trajectory SLBMs.¹³¹ This appears to have been another move to make SALT II more palatable in the Senate; a persistent objection to a standoff bomber force composed of slow, soft, wide-bodied cruise missile carriers was their vulnerability to an attack on air bases.

The issues that remained to be resolved included the following:¹³²

- (a) the timing of reductions to the new ceiling of 2,250 on strategic delivery vehicles,
- (b) the number and type (MIRVed or un-MIRVed, fixed or mobile) of new ICBMs and SLBMs that would be permitted,
- (c) the Backfire. The Soviets were prepared to make a unilateral statement while the US wanted a joint agreement but outside the SALT II context,
- (d) the permissible increase in the range of the ALCM beyond 2,500 km to allow for evasive manoeuvring,¹³³
- (e) the US proposal to ban the flight testing of ICBMs and SLBMs with more re-entry vehicles than the largest number already tested by either side.

This was a formidable list. Vance and Gromyko apparently reached agreement on item (b) above, allowing each side one new ICBM plus no restrictions on new SLBMs, but compromises on the other issues eluded them.¹³⁴ Even the ICBM issue had not been completely resolved. The Soviets insisted that any new ICBM developed during the protocol period be restricted to a single warhead. This would have amounted to a three-year delay for the MX which had always been planned with a MIRVed warhead.¹³⁵ However, both men professed to be satisfied with the discussions and Vance said that 'many new ideas' had been proposed.¹³⁶ One of these, apparently, was that the impasse over the Backfire could be overcome by allowing the US to build a comparable aircraft.¹³⁷ The only surprising thing about this new proposal is that it took

so long to surface. Since the cancellation of the B-1, an enlarged version of the FB-111 had been viewed with increasing favour in the US as a complement to the B-52/ALCM or wide-bodied cruise missile carrier standoff bomber force. In fact, a 'stretched' FB-111 was included in one of the alternative bomber forces modelled in the Joint Strategic Bomber Study in 1974. It was also reported subsequently, that at the talks in September 1978, Gromyko dropped the demand for any precise limitation on the range of the ALCM. In fact he was quoted as saying: 'You can fly your cruise missile around the world if you like'.¹³⁸ This concession was made in the context of a report that, one week before Gromyko's remark, a MiG-25 flying at high altitude fired a missile that intercepted a drone target flying at 200 feet — the penetrating altitude for cruise missiles.¹³⁹

Despite these indications of progress, when Vance proceeded to Moscow toward the end of October, the list of outstanding issues was almost identical to the one in September. The Carter Administration was still acutely aware that Senate ratification of a SALT II treaty would depend heavily on the manner in which the remaining issues were resolved. The original strategy, presumably, was that the United States would meet Soviet concerns about cruise missiles by limiting them in a temporary protocol while the Soviet Union, in turn, would meet American concerns about Soviet ICBMs. As things stood, American medium-range weapons (the cruise missile) were constrained while the Soviet SS-20 was untouched and the Backfire would be treated outside the framework of SALT. If, in addition, the Soviets remained free to fully exploit their lead in ICBM throw-weight by modernising existing weapons and deploying new models, the restrictions in the protocol could be made to look rather one-sided.

Moreover, though the Administration viewed SALT as a separate endeavour, the attitude of the Senate seemed to be shaped much more by a general assessment of Soviet behaviour. Accordingly, Administration officials, including President Carter in private correspondence with Brezhnev, tried to make it clear that support for SALT II in the Senate depended not only on the satisfactory resolution of differences in the negotiations but on visible Soviet restraint elsewhere, notably in Africa.¹⁴⁰ The Soviets, of course, objected strongly to this pressure. At best, they saw it as a sign of weakness in the US Administration. At worst it suggested that the Administration was not really interested in concluding a SALT II treaty and was using the Senate to disguise this fact. In any event, the Soviets retaliated by hinting strongly that Carter's decision in October to proceed with the production of enhanced-radiation warheads (neutron bombs) would retard progress at SALT.¹⁴¹

The result of the two days of talks (October 22-23) was that, in Gromyko's words, 'we are a little closer than we were in Washington'.¹⁴² It was reported that Gromyko continued to insist that the SLCM and GLCM be limited to a maximum range of 600 km and that aircraft armed with cruise missiles count as one MIRV for every 20 missiles carried.¹⁴³ The United States was similarly insistent on (a) preventing an increase in the number of warheads on MIRVed missiles already deployed and (b) limiting to 10 or 14 the number of warheads that could be installed in any new MIRVed ICBM. This, clearly, was an indirect way of tackling the imbalance in ICBM throw-weight. Projections were being made in the US that the Soviet Union would eventually be capable of putting 20, 30 or even 40 re-entry vehicles on a missile the size of the SS-18.¹⁴⁴ Thus a force of 300 SS-18s could threaten US ICBMs even if the US moved to a MAP deployment mode.

It seems that the Russians also pointed out the difficulty of verifying whether SLCMs and GLCMs, when deployed, were armed with nuclear or conventional warheads. Thus the question of whether the US could be permitted to deploy cruise missiles with conventional warheads — or whether it would be necessary to assume that all of them were nuclear — was another issue left hanging at the conclusion of this round.¹⁴⁵

During November and December 1978 there was an atmosphere of hushed expectancy surrounding SALT. President Carter continued to take steps that seemed to be motivated in part by a desire to appease the opponents of SALT II in the Congress. He proposed to increase spending on civil defence by 45 per cent and to request funding for the full-scale development of the MX ICBM. It was also indicated that the Department of Defense would be the exception to the rule in efforts to hold down Federal expenditure; military expenditure in FY1980 would rise by 3 per cent in real terms.¹⁴⁶ In addition, President Carter and other officials began to drop hints that the Administration was becoming more favourably disposed toward acquiring a counterforce capability of some considerable dimension and was leaning toward giving military targets priority over economic recovery targets.¹⁴⁷

The campaign to prepare the ground for Senate approval of SALT II suffered a setback in the mid-term elections; six senators considered to be generally pro-SALT lost their seats. In addition, the attempt to assuage the concerns of the critics of SALT by accelerating defence programmes was obviously a double-edged weapon; even those in favour of a new agreement might conclude that the price for arms control was too high. As always, other events, with at best unpredictable ramifications for SALT, continued to occur. The United States became

increasingly nervous about the deepening crisis in Iran; the Soviet Union warned against intervention and ceremoniously signed a twenty-year treaty of friendship with neighbouring Afghanistan. The Soviet Union was embarrassed by Romania's open refusal to go along with a Warsaw Pact call for increased military expenditure; the United States despatched Michael Blumenthal, Secretary of the Treasury, on a goodwill trip to that country. It was revealed that the Soviet Union had delivered a dozen or so MiG-23s to Cuba, including a few fighter-bomber versions that, in principle, could be equipped to deliver nuclear weapons.¹⁴⁸ The United States immediately mounted an extraordinary intelligence effort to establish that no nuclear weapons had been delivered but it remained unclear as to whether the Soviet Union had violated the 1962 understanding that no 'offensive' weapons would be deployed in Cuba.¹⁴⁹ It also appears that the Soviet Union had resumed the practice of encrypting the telemetry data from its weapon tests, a violation of the understanding that neither side would interfere with the other's 'national technical means' of verification. Finally – although this is by no means a complete list – came the dramatic announcement that the United States would establish full diplomatic relations with the People's Republic of China on 1 January 1979.

In Washington, on December 7 and 8, Secretary Vance briefed Soviet Ambassador Dobrynin on some new US compromise solutions on outstanding issues. There was apparently some hope that these proposals would prove sufficiently attractive to the Soviets to make another Vance-Gromyko session unnecessary.¹⁵⁰

Once again, however, such hopes were dashed. In a three-day session in Geneva (21-23 December, 1978) the two men 'essentially' reached agreement on the majority of outstanding issues, but a complete agreement in principle eluded them. Some press reports to the contrary, this outcome was not the result of Soviet foot-dragging on trivialities to protest the full recognition of China. The Russians did make it clear that they had no intention of coming to Washington to sign a SALT II treaty before or even immediately after the visit of China's Deputy Prime Minister, scheduled for the end of January 1979. But the unresolved issues in SALT were neither new nor trivial. Reportedly, Gromyko now insisted that cruise missiles with a dual nuclear/conventional warhead capability be banned. In other words, the Russians wanted all cruise missiles, irrespective of the type of warhead, to be subject to the limitations contained in the SALT II treaty and its protocol.¹⁵¹ On the same theme, Gromyko further insisted that all pilotless vehicles, whether armed or unarmed, be subject to the range limitation for cruise missiles. This demand was presumably made to forestall the possibility of the US deploying long-range remotely piloted vehicles, ostensibly for reconnaissance or as targets, but capable of being quickly fitted with a

warhead. The United States accepted the Soviet position on both issues.¹⁵² The two sides also remained divided on the base number of ALCMs per aircraft (the Russians wanting 20 and the Americans 35) and the number of warheads per MIRVed missile.¹⁵³

It is also reported that Vance and Gromyko agreed on a loosely worded provision regarding the encoding of data from missile tests. It was reported that this provision permitted the Soviets to encode any missile-test data not relevant to verification of compliance with SALT II.¹⁵⁴ Predictably, it was a controversial development, but since the encoding issue remained active in the ensuing months it seems unlikely that any 'agreement' was reached in December 1978; Vance probably agreed to consider a Soviet proposal to allow selected encoding.¹⁵⁵

On 13 February 1979 Vance met with Soviet Ambassador Dobrynin and submitted some new US proposals on where to draw the line between a new ballistic missile and the modernisation of an existing missile.¹⁵⁶ The Soviet position, put forward in Geneva in December 1978, was that modified ICBMs should not be considered new weapons if they were not 5 per cent greater or 20 per cent less in volume than current models. The US considered that *any* change in volume above 5 per cent should be the criteria for a new weapon. On the cruise missile, the only outstanding question seems to have been the base number of ALCMs per carrier although Nitze claims that the Soviets were still pressing to have the 600 km range limit on deployed sea- and ground-launched cruise missiles apply for the duration of the treaty rather than the two-year protocol.¹⁵⁷

The revelation, at about this time, that the Soviet Union was testing an ALCM out to ranges of 750 miles probably did not raise any new technical issues for SALT. It was already established that any aircraft armed with cruise missiles with a range in excess of 600 km would be accountable under the SALT ceilings. It also seems to have been agreed that any aircraft so armed would be given externally observable differences to permit verification. It was further revealed that the Soviet Union had two new long range bombers in advanced development and expected to become operational in 1982/83. Of more immediate concern for SALT II was the indication that another variant of the Backfire, with improved engines and redesigned inlets to increase range, was under development.¹⁵⁹

Within a week of this meeting, on 17 February, China invaded Viet-Nam and what little momentum the SALT negotiations had was again disrupted. On 27 February Ambassador Dobrynin presented President Carter and Secretary Vance with some new proposals on SALT but a prompt US response was prevented by the war in Indochina, a new deadlock in the Israeli-Egyptian peace talks, the chaos in Iran and so on. Dobrynin's proposals mainly concerned the encoding

of missile test data and the criterion for 'new' missiles. On the latter question the new Soviet proposal was that existing missiles could be made five per cent larger or ten per cent smaller and not be considered a new weapon.¹⁵⁹

Two weeks passed before the United States was ready to reply but on March 16 Vance and Dobrynin met again. Differences on missile modernisation and the encoding of weapon test data were narrowed to the point where Vance was able to say that 'we have not completed it, but we really are now at what I would call the bitter end . . .'¹⁶⁰

Vance and Dobrynin continued to meet regularly for the next seven weeks. In the second week of April the Soviet Union accepted the latest US formulation of treaty language on the encoding question.¹⁶¹ At the same time the Soviet Union agreed that modernisation of existing missiles could not result in changes of more than 5 per cent in length, diameter, launch weight or throw-weight.¹⁶² Further, the haggling over the base number of cruise missiles per aircraft converged on 28. This would be the maximum *average* loading so that, taken together, a B-52 with 20 cruise missiles and another aircraft type with 36 would count as two MIRVed delivery vehicles since 20 and 36 average out to 28 per aircraft. On balance, this outcome must be considered another concession by the Soviet Union. Since July 1978 the Soviets had explicitly linked agreement to freeze the number of MIRVs on ballistic missiles (a provision regarded as critically important by the US) with the adoption of the rule that every batch of 20 ALCMs would count as one MIRVed system. The Americans wanted 35 ALCMs, on the average, to count as one MIRVed system. As it turned out the Americans secured the averaging approach *and* the freeze on the number of re-entry vehicles on ballistic missiles at the expense of splitting the difference between 20 and 35.

