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CONTENTS

Reports of the Pugwash Conferences, Symposia and Workshops represent the views of the individuals attending a particular meeting. Occasionally, the Pugwash Council or its Executive Committee issues official statements on behalf of Pugwash.

GENEVA - DECEMBER 1981

The risky experiment of overlapping (at least for one afternoon) two quite different workshops in Geneva, 11-13 December, emerged surprisingly well considering the snags in air transport because of snowstorms, the compressed nature of the discussions, and the nagging uncertainty of being able to achieve new dimensions for the subjects involved. The success was due in large part to the high level of expertise and authority of the participants. This is the best guarantee for the clarification of complex issues, and movement forward in resolving them. As the accounts by Bernard Feld and Nigel Calder in this issue of the Newsletter show, we did succeed in mapping some feasible moves to be taken in achieving the goals of stopping and reversing the deployment of nuclear forces in Europe, and in using the power of the media in avoiding nuclear war. We await resultant actions with reasonable grounds for hope.

As is usual with our meetings, the opportunity was taken in closed sessions or in individual talks between participants to exchange views on sensitive issues outside the agenda, of which several marked that eventful period - the institution of martial law in Poland, the Sakharov fast, and the annexation of the Golan Heights.

The Pugwash Executive Committee which met immediately before and after the workshops had its hands full in making decisions concerning preparations for the Warsaw Conference in August 1982 (see p139), and for other meetings (see Calendar,p139). For example, the Ninth Pugwash Workshop on Chemical Warfare has been transferred from Prague to Geneva (12-14 March 1982), and Sri Lanka as host for a Conference will be postponed from 1983 to 1984 because of local difficulties (national elections). We should be able to announce the host country for the 1983 Conference in the next issue of the Newletter.

Our fifth meeting on Nuclear Forces in Europe took place a few hundred metres from where official USA-USSR negotiations had only just begun. We had strongly endorsed this move since January 1980 when we first met to discuss the subject shortly after a complete breakdown in East-West communications, following the NATO decision of 12 December 1979 to go ahead with plans for production and deployment of Pershing IIs and ground launched missiles. The group was well aware that official negotiations would be protracted and risked the same negative fate of other long drawn out talks during the past decade - SALT II, the Chemical Warfare Treaty, the Comprehensive Test Ban Treaty, and the Vienna and Madrid talks on Conventional Forces and the Helsinki pact, respectively. While technology introduces new weapons, the cocktail circuits of diplomats keep busy crossing the t's and dotting the i's of agreements which are out-dated before they start. The crescendo of public opposition to nuclear weapons on both sides of the Atlantic, however, may well prove to be the decisive factor in forcing the necessary first step of a freeze (stop before reversing), followed by the needed unilateral initiatives for rapid and significantly deep cuts in already deployed nuclear forces (old as well as "modernized") to give impetus to official negotiations. The essential irrelevance of the numbers game in counting launchers and warheads in the face of the vast overkill available to both sides seems to have reached the public, but not the military establishments or their presumed government masters (see for example, a review of Lord Zuckerman's book, p136).

Our second meeting on the Role of the Media in Averting Nuclear War paid particular attention to television. As with his review of the first meeting (Newsletter, January 1981 p.79), Nigel Calder again summarizes excellently the content of the discussions (p.128). It is now up to the Pugwash national groups to make available their expertise and to work with the media in their own countries in educating the public on nuclear weapons and their consequences, taking into account particular national circumstances.

The Swiss Association of the Friends of Pugwash once more made financially and socially possible the holding of the meetings in Geneva. The participants enjoyed a cocktail

reception at the charming and historic chateau of Sadruddin Aga Khan, a long-time supporter of Pugwash aims, followed by dinners for small groups given at the homes of a number of the "Amis". We owe them another debt of gratitude.

M.M. Kaplan

PROTEST FROM THE DUTCH PUGWASH GROUP ABOUT THE REFUSAL OF VISAS TO RUSSIAN PUGWASH COLLEAGUES

The Dutch Pugwash Group was shocked to learn that two Russian Pugwash colleagues who were invited to attend the Banff Conference were refused visas by the Canadian government. (Pugwash Newsletter, October 1981, p.56).

We are deeply disturbed by the fact that the Pugwash Council did not register an effective protest, as could have been done by cancelling the opening ceremony. Had the Council done this it would have made clear to the Canadian and all other governments that the Pugwash principle of free exchange of thoughts is more than just loose words. By bowing to expediency Pugwash has debased its name and credibility, and may well have started a process which will end in its own destruction.

FIFTH PUGWASH WORKSHOP ON NUCLEAR FORCES IN EUROPE

Geneva, 11 and 12 December 1981

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STATEMENT FROM THE PUGWASH EXECUTIVE COMMITTEE ON THE FIFTH WORKSHOP ON NUCLEAR FORCES IN EUROPE

The fifth in the series of Pugwash Workshops on European Nuclear Forces in Europe was held in Geneva on 11-12 December 1981. It was attended by 34 participants.

The previous workshops in this series, which began in January 1980 when communications between the parties had almost completely broken down, all emphasized the need for resumption of official negotiations. The participants therefore welcomed the start of formal Soviet-American negotiations on European Nuclear Forces.

The following summary, based on the discussions at the Workshop, has been prepared by the Executive Committee of the Pugwash Conferences on Science and World Affairs, and represents the views of the Committee.

It is essential that these negotiations rapidly lead to an early agreement to meet the growing anxieties of the people of Europe, particularly in the light of previous experience that prolonged negotiations encourage the acquisition of new systems for extra bargaining strength.

The proposals put forward by both sides were thoroughly analysed, and much clarification was achieved, both with respect to the substance of the proposals and the data on nuclear weapon deployments on which these proposals were based.

Among the steps considered, that could improve the political climate of the negotiation, was a moratorium on further deployments by either side during the process of negotiation.

The new European systems to which this moratorium would apply include amongst others the Pershing II and Cruise Missiles on the NATO side, and SS-20 Missiles being deployed by the Soviet Union.

Various possibilities for unilateral moves by both parties, that are both feasible and significant, and which might facilitate the inception of negotiations, were also discussed.

A step by step approach, maintaining equal security for all the States involved, could in time accommodate both the American and Soviet versions of the "zero-option".

The withdrawal of especially offensive conventional forces, and the denuclearization of dual-capable systems, are measures which could increase confidence and thus remove incentives for further nuclear deployments.

THE FIFTH MEETING ON NUCLEAR FORCES IN EUROPE - A BRIEF ACCOUNT

B.T. Feld

The fifth in a series of workshops - of which the first took palce almost two years ago - on Nuclear Forces in Europe was held even as the official bilateral Soviet-American talks on this issue were finally getting under way close to where we met in Geneva.

Ironically, the major conclusions of our discussions on 11 and 12 December were very little different from those of the first meetings we held some two years ago. Had our recommendations been heeded then, the critical aspects of the present situation could have been avoided, and Europe would have been much closer to the goal of denuclearization from Urals to the Atlantic, which we agreed would be most desirable. As it is, even as the official talks start, both sides are going ahead with current deployment programmes (the SS-20) and preparations for a new round of "modernization" (installation of Pershing IIs and ground launched cruise missiles). Some thoughts that emerged were the following.

It was evident to the group that, considering the slow pace of negotiations, the only hope for avoiding this new round of mutual "modernization" would be through the acceptance of a standstill moratorium on all new deployments for as long as the negotiations continued in good faith. In the current situation of gross mutual "overkill", such a moratorium could be initiated by its unilateral proclamation by either side, accompanied by a pledge of its continuation as long as the other side follows suit.

Furthermore, it is in the nature of current nuclear missile deployments that such a moratorium can be monitored entirely by "national" means of verification. This would be rendered impossible with the introduction of cruise missiles.

Also, what about the production component of a moratorium? This could well be unacceptable to one or both sides, but even if production were not covered we would not be worse off than we are now.

Once the moratorium on deployment is in place, the road will have become cleared for the negotiation of agreed and rapid reduction of current levels of European nuclear deployments, down to zero levels. Although there are a number of possible proposals for the achievement of some kind of "zero option", the important principle that must govern these reductions is that of "equal security for both sides". This is not easy to define because perceptions of what constitutes "security" can be quite different, with the word "superiority" often being equated with security. Here, the numbers game so much indulged in by negotiators becomes the stumbling block, where in fact it is irrelevant in the overall context of existing force levels.

Finally, it was recognized that the achievement of a denuclearized Europe requires the resolution of a number of thorny issues: the elimination, or at least drastic reduction, of especially offensively-oriented conventional forces; the definition of permitted level of "strategic" forces capable of attacking Europe, east from the Atlantic and west from behind the Urals; the role of the strategic missile deployments of the United Kingdom and France in the European balance.

Such problems make it clear that the Vienna talks and the bilateral SALT negotiations are, in the final analysis, closely interrelated, and that Europe must be brought into the strategic talks at an early date.

From now, however, the problem is one of resurrecting the almost moribund SALT process, and instilling will into the parties to move ahead with urgency and dispatch. Europe, as well as the rest of the world, has a large stake in the successful achievement of this goal.

WORKING PAPERS

Editor's note: The original papers submitted by Simon Lunn and Jane Sharp reproduced below contain additional detailed tables listing NATO and WTO theatre nuclear forces which can be obtained on request to the authors. The consolidated table given as an appendix to Lunn's paper contains the numbers arrived at during the discussions at the workshop; they are significant because the Soviet figures are new.

LONG-RANGE THEATRE NUCLEAR FORCE NEGOTIATIONS IN GENEVA: PROBLEMS AND PROSPECTS

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Introduction

When the fourth Pugwash Workshop on Nuclear Forces in Europe met in May 1981, negotiations between the United States and the Soviet Union were still a gleam in the eye. By the time the fifth workshop meets, Soviet and American negotiators will have commenced negotiation. These talks take place almost one year after the preliminary discussions which began under the Carter Administration were terminated. What difference has the change in the Administration made to the American position, and how has the Soviet position evolved? What are the problems and prospects for the current negotiations? Most significant, does the commencement of negotiations signify the sincere willingness of either side to obtain reductions or limitations on theatre nuclear forces (TNF), or does the real motivation lie in the perceived need to win the propaganda battle for what has been termed elsewhere "the soul of Europe"? This paper will attempt to provide a brief assessment of these issues.

Glossary

The High Level Group (HLG) was established by NATO in October 1977 to study the need for theatre nuclear force (TNF) modernization. It is chaired by the US Assistant Secretary of Defence for International Security Affairs (Richard Perle) and comprises officials from 11 Alliance member countries. These officials are drawn from national capitals to ensure that nuclear issues receive high level attention. The HLG reports directly to the Nuclear Planning Group. During its initial meetings the HLG decided that the long range component at NATO's TNF should be the first area to receive attention.

The Special Group (SG) now the Special Consultative Group (SCG), was established in April 1979 to examine the arms control approach of an LRTNF modernization decision, in parallel with the work of the HLG. It is chaired by the Assistant General of State for European Affairs (currently Lawrence Eagleburger). Like the HLG it is staffed from national capitals. It is the forum within which the United States informs and consults the NATO allies on the negotiating strategy for LRTNF negotiations.

The dual track decision. On December 12, 1979 NATO adopted two parallel and complementary approaches by deciding to modernize its LRTNF through the introduction of 572 warheads on ground launched cruise missiles and Pershing II ballistic missiles, and at the same time to begin negotiations with the Soviet Union on LRTNF arms limitations.

Background

In order to assess the prospects for the LRTNF negotiations to begin in Geneva on 30 November, it may be useful to refer, albeit briefly, to the background against which these negotiations have evolved.

There can be little doubt that in the original NATO dual track decision of 12 December 1979, priority was given to the need for modernization. Considerable uncertainty exists as to when the requirement for an arms control component seriously emerged. However, it is clear that by 1978 several governments had expressed concern that NATO was concentrating on a hardware solution to the LRTNF problem, and ignoring arms control considerations, without which public support for modernization would be difficult to obtain. Accordingly, in April 1979, NATO established a Special Group (SG) to examine the arms control implication of an LRTNF decision in parallel with the work of the High Level Group (HLG).