Some time was also spent on additional provisions to ensure that the agreed limits on the number of MIRVs per missile could not be covertly violated and on the date and site for the Carter-Brezhnev summit to sign the treaty.¹⁶³ Finally, on 9 May, Vance announced that 'Ambassador Dobrynin and I have concluded our negotiations on SALT'.¹⁶⁴ In fact, there was no final text for the two officials to initial but an agreed set of instructions on all outstanding issues had been sent to the negotiating teams in Geneva for incorporation in the joint draft treaty. Shortly afterwards, it was announced that General Secretary Brezhnev and President Carter would meet in Vienna on 15-18 June to sign the treaty. As far as the cruise missile was concerned, the years of negotiation had crystallised into just a handful of main provisions.¹⁶⁵ For the treaty-

- (a) *any* aircraft armed with long-range cruise missiles (range in excess of 600 km) would count as one MIRVed strategic delivery vehicle.
- (b) existing heavy bombers can carry up to 20 long range cruise missiles and the number on existing and future types cannot exceed an average of 28.
- (c) up to 120 aircraft armed with long-range cruise missiles can be deployed without cost in terms of displaced MIRVed missiles. Deployments in excess of 120 are permitted but only at the expense of an equal number of MIRVed missiles.
- (d) if an aircraft type is deployed as a cruise missile carrier and in other roles, the former variant will be given externally observable differences to permit verification.
- (e) multiple-warhead cruise missiles are banned.

For the protocol (which expires on 31 December 1981):

- (f) ground- and sea-launched cruise missiles, if deployed, will be limited to a maximum range of 600 km although prototypes can be tested to any range.

An Assessment

For more than four years after the Vladivostok summit the cruise missile wove a tortuous and destructive path through the negotiations on SALT II. There is little doubt that bargaining leverage at SALT was a consideration uppermost in the minds of those who proposed a strategic cruise missile, but it is unlikely that anyone anticipated that the weapon would repeatedly bring the negotiations to a dead stop.

The United States — at least its top political leadership — took some time to recognise that the cruise missile could become (a) a lever of some consequence in the SALT negotiations and (b) a major US strategic initiative. This became evident at Vladivostok, two and a half years after the SLCM was first proposed and 18 months after the ALCM programme was started. There seems no other explanation for the agreement by President Ford and Henry Kissinger to limit bomber-launched weapons to a range of 600 km and the subsequent argument

that the US thought it was understood that this referred to ballistic missiles. In any event, it is clear that long after Vladivostok the Soviet Union viewed limitations on the cruise missile more as a question of principle than a subject for give-and-take negotiations.

The United States seemed to take a similar view of the Backfire. The Backfire force that the Soviet Union was likely to deploy by the mid-1980s could not be presented as a major strategic threat to the continental United States. The United States nevertheless insisted that the aircraft be subject to legally binding constraints, either in the SALT II treaty or outside it. This was probably done mainly for tactical reasons; if the Soviet Union was going to insist on counting in SALT all US nuclear weapons capable of reaching Soviet territory, negotiating tactics required that the United States make a similar demand. It is true that the Vladivostok accord was based on the deferral — for the second time in SALT — of consideration of forward based systems, but the Soviet Union effectively if not formally re-opened this question when it demanded limits on sea- and ground-launched cruise missiles. Alliance considerations probably also contributed to the US position on the Backfire; the aircraft represented a major qualitative increase in the strategic threat to US allies on the Soviet periphery. With each side taking positions based predominantly on principle it was inevitable that progress would be slow.

Looked at in perspective, Soviet insistence on limitations on the cruise missile was not without success. On the ALCM the US moved from a position of arguing that it was a bomber weapon outside the purview of SALT (because the bombers themselves were already counted) to agreement that bombers armed with cruise missiles would be counted as MIRVed systems. The sea- and ground-launched cruise missiles, which are viewed as theatre nuclear weapons by the United States, are limited to a range of just 600 km, although only until 31 December 1981, the expiry date for the protocol.

Many people in the United States questioned the wisdom of agreeing to limit bombers and bomber-launched weapons in SALT while air defences were left unfettered. This concern was voiced particularly strongly after the B-1 was cancelled. That decision left the ALCM as the major near-term counter-weight to the growing Soviet lead in ICBM throw-weight and strong pressure was applied to prevent the Administration from making further concessions on this weapon. In fact, the Administration was urged to seek a higher limit on ALCM range and US negotiators were instructed accordingly. The result, as we have seen, was the removal, over a year later, of all range limits on the ALCM. It is possible, as Henry Kissinger has speculated, that the Soviets opted to give the Americans a relatively free rein on the ALCM — essentially a weapon for retaliatory or

delayed counterforce strikes – in the hope that this would divert them from programmes designed to enhance US first strike counterforce capabilities.¹⁶⁶

Similarly, there is a widespread view that the protocol represents a particularly bad bargain for the United States or, conversely, a major coup for the Soviet Union. One dimension to this view is a concern over the precedential value of the limitations in the protocol in influencing the course of the post-protocol negotiations. The Soviet Union has made no secret of its expectation that the protocol will be extended. And although officials argue that the US could not violate the protocol limits even if it wanted to many observers perceive no logic in this position other than willingness to extend at least some of the protocol's restrictions in the post-protocol period.

The other dimension focuses directly on the asymmetry of the restrictions in the protocol: ground and sea-launched cruise missiles are addressed while the Backfire and the SS-20 are not. The unsigned Soviet letter concerning the Backfire was less specific than the United States had expected and President Carter was obliged to seek a *verbal* assurance from Mr Brezhnev that production of the aircraft would not exceed 30 per year. Further, current production versions of this aircraft have an air-refueling probe so that its alleged inability to operate at intercontinental distances could be rectified simply by providing it with tankers. Yet another nagging point is that the Backfire's range, even under conservative estimates, is greater than the early 'D' model B-52s which are included in the SALT totals. On the SS-20, it is pointed out that this weapon has intermediate range only by virtue of its relatively heavy MIRVed payload; a light single warhead can give it intercontinental range. Similarly, it is argued that the United States cannot verify the Soviet pledge not to produce and deploy the SS-16. The third stage missing from the SS-20 could be produced and stockpiled covertly and conversion to the SS-16 completed within hours. Detection of this conversion would be quite meaningless given the context in which it would take place.

The fact that cruise missiles posed unique verification problems was not only recognised at the outset but was in fact cited as part of the rationale for these weapons. In the early days of the strategic cruise missile programme in the United States it was argued that verification difficulties would probably permanently exclude these weapons from accountability under SALT.¹⁶⁷ And since the Soviet Union already had cruise missiles with strategic potential it was considered advisable on these grounds alone for the United States to acquire similar weapons.

In the SALT II negotiations themselves, a reasonably firm agreement emerged on the ALCM both because the US was most insistent on freedom to deploy this variant and because it presented the least problems from the verification point of view. The 2,500 km limit on range, first proposed by the Soviets in January 1976, was only slightly less than the maximum range considered feasible with the first-generation ALCM. Similarly, by making all aircraft capable of carrying long-range cruise missiles readily distinguishable and by counting these aircraft as MIRVed systems, a reasonable degree of control could be established over the aggregate number of ALCMs deployed.

In one instance, however, verification considerations apparently prevailed. In 1977 the US proposed a definition of cruise missiles that would have permitted, once the protocol expired, the deployment of conventionally-armed cruise missiles on aircraft other than heavy bombers without these aircraft counting against the 1,320 MIRV ceiling. US officials eventually decided that keeping open this option was not worth the risk that the Soviets might arm Backfires with nuclear cruise missiles disguised as conventional ones and thus have a strategic weapon not covered by SALT.¹⁶⁸ In December 1978 — when the US had just become aware of the new Soviet ALCM — American negotiators conceded that any aircraft armed with long-range cruise missiles should be accountable as a MIRVed weapons system under SALT.

With respect to the SLCM and GLCM, the prospects for simplifying verification of any agreed upon limits are not good. The US Navy wants a 400 n.m. range anti-ship cruise missile with a conventional warhead for widespread deployment on surface ships and submarines. The US Department of Defense and many NATO countries want (a) a 2,000 n.m. range submarine-launched cruise missile with a nuclear warhead and (b) a ground-launched cruise missile with a range of about 1,500 n.m. with both a nuclear and, ultimately, a conventional warhead. It is possible that all of these plus the strategic bomber-launched ALCM will be identical in external appearance in which case 'national technical means' of verification will be particularly hard pressed to support any proposed limitations.

Implications for SALT III

(a) Cruise missiles and the central balance.

The 3,400 ALCMs that will be produced over the 1980-1986 period will play the major role in preserving the US lead in numbers of strategic warheads during the term of SALT II. This is regarded as particularly important from the standpoint of perceptions since the Soviet Union is already ahead on most of the other indices used to measure strategic balance.

The ALCM will also strengthen the viability of the bomber leg of the strategic Triad at least as much, if not more, than the B-1 would have done and at a substantially lower cost. The pre-launch survivability of bombers is very high. The supreme test — that of a mass attack by SLBMs launched from close range on depressed trajectories — is becoming increasingly hypothetical as the Soviet Union extends the range of its SLBMs and keeps its strategic submarines deployed close to home. This means that, from the mid-1980s, the US should have no difficulty in mounting a bomber attack that would direct well over 2,000 ALCMs at targets in the Soviet Union with other aircraft (B-52s and FB-111s) penetrating Soviet airspace to deliver SRAMs and gravity bombs. This will be a most formidable capability. Even now, despite the Soviet Union's massive air defence system, the Air Force remains confident that the B-52s can penetrate and accomplish their assigned missions. The Strategic Air Command's official position is that, in combined operations with ICBMs and/or SLBMs, at least 75 per cent of attacking B-52s will be able to complete their assigned missions through 1985.¹⁶⁹ The ALCM programme is intended to make doubly sure that this state of affairs does not change.

The ALCMs one shortcoming (or virtue) is that it is subsonic. Some 5 — 10 hours would elapse between the order to attack and the arrival of cruise missiles over their targets. This, of course, makes it a retaliatory weapon but its superb accuracy also suggests that, as far as possible, it will be used in the counterforce role. In the event of nuclear war the ALCMs could be targeted against Soviet fixed land-based nuclear weapons held in reserve but, given the low confidence that the Soviets would have in riding out such an attack, their probable reaction would be to use the weapons in a second strike before the cruise missiles arrive. The other possible counterforce role for the ALCM would be to destroy those

silos that contained cold-launched missiles and prevent them from being reloaded. Apart from this rather limited (and potentially counterproductive) counterforce potential, the cruise missile would be quite devastating against economic/industrial targets. One study concludes that 900 cruise missiles (which could be carried by just 45 surviving bombers) would be expected to destroy about 80 per cent of the Soviet industrial target base.¹⁷⁰

In addition to strengthening the retaliatory capability of US strategic forces, another major plus for the ALCM is the probability that it will elicit a disproportionate defensive response from the Soviet Union. In the opinion of US analysts, as noted above, a respectable defence against the ALCM would consist of 50 – 100 airborne warning and control aircraft carrying a large look-down radar (similar to the E-3A AWACS); over 1,000 modern interceptors with a look-down/shoot down capability (comparable to the F-14 and F-15 aircraft with Phoenix or late-model Sparrow or Sidewinder air-to-air missiles); and 500 – 1,000 complexes for a fast-reacting, highly-maneuvrable surface-to-air missile, (comparable to the Improved Hawk or Patriot systems). The acquisition cost alone of these forces is estimated at \$60 billion or nearly ten times that of mounting the cruise missile threat. Moreover, it will take the Soviet Union at least ten years to produce and deploy these systems in these numbers, ample time for the US to upgrade the cruise missile or to develop and deploy a bomber defence missile. The Soviet Union is known to have an AWACS under development, it has demonstrated a look-down/shoot-down capability in the MiG-25 and it has just begun deployment of the SA-10 SAM.

Unfortunately, the theorem of disproportionate response works just as well for the Soviet Union. In the latter half of the 1950s the Soviet Union produced some 200 TU-95 Bear and Mya-4 Bison long-range bombers and for the next 15 years did virtually nothing to upgrade this force. The United States took advantage of this small and diminishing threat from Soviet bombers to cut back its continental air defence systems almost to zero. In December 1974, after the signing of the Vladivostok accord, Secretary of State Kissinger even predicted that the Soviets would probably abandon bombers altogether in accommodating to the 2,400 ceiling on delivery vehicles. It is now apparent that the Soviets have other plans. Occasional rumours since 1974 that the Soviets were developing a new strategic bomber were confirmed late in 1978. At about the same time, the Soviets were observed testing a new ALCM of their own. By all accounts, it is nowhere near as capable as the American one but given the current state of US air defences it won't have to be.

What seems abundantly clear is that air-breathing systems, for many years a relatively quiescent area of the strategic competition, have been strongly revitalised. Both sides are now under strong pressures to upgrade their defence systems and this will inevitably provoke greater efforts in bombers and bomber-launched weapons. The United States is examining various wide-bodied airframes as potential cruise missile carriers. Similarly, the B-1, suitably modified to be effective as a cruise missile carrier as well as a penetrator, and a stretched and re-engined FB-111 are options under consideration. It remains to be seen exactly what the Soviet Union has in mind.

(b) Cruise missiles and SALT III.

By far the most significant development linked with the cruise missile is the future of SALT as a bilateral negotiating forum concerned with the so-called central strategic systems. The ground and sea-launched cruise missiles, together with the Soviet peripheral or gray area systems – primarily Backfire and the SS-20 – accounted for a major portion of the time spent in negotiating the SALT II agreement and long before agreement was reached most observers had concluded that some formal restructuring was unavoidable if future negotiations were not to be similarly paralysed by the lack of agreement on what was subject to negotiation and what was not.

SALT's preoccupation with the 'central' strategic weapons has principally been a US concern. Except as a temporary concession the Soviet Union has never wavered from the view that a weapon is strategic if it can strike targets in the opponent's homeland and that, therefore, the several hundred US nuclear-capable aircraft deployed in and around Europe (including the UK) should be counted in the US total. The American counter-argument was that SALT was a bilateral forum and could only be concerned with the strategic nuclear threat that each country poses, exclusively, for the other; the other weapons that the Soviet Union argued were accountable involved the security of allies and U.S. negotiators were not free to put them on the bargaining table. Although the US has thus far been successful in excluding these FBS from explicit accountability in SALT they have never been totally excluded. Thus, in 1971, when the Soviet Union finally agreed to limit the negotiations on offensive weapons to ICBMs and SLBMs, these FBS remained among the 'other considerations' for which it sought and received compensation in the form of higher ceilings for central weapons.

The Soviet Union persevered with this view in the opening phase of the SALT II negotiations, one of the reasons why there was almost no progress in the first two years. At the Vladivostok summit meeting in November 1974 the Soviet Union accepted the principle of equal aggregate ceilings for central strategic systems but it soon became apparent that, for both sides, these systems had ceased to be easy to identify or to be a convenient and acceptable means of narrowing the scope of the negotiations. The focus of concern was no longer the US FBS *per se* but, for the Soviets and sea-and ground-launched cruise missiles and for the Americans, the Backfire and SS-20.

The Soviet Union insisted that all the US cruise missiles (including, initially, the air-launched version) should be counted as individual strategic delivery vehicles if they had a range in excess of 600 kilometers. With respect to the SLCM, the US had no really viable counter-argument. With a range of 2,000 miles and deployed on submarines, the SLCM was clearly a strategic system. On the other hand, the Soviet determination that SALT should address the GLCM moved the negotiations quite decisively in the direction of intermediate range land-based systems.

In the case of the United States, as we have seen, the Backfire was a problem because it appeared to be capable of delivering nuclear weapons over intercontinental distances even if this was not its primary function. The immediate US concern with the SS-20 was its relationship to the SS-X-16 ICBM. It had become apparent at an early stage that the SS-X-16 was suitable for deployment as a land-mobile ICBM. It appears that the US was concerned that the SS-20 and a land-mobile SS-16 would be too similar to be reliably distinguished by national technical means of verification.¹⁷¹ The Soviet Union agreed not to produce or deploy the SS-X-16 in either a fixed or mobile mode but, in the meantime, the deployment of the SS-20 had provoked the European NATO countries into seeking a more direct input to the SALT negotiations than had previously been the case.

The development and deployment of the SS-20 appears to have been interpreted, probably correctly, as evidence that the Soviet Union views the NATO forces in Western Europe as a threat to its security quite separate from the US threat and requiring separate countermeasures. From this perspective, the balance in intermediate-range or 'Euro-strategic' nuclear weapons quickly became a major concern. It was argued that if parity at the strategic level, codified in the SALT II treaty, effectively neutralised these forces the Soviet preponderance in long-range theatre nuclear weapons could provide it with a psychological advantage in the European arena. At this very general level, the issue really boils down

to missile systems and here the imbalance is quite marked: nearly 600 Soviet weapons including increasing numbers of the highly-capable SS-20 against 64 British and 82 French weapons with the latter, of course, being outside NATO control. The US also assigns 80 SLBMs to the Supreme Allied Commander, Europe (SACEUR) and, in addition, almost certainly has strategic warheads aimed at all the worthwhile targets in the Western USSR and probably the other Warsaw Pact states as well. The key issue, however, is that the Soviet Union, particularly with the SS-20, can threaten targets deep in Western Europe with weapons that, in the superpower context, are not strategic. In other words, the Soviet Union can pose this threat without crossing the psychological threshold of invoking its central strategic systems while NATO cannot, at least not a threat of comparable magnitude. The essential rationale behind the pressure to expand NATO's theatre nuclear weapon force is therefore that there should be a balance at every rung on the nuclear escalation ladder.

As a practical matter, the issue is considerably more complex. The broad balance that has emerged in the superpowers' strategic forces, and its codification in the bilateral SALT II agreement, is perceived in Europe as having a powerful tendency to decouple these forces from the NATO/Warsaw Pact scene. Part of the dilemma for the NATO countries is that the acquisition of a fully developed theatre nuclear weapon force would reinforce the decoupling of US strategic focus from Europe which, to West Europeans, seems to weaken deterrence and encourage the Soviets to take greater risks. Another major issue is that the decision to acquire new theatre nuclear weapons will almost certainly force an open and comprehensive re-examination of NATO's strategy for the use of nuclear weapons. There is no general agreement as to whether NATO's existing flexible response strategy is fundamentally a deterrent or a war-fighting strategy. Similarly, when, how and on what scale nuclear weapons would be used remains quite ambiguous. The new developments make these ambiguities increasingly difficult to live with. Further, it seems reasonable to suppose that when the US Congress is confronted with the full (and presumably escalating) cost of developing and producing the new theatre weapons the issue of NATO burden-sharing will once again raise its head and generate the usual strains within the Alliance.

In the United States, the decision to bring the long-range theatre nuclear systems into the purview of SALT was probably made in 1978, if not earlier. In 1978/79, draft versions of the Statement of Principles attached to the SALT II treaty specifically mentioned these systems as topics for negotiation in SALT III. This specific reference was dropped from the final text, apparently on Soviet insistence, but the United States was already engaged in consultations with its NATO allies on working arrangements for the preparation of negotiating positions.

In July 1979 the Carter Administration proposed the deployment in Europe of 200-600 medium range nuclear missiles beginning in 1983. The proposal itself was not surprising but its timing was related to the Senate ratification debate on SALT II which began on 9 July. An influential group in the Senate, lead by Senator Nunn, strongly sympathised with the European NATO groups that considered a response to the Soviet Backfire/SS-20 deployments to be an urgent priority for the Alliance. The new force would be composed of 1000-mile range Pershing II ballistic missiles and 1500-mile range GLCMs to be deployed in the Federal Republic of Germany, the Netherlands, Belgium, the United Kingdom and Italy.

The Federal Republic of Germany, which strongly supported the proposal, reiterated its long-standing position that it would not accept new nuclear weapon systems unless at least one other non-nuclear member of NATO also accepted them. It also indicated that it would prefer to have the new weapons under complete and exclusive US control rather than the 'two key' arrangement which currently covers approximately one half of the 7000 US nuclear warheads in Europe.¹⁷² This was clearly done to pre-empt the predictable reaction – particularly from the Soviet Union but also from the other NATO countries – to any development that placed a West German finger on or near the trigger of a long-range nuclear weapon.

In all the countries concerned, it was recognised that, in order to secure political support for the new missiles, it would be essential to couple a deployment decision with an announcement that negotiations would take place with the Soviet Union to limit theatre nuclear weapons. By early October 1979, the NATO governments had agreed to enter into such negotiations with the Soviet Union and an *ad hoc* NATO 'high-level group' had approved the plan to deploy the new missiles.¹⁷³ These circumstances led the European members of NATO to be noticeably more forceful in urging the US Senate to ratify SALT II, since, without SALT II, there could be no SALT III. NATO's formal decision on the new missiles was scheduled to be taken on 12 December but the ratification of SALT II before this date was never a real possibility. On 6 December it was announced that the full Senate would not debate the treaty until 1980.

On 6 October, Mr Brezhnev declared the Soviet Union's willingness to reduce the number of medium-range nuclear systems deployed in the Western USSR on the condition that NATO did not deploy additional systems of this kind.¹⁷⁴ He also pointed out that, for the past ten years, the Soviet medium-range nuclear forces deployed in the Western USSR had remained numerically static.

Although it was already clear that future negotiations would embrace these weapons, Mr Brezhnev's remarks put them into full public view. The official NATO reaction, following the US lead, was quite negative and it was determined that the formal decision to deploy the Pershings and GLCMs would be taken before any official response was made.¹⁷⁵ US and other NATO officials pointed out (a) that the Soviet Union possessed about 2100 bombs and missile warheads capable of striking NATO territory from the Western USSR against 500 NATO weapons capable of being delivered on Soviet territory,¹⁷⁶ (b) that the single warhead SS-4/5s were being replaced by the SS-20 with 3 MIRVed warheads. With this replacement programme and production of the Backfire the US Defence Department projected that the Soviet Union would have 3250 medium-range nuclear weapons directed at Western Europe by 1985,¹⁷⁷ and (c) that the SS-20 had the range to target Western Europe even if it was deployed in the central USSR.