The SG established a number of guidelines, the most significant being: that the work of the HLG constituted the basic point of reference for the SG, as arms control negotiations would be neither realistic nor possible without an agreed modernization plan and a decision to implement it; LRTNF negotiations should be conducted within a SALT III framework; and the negotiations should ensure 'de jure' equality in ceilings and in rights.

The linking of arms control and modernization has resulted in a considerable degree of ambiguity concerning NATO's objectives which remains unresolved. The need to modernize NATO's LRTNF was taken as the starting point of the SG's work and was reflected in the NATO communique of 12 December 1979, with the acknowledgement that the level of deployments could be affected by negotiations. Thus the modernization requirement existed independently from arms control. Yet the introduction of the arms control component suggested that a solution was possible that would obviate the need for deployments. (This aspect is discussed further in the later consideration of the zero option.) Similarly, the arms control principle of 'de jure' equality in ceilings and in rights ran counter to the HLG's work, which had deliberately avoided creating any perception of balance. Hence the choice of the relatively low figure of 572 systems.

The NATO December 12 decision combined an agreement to modernize with the recommendation that arms control negotiations between the US and the Soviet Union should begin as soon as possible. However, a variety of factors prevented any progress being made in the arms control field. A speech by President Brezhnev on 6 October 1979, had contained an offer to negotiate on LRTNF on the condition that NATO did not take its decision to modernize. NATO rejected this offer and Soviet officials subsequently declared that the 12 December decision had cancelled the basis for negotiations. The ensuring deadlock was broken by Chancellor Schmidt's visit to Moscow in June 1980, and talks between the US and the Soviet Union commenced in Geneva in October 1980.

Although the first round of discussions at Geneva were short lived, they at least permitted the sides to establish their basic negotiating positions. The main points of the Alliance position as agreed by the Special Group were: the negotiations should be a step by step process focusing on narrow and selective areas, rather than attempting a comprehensive approach which would multiply the difficulties and complexities involved and minimise the chance of progress; they should focus on the Soviet land based missile force as the most immediate threat and attempt to reduce this force by limiting SS-20 deployment and ensuring the retirement of the SS-4s and SS-5s. As the most simple and direct approach, this was considered to be the most likely to facilitate the progress deemed necessary in order to sustain public support for the modernization programme; limitations should apply to world-wide land based LRTNF deployments (i.e., global ceilings on systems located within striking range of NATO (European subceilings); the effective unit of limitation should be the number of warheads on launchers; aircraft would be considered at a later stage.

According to State Department officials, the Soviet negotiators at Geneva initially adopted a very general approach which became more specific as the talks progressed. The Soviet position was that when all principal nuclear arms in Europe were taken into account, a general balance existed. In accordance with President Brezhnev's insistence in June that American Forward Based Systems (FBS) be included, they mentioned a broad range of NATO's nuclear capabilities as being relevant to the general balance. Their objective appeared to be to freeze this balance at existing levels. Their negotiating position was based on a "freedom to mix" and they proposed launchers as the units of account.

Despite the brevity of the Geneva talks, it was apparent that the negotiating positions of the two sides were very far apart.

The Reagan Administration

The election of President Reagan introduced a fresh element of uncertainty into the prospects of LRTNF negotiations. The President and a number of his key advisers were on record as being critical of the past achievements of arms control negotiations, and of what was perceived as an excessive preoccupation with arms control in national security considerations. The Administration announced that it would undertake a lengthy and comprehensive strategic review from which it would evolve its arms control approach. With regard to negotiations on LRTNF, the prevailing view was that they were "a necessary evil" to appease European public opinion. Because of the existing imbalance in TNF, it was argued that such negotiations could do little to enhance Alliance security. However, substantial pressure from a number of European governments, concerned at the rapid growth of the anti-nuclear movement, convinced the Administration of the necessity to move ahead with LRTNF negotiations. It was evident that further delays would have jeopardized the already fragile Alliance consensus on the NATO double track decision. Accordingly, the Administration announced that it would commence LRTNF negotiations with the Soviet Union in Geneva on 30 November.

At this stage it is important to identify what changes, if any, the Reagan Administration has introduced into the Alliance position.

The Administration initiated two studies through the High Level Group - a new threat assessment and a functional requirements study. The results of these studies reflect the criticism of certain Reagan Administration officials concerning certain aspects of the current arms control approach: firstly, the increased rate of deployment of the SS-20. American officials emphasized that the number of SS-20 deployments exceeded the number predicted in 1979 and deployments were continuing at a rapid rate. (Most recent estimates put the number of SS-20 at 250. While a number of SS-4s and SS-5s have been retired,

the NATO NPG communique of April 1981 notes that some 380 SS-4s and 5s are being maintained. According to the 1981 DoD report, this indicates that "the SS-20 is augmenting rather than replacing those older missiles." This assertion contrasts with Soviet statements that they are replacing old with new missiles. "When we deployed one new missile we withdrew one or two old ones and together with the launchers, we scrapped them, strictly seeing to it that the arms parity was not violated." Yury Zhukov, Pravda political observer, 21 November 1981). Secondly, the breadth of Soviet TNF modernization. The report noted that Soviet modernization is not restricted to its long range forces but extends to all levels of its TNF. However, Western attention has been focused on the long range element, and the Western arms control position concentrated on this one element to the exclusion of other equally threatening developments; finally, the functional requirements study, which sets out the characteristics NATO requires of its nuclear weapons, established that the requirements of NATOs doctrine of flexible response (i.e., survivability, penetrability etc.) pointed to the need for both Pershing II and the ground launched cruise missile.

The implications of these studies for Administration policy remains to be seen. For a period it was believed that the emphasis on the increased numbers of SS-20 was designed to reinforce the view of several American officials that 572 was the minimum number that NATO required, and that this number would need augmenting. Reports from the HLG indicate that European officials have stressed that no increase in the agreed 1979 number is possible, and that 572 is "carved in granite". However, the American view that because of increased Soviet force levels, 572 is at the low end of NATO requirements (as opposed to the prevailing European view which is that it is at the high end), may influence the number of NATO LRTNF that the US is willing to negotiate.

The emphasis on the broader nature of the Soviet threat implies a criticism of the original Alliance negotiating position which focused specifically on gaining reductions in the SS-20, SS-4 and SS-5. It suggests that the Alliance position should take into account other equally threatening developments on the Soviet side. This approach is consistent with the arguments of a number of Reagan officials before they entered the Administration. For example, criticising the tendency to tie NATO modernization to the SS-20, Richard Burt, now Director of the Bureau of Political and Military Affairs in the State Department, wrote:

> "Moscow's nuclear modernization programme is not centred around a single system but consists of several new weapons, including the SS-21 and SS-22 and the SS-23 battlefield nuclear support missiles, the Backfire medium-range bomber and the SU-19 Fencer attack aircraft. The problem of course is that having linked NATO's nuclear plans to the SS-20, Moscow, in future talks, could agree to limit its options for this system in order to gain leverage over the Alliance's Pershing II and cruise missile programme. While such a process might result in limitations on the SS-20, it would do little or nothing about the other Soviet nuclear deveopments alluded to above."

('From Weakness to Strength', Institute for Contemporary Studies, 1980.)

The current US position

While few details have been made public concerning the negotiating position the US will advance at Geneva, press reports and official and unofficial comments indicate that it will differ from the previous approach in the following respects:

The zero option

During a recent speech to the National Press Club, President Reagan announced that in the forthcoming negotiations, the United States would propose that it would cancel deployment of Pershing II and ground launched cruise missiles if the Soviets would dismantle their SS-20, SS-4 and SS-5 missiles. In effect, this made the so-called

'zero option' the US negotiating objective.

The scope

While initial concentration will be on the SS-20, SS-4 and SS-5, it is likely that the Administration will reserve the right to gain limitations and reductions at a later stage on Soviet medium range missiles (the SS-22s and SS-23s) in order to prevent Soviet circumvention of the limits on long range missiles. If this were so, then it would suggest the reciprocal inclusion of Pershing IA on the Western side.

Geographic scope

Whatever ceilings are finally agreed upon must be equal for each side and global in application. Press reports indicate that the Administration has dropped the idea of a European regional sub-ceiling which would have effectively allowed the Soviet Union additional missiles for regional requirements versus China.

Counting

The unit for counting should be warheads on missiles which will include all reload missiles and not just those on launchers. This would increase the already complex verification problems.

Aircraft

The Western position on aircraft still appears open to debate. It is acknowledged that the inclusion of aircraft presents very complex technical questions. Also inclusion of aircraft would run counter to the need for a simple and direct approach. Nevertheless, as the Soviet side is almost certain to demand the inclusion of FBS, it has been suggested that the West should take the initiative. However, it is most likely that the West will propose the inclusion of aircraft at a later stage after initial agreement on land based missiles.

Verification

Statements by Administration officials indicate that they will propose more demanding verification procedures. The mobility of the systems under negotiation means that verification will be more difficult anyway.

While the basic framework for the current Administration's negotiating position remains essentially the same as that evolved by the Carter Administration, there are a number of differences of detail. If these differences appear relatively minor, they nevertheless reflect the more exating and critical attitude of the Reagan Administration towards arms control, and these negotiations in particular, and could make progress in an already complex negotiation even more difficult.

It is difficult to see how the Administration could insist on broadening the scope of the negotiations to include other elements of the Soviet TNF threat while continuing to deny the inclusion of FBS. Similarly, while defining the geographic scope of a regional sub-ceiling will cause problems, it would appear to offer a more equitable solution than a 'global only' ceiling which effectively denies the existence of the Chinese nuclear forces. The most serious questions however concern the adoption of the zero option formula.

The seriousness of the 'zero option' as a negotiating proposal must be questioned on two grounds: firstly, in its present form, it appears to suggest that the Soviet Union has no regional security requirements; secondly, it is inconsistent with the original rationale that lay behind the NATO 12 December decision.

The initial requirement for NATO's LRTNF modernization decision rested in the politica judgement that NATO's strategy of flexible response required systems based on European

territory and capable of striking the Soviet Union, and the military/technical judgement that the existing assets for that purpose (F111s and Poseidon RV's) were no longer adequate. The existence of the SS-20 made NATO's situation worse (how much worse is debatable) but NATO's modernization requirements were not directly related to the number of SS-20 deployments. The SS-20 became the centre of attention because it was a convenient symbol with which to justify the need to modernize. But even if the SS-20 had never been deployed, NATO would have been faced with the problem of modernizing its LRTNF.

The proposal that if the Soviet Union dismantles its land based LRTNF missile force NATO need not modernize its own LRTNF, runs counter to NATO's doctrine of flexible response. Thus the zero option runs the risk of being interpreted as a political tactic for making the Soviet Union responsible for NATO's reductions or deployments. Rather than acknowledge that NATO will modernize because of its own force requirements, the logic of the zero option suggests that the Alliance will modernize only because of Soviet reluctance to make reductions. The proposal may prove to be an effective formula with which to counter the demands of the peace movement, but because of its obvious contradiction, even this is doubtful.

However, the more serious question is whether it constitutes a serious starting point for negotiations. How far will the United States be prepared to move away from the rigid insistence that all SS-20s be dismantled?

The Soviet Position

Statements by Soviet leaders and political commentators indicate that the Soviet view of the balance of nuclear forces in Europe has not changed. Soviet officials constantly emphasize that when all relevant weapons are counted, an approximate balance exists with either side having an advantage in certain categories. However, the Soviet leadership has made a number of suggestions with regard to obtaining agreement on limitations.

In his speech to the 23rd Party Congress in February 1981, President Brezhnev proposed a moratorium on the deployment in Europe of all medium range nuclear missiles of both NATO and the Soviet Union. This moratorium would enter into force the moment negotiations began on this score and would operate until a permanent treaty was concluded in limiting or reducing such nuclear weapons in Europe. According to the Soviet leader, this moratorium would mean that the two sides would stop all preparations for the deployment of additional new weapons.

During his recent visit to Bonn, President Brezhnev took his suggestion a stage further. Should both sides agree to a moratorium, then the Soviet Union would be prepared not only to discontinue further deployment of the SS-20, but as an act of goodwill would unilaterally reduce part of the Soviet medium range nuclear weapons in the European part of the Soviet Union.

> "In other words engage in some anticipatory reductions moving to that lower level which could be agreed upon by the Soviet Union and the United States as a result of the talks." (President Brezhnev's speech in Bonn 24 November 1981).