The NATO proposal has crystallised into a total force of 572 missiles – 108 Pershing II and 116 GLCM launchers each with four missiles.¹⁷⁸ It has been suggested that this total is tied to the assumption that the Soviet Union will eventually deploy 200 SS-20s (600 warheads) in the Western USSR.¹⁷⁹ US officials have also pointed out that the number is predicted on all five countries – the UK, FRG, Netherlands, Belgium and Italy – approving deployment on their territory. The number will be revised if any of these countries refuse such deployment.¹⁸⁰ The tentative plans for the distribution of the GLCM force are UK (160), Italy (112), Germany (96), Belgium (48) and the Netherlands (48).¹⁸¹

As scheduled, on 12 December, a meeting of NATO foreign and defence ministers formally approved deployment of the new missiles although the Netherlands refused deployment on its territory and Belgium indicated that its agreement would be reviewed in May 1980. The future of this commitment is heavily dependent on how quickly and with what reservations the US Senate ratifies SALT II. Similarly, Soviet ratification of the treaty probably cannot any longer be regarded as a mere formality, particularly if they reach the judgment that a threat to deny ratification stood a good chance of destroying NATO's resolve to proceed with the new missiles. As pointed out earlier, Soviet opposition to the cruise missile during the course of the SALT II negotiations focused increasingly on the GLCM and SLCM and their determination to stop these weapons should not be underestimated.

Conclusions

As a weapons concept it certainly looks as though the cruise missile will live up to its billing as the most significant technological development of the 1970s. By any reckoning it is already a supremely elegant and highly effective weapons system but its technological refinement in the coming years will nonetheless be quite rapid. The developments that can now be foreseen include higher speeds through the adaption of ramjet propulsion and reduced vulnerability by the incorporation of electronic countermeasure systems and an automatic reactive manoeuvring capability. Improved accuracy is also near at hand, utilizing either inbuilt terminal homing systems or satellite systems such as the NAVSTAR Global Position System. The imminent prospect of being able to achieve pinpoint accuracies even at very long ranges has led some observers to suggest that cruise missiles with conventional warheads could be used effectively in the strategic role.

The development of the cruise missile has had far-reaching implications for arms control. Most particularly, the cruise missile illustrated the essential artificiality of the distinction between strategic and theatre or tactical weapons. As a result of the technical characteristics of the cruise missile (and the Backfire and the SS-16/20) one of the central pillars of SALT — the ability to agree on a set of weapons in terms of their (strategic) function — began to crumble.

The widening of SALT's mandate which is now in prospect presents both risks and opportunities. SALT II is not a bad treaty but it is still very disappointing as an arms control measure: even if the treaty is ratified the number of warheads in the strategic arsenals of the two superpowers will increase to more than 20,000 by 1985 from about 14,500 in mid-1979. The prolonged negotiations and the meagre results have significantly undermined the credibility of the thesis that arms control agreements are a preferable and viable alternative to unilateral armament as a way of preserving a strategic balance. Expanding the scope of the negotiations may open up more opportunities for mutually beneficial limitations. An early negotiating success in the European theatre would do much to rebuild the credibility of arms control and restore expectations of hope.

On the other hand, the limitation of theatre nuclear weapon systems in the European arena could well prove even more intractable than constraining the size of the central strategic forces. Compared to the panoply of weapons arrayed in and around Europe the central strategic forces look positively simple and straight-

forward. The geographic asymmetry between NATO and the Warsaw Pact plus the fact that nearly all the theatre systems are highly mobile and many of them dual-capable will make it very difficult to agree on what types to count and to verify how many there are.¹⁸² Moreover, at least for NATO, securing general agreement on negotiating positions and tactics will be a difficult and possibly divisive process. The recent furor over the deployment of enhanced radiation warheads and the elaborate machinations in the second half of 1979 to seek a commitment to deploy Pershing IIs and GLCMs are indicative of the problems that will arise.

It now appears most likely that the negotiations on central and theatre weapons will proceed simultaneously in separate but related forums with the United States acting as the NATO spokesman in the latter. It seems clear, however, that, on both sides, the same bureaucratic apparatus will support both sets of negotiations and that each will pace the other. If the negotiations on theatre systems bog down there is a substantial risk that SALT will be distracted from its central purpose which is to reduce the strategic arsenals and constrain the pace of qualitative developments in strategic weaponry.

In any event, NATO is more or less irreversibly committed to making some response to the Soviet SS-20, even if it is primarily for political rather than military reasons. The opening of formal negotiations on the limitation of long-range theatre weapons in 1980, coupled with a NATO decision in principle to deploy new theatre systems from 1983 onwards, is virtually certain.

Whatever happens, it is clear that the SS-20 and GLCM will move out of the gray area in the coming years and share the spotlight with central weapons like the SS-18 and the MX. It is also clear that the cruise missile has so far successfully outrun arms control and in all probability will continue to do so for the foreseeable future.

Footnotes

- ¹ *Flight International*, 12 November 1977, p.1411.
- ² *Electronic Warfare/Defense Electronics*, September-October 1977, p.55.
- ³ *International Herald Tribune*, 3-4 February 1979, pp.1 and 2. One high-level Carter Administration official stated that US detection of the cruise missiles tests was 'unanticipated' by the Soviets. The implication, of course, is that the US believes that the Soviet Union was trying to develop a long-range cruise missile covertly. [*Aviation Week & Space Technology*, 19 February 1979, p.14.]
- ⁴ *ibid.*, and *Aviation Week & Space Technology*, 12 February 1979, p.22. Another significant deficiency of the new Soviet ALCM was its relatively large size; 'as big as a boxcar', according to one White House official [*Newsweek*, 19 February 1979, p.21.]
- ⁵ With the preoccupation with deterrence little thought was given to the employment doctrine for these weapons. As a result their numbers were determined more by the US production capacity of fissionable material and the determination of all three services to have a tactical nuclear role. On the influence of these two factors see, respectively, the testimony of James Schlesinger in *Nuclear Weapons and Foreign Policy*, hearings, Senate Committee on Foreign Relations, March-April 1974, pp.197-198 and Uwe Nerlich, *The Alliance and Europe: Part V, Nuclear Weapons and East-West Negotiations*, Adelphi Papers No. 120, London: International Institute for Strategic Studies, 1976, p.1.
- ⁶ These include the SS-1B SCUD A (SRBM, 1954): the SS-3 Shyster (MRBM, 1956) and the FROG series of artillery rockets.
- ⁷ *New York Times*, 1 September 1976, p.2. It was with this weapon, in 1974, that the Soviets started the practice of encoding the telemetry from test firings and frustrating US intelligence-gathering efforts. This became a major issue in SALT in the latter half of 1978.
- ⁸ Lothar Ruehl, 'SALT and Europe', *NATO's Fifteen Nations*, June-July 1979, p.71 and Barry Gwertzman, 'US Queries Russia on Missile Reduction', *International Herald Tribune*, 22 October 1979, p.1. It appears that each SS-20 launcher is provided with several reload missiles. See *Aviation Week & Space Technology*, 22 October 1979, p.51.

- ⁹ For a detailed and enthusiastic examination of the roles cruise missiles could perform in the European theatre see Robert L. Pfaltzgraff Jr and Jacquelyn K. Davis, *The Cruise Missile: Bargaining Chip or Defense Bargain?*, (Cambridge, Mass.: Institute for Foreign Policy Analysis, Inc., 1977).
- ¹⁰ Henry Kissinger is of the opinion that the Soviets reasoned in this way and insisted on the protocol to the treaty. See 'Kissinger's Critique', interview, *The Economist*, 3 February 1979, p.21.
- ¹¹ Thomas W. Wolfe, one of the leading American specialists on the Soviet Union, has stressed this feature in numerous publications. A recent expression of his views appears in, *The Soviet Union: Internal Dynamics of Foreign Policy, Present and Future*, hearings, House Committee on Foreign Relations, September-October 1977, pp.81-128. Two notable studies specifically on the military dimension of decision-making are Matthew P. Gallagher and Karl F. Spielmann Jr, *Soviet Decision-Making for Defence* (New York: Praeger, 1972) and Karl F. Spielmann, *Analysing Soviet Strategic Arms Decisions* (Arlington, Va.: Institute for Defense Analysis, April 1977).
- ¹² Wolfe, *The Soviet Union: Internal Dynamics of Foreign Policy, op.cit.*, p.109.
- ¹³ Gallagher and Spielmann, *Soviet Decision-Making for Defence, op.cit.*, p.78.
- ¹⁴ John Newhouse, *Cold Dawn: The Story of SALT*, New York, Holt, Rinehard and Winston, 1973, pp.55-56.
- ¹⁵ Igor S. Glagolev, 'The Soviet Decision-Making Process in Arms-Control Negotiations', *Orbis* (Winter 1978): 767-776. Glagolev held the position mentioned in the text between 1961 and 1964. He has been a resident of the United States since October 1976.
- ¹⁶ See Nitze's testimony in *Consideration of Mr Paul C. Warnke to be Director of the U.S. Arms Control and Disarmament Agency and Ambassador*, hearings, Senate Armed Services Committee, February 1977, p.164.
- ¹⁷ Wolfe, *The Soviet Union: Internal Dynamics of Foreign Policy, op.cit.*, p.127.
- ¹⁸ Quoted in *Aviation Week & Space Technology*, 16 February 1976, p.14.
- ¹⁹ These figures are given in *International Herald Tribune*, 5 June 1978, p.3 and *Flight International*, 12 November 1977, p.1411.
- ²⁰ *Aviation Week & Space Technology*, 12 December 1977, p.13.

²¹ In 1979 the US had 72 SSNs in service and 28 under construction or planned.

²² The reader who wants to pursue this subject is advised to begin with the following two volumes. Michael MccGwire (ed.), *Soviet Naval Developments: context and capability*, Halifax, Nova Scotia: Centre for Foreign Policy Studies, Dalhousie University, 1973 and Michael MccGwire, Ken Booth and John McDonnell (eds), *Soviet Naval Developments: Objectives and Constraints*, New York, Praeger, 1975. I have briefly reviewed the competing schools of thought in 'World Stock of Fighting Vessels, 1950-74', *World Armaments and Disarmament, SIPRI Yearbook 1975*, pp.280-286.

²³ This comment holds only for the land-attack SLCM. For the tactical anti-ship variant (and its predecessor, the Harpoon) it can be presumed that the Soviet Union will be driven to install fast-reacting gun and missile systems on its surface ships. For example, US intelligence recently disclosed that the SA-10 SAM was being installed on new vessels in naval shipyards [*International Herald Tribune*, 24 October 1978, p.2.]

²⁴ See my, 'Soviet SSBNs: How Many, Doing What?' *Pacific Defence Reporter* (February 1979) pp.60-67.

²⁵ For a general review of the difficulties see my, 'Estimating Soviet Military Expenditure', *World Armaments and Disarmament, SIPRI Yearbook 1974*, pp.172-204.

²⁶ For a brief discussion of the origins and implications of these new estimates see my 'The Soviet Military Expenditure Muddle', *The Australian Journal of Defence Studies* (April 1978) pp.54-61.