President Brezhnev stressed that during negotiations the Soviet Union would be prepared to effect reductions not by dozens but by hundreds of weapons of that class, and he stated that the Soviet Union favoured Europe eventually becoming free from both medium range and tactical nuclear weapons - this in his words would be "a genuine zero".

The proposal for a moratorium was rejected almost immediately by the Alliance as freezing a situation which was grossly unfavourable to NATO. Western reaction to President Brezhnev's latest proposal has been limited to statements by both President Ragan and Chancellor Schmidt that retiring SS-20s behind the Urals does not improve

European security as it still leaves Europe within their range. Alliance observers have also noted that the offer to unilaterally withdraw SS-20s in advance of negotiations may indicate a more flexible Soviet attitude towards the concept of parity.

However, Soviet statements on the prospects for the negotiations have continued to stress points that have long been fundamental to their position:

Soviet statements now refer to force levels designed to support the notion that a position of rough parity exists in the European theatre. They claim that the West has 986 medium range missiles capable of hitting the Soviet Union from European territory or the waters adjacent to Europe. These include more than 700 F111s FB111's, F4's, A5's and A7's, plus 64 ballistic missiles and 55 bombers belonging to France. According to their estimates the Soviet Union has 975 systems of comparable type. (See table in Appendix)

They reiterate the argument that the SS-20 does not represent the jump in capability claimed by Western analysists; "the summary yield of its 3 warheads is less than that of the old one", (Pravda, ibid) and that they are replacing their land based LRTNF missiles on a one for one basis.

Finally, they continually emphasize that NATO figures ignore the continuous modernization of French and British strategic nuclear forces.

In view of the consistency of these arguments, it can be expected that they will form the basis of the Soviet negotiating position in Geneva. Soviet negotiators will almost certainly argue that any limitation or reduction should perpetuate the balance of forces that they believe currently exists.

Problems and Prospects

The two sides are far apart and the disagreements between them are fundamental. They include:

The systems to be included: NATO wants an initial concentration on land based LRTNF missiles; the Soviet Union wants a broader approach including FBS;

The geographic scope: NATO wants global ceilings; the Soviet Union ceilings on systems directly related to the European theatre;

The unit of counting: NATO wants to count warheads; the Soviet Union delivery vehicles.

Verification: the US will almost certainly press for verification procedures that the Soviet Union will be unwilling to accept.

Both sides have expressed their interest in achieving reductions - but reductions of what? Their views of the balance are so different that it is difficult to see any common ground on the form or content of the negotiations. The divergence of perception was symbolized by the respective initiatives of either side - the moratorium and the zero option, and by their immediate rejection. So where is there flexibility for manoeuvre and compromise?

To assess the politically possible rather than the politically probable, there may be some room for manoeuvre over the 'what' and 'where' of the negotiations.

The most pressing requirement will be the question of scope, whether the negotiations should adopt the Western preference for a focused state by stage approach, which would appear to offer the best chance of progress, or the more complex Soviet proposal of a broader approach. Because of the anti-nuclear movement, the question of progress will be a preoccupation for Western governments. Therefore, if the Soviet Union were to agree to the stage by stage approach, this would imply the need for a Western concession over the number of SS-20s to be dismantled and a firm commitment concerning the

inclusion of FBS at a second stage. The Alliance would agree to the existence of a number of SS-20s to compensate for the Chinese, British and French strategic forces. However, within the context of the zero option concessions over SS-20 levels would require the Alliance to reconsider how many SS-20s it could live with. It would also require a re-assessment of the need for its own LRTNF deployments.

Both of these questions highlight the ambiguity of NATO's current approach: is the objective of the arms control position to obtain an agreement which legitimizes a number of LRTNF deployments, or is it to genuinely seek a zero solution? How negotiable is the 'zero' in the zero option? Equally, the Soviet Union will have to decide how many SS-20s it is prepared to dismantle in order to gain the cancellation of the NATO programme. Or alternatively, how many NATO LRTNF deployments it is prepared to live with. Likewise in the event of a negotiated trade off, it may be necessary to consider which of the two NATO systems is most threatening.

Posing the issues in this way already presupposes a willingness to look at the problems in the same light. But even this assumption may be unduly optimistic, because it assumes a degree of flexibility which neither side has demonstrated to date. Progress, as in all negotiations, will depend on the motivation of either side. The rhetoric of the Reagan Administration on the way to negotiate with the Soviet Union, and the principles and priorities that must determine any agreement, do not suggest the willingness to compromise necessary for making progress in such a complex area. Similarly, there may be a temptation for the Soviet Union to adopt an uncompromising position in the belief that the peace movement will ultimately prove to be the most effective arms control instrument.

An additional problem that looms in the background is the relationship of the LRTNF negotiations to the SALT process. It is difficult to see how LRTNF ceilings can be established without knowing the overall strategic context, particularly as the Reagan Administration has indicated that it will go for substantial reductions in strategic forces. Furthermore, strategic force developments could influence theatre negotiations. For example, the widespread deployment of American sea launched cruise missiles could make ceilings on land based LRTNF somewhat irrelevant.

Despite the glare of publicity surrounding the commencement of negotiations, and the general air of public expectation, it is difficult to be optimistic about the prospects for the negotiations. For those who were always critical of the notion of a separate theatre balance, and therefore of the NATO modernization decision, the solution would be relatively simple - a substantially lower level of SS-20s and no NATO deployments. But such a solution would be to reverse the logic that has driven the NATO decision. Indeed it is the logic that has guided both sides as the Soviet Union is equally culpable in its failure to anticipate Western sensitivity over the somewhat excessive deployment of the SS-20. To echo Professor Calogero, the basic problem remains to convince decision makers:

> "that the attempt to score the maximum possible gain in every negotiation is in fact self defeating, that the obsession with the idea of a precise balance of forces is inapplicable and indeed plain silly in the face of the preposterous overkill capabilities available to both camps."

But negotiations <u>have</u> begun and both sides have publicly committed themselves to the objective of <u>reductions</u>. The cynic may rightfully argue that both these gestures own more to the perceived need to influence the peace movement, than to sincere belief in the utility of negotiations. But public pressure has contributed substantially to bring us to where we are today, and perhaps can contribute to breaking the seemingly inpenetrable barrier that separates the perspective of the two sides.

APPENDIX

A Note on the Problems of Measurement

A direct comparison of NATO and Warsaw Pact nuclear forces assigned to theatre or continental strategic missions is a complex proposition as it involves a number of assumptions concerning the characteristics and missions of a variety of systems. Given geostrategic realities and the advanced technological means at the disposal of the two Alliances, any attempt to separate the theatre from the strategic balance is bound to produce an artificial picture which has little to do with the realities of a potential confrontation. However, because of the arguments developed since 1977 concerning the "Eurostrategic" balance and the requirements of arms control negotiations (the need to compartmentalize), it is this artificiality with which the Geneva negotiations must cope.

One of the principal problems at Geneva will be to get agreement on what systems should be negotiated and in what order. Because the United States and the Soviet Union have different geostrategic concerns and because they have evolved their forces in different ways, their perspectives on the current balance of nuclear forces in the European theatre differ considerably. These "subjective" differences are compounded by a number of "objective" factors, primarily the characteristics of modern weapons systems which made their precise classification extremely difficult. In other words, even if there is agreement on what categories to negotiate over, there will also be further problems concerning how they should be counted.

The following points indicate some of the problems involved in trying to assess the balance of forces in theatre nuclear systems:

- The use of the terms "strategic" and "theatre" to define the range of a system rather than its application creates considerable ambiguity. United States strategic systems clearly overlap in target coverage with nuclear systems based in Europe. The United States actually allocates 400 Poseidon RV's from its strategic forces to SACEUR for NATO use. The Soviet Union has in the past targetted Western Europe with a portion of its strategic ICBM force.

- Similarly, medium range systems have a theatre application in certain circumstances. By deploying its newer medium range missiles in Eastern Europe, the Soviet Union could target considerable areas of Western Europe. Likewise, the United States could utilize its naval assets to deploy aircraft, or, more significantly, cruise missiles against Soviet territory.

- The strategic/theatre ambiguity is further blurred when the nuclear forces of China, France and the United Kingdom are taken into account.

- The mobility of the nuclear systems which will be under negotiation also causes substantial problems. NATO, for example, claims that those SS-20's targetted against China could be switched in a crisis to target Europe, and the Soviet Union can equally point out that nuclear aircraft based in the United States can be rapidly deployed to Europe.

- The characteristics of aircraft make their classification especially difficult. Ranges vary according to mission and payload. Many are capable of performing in either a conventional or a nuclear role. The controversy over the role of Backfire during the SALT II debate provides an excellent example of the problems in defining aircraft. The disparities in public assessments of the theatre balance are frequently due to different assumptions about aircraft.

The validity and usefulness of any comparison of theatre forces is entirely dependent on the assumptions that have been made concerning a wide range of variables. This

divergence in fundamental assumptions explains why theatre force calculations differ from source to source. For example:

- The 1979 German White Paper on defence stated that NATO had 386 medium-range systems, and the Warsaw Pact had 1,370. But its calcuiations were based only on the inclusion of systems with ranges of 1,000 miles and over, and exclusion of the 400 Poseidon warheads allocated to NATO.

- The IISS in 1979 gave the total number of NATO forces available for theatre missions as 2,045 and the Warsaw Pact as 5,364. The IISS listed all systems capable of performing theatre missions against the other side irrespective of likely mission orientation. Both studies included all Soviet intermediate and medium-range missiles, even those targetted on China.

A further problem concerning force assessment is that static indicators give no indication of how the systems would actually function in a wartime scenario, that is, their comparitive reliability, survivability, penetrability, accuracy etc. Since 1979, the IISS has provided a dynamic analysis which accounts for these various factors by making a number of assessments for each system. In 1979, the Institute indicated a position of close parity with the situation moving in favour of the Warsaw Pact because of the introduction of the SS-20. The subsequent analysis for the years 1980 and 1981 have indicated that this advantage has moved steadily in favour of the Warsaw Pact. The 1979 ratio was 1.13:1 in favour of the Warsaw Pact, the 1980 ratio had moved to 1.5:1 and in 1981 to 1.57:1.

These calculations include Poseidon warheads for NATO. Without Poseidon, the 1981 balance shifts to 3.27:1 for the Pact. However, it cannot be stressed enough that these calculations are entirely assumption-dependent and their utility is accordingly limited. It is interesting to note that the very considerable differences in the Institute's calculations for "available warheads" for NATO in the 1979 and 1980 calculations, from 1,411 in 1979 down to 768 in 1980, are due almost entirely to a change in their assumptions about NATO aircraft.

US View

	US		USSR		
IRBM	0		SS20	250	(243)
			SS4 & 5	350	(253)
			SS12/22	100	(50) but irrelevant
			SSN5	30	(13)
Bombers					
F111 in W.Europe	164	(172)	Backfire	45)	(461)
FB111 in US	63	(65)	Blunder	350)	
F4	265	(246)	Badger		
A6/A7	68	(240)	SU 17)		
			SU 24)	2700	(irellevant)
			Mig 27)		
	560	(723)		3825	(461)

(The figures in brackets are Soviet estimates)

Soviet criticism of US figures:
The number of US aircraft is too low - the major difference is in carrier based aircraft (240 not 68). The SS12 should not be included as its range is too short; the SS22 does not exist. The number of SSN5 is too high. (18 not 30). The number of SS4 and

SS5 is too high. (253 not 350). The number of Backfire, Blunder, Badger is too low. SU17/24/27 should not be included as their range is too short.

Soviet View

US and NATO			USSR	
CBM				
French IRBM	18		SS20	243
French SLBM	80		SS4 & 5	253
UK Polaris	64		SSN5	18
Bomber				
US FB 111	65	)	Backfire	)
F III	172	)	Badger	) 461
F 4	246	) 723	Blinder	)
Carriers		)		
A6/7	240	)		
French Mirage IV	46			
UK Vulcan	55			
	986			975

NB:

The Soviet Union does not include Pershing IA on the Western side nor the SS12 on their side. Soviet estimates of French Mirage is 46 rather than 33 and of the Vulcan 55 not 56. Soviet estimates allow for 240 carrier based aircraft. Soviet estimates include the F4 because its range is over 1000 kms.