²⁷ This particular concern was undoubtedly exacerbated by rumours in 1977/78 that the West Germans were secretly developing and testing both a long-range cruise missile and a IRBM using a large proving ground in Zaire. The 'cover' for this operation was a German firm called OTRAG ostensibly engaged in developing low-cost boosters to launch commercial satellites. See Tad Szulc, 'Germany Rearms', *Penthouse* (March 1978) pp.76-82.

²⁸ *Fiscal Year 1974 Authorization for Military Procurement . . .*, hearings, Senate Armed Services Committee, Part I, February 1973, p.159.

²⁹ Newhouse, *Cold Dawn, op.cit.*, pp.192-198.

³⁰ *The Age*, 17 August 1972, p.7. The problem, it appears, is that the US considered an SSBN to be under construction when the hull began to be assembled in a shipyard while the Soviets maintained that construction began with the propulsion reactor, an activity that the US could not observe.

³¹ For more details on these and other issues concerning compliance with the terms of SALT I see, *The State Department, Selected Documents, No.7*, 1978.

³² The text of the Interim Agreement together with agreed interpretations and common understandings are reprinted in John H. Barton and Lawrence D. Weiler (eds), *International Arms Control: Issues and Agreements* (California: Stanford University Press, 1976), pp.375-382.

³³ *ibid.*, p.381.

³⁴ *Military Implications of the Strategic Arms Limitation Talks Agreements*, hearings, House Armed Services Committee, July 1972, pp.15144-15145.

³⁵ See Colin S. Gray, 'SALT II and the Strategic Balance', *British Journal of International Studies*, (Vol.1, 1975) p.190.

³⁶ It appears that the US delegation was informally advised at Helsinki in May 1972 that the Soviet Union would be deploying new ICBMs in SS-11 silos but that these new missiles would not exceed the halfway mark in terms of volume between the SS-11 and the SS-9. However, to the best of my knowledge, this fact was not made generally known until January 1976. See the article by Gerard E. Smith, the chief US negotiator during SALT I, in the *New York Times*, 16 January 1976, p.29.

³⁷ The Carter Administration evidently took this lesson to heart, at least as far as unilateral declarations were concerned. In July 1978 Paul C. Warnke assured a conference audience that there would be no such declarations in SALT II.

³⁸ Nitze was on the US negotiating team until June 1974.

³⁹ Paul H. Nitze, address before the staff of the Los Alamos Scientific Laboratory, 17 December 1974, reprinted in *Hearings on Military Posture and H.R. 3689*, House Armed Services Committee, February 1975, pp.1617-1643.

⁴⁰ *The Times* (London), 29 December 1973, p.11.

⁴¹ *New York Times*, 6 February 1974, pp.1 and 12.

⁴² *New York Times*, 24 March 1974, p.3.

- ⁴³ *New York Times*, 12 April 1974, p.2.
- ⁴⁴ *New York Times*, 26 December 1974, (editorial).
- ⁴⁵ *New York Times*, 9 July 1974, p.1.
- ⁴⁶ *ibid.*, p.3.
- ⁴⁷ *ibid.*, p.1.
- ⁴⁸ *The New Yorker*, 29 July 1974, p.70.
- ⁴⁹ *New York Times*, 3 December 1974, p.1.
- ⁵⁰ On these respective speculations see Thomas W. Wolfe, *The SALT Experience: Its Impact on US and Soviet Strategic Policy and Decisionmaking*, Santa Monica, California: Rand Corporation, R-1686-PR, September 1975, pp.161-164.
- ⁵¹ Quoted in *Defense/Space Business Daily*, Washington, D.C., 17 June 1974, p.256.
- ⁵² 'Text of Secretary of State Henry A. Kissinger's Background Briefing on Vladivostok, 3 December 1974', in Robert J. Pranger and Roger P. Labrie (eds), *Nuclear Strategy and National Security: Points of View* (Washington, D.C.: The American Enterprise Institute for Public Policy Research, 1977), p.399.
- ⁵³ Wolfe, *The SALT Experience*, *op.cit.*, pp.165-166.
- ⁵⁴ *New York Times*, 10 December 1974, p.12.
- ⁵⁵ Pranger and Labrie (eds), *Nuclear Strategy and National Security: Points of View*, *op.cit.*, p.397.
- ⁵⁶ *New York Times*, 4 December 1974 (editorial). For the rest, the editorial was highly critical because it permitted virtually all the known plans on each side for the expansion and modernization of the strategic force. One of the best elaborations of this line of criticism is Milton Leitenberg, 'The Vladivostok ceilings, and why they are so high', *British Journal of International Studies* (July 1976) pp.149-163.
- ⁵⁷ *Fiscal Year 1976 and July-September 1976 Transitional Period Authorization for Military Procurement . . .*, hearings, Senate Armed Services Committee, February-April 1975, p.5180.

⁵⁸ In his background briefing Kissinger indicated that these two issues were again discussed *jointly* at Vladivostok. See Pranger and Labrie (eds), *Nuclear Strategy and National Security: Points of View*, *op.cit.*, p.400. It can also be mentioned that on 24 October, 1974, the US Air Force conducted a test involving the air-launch of a Minuteman I ICBM. However, this test was connected with the interest in mobile ICBMs; it was not an air-launched ballistic missile in the sense relevant here.

⁵⁹ *Fiscal Year 1976 and July-September 1976 Transitional Period Authorization for Military Procurement . . .*, *op.cit.*, p.5162.

⁶⁰ *The Times* (London), 21 October 1975, p.6.

⁶¹ *ibid.*

⁶² See testimony of Paul Nitze in *Consideration of Mr Paul C. Warnke to be Director of the U.S. Arms Control and Disarmament Agency and Ambassador*, hearings, *op.cit.*, p.192.

⁶³ *Washington Post*, 6 November 1975. Another source suggests that the proposal was for equal numbers of Backfires and *aircraft* armed with cruise missiles. [*New York Times*, 3 December 1975, p.18.]

⁶⁴ *New York Times*, 8 November 1975, p.4. At the Helsinki summit between Ford and Brezhnev in July 1975 the Soviets reportedly suggested that, for GLCMs, only those of inter-continental range (5,500 km or more) be counted. Why the US refused this offer is not clear but it probably reflects the confusion at the time on roles and missions for cruise missiles. [Jan M. Lodal, 'SALT II and American Security', *Foreign Affairs* (Winter 1978/79) p.248.]

⁶⁵ *ibid.*

⁶⁶ *New York Times*, 16 January 1976, pp.1 and 4. Three years later Henry Kissinger recalled that the US negotiating objective at this time – an objective with which he claims the Soviets were broadly sympathetic – was to permit the US medium-range ground and sea-launched cruise missiles in numbers related to the number of Backfires on the Soviet side. ['Kissinger's Critique', interview, *The Economist*, 3 February 1979, p.21.]

⁶⁷ See *Aviation Week & Space Technology*, 19 January 1976, p.11. One indication of the pressure on Kissinger was that, for the first time, a senior defence official was included in the team he took to Moscow.

⁶⁸ *Aviation Week & Space Technology*, 16 February 1976, p.13.

- ⁶⁹ *New York Times*, 24 January 1976, pp.1 and 3.
- ⁷⁰ *New York Times*, 17 February 1976, p.8.
- ⁷¹ *New York Times*, 2 February 1976, p.22.
- ⁷² *New York Times*, 17 February 1976, p.8.
- ⁷³ *New York Times*, 22 March 1976, p.11 and 11 April 1976, p.1.
- ⁷⁴ *New York Times*, 11 April 1976, p.1.
- ⁷⁵ *International Herald Tribune*, 28 March 1977, p.1.
- ⁷⁶ *New York Times*, 19 January 1977, p.4.
- ⁷⁷ See, *Consideration of Mr Paul C. Warnke to be Director of the U.S. Arms Control and Disarmament Agency and Ambassador*, hearings, *op.cit.*, p.141, and *New York Times*, 5 April 1977, p.6.
- ⁷⁸ *New York Times*, 9 February 1977, p.1.
- ⁷⁹ *New York Times*, 4 February 1977, p.1.
- ⁸⁰ Transcript of a press conference reprinted in *Aviation Week & Space Technology*, 18 April 1977, pp.34-39.
- ⁸¹ *ibid.*
- ⁸² *International Herald Tribune*, 7 July 1977, p.4.
- ⁸³ The figure on range implied was probably 2,500 kilometers. It has been rumoured that, at the last minute, Vance and Warnke amended this proposal so that the 2,500 km range limit on ALCMs would apply only to ALCMs carried on heavy bombers, that is, bombers indisputably accountable in SALT. ALCMs on all other aircraft would be limited to a range of 600 km. This was done to prevent the Backfire, in the event it was not included in the SALT ceilings, from being equipped with long-range cruise missiles [*International Herald Tribune*, 4 May 1977, p.4.]
- ⁸⁴ Herbert Scoville Jr, 'The SALT Negotiations', *Scientific American* (August 1977) p.28.
- ⁸⁵ Gromyko's remarks are reprinted in Pranger and Labrie (eds), *Nuclear Strategy and National Security: Points of View*, *op.cit.*, pp.416-425.
- ⁸⁶ From an edited version of the *Pravda* article printed in *Flight International*, 28 May 1977, p.1476.

⁸⁷ *SALT Negotiations with the Soviet Union*, Presidential Documents: Jimmy Carter, 1977, Volume 13, Number 14, 30 March 1977.

⁸⁸ One source suggests that it was proposed to allow only 190 of the 308 SS-9s to be replaced with SS-18s. See Colonel Joel M. McKean, *SALT TWO Ratification Issues*, Washington, D.C.: National Defense University, Monograph 78-2, March 1978, p.2.

⁸⁹ *New York Times*, 13 June 1977, p.1 and the *New York Times Weekly Review*, 18 September 1977, p.6.

⁹⁰ See *International Herald Tribune*, 10 May 1977, p.4. Earlier, Dr Georgi Arbartov, Director of the Institute for United States and Canadian Affairs, had made the pointed remark that 2,500 kilometers, the range limit proposed in March for *all* cruise missiles, was precisely the distance between London and Moscow [*The Age*, 2 May 1977, p.10.]

⁹¹ *New York Times*, 13 April 1977, p.12.

⁹² *Aviation Week & Space Technology*, 15 August 1977, p.13.

⁹³ *Aviation Week & Space Technology*, 4 July 1977, p.16.

⁹⁴ *ibid.*

⁹⁵ *ibid.*

⁹⁶ *New York Times*, 11 October 1977, p.1.

⁹⁷ *Aviation Week & Space Technology*, 4 July 1977, p.16. A pertinent observation here is that earlier in September Secretary of Defense Harold Brown had given the first official acknowledgement that the Soviet Union had four new ICBMs under development. [*New York Times*, 16 September 1977, p.9.]

⁹⁹ *International Herald Tribune*, 7 November 1977, p.3.

¹⁰⁰ *New York Times*, 28 September 1977, p.37. Although this arrangement was reported in the press and, to my knowledge, not retracted, one suspects an error in the Defense Department's announcement or in the *Tribune* resumé of this announcement.

¹⁰¹ *International Herald Tribune*, 8 December 1977, pp.1 and 2.

¹⁰² *ibid.*

¹⁰³ Reported in the *International Herald Tribune*, 16 February 1978.

¹⁰⁴ Opposition to the Administration's strategy in SALT had built up rapidly since it began to retreat from the comprehensive proposal submitted to the Soviets in March 1977. A good overview of the groups opposing the SALT II treaty is given by Morton Kondracke, 'The Assault on SALT', *The NEW Republic*, 17 December 1977, pp.19-21.

¹⁰⁵ *International Herald Tribune*, 13 February 1978, pp.1 and 2.