FOUR WAYS TO SKIN THE EUROPEAN NUCLEAR FORCE CAT

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Background to the ENF Talks

In the late 1950s and early 1960s attempts to limit European nuclear forces (ENF) stemmed mainly from Soviet and East European concerns about successive new NATO deployments, in particular the possibility that West Germany would gain access to an independent nuclear arsenal. These early efforts generally took the form of proposals

for nuclear-free zones in Europe and were rejected by the NATO powers largely because of West German fears of singular treatment within the alliance. Negotiation of the Non-Proliferation Treaty in the late 1960s met some of the Eastern bloc's concerns, but during the 1970s the Soviets repeatedly sought to include in the SALT ceilings those American nuclear weapons based in Western Europe which could strike Soviet territory. These efforts were resisted by the United States on the grounds that Forward Based Systems (FBS) were designed to protect NATO and could not be negotiated away bilaterally. At the MBFR talks in Vienna the Soviets again tried to limit FBS. This effort also failed, in the sense that no legally binding limits were imposed, but there was some NATO interest in trading nuclear warhead superiority against Soviet tank strength, and a tacit trade in unilateral reductions took place during 1980.

It is something of a paradox after decades of effort by the East to negotiate limits on American forward-based nuclear weapons, that when formal ENF talks are finally convened it is largely because of West German concerns about Soviet medium range missiles - the analogues of FBS - being unconstrained by SALT. These concerns are as much political as military but once underway the talks will have to deal largely with technical problems, in particular how to assess the balance of forces under consideration.

Perceptions of the ENF Balance

Military capabilities depend on many unquantifiable variables such as military training, political will, technological sophistication, and geographical asymmetries. In the absence of arms control negotiations, force postures and capabilities can be broadly assessed and asymmetries offset against each other. (See in particular, Paul M. Doty and Robert Metzger, "Arms Control Enters the Grey Area", International Security, vol.3, no.3, Winter 1978/79). Soviet and NATO forces were developed on different schedules to meet the different security needs of a large continental land mass and a maritime alliance. Not surprisingly, these forces cannot easily be balanced quantitatively despite an overall parity in deterrent capability.

In the mid 1950s NATO adopted a nuclear defence policy, and the United States deployed short range battlefield nuclear weapons in Europe to compensate for a perceived Soviet superiority in conventional forces on the continent. To threaten Soviet territory directly, the United States maintained a fleet of strategic bombers at forward bases and on aircraft carriers around the Soviet perimeter. Intermediate land-based missiles were deployed in Western Europe in the wake of Sputnik only as a temporary measure pending development of an American intercontinental range missile. Since the mid 1960s, in order to achieve maximum invulnerability, the United States has deployed the bulk of its strategic warheads on submarine-based missiles. By contrast, the Soviets focused their earliest effort on intermediate range land-based missiles to counter American forward-based systems, chose not to develop an intercontinental range bomber, maintain less than 25% of their strategic warheads on submarines, have no aircraft carriers and have only recently developed nuclear artillery.

For two decades these nuclear asymmetries between East and West in Europe were relatively tolerable to both sides. For example, far from trying to match Soviet superiority in intermediate land-based missiles in Europe, during the 1960s United States Secretary of Defence MacNamara withdrew analogous American systems (Thor and Jupiter ballistic missiles, Mace and Matador Cruise) in favour of less vulnerable submarine-launched Polaris missiles - sound defence planning which emphasized rather than corrected existing asymmetries.

In effect the balance of forces did not need to be precisely measured and matched. For the purpose of negotiating formal ENF limits, however, military balances will have to be measured in static quantifiable units, an artificial and difficult exercise when conducted in good faith and one which inevitably reduces tolerance for asymmetries and

generates pressures to correct newly perceived imbalances. The ten year effort to measure and codify strategic parity between the United States and the Soviet Union undermined tolerance for East-West asymmetries in Europe in several ways. The decision to exclude the SS-20 and the Backfire Bomber from SALT II limits, for example, served to focus attention on the threat which both systems posed for Europe and to generate pressure for analogous NATO systems - despite the fact that the overall military balance had not changed. Furthermore, Soviet efforts to ban the transfer of cruise missile technology suggested to the NATO allies, that Soviet-American arms control could deny Western Europe useful defence technologies; in effect that SALT could be at the expense of West European security.

The Geneva talks will probably begin with a lengthy debate about which systems to include in the negotiations, not an easy task since the Soviets have always insisted on including American forward-based systems, while the Americans are known to prefer limiting land-based missiles only. A second order of business will be to establish an agreed data base. Given the widely different American and Soviet presentations of "the facts" about their respective nuclear deployments in, and targetted on, Europe, this too is likely to be a lengthy process. In 1979, both sides produced accurate numbers for their strategic nuclear delivery vehicles and promised to keep them up to date as part of the SALT II treaty. Agreeing on data for nuclear forces in Europe will be a more formidable task, however. Not only are the forces much less symmetrical, but many systems are multi-capable so that their nuclear status will be ambiguous without agreed monitoring and inspection procedures. In addition some systems with obvious European missions are already counted in the ceilings established at SALT (American Poseidons assigned to SACEUR, and Soviet SS-11 and SS-19 missiles targetted on Europe). Most delicate of all, this is a bilateral forum which must deal with the nuclear forces of at least two, possibly three, other powers.

Four Ways to Skin the ENF Cat

In the Appendix, tables of short and intermediate range nuclear forces stationed in and targetted on Europe show that, while imbalances exist in selected categories, an overall East-West parity prevails. Given this situation, stability could best be maintained by a mutual moratorium on additional nuclear forces and a tacit understanding to tolerate existing asymmetries. With the current tensions in Soviet-American and intra-NATO relations, however, tacit understandings are not likely to satisfy political leaders who are looking for equitable, verifiable arms control agreements to sell to sceptical parliaments, and to a public looking for signs of real progress towards nuclear disarmament.

President Reagan's zero-option notwithstanding, there are several different ways to fashion an ENF agreement. At least four alternative approaches seem possible: the Status Quo, the Status Quo Ante, the SALT-plus, and the Comprehensive.

The status quo approach

If we have learned anything from the past three decades of arms control diplomacy, it is that prolonged negotiations are net consumers of trust and confidence between political adversaries. An early agreement to codify mutually agreeable aspects to the status quo should preclude lengthy debates about setting new ceilings, and avoid the problems associated with the acquisition of extra forces as bargaining chips and the rechannelling of effort from limited to unlimited systems. The simplest status quo agreement would be to select a package of forces in which an obviously equitable balance exists, but is threatened by planned additions and should be codified before the crucial stages of testing proposed new systems have been completed. At first sight Table 1 suggests that intermediate range ballistic missiles are hopelessly out of balance with 639 Soviet systems and only 282 for NATO and China combined. However, since it is the

new SS-20s which concern West Europeans rather than the SS-4s and SS-5s, these older systems could be either dismantled or discounted for the sake of forging an agreement. The balance of Soviet IRBMs versus IRBM threats to the Soviet Union from the UK, France and China would then be 289:282.

One obvious problem with this package is that neither France, Britain nor China are parties to the Geneva talks, so that imposing a ceiling of, say 280, on Soviet IRBMs would have to be balanced on the Western side by a freeze not only on new American deployments but also on French, British, and Chinese strategic systems. Another drawback is that such a status quo agreement would not reduce the current level of SS-20s and may not adequately meet the concerns of those who fear the SS-20 as a qualitatively new military threat. Given previous arms control experience, however, which suggests that newly deployed forces are not easily, if ever, relinquished, the chances of dismantling SS-20s seem slim. A firm ceiling on current deployments should at least ease the fears of those, like Chancellor Schmidt, who see the Soviets using their growing preponderance in IRBMs to exert political pressure.

Another potential status quo package could balance Soviet and NATO medium range nuclear-capable bombers. The Soviets themselves claim a NATO:Soviet superiority of 700:410 in these systems. (Baltimore Sun, 21 November 1981). According to Table 2 using IISS figures, however, Soviet Long Range Aviation currently deploys some 880 nuclear-capable aircraft, while NATO plus China deploys 467 aircraft of similar range and capability. Again at first glance this looks like a formidable Soviet superiority, but 350 of the 880 aircraft are assigned to naval missions and, according to some analysts, should not be included in the ENF balance. Alternatively, the Soviets could denuclearize their 580 (1955 vintage) Badger bombers, at which point Soviet nuclear-capable medium range bombers are reduced to 300 systems facing a NATO (without China) capability of 377. NATO could be brought well within a ceiling of 300 by denuclearizing either or both the British Vulcans or Buccaneers, something which is scheduled for the near future in any event.

Fashioning an obviously equitable package of shorter range nuclear-capable aircraft looks more difficult with a Soviet:NATO ratio of 2,785:1,996 (Table 3). Almost certainly, however, many, if not most, of these sytems do not have assigned nuclear missions, even though theoretically nuclear-capable. The ENF talks could perform a useful arms control purpose by establishing agreed monitorable procedures for formally denuclearizing aircraft. This would not only reduce the risk of nuclear war by miscalculation, but would also serve to shore up the conventional deterrent on both sides, persumably making an ENF agreement more acceptable to the military establishments of both East and West.

It should be noted that proposals to unilaterally denuclearize some American FBS have been made in connection with the NATO "double decision", which requires that for each new GLCM warhead deployed, one old warhead must be withdrawn. Harold Brown has suggested that GLCMs specifically replace nuclear warheads allocated to American FBS in Europe so as to free up dual capable aircraft for a conventional defence role. (FY 1981 Posture Statement, p.96). From the Soviet perspective, replacing one American nuclear warhead with another may not seem much like arms control; a more attractive, and possibly negotiable option might be to persuade NATO to deploy 464 conventionally armed cruise missiles to replace American FBS, especially if intra-NATO politics required the form of the double decision to be retained as far as possible in its original form.

The status quo ante approach

There are several versions of this approach which seeks modest to radical reductions in current SS-20 levels. At one extreme is the Reagan zero option which has the full support of Mrs. Thatcher's government and rather more qualified support elsewhere in the alliance. President Reagan suggested in a speech to the National Press Club on

12 November that NATO would cancel its plans to deploy Pershing XR II and GLCMs in Europe in exchange for the dismantling of all Soviet land-based medium range missiles in Europe. In effect this calls for a return to the status quo ante of 1957. A somewhat more reasonable approach would be to return to the status quo ante of October 1979 at which time Mr. Brezhnev declared parity in East-West European missiles. If parity existed then, it can hardly be said to still hold in December 1981 since only the Soviets have added new hardware in the intervening period. On his recent visit to Bonn, Mr. Brezhnev suggested a Soviet willingness to withdraw "hundreds" of intermediate range missiles. Presumably he referred to old SS-4s as well as new SS-20s. Some of the West European allies have suggested that reduction back to the 100 SS-20s deployed in October 1979 would be sufficient to warrant cancellation of the proposed new NATO missiles. Others would permit the Soviets to deploy up to 244 SS-20s as long as all the SS-4s and SS-5s were dismantled. (For different interpretations of the 'zero-option' see "Holding It Together", The Economist, 14 November 1981, and The Washington Post, 8 November 1981). This would give the Soviets approximately the same number of warheads on medium range missiles as were deployed on SS-4s and SS-5s at their maximum level (733) in 1964/65. (See Hyland in Survival, September/October 1981, p.195).

The SALT-plus approach

The relationship between the current ENF talks in Geneva and the proposed reconvening in early 1982 of SALT - renamed START for Strategic Arms Reduction Talks - is far from clear. At the NATO meeting in Rome in May 1981, Secretary of State Haig linked the two fora, as he did again in September when he met with Soviet Foreign Minister Gromyko to set the date for the ENF talks. There has been little in the declaratory arms control policy of the Reagan Administration, however, to suggest any continuity with the SALT II treaty as negotiated by the Carter Administration, an agreement which President Reagan has described as "fatally flawed". Nevertheless, several defence analysts have suggested amending the SALT II limits to accommodate European systems. Lawrence Freedman has suggested raising the limit currently imposed on Soviet and American central (intercontinental range) systems to accommodate 400 medium range systems for both the United States and the Soviet Union. ("The Dilemma of Theatre Nuclear Arms Control," Survival, Jan/Feb 1981, pp.2-10). SALT could then limit American forward-based systems, a persistent Soviet objective since the very first negotiating session in November 1969. In exchange the Soviets would have to accept SALT limits on their own analogous intermediate and medium range systems: SS-20, SS-4 and SS-5 missiles, and Backfire, Badger, Blinder bombers. An obvious difficulty with this scheme is that a limit of 400 would not accommodate shorter range nuclear-capable fighter aircraft, and there might then be a tendency for these systems to proliferate if they were the only nuclear-capable elements unlimited by treaty. This suggests the need for more drastic reductions, or a higher limit than 400, or a denuclearizing of dual capable systems as proposed above.

William Hyland, a defence analyst in the Carter Administration and a major architect of the SALT II agreement, has proposed a first phase TNF agreement in which Soviet SS-20 missiles are offset by Pershing I and Pershing II missiles in West Germany. ("Soviet Theatre Forces and Arms Control," Survival, vol. XXIII, no.5, September/October 1981, pp.194-199). Hyland suggests that the Soviets reduce their force of SS-20s to "about 65" which implies a warhead count of approximately 200, which could then be offset by an equivalent number of Pershing I and II missiles in West Germany. This arrangement would accommodate all the 108 proposed new Extended Range Pershing II missiles and the existing 72 Pershing I missiles deployed under double key control with West German forces. The idea of controlling German-held weapons should have some appeal to the Soviets, but a more attractive version of this proposal for arms control

advocates would be to reduce the SS-20s to 60 (180 warheads) and consider these to be offset by current Pershing I deployments. The next phase of Hyland's plan would incorporate all cruise missiles in new SALT ceilings. Again, this is a concept which may appeal to the Soviets since, at best, it offers the opportunity to forestall deployment of American ground-launched cruise missiles in Western Europe (the December 1979 plan), and to preclude deployment of new submarine-launched cruise missiles on attack submarines as proposed by President Reagan in October 1981. It is almost certainly too late to prevent deployment of American air-launched cruise missiles, but at least these are limited by the (albeit unratified) SALT II Treaty.

At this writing it is not clear whether NATO governments would be uniformly in favour of a ban on sea and ground-launched cruise missiles. As noted earlier, during the SALT II negotiations Soviet efforts to ban the transfer of cruise missile technology were strenuously opposed by a small but influential coterie of American and West European defence analysts which argued that a ban on cruise would deny France and Britain useful strategic follow-on possibilities, and deny all West European defence establishments potentially useful non-nuclear defence technologies. (See Fred Kaplan in New York Times Sunday Magazine, December 1979). Since that time many other analysts on both sides of the Atlantic have emphasized the flaws in cruise technology as well as the serious strategic and arms race instabilities which could arise if both East and West deploy nuclear cruise. In addition a groundswell of opposition to the deployment of new GLCM in Western Europe is forcing governments to reconsider their acquiescence in the December 1979 decision and reweigh the pros and cons of cruise for NATO defence.

The comprehensive approach

In late 1981 a Soviet Whiskey class submarine, apparently carrying nuclear material violated Swedish territorial waters and ran aground off the Swedish coast. Europeans, who for the past two years had been preoccupied with a new Soviet/American competition in land-based intermediate range missiles on the continent, were thus sharply reminded that they are also surrounded by missile carrying submarines in the Baltic, Balkan and Mediterranean seas; only a portion of which are covered by SALT. This incident, together with the recent development of Soviet nuclear artillery and the upgrading of short range missiles on both sides, has prompted calls for a more comprehensive ENF negotiation to include all types and ranges of nuclear systems.

Table 4 shows NATO and Soviet land-based nuclear-capable systems under 1,000 km range. Until recently, NATO had a monopoly in nuclear artillery and still retains an overwhelming superiority - more than 1,900 pieces - over Soviet ground forces which deploy only 168 pieces, all of which are in the Western military districts of the Soviet Union. The Soviets maintain a nuclear edge in nuclear-capable missiles in the 50-1,000 km range with 1,338 Scuds, Frogs and Scaleboards, of which some 375-400 are deployed in the Far East. NATO deploys 361 analogous systems in Western Europe: Pershing IA, Lance, Honest John, and the French Pluton missiles. The actual balance of nuclear capability is particularly difficult to assess in these systems since only the Pershings and the Pluton are unambiguously nuclear; all the other NATO and Soviet systems are multi-capable with the option of carrying high explosive, chemical or nuclear warheads. Other land-based short range nuclear systems in Europe include Soviet and American air defence missiles and American atomic demolition mines (ADMs) intended, but apparently never so-deployed, to be used as a nuclear trip wire on the NATO/Warsaw Pact borders.

The case for trying to achieve comprehensive limits rests on the fact that piecemeal arms control agreements often encourage military establishments to cmpensate for limits imposed on one category of force by acquiring extra strength in other unlimited categories. Thus, if the Geneva talks set limits on intermediate range missiles and aircraft, there

would be a tendency to acquire more battlefield and submarine-based systems. Indeed these presures are already evident. President Reagan has decided to produce (but not yet deploy) the neutron bomb and his October 1981 speech announcing the new American strategic weapons programme includes a proposal to deploy 800-900 submarine-launched cruise missiles on some 70 attack submarines by 1987.

Including short range missiles and nuclear artillery in the ENF talks would be something of a mixed blessing, however, since these systems would then become important as bargaining chips. There have already been suggestions in the American defence literature that the negotiations should be used to rationalize an upgrading of NATO battlefield nuclear weapons, specifically to match the SS-21, SS-22 and SS-23 which are replacing the older Frog, Scaleboard and Scud missiles in the Soviet Union.

Concern about the upgrading of Soviet short range systems is certainly legitimate, but matching each new Soviet development may not be the optimum solution. On the contrary, many Western defence analysts argue that nuclear battlefield weapons serve no useful military purpose, complicate the task of conventional defence in Europe, and ought to be unilaterally withdrawn or denuclearized (NATO Shift Study, Freedman, York, Record.) Short range nuclear weapons are destabilizing primarily because they are deployed so far forward that they risk being overcome, or used, very early in any military conflict. The arms control paradox here is that an attempt to negotiate a comprehensive ENF agreement might preclude unilateral withdrawal of these systems.

If so, it would not be the first time that arms control diplomacy had interfered with sound defence planning. American Titan ICBMs, for example, were retained as bargaining chips at SALT long after they would otherwise have been due for retirement. Only in late 1981, after two serious accidents, did the Defence Department order these systems to be dismantled. Similarly, during the mid-1970s, when Greece and Turkey were at loggerheads over Cyprus, there was considerable pressure in the United States Congress and Defence Department to remove American nuclear weapons from what was seen as NATO's volatile Southern flank, and for removing obsolete nuclear systems from central Europe at the same time. In contrast to the quiet withdrawal of Thor, Jupiter, Mace and Matador missiles by Secretary MacNamara in the 1960s, proposals to remove obsolete nuclear weapons from the continent in the 1970s were blocked by the State Department on the grounds that removing NATO weapons would be squandering valuable bargaining chips at the MBFR negotiations with the Warsaw Pact in Vienna. (One can imagine similar debates in Moscow about the virtues of retaining SS-4s and SS-5s as bargaining chips in the current Geneva talks).

In December 1975, NATO's "Option III" proposal in Vienna offered to withdraw 36 Pershing IA missile launchers, 54 F-4 nuclear-capable aircraft and 1,000 nuclear warheads, in exchange for withdrawal of a Soviet tank army. The Soviets countered in February 1976 with a more symmetrical proposal: to withdraw equal numbers of US Pershing IA and Soviet Scud missiles, equal numbers of Soviet Fitter aircraft and F-4s, equal numbers of nuclear air defence missiles SAM-2s and Nike Hercules, and equal numbers of nuclear warheads. This proposal was unacceptable to NATO, and Option III was subsequently withdrawn.

Since that time, however, both sides have withdrawn unilaterally some of the systems included in these earlier proposals. The Soviets have withdrawn 20,000 troops and tanks from East Germany, and the United States has withdrawn 1,000 obsolete nuclear warheads and denuclearized some F-4s. In 1981 NATO Ministers agreed to withdraw several hundred obsolete Nike Hercules air defence missiles and atomic demolition mines in the near future (Walter Pincus, Washington Post, November 1 & 5, 1981). It will be interesting to see whether the Geneva talks will delay implementation of these decisions.

APPENDIX

Table 1. Intermediate Range Ballistic Missiles, 1,000-5,000 km range

Soviet Union			NATO and China[1]			
IRBM	SS-20	250	UK SLBM	64	IRBM	70
	SS-4)	350	French SLBM	80[2]	MRBM	50
	SS-5)		IRBM	18		
				162		120
				282		
SLBM	SS-N-5	39[3]				
	(Not in SALT limits)					
		639				
dismantled SS-4 + SS-5		350				
		289		282		

1. China also has 4 ICBMs - presumably targetted on the Soviet Union.
2. More SLBMs in French defence plans.
3. Military Balance 1981-1982, p.105

Table 2. Medium Range Nuclear-Capable Aircraft

Soviet "Long Range Aviation"		NATO and China			
Tu-16 Badger	580[4]	UK Vulcan	57	B-6	90
Tu-22 Blinder	165[5]	UK Buccaneer	60		
		French Mirage IVA	33		
Tu-26 Backfire	135[6]	US F-111	164[7]		
	880	US FB-111	63[7]		
less naval	350		377		90
	530			467	

4. of which 270 deployed with Navy
5. of which 40 deployed with Navy
6. of which 70 deployed with Navy
7. New York Times, November 30, 1981 for US State Department

Source: Unless otherwise specified is Military Balance 1981-1982, IISS, London, 1981.

Table 3. Shorter Range Nuclear-Capable Strike Aircraft

Soviet Frontal Aviation			NATO - US		
land based	Su-7 Fitter A	165	in US available for Europe:	F-4	800
	MiG-21 Fishbed J-N	750	in Europe:	F-4 (land)	204
	MiG-27 Flogger D	500		F-4 (carrier)	144
	Su-17 Fitter C-D	740		A-6 "	60
	Su-19-24 Fencer	480		A-7 "	144
		2,635			1,352
land based in E.Eur.:	Fitter Aircraft in Czechoslovakia and Poland	150	NATO-Europe		
		2,785	UK Jaguar) French Jaguar)		80
			French Etendard (carrier)		36
			French Mirage IIIE		30
			FRG, Greek, Turkish F-4		180
			W. European F-104		318
					644
			Total NATO		1,996

Table 4. Tactical (less than 1,000 km range) Nuclear Delivery Vehicles

USSR		NATO	
SRBM Scaleboard SS-12/SS-22	130	US in Western Europe	
Scud SS-1/SS-23	540	SRBM Pershing IA	108
FROG SS-21	668	SRBM Lance	36
		Artillery M-110 203 mm	56
		M-109 155 mm	252
		US systems under double key with W. European forces	
		SRBM Honest John	42
		SRBM Pershing IA	72
		SRBM Lance	61
Artillery S-23	168	Artillery M-110	202
		M-109	1,402
		French Pluton	42
Soviet Total	1,506	NATO Total	2,273

Table 5. Summary of Balances

1. I.R. Ballistic Missiles (1,000-5,000 km range)

USSR	630	W. Europe/NATO/China	282
SS-20 only	250		

2. Medium Range Nuclear-Capable Bombers

USSR	800	US/NATO/China	467
less 580 Badgers	300		

3. Shorter Range Nuclear-Capable Strike Aircraft

USSR and E. Europe	2,785	US/NATO	1,996

4. Shorter Range Missiles and Artillery

USSR and E. Europe	1,506	US/W.Europe/NATO	2,273

TOTAL - shorter range systems (3 + 4)

Warsaw Pact	4,291	NATO	4,269

ON THE RELATIVE PRIORITIES IN REDUCING THE PROBABILITY FOR NUCLEAR WAR AND FOR ACHIEVING VARIOUS POLITICAL GOALS

K. Gottstein

1. War and Nuclear War

In old times war was called the "ultima ratio" of kings. In the last century Clausewitz observed that war was the continuation of politics with the addition of other means. During the first quarter of this century Lenin stated that a last war between capitalist and socialist powers was unavoidable. During the second half of our century, under the impression of the horrible potential of nuclear weapons, Lenin's statement was replaced by the doctrine of "peaceful co-existence" which is sometimes described as a

continuation of the ideological struggle by all means except outright war. In the 1960's Marshal Sokolowski, in his famous book "Military Strategy", expressed the opinion that nuclear war must be expected to come, that Soviet forces must be prepared for it, and that the Soviet Union would win such a war if it was ever started by her foes.