¹⁰⁶ The Department of State, News Release, *The SALT Process*, 19 January 1978, p.13.

¹⁰⁷ *International Herald Tribune*, 13 February 1978, pp.1 and 2. In the statement in *Pravda* mentioned above it was stated that such a ban had already been agreed upon.

¹⁰⁸ *ibid.*

¹⁰⁹ *International Herald Tribune*, 9 May 1978, pp.1 and 2.

¹¹⁰ *ibid.*

¹¹¹ *Aviation Week & Space Technology*, 24 April 1978, p.16.

¹¹² *International Herald Tribune*, 17 April 1978, p.2. The remaining half could be assigned to the theatre nuclear strike role. US officials were confident of being able to detect the distinctive flight patterns associated with training for strategic nuclear bombing.

¹¹³ *International Herald Tribune*, 25 April 1978, p.3.

¹¹⁴ *ibid.* See also *International Herald Tribune*, 3 May 1978, p.1.

¹¹⁵ *Aviation Week & Space Technology*, 24 April 1978, p.16. Assuming that this was the position adopted by the US, it practically was open to question on the grounds of verification. It is easy to see how isolated reports of this kind generated concern in the European NATO countries that had great plans for the cruise missile.

¹¹⁶ *International Herald Tribune*, 9 May 1978, pp.1 and 2.

¹¹⁷ *ibid.*

¹¹⁸ *International Herald Tribune*, 27/28 May 1978, p.3.

¹¹⁹ Paul Warnke has indicated that limiting the number of warheads on a MIRVed missile was a key objective of the negotiations on modernisation since March 1977 but this was not revealed in the public record until a year later. [The Department of State, *SALT: Its Contribution to U.S. Security and World Peace*, Current Policy, No.27, August 1978.]

- ¹²⁰ *International Herald Tribune*, 5 June 1978, p.1 and 6 June, 1978, p.3.
- ¹²¹ *International Herald Tribune*, 10 July 1978, p.1.
- ¹²² See *International Herald Tribune*, 14 July 1978, p.1 and 25 July 1978, pp.1 and 2.
- ¹²³ See the pamphlet produced by the US Department of State, *The United States and the Soviet Union* (remarks by President Carter at the US Naval Academy Commencement on 7 June), p.11.
- ¹²⁴ *International Herald Tribune*, 25 July 1978, pp.1 and 2.
- ¹²⁵ *International Herald Tribune*, 24 July 1978, p.2.
- ¹²⁶ Quoted in *International Herald Tribune*, 26/27 August 1978, p.3.
- ¹²⁷ For a discussion of the US and Soviet positions on this question see *Aviation Week & Space Technology*, 19 February 1979, pp.17-18. Somewhere along the way, the United States persuaded the Soviets to completely abandon the SS-16 mobile ICBM on the grounds that reconnaissance satellites could not distinguish this weapon from the SS-20 IRBM. Reportedly, the Soviets agreed not to conduct any further tests of the SS-16 and not to deploy it in silos. [Jan M. Lodal, 'SALT II and American Security', *Foreign Affairs* (Winter 1978/79) p.250.] Critics of SALT II have focused on this as another aspect of the agreement that cannot be verified. [*Aviation Week & Space Technology*, 1 January 1979, p.16.]
- ¹²⁸ Remarks by Paul C. Warnke before the Foreign Policy Association, New York, 23 August 1978. Reprinted as *SALT TWO – The Home Stretch*, The Department of State, Current Policy, No.31 September 1978 (p.4.).
- ¹²⁹ Fred Charles Ikle, 'What to Hope For, and Worry about, in SALT', *Fortune* (October 1977) p.182.
- ¹³⁰ See my 'Soviet SSBN's: How Many, Doing What', *op.cit.*
- ¹³¹ *Aviation Week & Space Technology*, 4 September 1978, p.24.
- ¹³² *ibid.*, p.26.
- ¹³³ Defense Secretary Harold Brown was reportedly insisting that the limit be pegged at 40 per cent above the 2,500 km straight-line range limit. [*Air Force Magazine*, August 1978, p.14.]
- ¹³⁴ *International Herald Tribune*, 2 October 1978, p.1.

¹³⁵ Stephen J. Flanagan, 'Congress, the White House and SALT', *Bulletin of Atomic Scientists* (November 1978) p.39.

¹³⁶ *ibid.*

¹³⁷ *The Australian*, 7/8 October 1978, p.7.

¹³⁸ *The Australian*, 24 October 1978, p.2.

¹³⁹ *International Herald Tribune*, 24 October 1978, p.2.

¹⁴⁰ See James Reston, 'Carter's Next Big Challenge', *International Herald Tribune*, 14/15 October 1978, p.4. On the domestic front, in October, President Carter accepted the resignation of Paul Warnke. Warnke had been unpopular with Senate hard-liners from the outset and his departure was generally interpreted as a gesture to the Senate to improve the prospects of ratification. In nominating a successor to head the ACDA the Administration followed the same logic and settled on Lieutenant-General George Siegnious. Ralph Earl, Warnke's deputy in the ACDA was nominated for the post of chief SALT negotiator. [See 'Up in Arms over SALT', *The Economist*, 9 December 1978, pp.49-50.]

¹⁴¹ *International Herald Tribune*, 23 October 1978, p.2. Carter's decision was to proceed with the production of new tactical nuclear warheads that provided for, but for the time being would not include, the components to produce the enhanced radiation effect.

¹⁴² Quoted in *International Herald Tribune*, 24 October 1978, pp.1 and 2.

¹⁴³ *ibid.*

¹⁴⁴ *International Herald Tribune*, 27 October 1978, pp.1 and 2. It is considered technologically feasible to reduce the weight of a ballistic re-entry vehicle to about 300 lbs. The SS-18 is estimated to have a throw-weight of 16,000 lbs. The warhead issue was eventually resolved as follows. Neither side would increase the number of re-entry vehicles per missile of any type beyond the highest number deployed or tested on that type. Similarly, any new ballistic missile would not have more re-entry vehicles than the highest number on existing weapons on either side. This meant that the SS-18 could have a maximum of 10 warheads and the Minuteman III a maximum of 7 warheads, the number with which the weapon was successfully tested in the mid-1970s under the Pave Pepper programme. New ICBMs and SLBMs would be permitted a maximum of 10 and 14 warheads, respectively.

- ¹⁴⁵ *International Herald Tribune*, 12 December 1978, pp.1 and 2.
- ¹⁴⁶ *International Herald Tribune*, 6 December 1978, p.3.
- ¹⁴⁷ See, for example, Jonathan Steele, 'US Looks at War Options', *The Guardian Weekly*, week ending 10 December 1978, p.7. and *International Herald Tribune*, 6-7 January 1979, p.1. Defense Secretary Brown's annual report for FY1980 confirmed these changes.
- ¹⁴⁸ The US Government reportedly learned of the deliveries shortly after the first aircraft arrived in Cuba early in 1978 but chose not to make the fact public at the time. [*Air Force Magazine*, January 1979, p.17.]
- ¹⁴⁹ See William Beecher, 'Political Winds of Cuban MiG-23s', *International Herald Tribune*, 9-10 December 1978, p.4.
- ¹⁵⁰ *International Herald Tribune*, 9-10 December 1978, p.6.
- ¹⁵¹ *Aviation Week & Space Technology*, 8 January 1979, p.11.
- ¹⁵² According to Paul Nitze, the US had accepted these Soviet demands by early January 1979. [Paul H. Nitze, 'Considerations Bearing on the Merits of an Agreement', 15 January 1979: unpublished paper prepared for the Committee of the Present Danger.] This was confirmed by the *Washington Post* of 14 February 1979 [*The Age*, 15 February 1979, p.8].
- ¹⁵³ *The Australian*, 26 December 1978, p.4 and *Aviation Week & Space Technology*, 20 November 1978, p.20.
- ¹⁵⁴ Rowland Evans and Robert Novak, 'A Gamble With SALT', *International Herald Tribune*, 10 January 1979, p.6. On 21 December 1978, while Vance and Gromyko were negotiating in Geneva, the Soviet Union test-fired an SS-18 ICBM and again encoded the data transmitted by the missile. The US warned the Soviet Union not to impede its verification efforts, pointing out that the encoding of the December 21 test was an example of what would not be permitted. [*International Herald Tribune*, 1 February 1979, p.1.]
- ¹⁵⁵ The US ability to verify Soviet compliance with SALT II suffered another blow in January 1979 when the CIA was compelled to dismantle its intelligence-gathering equipment in Iran. The significance of this development soon became a subject of considerable controversy. [*Newsweek*, 14 January 1979, p.2 and 23 April 1979, pp.20-21.
- ¹⁵⁶ *The Age*, 15 February 1979, p.8 and *Aviation Week & Space Technology*, 19 February 1979, p.18.

- ¹⁵⁷ *Aviation Week & Space Technology*, 12 February 1979, p.22.
- ¹⁵⁸ *Aviation Week & Space Technology*, 19 February 1979, pp.14-17.
- ¹⁵⁹ *International Herald Tribune*, 3-4 March 1979, p.2. This question was settled in mid-April to the effect that key missile specifications would not be increased or reduced by more than 5 per cent. [*International Herald Tribune*, 20 April 1979, p.1.]
- ¹⁶⁰ Cited in *International Herald Tribune*, 20 March 1979, p.3. On the encoding issue, the narrowing of differences may have been due, in part, to the Pentagon's indication that some encoding was acceptable because it wanted to keep the Soviets from learning too much about US weapons. [*Newsweek*, 26 March 1979, p.7.]
- ¹⁶¹ See Don Oberdorfer, 'Agonizing Interval: Slow, Measured Steps in SALT-2 Time', *International Herald Tribune*, 12-13 May 1979, p.6.
- ¹⁶² *Time*, 21 May 1979, p.21.
- ¹⁶³ *ibid.*
- ¹⁶⁴ 'Vance Statement on SALT Agreement', *Daily Bulletin*, United States Mission, 80 Rue de lausanne, Geneva, 10 May 1979.
- ¹⁶⁵ The relevant sections of the SALT II Agreement are reproduced in Annex I.
- ¹⁶⁶ 'Kissinger's Critique', interview, *The Economist*, 3 February 1979, p.21.
- ¹⁶⁷ Early in 1974 the Navy included in an official list of reasons for proceeding with the SLCM (a) the fact that the weapon could be covertly deployed and (b) the fact that the identity of strategic and tactical versions could not be verified. [*Fiscal Year 1975 Authorization for Military Procurement* . . . , hearings, Senate Armed Services Committee, April 1974, p.3620.] A year later, the Chief of Naval Operations, Admiral Holloway, testified that any limitations on sea-launched cruise missiles, other than a total ban on both tactical and strategic variants, was likely to be meaningless. [*Hearings on Military Posture and H.R. 3689*, House Armed Services Committee, February-May 1975, pp.840-841.]
- ¹⁶⁸ *Time*, 21 May 1979, p.18.
- ¹⁶⁹ *The SALT Treaty*, hearings, Senate Foreign Relations Committee, Part I, 9-12 July 1979, pp.406-407.

¹⁷⁰ *Retaliatory Issues for US Strategic Nuclear Forces*, Congressional Budget Office, Washington D.C., June 1978, pp.54-57.

¹⁷¹ It is quite probable that the US also argued that the Soviet concept for the mobile deployment of the SS-X-16 – presumably a wheeled vehicle that could travel on any reasonably hard road – was in itself unacceptable on the grounds of verification. This view is supported by the extraordinary efforts made by the United States to devise a deployment mode for its MX ICBM that satisfies both the desired invulnerability and the requirements of verification.

¹⁷² Flora Lewis, 'Europeans loath to Share Nuclear Trigger with U.S.', *International Herald Tribune*, 3-4 November 1979, p.2.

¹⁷³ Richard Burt, 'Plan for New Missiles In Europe Is Backed', *International Herald Tribune*, 6-7 October 1979, p.1. US officials had in fact been engaged for some time in consultations with Allied governments to devise arrangements for the joint preparation of negotiating positions and evaluation of Soviet proposals. Even earlier, probably later in 1978, the US had discretely approached the French on their participation in negotiations on theatre weapons in the context of SALT III. The French declined. [*International Herald Tribune*, 22 January 1979, p.2.]

¹⁷⁴ *New York Times*, 7 October 1979, p.12.

¹⁷⁵ Eugene Kozicharow, 'NATO Rejects Brezhnev's Offer to Forego Arms Update', *Aviation Week & Space Technology*, 15 October 1979, pp.18-19.

¹⁷⁶ Richard Halloran, 'US Expects Russia to Increase Tactical Warheads 50% by 1985', *International Herald Tribune*, 16 October 1979, p.1.

¹⁷⁷ Tom Wicker, 'NATO and SALT: Issue of Missiles', *International Herald Tribune*, 25 October 1979, p.6.

¹⁷⁸ In addition, the nuclear-armed SLCM continues to lurk in the background. A decision on whether to deploy this weapon will not be taken until 1982 but a baseline procurement programme for 135 missiles is included in the FY1981 defence budget. [*Aviation Week & Space Technology*, 12 November 1979, p.13.] However, the conventionally-armed anti-ship variant which is dimensionally identical to the land-attack weapon, is scheduled to become operational in mid-1982.

¹⁷⁹ Michael Getler, 'Brezhnev Seen Skillfully Pressuring West', *International Herald Tribune*, 13-14 October 1979, pp.1-2.

¹⁸⁰ Walter Pincus, 'U.S. Will Push for NATO Missiles Deployment Despite Soviets', *Washington Post*, 9 October 1979, p.1. On 6 December 1979, despite earlier indications to the contrary, the Dutch parliament voted against the plan [*Canberra Times*, 8 December 1979, p.6].

¹⁸¹ *International Herald Tribune*, 14 November 1979, p.1.

¹⁸² For an exhaustive review see Robert Metzler and Paul Doty 'Arms Control Enters the Gray Area', *International Security*, Winter 1978/79, pp.17-52.

ANNEX

Cruise Missile Provisions in SALT II.**1. Article II, paragraph 3 of the Treaty.**

3. Heavy bombers are considered to be:

- (a) currently, for the United States of America, bombers of the B-52 and B-1 types, and for the Union of Soviet Socialist Republics, bombers of the Tupolev-95 and Myasishchev types;
- (b) in the future, types of bombers which can carry out the mission of a heavy bomber in a manner similar or superior to that of bombers listed in subparagraph (a) above;
- (c) types of bombers equipped for cruise missiles capable of a range in excess of 600 kilometers; and
- (d) types of bombers equipped for ASBMs.

First Agreed Statement. The term "bombers," as used in paragraph 3 of Article II and other provisions of the Treaty, means airplanes of types initially constructed to be equipped for bombs or missiles.

Second Agreed Statement. The Parties shall notify each other on a case-by-case basis in the Standing Consultative Commission of inclusion of types of bombers as heavy bombers pursuant to the provisions of paragraph 3 of Article II of the Treaty; in this connection the Parties shall hold consultations, as appropriate, consistent with the provisions of paragraph 2 of Article XVII of the Treaty.

Third Agreed Statement. The criteria the Parties shall use to make case-by-case determinations of which types of bombers in the future can carry out the mission of a heavy bomber in a manner similar or superior to that of current heavy bombers, as referred to in subparagraph 3(b) of Article II of the Treaty, shall be agreed upon in the Standing Consultative Commission.

Fourth Agreed Statement. Having agreed that every bomber of a type included in paragraph 3 of Article II of the Treaty is to be considered a heavy bomber, the Parties further agree that:

- (a) airplanes which otherwise would be bombers of a heavy bomber type shall not be considered to be bombers of a heavy bomber type if they have functionally related observable differences which indicate that they cannot perform the mission of a heavy bomber;

(b) airplanes which otherwise would be bombers of a type equipped for cruise missiles capable of a range in excess of 600 kilometers shall not be considered to be bombers of a type equipped for cruise missiles capable of a range in excess of 600 kilometers if they have functionally related observable differences which indicate that they cannot perform the mission of a bomber equipped for cruise missiles capable of a range in excess of 600 kilometers, except that heavy bombers of current types, as designated in subparagraph 3(a) of Article II of the Treaty, which otherwise would be of a type equipped for cruise missiles capable of a range in excess of 600 kilometers shall not be considered to be heavy bombers of a type equipped for cruise missiles capable of a range in excess of 600 kilometers if they are distinguishable on the basis of externally observable differences from heavy bombers of a type equipped for cruise missiles capable of a range in excess of 600 kilometers; and

(c) airplanes which otherwise would be bombers of a type equipped for ASBMs shall not be considered to be bombers of a type equipped for ASBMs if they have functionally related observable differences which indicate that they cannot perform the mission of a bomber equipped for ASBMs, except that heavy bombers of current types, as designated in subparagraph 3(a) of Article II of the Treaty, which otherwise would be of a type equipped for ASBMs shall not be considered to be heavy bombers of a type equipped for ASBMs if they are distinguishable on the basis of externally observable differences from heavy bombers of a type equipped for ASBMs.

First Common Understanding. Functionally related observable differences are differences in the observable features of airplanes which indicate whether or not these airplanes can perform the mission of a heavy bomber, or whether or not they can perform the mission of a bomber equipped for cruise missiles capable of a range in excess of 600 kilometers or whether or not they can perform the mission of a bomber equipped for ASBMs. Functionally related observable differences shall be verifiable by national technical means. To this end, the Parties may take, as appropriate, cooperative measures contributing to the effectiveness of verification by national technical means.

Fifth Agreed Statement. Tupolev-142 airplanes in their current configuration, that is, in the configuration for anti-submarine warfare, are considered to be airplanes of a type different from types of heavy bombers referred to in subparagraph 3(a) of Article II of the Treaty and not subject to the Fourth Agreed Statement to paragraph 3 of Article II of the Treaty. This Agreed Statement does not preclude improvement of Tupolev-142 airplanes as an anti-submarine system, and does not prejudice or set a precedent for designation in the future of types of airplanes as heavy bombers pursuant to subparagraph 3(b) of Article II of the Treaty or for application of the Fourth Agreed Statement to paragraph 3 of Article II of the Treaty to such airplanes.

Second Common Understanding. Not later than six months after entry into force of the Treaty the Union of Soviet Socialist Republics will give its thirty-one Myasishchev airplanes used as tankers in existence as of the date of signature of the Treaty functionally related observable differences which indicate that they cannot perform the mission of a heavy bomber.

Third Common Understanding. The designations by the United States of America and by the Union of Soviet Socialist Republics for heavy bombers referred to in subparagraph 3(a) of Article II of the Treaty correspond in the following manner:

Heavy bombers of the types designated by the United States of America as the B-52 and the B-1 are known to the Union of Soviet Socialist Republics by the same designations;

Heavy bombers of the type designated by the Union of Soviet Socialist Republics as the Tupolev-95 are known to the United States of America as heavy bombers of the Bear type; and

Heavy bombers of the type designated by the Union of Soviet Socialist Republics as the Myasishchev are known to the United States of America as heavy bombers of the Bison type.

2. Article II, paragraph 8 of the Treaty.

8. Cruise missiles are unmanned, self-propelled, guided, weapon-delivery vehicles which sustain flight through the use of aerodynamic lift over most of their flight path and which are flight-tested from or deployed on aircraft, that is, air-launched cruise missiles, or such vehicles which are referred to as cruise missiles in subparagraph 1(b) of Article IX.

First Agreed Statement. If a cruise missile is capable of a range in excess of 600 kilometers, all cruise missiles of that type shall be considered to be cruise missiles capable of a range in excess of 600 kilometers.

First Common Understanding. If a cruise missile has been flight-tested to a range in excess of 600 kilometers, it shall be considered to be a cruise missile capable of a range in excess of 600 kilometers.

Second Common Understanding. Cruise missiles not capable of a range in excess of 600 kilometers shall not be considered to be of a type capable of a range in excess of 600 kilometers if they are distinguishable on the basis of externally observable design features from cruise missiles of types capable of a range in excess of 600 kilometers.

Second Agreed Statement. The range of which a cruise missile is capable is the maximum distance which can be covered by the missile in its standard design mode flying until fuel exhaustion, determined by projecting its flight path onto the Earth's sphere from the point of launch to the point of impact.

Third Agreed Statement. If an unmanned, self-propelled, guided vehicle which sustains flight through the use of aerodynamic lift over most of its flight path has been flight-tested or deployed for weapon delivery, all vehicles of that type shall be considered to be weapon-delivery vehicles.

Third Common Understanding. Unmanned, self-propelled, guided vehicles which sustain flight through the use of aerodynamic lift over most of their flight path and are not weapon-delivery vehicles, that is, unarmed, pilotless, guided vehicles, shall not be considered to be cruise missiles if such vehicles are distinguishable from cruise missiles on the basis of externally observable design features.

Fourth Common Understanding. Neither Party shall convert unarmed, pilotless, guided vehicles into cruise missiles capable of a range in excess of 600 kilometers, nor shall either Party convert cruise missiles capable of a range in excess of 600 kilometers into unarmed, pilotless, guided vehicles.

Fifth Common Understanding. Neither Party has plans during the term of the Treaty to flight-test from or deploy on aircraft unarmed, pilotless, guided vehicles which are capable of a range in excess of 600 kilometers. In the future, should a Party have such plans, that Party will provide notification thereof to the other Party well in advance of such flight-testing or deployment. This Common Understanding does not apply to target drones.

3. Article VIII of the Treaty.

Article VIII

1. Each Party undertakes not to flight-test cruise missiles capable of a range in excess of 600 kilometers or ASBMs from aircraft other than bombers or to convert such aircraft into aircraft equipped for such missiles.

Agreed Statement. For purposes of testing only, each Party has the right, through initial construction or, as an exception to the provisions of paragraph 1 of Article VIII of the Treaty, by conversion, to equip for cruise missiles capable of a range in excess of 600 kilometers or for ASBMs no more than sixteen airplanes, including airplanes which are prototypes of bombers equipped for such missiles. Each Party also has the right, as an exception to the provisions of paragraph 1 of Article VIII of the Treaty, to flight-test from such airplanes cruise missiles capable of a range in excess of 600 kilometers and, after the date on which the Protocol ceases to be in force, to flight-test ASBMs from such airplanes as well, unless the Parties agree that they will not flight-test ASBMs after that date. The limitations provided for in Article III of the Treaty shall not apply to such airplanes.

The aforementioned airplanes may include only:

- (a) airplanes other than bombers which, as an exception to the provisions of paragraph 1 of Article VIII of the Treaty, have been converted into airplanes equipped for cruise missiles capable of a range in excess of 600 kilometers or for ASBMs;
- (b) airplanes considered to be heavy bombers pursuant to subparagraph 3(c) or 3(d) of Article II of the Treaty; and
- (c) airplanes other than heavy bombers which, prior to March 7, 1979, were used for testing cruise missiles capable of a range in excess of 600 kilometers.