Likewise, in the West the notion of deterrence was developed, first as deterrence by the threat of "massive retaliation" then by the preparedness for "flexible response". As a consequence large arsenals of nuclear weapons were produced and stored on European soil, both East and West.

Recently, official Soviet sources (news agency TASS in its comments on a new Soviet book "Europe in danger") informed us that the Soviet military doctrine of the 1980s cannot be identified with theoretical Soviet work of the 1960s. Today, the political leaders in the East and West seem to agree that nuclear war is too dangerous to be started because there is no guarantee that it could be limited.

2. Can Nuclear War be Limited?

The statement that there is no guarantee for the limitability of nuclear warfare is not to be confused with another pronouncement which is part of the doctrine of flexible response, namely, that there must be preparations for limited nuclear war in order to preserve peace. Whereas it is true that there is no guarantee that nuclear war can be limited - in fact it would be very likely to escalate - there is also no guarantee that it cannot be limited. Actually, every responsible leader would try to limit and end it if it had ever started by some tragical event or mishap. If nuclear wars were deemed unlimited by definition, and consequently preparations for limited nuclear defence against superior conventional attacks considered unnecessary, then there would be no deterrence against certain types of limited attacks. The attacker would know that, because of the unacceptability of unlimited nuclear war, he would get away with his limited objectives. On the other hand, if the potential attacker knew that his intended victim was prepared for "limited" nuclear defence, then - with all the uncertainties regarding possible escalation into unlimited nuclear war - he would probably refrain from attacking. This is how "flexible response" is expected to work. It is meant to prevent war in general, and nuclear war in particular. There is no logical contradiction between this intention and the preparations for limited nuclear war which are made by both East and West. In the public discussion there is often misunderstanding about this.

Quite a different matter, however, is the question whether the actual effects of introducing new types of nuclear weapons will always obey these peaceful intentions. Will the probability for the outbreak of war, in particular nuclear war, be lowered or increased by such moves?

Fortunately, there is agreement among present world leaders that an unlimited nuclear war would have no winners because for all involved, and possibly for all mankind, it would be the end of civilization as we know it.

3. Political Priorities

In spite of this knowledge and this agreement governments in East and West, strangely enough, seem to have items on their agenda which for them consciously or unconsciously, have a higher priority than the avoidance of the nuclear annihilation of mankind.

For the West such items seem to be defending freedom, overcoming the present economic depression, upholding our standard of living and strengthening the Western alliance. Strengthening and enlarging the socialist camp, on the other hand, has the highest priority in the Soviet Union.

Neither side is willing to sacrifice, e.g., a significant part of their strength for

the sake of increasing the security of mankind from nuclear disaster. Or so it seems.

4. Flaws in Political Cost-Benefit-Analysis

What is going on? Obviously governments in East and West are well aware of the destructive potential of nuclear weapons. But within the time-frame relevant to them they seem to have come to the conclusion that the risks and benefits of being underarmed, and the risks and benefits of being strongly armed, when compared and properly weighed, still show a balance in favour of strong, including nuclear, armaments. Let us look at this cost-benefit-analysis, and see where it may have gone astray:

One flaw may be that a reduction in armaments is still seen much too automatically as a direct and immediate set-back in strength, in spite of the fact that in the nuclear age "more arms" no longer means more power under all circumstances. "More arms" can mean greater vulnerability, less flexibility, a weaker psychological position, and less strength and power. This is sometimes forgotten.

Another flaw can be that, since nuclear weapons have not been used for several decades, the necessity for pushing the probability for nuclear war very low is not permanently kept in vision. Every action, or planned action, in the field of armaments (including arms reduction) must be scrutinized for its effect on that probability. Incidentally, because nuclear weapons do exist, this is true not only for actions in the field of armaments, but also for military strategy and international politics in general.

The economic benefits of arms reduction are often underestimated. The economic strength of Japan and of the Federal Republic of Germany can be traced to some extent to the fact that these two countries were completely disarmed after World War II and could concentrate their efforts on more productive investments than weaponry.

Pugwash should exert whatever influence it has that these neglected factors are properly taken into account in the risk-benefit-analyses of the decision-makers. Policies must be optimized in such a wasy that the probability for nuclear war becomes a minimum. Of course it can never become zero again because the knowledge of how to make nuclear weapons will continue to exist even after complete nuclear disarmament. But the necessarily biassed views of those lobbies, bureaucracies and individuals in East and in West whose influence, careers and income depend on the production of weapons - this may be their legitimate task professionally assigned to them - must not be allowed to disturb a balanced assessment of the risks involved.

5. The Need for Re-orientation of Priorities

Strategies which pursue goals prescribed by national policies, or by ideologies on historical destination, in the tradition of the pre-nuclear age without due assessment of the risks incurred in the presence of nuclear weapons, should be re-oriented as soon as possible.

Here are two examples of such possible re-orientations, painful as they may be.

a. Western countries have a tradition of relying on most advanced technology and automation rather than on personnel-intensive technologies. This is also true in the military field. Armies in the West are much smaller, and the duration of military conscription much shorter than in the East. Although the total population of NATO countries is larger than that of Warsaw Pact countries, the armies of the latter are said to be much stronger conventionally than the armies of the former. Therefore, in the NATO doctrine of flexible response, the right is reserved to use nuclear weapons for deterring a conventional attack of overpowering strength.

There should be serious studies whether, in the long run, peace would not be more secure if NATO countries sacrificed the convenience of short military service and large numbers of exemptions, and raised their armies to a conventional strength equal to that of the Warsaw Pact countries, at the same time giving up the option of using nuclear weapons in the case of being attacked conventionally. Nuclear weapons would only be used in retaliation in the case of a nuclear attack.

It is not entirely clear to the author whether such a study would show that peace would be more stable after an abandonment of the first-use option in combination with conventional re-armament, or whether the opposite would be found. But in any case, the present situation of the Warsaw Pact superiority in conventional arms need not be accepted as unalterable. It could be changed in the long run if that would help to stabilize peace.

b. The Soviet Union has a policy of supporting revolutionary movements directed against governments friendly to the West, and of suppressing revolutionary movements directed against governments friendly to the Soviet Union. This is entirely in keeping with the marxist-leninist principles of partiality and of socialist internationalism which govern the actions of the Soviet Union. This policy is therefore legitimate from the point of view of the Soviet Union. From the point of view of the Western powers, however, it is not acceptable because it treats the road into close alliance with the Soviet Union as a one-way-street: You are allowed, even prodded, to join but you are not allowed to leave, irrespective of what the majority of the population may think. Clearly, this principle is a source of international tension. It raises the risk of war. In the nuclear age it should be changed. The Politbureau should commission studies how to justify such a change ideologically.

6. Discussion with the Public

More information for the public should be made available. A growing section of the population in Western Europe, and particularly among the younger generation, is becoming increasingly alarmed at the prospect of having to spend their lives under a permanent nuclear threat to which the majority of the older generation has become resigned.

It is good that younger people do not accept unquestioned a situation which they have inherited from the developments at and after the end of World War II. There is a learning process going on. Also some senior Western politicians begin to think about the long-term future. They tend to admit that nuclear deterrence of the present ype, though it may have secured peace in Europe for the last 36 years, cannot be the ultimate solution for centuries to come. Mankind must invent another, less risky, instrument for the preservation of peace.

7. The Geneva Negotiations

Until that instrument of the future is invented, however, we must proceed very cautiously, step by step. If one discovers that he is in the middle of a mine-field he would be ill-advised just to try and run for safety. The best policy in such a situation is to probe the ground very carefully before each step, and move very slowly.

The present negotiations in Geneva between the US and the USSR may be considered as such a probe which, hopefully, will lead to a step in the right direction. Indeed, there are some encouraging aspects in the whole process which should not be overlooked. Whereas it has been the tradition of the past to introduce new weapon systems as an accomplished fact without prior warning, the US has announced two years in advance the intention to introduce new weapon systems (Pershing II and cruise missiles) in Western Europe. Moreover, the United States declared that under certain conditions it would refrain from stationing these weapons, and it offered negotiations on these conditions. These negotiations are in themselves another positive aspect of the world situation. So

far, only "strategic" nuclear weapons were covered by the SALT agreements whereas medium-range missiles of the kind to which the SS-20 and Pershing II belong are within that "grey area" in which no limitations of any kind apply.

Pugwash should encourage the negotiators on both sides to make the best of the chances which these two "firsts" offer. They should search, patiently and carefully, for every possible path leading towards a solution which significantly decreases the risk of nuclear war and total destruction. The "zero solution" could be such a path. Ofcourse, it will not be the final answer to the problem of nuclear weapons. Mankind will have to continue, as long as it will exist in a civilized form, to live with the technical know-how for making nuclear bombs. And in order to be able to continue its civilization, mankind will have to learn always to place the highest priority on the avoidance of nuclear war. All other considerations, including those principles which East and West traditionally consider the backbones of their respective systems and societies, must rank second. This will be very difficult to achieve, but it must be attempted.

A GRADUAL APPROACH TO A SECURITY ZONE IN EUROPE

A. de Smaele

There are in Europe three nuclear states: the Soviet Union in the East, France and Great Britain in the West.

The security zone is the territory between the two nuclear frontiers. This territory is occupied by the 11 non-nuclear states of the North Atlantic Treaty Organization namely: Belgium, Denmark, Federal Republic of Germany, Greece, Iceland, Italy, Luxemburg, The Netherlands, Norway, Portugal and Turkey; by the 6 non-nuclear states of the Warsaw Pact Organization, namely: Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland and Rumania; and by the 13 non-nuclear states not members of one of the Alliances, namely: Austria, Cyprus, Finland, Holy See, Ireland, Liechtenstein, Malta, Monaco, San Marino, Spain, Sweden, Switzerland and Yugoslavia.

The 30 States are qualified as Security Zone States.

The quest is for "equal security". This can be pursued through a military approach or a political one. The military approach is based on the hypothesis that war is inevitable. This has led us from one Hiroshima bomb - 150,000 victims - to a global capacity of over one million Hiroshima's. In Europe social order would not survive a hundred of them: a thousand would be sufficient to make a desert out of all the urbanized territory. The political approach is based on the conclusion that peaceful co-existence of different systems is indispensible to survival. Those who have studied the dnager of nuclear war have long since recognized that arms control can only be effectively negotiated when a large majority of public opinion has understood that "superiority" or "inferiority" in nuclear strategy is a complete "mirage". The awareness of this "mirage" is now spreading amoung the people of the theatre, whether members of the Alliances, non-aligned or neutral. The popular support for a political approach is now developing. Governments should take care not to interfere with it, for they need it as a lever for the negotiation of the vital new deal.

It should be politically possible now to elaborate a process whereby political decisions command developments in the field of nuclear and conventional arms. The

process would lead step by step to effective equal security for each nation in Europe. The basic guidelines can be found in the "Non-Proliferation Treaty", and "Final Act of Helsinki", and in the draft of the "Confidence-Building Measures" elaborated in Madrid.

One such procedure is summarized below, the basic elements of which were drafted in mid-1979 and then brought up to date in light of the current situation.

The proposal is:

a. measures be taken to ensure that no conventional or nuclear arms be fired from or at the zone;

b. nuclear and conventional arms be frozen and reduced in the zone between the two nuclear frontiers to levels existing when the signatories of SALT II explicitly recognized the existence of a global equilibrium between the nuclear forces of the two Alliances;

c. subsequently, foreign nuclear and conventional arms be withdrawn gradually from the zone in balanced proportions;

d. nuclear and conventional arms be reduced in a parallel manner on the whole of the European territory, and the location of the arms retained be specified;

e. and, finally, that the non-nuclear nations be organized effectively for non-nuclear defence.

It is clear that the combination of the political impact and of the defence capacity of 400 million people in the non-nuclear European zone could make a decisive contribution to the establishment of peace.

SECOND PUGWASH WORKSHOP ON AVERTING NUCLEAR WAR: THE ROLE OF THE MEDIA

Geneva, 12 and 13 December 1981

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AN OVERVIEW

N. Calder

If the nuclear arms race is irrational, how can anyone expect to make it comprehensible to the public? Even the public demonstrations against preparations for nuclear war may be conniving in a false governmental belief that real security hinges on what to do about nuclear weapons - whether to deploy them or remove them. Any attempt by Pugwash to use the media to convey particular attitudes to nuclear weapons must be recognized for what it is: a form of manipulation, even if in a good cause.

Sharp remarks such as these come from participants in the Fifth Pugwash Workshop on Nuclear Forces in Europe, when they were invited to express their views at a joint session with the Second Pugwash Media Workshop in Geneva. The previous meeting on media, held at Bad Altenburg, Austria, in 1980, had contrasted the viewpoint of media people with that of scientific and military analysts who are the typical Pugwashites. While deferring to specialist technical knowledge, media representatives claimed a greater understanding of political factors and public emotions, but never omniscience. The Second Workshop addressed different questions, in particular, what kinds of "messages" Pugwash might seek to send out to the world, and the practicalities of such communication. Many contributions, digested here, established a framework for possible answers to the questions and threw up some specific proposals that are put into context below, namely:

- A panel of experts available to the press;
- National Pugwash media workshops;
- Pugwash lectures adaptable to television;
- An East-West film on the mirror image of fear.

Professionals in the media are craftsmen who succeed or fail according to their skill in communicating information in a form adapted to the mental framework of the audience, and in articulating credible opinions that preserve confidence. They are not empowered to make propaganda for good causes, unless these qualify by tests of newsworthiness and public interest. On the other hand, journalists engage in self-censorship to a degree, and media often reflect official thinking. They may also deal with world problems too narrowly: events in the Third World for example, may be discussed in relation to the

superpower confrontation, rather than to the griefs and aspirations of the countries directly involved. The language used to describe terrible possibilities is sometimes euphemistic to the point of being inhuman. A tradition of invective and stereotyped perceptions of oponents can impede reasonable expositions of the state of the world.

Successful use of the media is a matter of catching attention with surprising new information, and also of enlisting the emotions of the audience. Gimmicks are not to be scorned: adjustments to the clock (so many minutes to midnight) on the cover of the Bulletin of the Atomic Scientists arouse more press interest than all the scholarly articles inside. Nevertheless, for an organization such as Pugwash, the intention must be to proceed as quickly as possible to reasoned argument. A story has first to engage the interest of a reporter or producer; then it has to clear the most difficult hurdle of editorial and managerial control; and finally the story has to be well told if the public is to register it properly.

Psychological studies in health education have shown that people close their minds to threats when they perceive no remedy. The poorly informed are easily swayed by conflicting information, while well-informed individuals are less readily persuaded to change their minds. Moreover, the public can assimilate quite complex information if motivated to do so. On the other hand, the information-capacity of the media is limited and television, for example, is better suited to announcing issues and putting them on the agenda than to analysing them thoroughly.

Audiences respond most strongly to the risk of nuclear war when it is manifestly a direct danger to themselves and their families, for example in districts where missiles are sited. But, as the health-education studies suggest, there should if possible be some element of hope. Otherwise the more vividly the dangers are rehearsed the more surely will an audience forget about them as quickly as possible.

Three possible aims for Pugwash vis-a-vis the media can be distinguished, together with suggestions and points of guidance from the workshop.

1. The aim of stimulating greater attention by the media to the risk of nuclear war and to ways of averting it.

The media require new information or insights with which to work and to produce new programmes or articles; generalities are unhelpful. The media also need readily available contacts for technical and analytical advice and participation; the panel of willing experts organized by the Scientists' Institute for Public Information in the USA may be a model for other schemes of this kind. Scientists and other experts are entitled to reasonable assurance that their contributions will not be abused, for example, edited in ways that alter the sense or context of the remarks.

National Pugwash media workshops, bringing Pugwashites and media people together to discuss substantive issues and the role of the media, may be an effective way of stimulating attention on a country-by-country basis to the problems of avoiding nuclear war.

2. The aim of using the resources of Pugwash to generate distinctive output through the media.

One suggestion was for a series of Pugwash lectures that could be filmed and, with suitable editing and embellishment with visual material, adapted into television programmes. Another was for a short television film based on the notion of the "mirror image" - somewhat central to Pugwash thinking - that neither superpower intends to attack the other or its nearest allies, but each fears that the other harbours such intentions. Pugwash might persuade highranking experts and political figures from the East and West to participate, so that the views of the two sides might be clearly enunciated, in "mirror-image" fashion.

Consideration could be given to joining forces with other organizations active in studying the danger of nuclear war, (e.g., the Stockholm International Peace Research Institute) to strengthen the presentation of peacemaking expertise. The recent success of the physicians in arousing public interest in the medical consequences of nuclear war may be a model for other professional groups that have special knowledge and responsibility. It should always be borne in mind that material may have to be reworked to suit different media and different countries.

3. The aim of achieving greater publicity for Pugwash and its activities

Military and "hawkish" organizations make effective use of public relations techniques for commanding attention by the media; in principle such techniques are available to Pugwash. In practice, the chief impediments are (i) financial and organizational limitations, (ii) the necessary Pugwash tradition of private meetings, and (iii) the inevitably allusive wording of many of its statements. Public information sessions or news conferences at the end of Pugwash meetings or workshops remain the most practical way of attracting press interest.

A reservoir of goodwill exists among experienced media people who could advise about publicity if Pugwash itself were clearer about its wishes in this respect, and were able and willing to adapt to media needs.

MASS MEDIA EDUCATION ABOUT NUCLEAR WARFARE

Prof. N. Maccoby
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Scholars of the media have argued that mass media have little or no effects on things that matter. They cite data from studies made in the United States of the ineffectiveness of mass media in political campaigns, in public education programmes aimed at promoting participation in the discussion of foreign affairs, and in public safety campaigns such as on the use of car seat belts. They argue that only in advertising campaigns in which there is a low level of involvement in what is being advertised are such campaigns at all effective. After all, it is argued, no one cares much about which brand of soap or toothpaste they buy. Even then, relatively small shifts in brand loyalty are the typical outcomes.

Others have argued that, on the contrary, modern mass media are all powerful; that they can quickly influence millions of people - that they can not only establish the battlegrounds of public debate but can also greatly affect the outcomes of such debates. Actually, for most public issues, measuring the effects of the media in any reasonably sound way is generally quite a difficult task. Furthermore, even when it might be feasible, it typically isn't done. There is, however, one effect that mass media can achieve brilliantly; namely, influencing the public agenda - establishing the issues that will be discussed.

It should be pointed out that, as is well know, it is difficult for television as a medium to convey complex information in sufficient depth. Print media can, of course, do a much more comprehensive job. However, far fewer people will read educational

and informational material than will attend to such communications on television. There is a saving grace. Television can be a highly successful means of capturing people's attention. Evidence is clear that television viewing can influence people to pay attention to the same topics in other media - notably print. Television thus becomes an effective agenda setter. So can other media when used briefly in similar ways. It has been observed that while the media may not be highly effective in telling people what to think, they can be superbly effective in influencing what people think about. If they can't establish a given set of opinions, they can certainly influence the topics of thought and conversation. It ought to be possible to harness this finding to communicating about nuclear warfare issues.

Furthermore, there is a recent and growing body of evidence indicating that mass media, particularly when combined with live group and interpersonal communication, can have substantial effects on important behaviour. Much of these data comes from the area of health education for disease prevention and health promotion. Evidently, the mass media can play a significant role in health education that can lead to changes in certain life style behaviours; particularly those related to risk of cardiovascular disease. Perhaps some of these methods can be adapted to public education concerning means of averting nuclear war.

Both in North Karelia in Finland and in Central California almost a decade ago, community studies were undertaken with the aim of helping people to change some of their daily habits in order to reduce cardiovascular disease. Both efforts but especially to the California studies conducted by the Stanford Heart Disease Prevention Programme, used a combination of mass media, featuring but not limited to television as a means of community education. The results clearly demonstrated that mass media, when appropriately employed, could achieve substantial results when compared to control communities. At the present time, many comparable studies are being undertaken not only in the US and in Finland, but in many parts of the world - in Australia, here in Switzerland, in Germany (FRG), in South Africa and in the Soviet Union. On campaigns on other topics in health, such as alcohol and drug abuse, family planning and driver education have also met with some success. Some of the scepticism of a decade ago that mass media could be an effective medium has been dissipated by these findings.

Let me cite one example with which I am most familiar. The current Stanford studies as well as some others, are attempting to enlist community organizations as a means of mobilizing people in health promotion efforts. These efforts are aimed not only at helping people to learn more healthful habits but to make it more likely that these new habits will be maintained for a long time. Such maintenance is clearly necessary if risk reduction is to be achieved. Cessation of cigarette smoking might not do much good if smoking is resumed after only a relatively brief interruption - a typical outcome of smoking cessation efforts. However, if there is a support system through a network of community organizations, the chances for long term smoking cessation increases. Other risk factors are being similarly treated.

One of the ways in which we have been using television successfully to educate people on cardiovascular risk reduction is a format previously used by BBC in Britain and CBS in the United States. We produced an hour long television programme with a format designed to attract viewers and enlist their participation. We called it the Heart Health Test. The programme involves explanation of risk factors and suggested behaviour changes. Viewers are asked to answer test questions and are fed back the correct answers so that they can score their own work. In our test communities, we succeeded through advance promotion in attracting sizeable audiences in prime time on a regular commercial channel. The advertising in this programme consisted of heart health spots (30 - 60 seconds). Television can be used to educate people on important topics. The Northern Karelia project was originally developed in this way. The

community when informed by the World Heart Organization that they lead the world in deaths due to cardiovascular disease, succeeded in getting action from their government.

What do we know about the potential obstacles to effective public communication on averting nuclear warfare? We know that communications that arouse very strong fear can have the opposite effect from the one intended. People exposed to strong, severe threats tend to avoid thinking about those threats. This is especially the case when no remedial course of action is available. Clearly, such would seem to be the case with threats of nuclear war. The horrors can be clearly described - and even when understated, they constitute an enormous threat. The typical response is to avoid all thought and all discussion of nuclear war. However, when a proposed course of action is presented which has some chance of averting that threat, strong fear arousal becomes a highly effective means of influencing thought and action.

Thus, if ways of coping with the threat were coupled with the presentation of nuclear horrors, increased attention to such issues instead of denial might take place. For example, if people could see ways in which political activity might be influential in aborting the use of such weapons, then increased attention to the issues and increased action might occur. The mass media can play a critically important role in such a process.

There is another critically important role for media in this area. There are so many highly technical issues involved in nuclear weaponry that most people feel that they can't possibly know enough to have an opinion or that their ideas on the subject are worthless. What the media can do is first of all, point out to people that since various experts hold a variety of opinions, laymen are going to have to participate in the decision-making process. To paraphrase a famous saying, "nuclear war is too important to be left to the military and the politicians". Finally, it is possible for science writers and reporters to learn to do a more effective job of communicating nuclear information and policy ideas to intelligent, well-educated lay people. Reporters like other people, must become more specialized in their areas of reporting. They need to routinely pretest their copy on people to whom they are communicating. After all, most deadlines for the reporting of nuclear warfare matters are not so tight as to interfere with such a process.

Another relevant finding from social psychological research on persuasion is that the less people know about a topic, the more easily do they succumb to persuasion. Conversely, the more they know about a subject, the less volatile are their opinions on that topic. Thus, the more people know about nuclear warfare matters, the more they are likely to respond rationally and judiciously to new persuasive information. They are much less likely to swing from one extreme position to another, depending on the last arguments they have heard.

STATEMENT BY ITALIAN PHYSICISTS ON NUCLEAR WEAPONS

(This document, signed by over 800 Italian physicists, including over 150 full professors, was handed to the President of the Italian Republic, and issued to the press, on November 27, 1981).

In the face of the current escalation of the nuclear arms race, with a direct involvement of Italy, we feel duty-bound, as physicists, to address public opinion. Our purpose is to clarify the issue by putting forward some points on which we all agree, in spite of the diversity of our political opinions and ideological backgrounds.