The airplanes referred to in subparagraph (a) and (b) of this Agreed Statement shall be distinguishable on the basis of functionally related observable differences from airplanes which otherwise would be of the same type but cannot perform the mission of a bomber equipped for cruise missiles capable of a range in excess of 600 kilometers or for ASBMs.

The airplanes referred to in subparagraph (c) of this Agreed Statement shall not be used for testing cruise missiles capable of a range in excess of 600 kilometers after the expiration of a six-month period from the date of entry into force of the Treaty, unless by the expiration of that period they are distinguishable on the basis of functionally related observable differences from airplanes which otherwise would be of the same type but cannot perform the mission of a bomber equipped for cruise missiles capable of a range in excess of 600 kilometers.

First Common Understanding. The term "testing", as used in the Agreed Statement to paragraph 1 of Article VIII of the Treaty, includes research and development.

Second Common Understanding. The Parties shall notify each other in the Standing Consultative Commission of the number of airplanes, according to type, used for testing pursuant to the Agreed Statement to paragraph 1 of Article VIII of the Treaty. Such notification shall be provided at the first regular session of the Standing Consultative Commission held after an airplane has been used for such testing.

Third Common Understanding. None of the sixteen airplanes referred to in the Agreed Statement to paragraph 1 of Article VIII of the Treaty may be replaced, except in the event of the involuntary destruction of any such airplane or in the case of the dismantling or destruction of any such airplane. The procedures for such replacement and for removal of any such airplane from that number, in case of its conversion, shall be agreed upon in the Standing Consultative Commission.

4. Article II of the Protocol.

Article II

1. Each Party undertakes not to deploy cruise missiles capable of a range in excess of 600 kilometers on sea-based launchers or on land-based launchers.
2. Each Party undertakes not to flight-test cruise missiles capable of a range in excess of 600 kilometers which are equipped with multiple independently targetable warheads from sea-based launchers or from land-based launchers.

Agreed Statement. Warheads of a cruise missile are independently targetable if maneuvering or targeting of the warheads to separate aim points along ballistic trajectories or any other flight paths, which are unrelated to each other, is accomplished during a flight of a cruise missile.

3. For the purposes of this Protocol, cruise missiles are unmanned, self-propelled, guided, weapon-delivery vehicles which sustain flight through the use of aerodynamic lift over most of their flight path and which are flight-tested from or deployed on sea-based or land-based launchers, that is, sea-launched cruise missiles and ground-launched cruise missiles, respectively.

First Agreed Statement. If a cruise missile is capable of a range in excess of 600 kilometers, all cruise missiles of that type shall be considered to be cruise missiles capable of a range in excess of 600 kilometers.

First Common Understanding. If a cruise missile has been flight-tested to a range in excess of 600 kilometers, it shall be considered to be a cruise missile capable of a range in excess of 600 kilometers.

Second Common Understanding. Cruise missiles not capable of a range in excess of 600 kilometers shall not be considered to be of a type capable of a range in excess of 600 kilometers if they are distinguishable on the basis of externally observable design features from cruise missiles of types capable of a range in excess of 600 kilometers.

Second Agreed Statement. The range of which a cruise missile is capable is the maximum distance which can be covered by the missile in its standard design mode flying until fuel exhaustion, determined by projecting its flight path onto the Earth's sphere from the point of launch to the point of impact.

Third Agreed Statement. If an unmanned, self-propelled, guided vehicle which sustains flight through the use of aerodynamic lift over most of its flight path has been flight-tested or deployed for weapon delivery, all vehicles of that type shall be considered to be weapon-delivery vehicles.

Third Common Understanding. Unmanned, self-propelled, guided vehicles which sustain flight through the use of aerodynamic lift over most of their flight path and are not weapon-delivery vehicles, that is, unarmed, pilotless, guided vehicles, shall not be considered to be cruise missiles if such vehicles are distinguishable from cruise missiles on the basis of externally observable design features.

Fourth Common Understanding. Neither Party shall convert unarmed, pilotless, guided vehicles into cruise missiles capable of a range in excess of 600 kilometers, nor shall either Party convert cruise missiles capable of a range in excess of 600 kilometers into unarmed, pilotless, guided vehicles.

Fifth Common Understanding. Neither Party has plans during the term of the Protocol to flight-test from or deploy on sea-based or land-based launchers unarmed, pilotless, guided vehicles which are capable of a range in excess of 600 kilometers. In the future, should a Party have such plans, that Party will provide notification thereof to the other Party well in advance of such flight-testing or deployment. This Common Understanding does not apply to target drones.

**The Strategic and Defence Studies Centre,
Research School of Pacific Studies,
The Australian National University.**

The aim of the Strategic and Defence Studies Centre, which was set up in the Research School of Pacific Studies in the Australian National University, is to advance the study of strategic problems, particularly those relating to the general region of the Indian and Pacific Oceans and South-east Asia. Participation in the Centre's activities is not limited to members of the University, but includes other interested professional and Parliamentary groups. Research includes not only military, but political, economic, scientific and technological aspects. Strategy, for the purpose of the Centre, is defined in the broadest sense of embracing not only the control and application of military force, but also the peaceful settlement of disputes which could cause violence.

This is the only academic body in Australia which specialises in these studies. Centre members give frequent lectures and seminars for other departments within the ANU and other universities. Regular seminars and conferences on topics of current importance to the Centre's research activities are held, and the major defence training institutions, the Joint Services Staff College, and the Army and RAAF Staff Colleges, are heavily dependent upon SDSC assistance with the strategic studies sections of their courses.

Since its inception in 1966, the Centre has supported a number of Visiting and Research Fellows, who have undertaken a wide variety of investigations. Recently the emphasis of the Centre's work has been on problems posed for the peace and stability of Australia's neighbourhood; the defence of Australia; arms proliferation and arms control; decision making processes of the higher levels of the Australian Defence Department; management studies and the role of the Minister in Australia's defence policy making; and the strategic implications of developments in South-east Asia, the Indian Ocean and the South West Pacific Area.

The Centre contributes to the work of the Department of International Relations through its graduate studies program; and the Department reciprocates by assisting the Centre in its research. A comprehensive collection of reference materials on strategic issues, particularly from the press, learned journals and government publications, is maintained by the Centre.

The Centre also conducts seminars and conferences which have led to several volumes of published proceedings.

The following series of studies by the Strategic and Defence Studies Centre are distributed by: The ANU Press, PO Box 4, Canberra, ACT, Australia, 2600:—

Canberra Papers on Strategy and Defence:

NO.

- * 1. Oil Supply in Australia's Defence Strategy,
by Alex Hunter.
- * 2. The Strategic Situation in the 1980s,
by Geoffrey Jukes.
- * 3. Australia and the Non-proliferation Treaty,
by J.L. Richardson.
- * 4. An Australian Nuclear Force,
by Ian Bellany.
- 5. Educating for the Profession of Arms,
by P.H. Partridge.
- * 6. The Strategy of General Giap Since 1964,
by Robert J. O'Neill.
- * 7. Soviet Policies in the Indian Ocean Area,
by T.B. Millar.
- * 8. Australian Defence Procurement,
by Ian Bellany and J.L. Richardson.
- * 9. Japan and Nuclear China,
by John Welfield.
- *10. The Army in Papua New Guinea,
by Robert J. O'Neill.
- *11. Conscription and Australian Military Capability,
by Darcy McGaurr.
- *12. The Strategy of Total Withholding,
by Peter King.
- *13. Chinese Military Thinking under Mao Tse-tung,
by W.A.C. Adie.
- *14. The Development of Soviet Strategic Thinking Since 1945,
by Geoffrey Jukes.
- *15. The Moscow Agreements and Strategic Arms Limitation,
by Hedley Bull.
- 16. Arms Limitation in South-east Asia: A Proposal,
by Ron Huisken.

* Out of print

17. The Development of Australian Army Officers for the 1980s,
by Ross Babbage, Desmond Ball, J.O. Langtry and Robert O'Neill.
18. The Horn of Africa: Regional Conflict and Super Power Involvement,
by Mohammed Ayooob.
19. Strategic Factors in Interstate Relations in South Asia,
by Shelton Kodikara.
20. The Cruise Missile and Arms Control,
by Ron Huisken.
21. The Persian Gulf: Arms and Arms Control,
by K.R. Singh.

**Proceedings of Conferences organised by
The Strategic and Defence Studies Centre:**

- *1. The Defence of Australia: Fundamental New Aspects,
Ed. Robert O'Neill.
 2. The Future of Tactical Airpower in the Defence of Australia,
Ed. Desmond Ball.
 3. The Strategic Nuclear Balance: an Australian Perspective,
Ed. Robert O'Neill.
 4. The Strategic Nuclear Balance, 1975,
Ed. H.G. Gelber.
- Also:
- *5. Australia's Defence Resources: A Compendium of Data,
by Jolika Tie, J.O. Langtry and Robert O'Neill.
 6. A Select Bibliography of Australian Military History, 1891-1939,
by Jean Fielding and Robert O'Neill,
published by the Australian Dictionary of Biography,
The Australian National University.
 7. Naval Power in the Indian Ocean: Threats, Bluffs and Fantasies,
by Philip Towle.
 8. Arms for the Poor: President Carter's Policies on Arms Transfers to
the Third World,
by Graham Kearns.

* Out of print

Published and distributed by
The Strategic and Defence Studies Centre:

Working Papers:

NO.

1. The Defence of Continental Australia,
by Robert O'Neill.
2. Manpower Alternatives for the Defence Forces,
by J.O. Langtry.
3. Structural Changes for a More Self-reliant National Defence,
by Robert O'Neill.
4. Australia and Nuclear Non-proliferation,
by Desmond J. Ball.
5. American Bases: Some Implications for Australian Security,
by Desmond J. Ball.
6. The Political Military Relationship in Australia,
by T.B. Millar.
7. The Two Faces of Political Islam: Pakistan and Iran Compared,
by Mohammed Ayoob.
8. Cost-effectiveness and the B-1 Strategic Bomber,
by Ron Huiskens.
9. Limiting the Use of Conventional Weapons: Prospects for the 1979 U.N.
Conference (Future of incendiaries, cluster bombs, high velocity rifles,
fuel-air explosives and land mines.)
by Philip Towle.
10. The Structure of Australia's Defence Force,
by Robert O'Neill [Superseding No.1]
11. Australia as a regional Seapower: An External View,
by Michael McGwire.
12. The Indian Ocean Littoral: Projections for the 1980s,
by Mohammed Ayoob.
13. The Australian Tactical Fighter Force: Prologue and Prospects,
by Desmond J. Ball.
14. Non-aligned Criticisms of Western Security Policies,
by Philip Towle.
15. Aggression and Annexation: Kampuchea's Condemnation of Vietnam,
by Milton Osborne.

16. **Blueprint for a Catastrophe: Conducting Oil Diplomacy by 'Other Means' in the Middle East and the Persian Gulf,**
by Mohammed Ayoob.
17. **Developments in US Strategic Nuclear Policy Under the Carter Administration,**
by Desmond J. Ball.
18. **Australian Policy in the Committee on Disarmament,**
by Philip Towle.
19. **Pakistan's Quest for Nuclear Technology,**
by Pervaiz Iqbal Cheema.
20. **The Strategy of War by Proxy,**
by Philip Towle.

Other Monographs:

Controlling Australia's Threat Environment:

A methodology for planning Australian defence force development,
by J.O. Langtry and Desmond J. Ball.

Published and distributed by

Phoenix Defence Publications,

PO Box 574, Manuka, ACT, 2603:

Problems of Mobilisation in Defence of Australia,

Ed. Desmond J. Ball and J.O. Langtry.