1. The destructive potential of nuclear weapons is enormous. For instance, the largest thermonuclear bomb exploded has yielded, in a fraction of a second, many times the energy produced by all the explosions that have occurred in war throughout human history (including two World Wars, the blanket bombings of Germany and Japan, the nuclear bombs of Hiroshima and Nagasaki, the devastation of Vietnam).

2. The nuclear arms race has attained abnormal proportions. The Soviet Union has now some 7000 strategic nuclear warheads and the United States some 9000; each of these has the capability to destroy a city. There are in addition twice as many "tactical" nuclear weapons, many of which have a larger yield than the bomb that destroyed Hiroshima and are deployed in Europe. A nuclear conflict in Europe, in which even only a tiny fraction of these weapons were employed, would cause the total destruction of Europe; very many Europeans would die promptly, and most of the survivors would envy the dead.

3. There is no possibility of defence from nuclear weapons. A nuclear war cannot be won; all participants would suffer death and destruction on a scale and of a kind never before experienced throughout history.

4. Thus, the main problem is to avoid by all means the use of nuclear weapons. The best route to realize this goal is the total elimination of such weapons; but this is not easily feasible. It is however at least necessary to prevent the diffusion of nuclear weapons. For this reason many of us took a public stand in 1967 to support the Treaty against the Proliferation of Nuclear Weapons (NPT) and the signature of this Treaty by Italy. Today 112 Non-Nuclear-Weapon Countries are party to the NPT, that provides a valid brake to the proliferation of nuclear weapons to other Countries (albeit in the worrisome context of a continuing vertical proliferation of the nuclear armaments of the Nuclear-Weapon Countries).

5. As for the Nuclear-Weapon Countries, and in particular the two Superpowers, USA and USSR, it is widely believed that the exclusion of the use of nuclear weapons is guaranteed by the certainty that any nuclear attack ("first-strike") would be followed by a reprisal ("second-strike"), such as to cause the total destruction of the Country that initiated the nuclear aggression. The relative invulnerability of the strategic arsenals now available, that include long-range bombers, intercontinental ballistic missiles (ICBMs) and missiles on submarines (SLBMs), and the enormous size of these arsenals, guarantees by a wide margine such a capability of second-strike reprisal, since one percent of the American strategic weapons are sufficient to wipe out altogether the Soviet Union as a viable society (and viceversa).

6. The enormous difference between the nuclear weapons that are now operational and the conventional weapons used throughout history contradicts some strategic conceptions that have developed through centuries. But these obsolete ideas linger and

continue to characterize the way of thinking of large sectors of public opinion and of many political leaders. For instance, to maintain the equilibrium based on deterrence it is not required that the two Superpowers have the same destructive potential, as long as each has more than enough to destroy the other side in a retaliatory second strike. In this context, the idea that one of the two Superpowers be "stronger" than the other makes no sense; yet people still think in such terms. Thus, the idea of sufficiency is replaced (at best) by that of parity. But parity is hard to assess; each side prudently underestimates the efficiency of one's own weapons and overestimates those of the other side. There ensues a permanent stimulus for a nuclear arms race, that has produced the enormous existing arsenals, and whose end result will presumably be a universal catastrophe.

7. How to stop this suicidal course? The analysis outlined above suggests that there is a wide spectrum of initiatives of limitation and reduction of armaments, that could be undertaken, even unilaterally, at no risk. For instance, the former US ambassador in the USSR, George Kenan (who certainly is not an extremist), suggested recently immediate reductions by 50%. On the other hand a policy of limitations of nuclear weapons cannot succeed if it is not eventually pursued by both sides. In this connection, we are well aware that, while it is possible for Western scientists to take a public stand on these themes even in a critical position with respect to their governments, this is not permitted in the Soviet Union nor in other East European countries. But this asymmetry cannot force us to remain altogether silent.

8. As Europeans and as Italians, we are especially worried by the current novel start of the nuclear arms race in Europe, with the deployment of the Soviet missiles SS-20 (at the pace of one per week) and with the prospective deployment of new American missiles on the European soil (108 Pershing II and 464 Ground-Launched Cruise Missiles). Some of us believe the NATO "double decision" of December 1979 (namely, to begin in 1983 the deployment of the Pershing II and Cruise missiles, and to offer in the meantime to the Soviets to negotiate the limitation and reduction of nuclear weapons in Europe) - a decision that was shared by the Italian Government - to be justified as a response to the "modernization" of Soviet intermediate-range missiles (the SS-20 missiles are much faster and more accurate than the SS-4 and SS-5 missiles they are supposed to replace; moreover each of them, in contrast to the SS-4 and SS-5 missiles, carries 3 independently-targettable nuclear warheads). Others among us consider that decision wrong: because it was not justified by any real need (there are already thousands of "tactical" nuclear weapons in Western Europe, and moreover some of the strategic American nuclear weapons are in any case already assigned to NATO); because it stimulates a nuclear arms race in Europe, that will make everybody less secure; because the deployment of nuclear weapons on one's own territory (Italy is committed to accept 112 cruise launchers) increases the risk rather than strengthening one's own security. But we are all agreed in hoping that the Soviet-American negotiations scheduled to begin at the end of November in Geneva yield quickly an agreement, that not only put an end to this novel round of nuclear rearmament in Europe, but also initiate a reduction of nuclear weapons. And we all wish that the European States, and in particular Italy, support actively and autonomously such a policy, in every international context and especially within NATO.

9. The recent developments of the nuclear arms race in Europe seem motivated by the prospect of a "limited nuclear war" in Europe. In fact, it is for such an eventuality that nuclear weapons are developed which appear conceived more for war fighting than for deterrence. For instance, both the so-called "neutron bomb" and the higher accuracy and lower yield of the warheads of the SS-20's (as compared to the SS-4's and SS-5's that the SS-20's are supposed to replace) are often interpreted as steps in this direction.

We are profoundly sceptical about the possibility that a nuclear conflict in Europe would remain limited; the escalation to a global nuclear war appears much more likely.

But in any case - and it is our duty as scientists to issue such a warning - a nuclear war in Europe, however limited, implies the destruction of Europe, on a much more dramatic scale than in the Second World War.

10. An aspect of the introduction of novel nuclear weapons in Europe that we deem important is the introduction of the strategic cruise missile. This low-altitude long-range flying vehicle is nuclear-armed and very accurate. Cruise missiles are ambiguous weapons, due to their multiple roles; they can be launched from the ground, the sea and the air, can carry a nuclear or a conventional warhead, and may fulfil strategic or tactical missions. They are quite small (15-20 feet long, less than 2 feet in diameter), and relatively inexpensive. Presumably, after their development is completed, they will be deployed in large numbers, first by the United States, then by the Soviet Union, and eventually by other Countries as well. As a result, the very foundation of any strategic arms limitation (or even of any unilateral restraint) will be eroded, since the sure information on the size of the strategic arsenal of the other side, that is now available by national means of verification (essentially satellites), will become questionable. Thus, the introduction of the strategic cruise missile jeopardizes the very feasibility (from a technical point of view, aside from the political difficulties) of any strategic arms limitations, because the verificability of such measures becomes moot. It would be tragic if the projected deployment of Ground-Launched Cruise Missiles in Europe, as well as the recent American decision to produce cruise missiles on a large scale and in many versions, were to torpedo the attempt to impede stepping beyond such a fateful, and irreversible, threshold. Such a possibility should have come to fruition in SALT III; indeed this prospect motivated the inclusion of the prohibition to deploy ground - and sea-based cruise missiles in the Protocol of SALT II. One must still hope this attempt to avoid the introduction of strategic cruise missiles succeeds in the context of the novel round of Soviet-American Strategic Arms Reductions Talks due to begin early next year.

11. Finally, let us emphasize - in unison with Nobel Peace Prize laureate A.D. Sakharov - that the goal to stop the nuclear arms race and to decrease the danger of nuclear war takes precedence over any other matter. Thus, it would not be justified to refuse to negotiate on these issues because of other considerations, however important they may appear (for instance, the Soviet military presence in Afghanistan). On the other hand it is unrealistic to expect progress in arms control, in an international environment characterized by a return to a cold war climate. We therefore wish all countries to behave so as to promote a revival of the policy of detente.

ISODARCO - 1982

ISODARCO, The International School on Disarmament and Research on Conflicts, sponsored by the Italian Pugwash Group, is in the process of organizing the 9th Course which will be held in Verona (Italy) from 19 - 29 July 1982. The Course will be devoted to two main topics: "Prospects in Arms Control" and "Conflicts and the Quest for Oil and other Natural Resources". As usual the Course will be given in formal lectures delivered by the principal lecturers, seminars offered by the participants, round-tables and general open discussions. This Course is intended for people who already have a professional interest in these problems or who would like to play a more active and technically competent role in this field. The working language will be English. A number of scholarships covering admission fee, accommodation and full board is available to those

who do not receive support from other sources.

All enquiries should be addressed to the Director of the School:

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BOOK REVIEWS

"Nuclear Illusion and Reality", by Solly Zuckerman, published by Collins, St. James's Place, London, 1982, pp.154. £4.95.

Lord Zuckerman has produced an indispensable primer for everyone concerned about nuclear war. A prospective reader may feel he has already been saturated by the literature on the subject, but it would be a great mistake to miss this impressive combination of fact, logic and lucidity of exposition. The sheer insanity underlying any idea for the possible use of nuclear weapons in any circumstances has never been more clearly put. He meets head-on the difficult questions of deterrence and unilateral nuclear disarmament, and although one might not agree fully with his reasoning, he advances powerful arguments which are not easy to refute.

Zuckerman is one of a few unflagging voices during the past quarter of a century who represents former corridors of power, and who speaks from first-hand experience of the difficulties of modifying from the inside political decisions largely based on pressures deriving from the military, the scientists and engineers who originate and develop new weapons, and industry. Others who are like Zuckerman in this respect are Herbert York, George Kistiakowsky, Jerome Wiesner and Andrei Sakharov. Let us hope such voices will cut through the noise of worst-case scenarios prepared by think-tank artists and desk-bound colonels, and the paranoid reasoning of some government advisers, to reach - if not the government masters - at least a sufficient number of influential people and the public at large who can stop the present mad descent to disaster.

M.M. Kaplan

"Nuclear Radiation in Warfare" by Joseph Rotblat, SIPRI: Taylor & Francis Ltd., London, 1981. 149 pages, £9.50 net.

An increasing likelihood of nuclear war, changes of military doctrines towards nuclear warfighting and consequences of different nuclear wars have become much-discussed issues recently. In this discussion emotional exaggeration has been common because the problem is very complex. The relevant scientific facts have been buried in the vast profesional literature published during the last twenty years. This book now changes the situation. All relevant data needed to understand and evaluate the effects of nuclear war are presented in a clear, concise and scientifically reliable way.

The author of the book, Professor Joseph Rotblat, former Secretary-General of the Pugwash Conferences on Science and World Affairs, is one of the leading authorities in the world in the field of radiation physics.

The book begins with a brief description of nuclear weapons: fission bombs, various fusion bombs and neutron bombs. The effects of nuclear explosions, other than radiation, are then briefly described: early fallout, thermal radiation, blast wave and electromagnetic pulse. The introductory chapter is completed by a description of the arsenals of nuclear weapons: strategic, tactical and "gray area" weapons (=theatre nuclear weapons). The "vertical arms race" which means accumulation of nuclear weapons in the stockpiles of the two superpowers is rapidly increasing. "Horizontal proliferation" which means their ominous spreading to increasing number of lesser powers threatens to really get loose during the 1980s.

The two main chapters of the book describe in considerable detail the biological effects of radiations on man and the radiations from nuclear explosions. The chapter on biological effects is unique, being quite up-to-date and admirably thorough. The doses which could be received from different types of weapons under different conditions are described in detail. Well chosen graphics make possible quantitative estimation of the effects of different parameters on the dose. Acute effects, long-term somatic effects, genetic effects and factors affecting the biological response to radiation are described with great expertise and admirable clarity. Initial radiation and fallout are also described in sufficient detail to make this book a recommendable handbook for most medical and civil defence personnel dealing with radiation situations.

Short chapters on radiation casualties in nuclear war, effectiveness of civil defence and other warlike uses of radiation, like attack on nuclear installations, radiological warfare, and terrorist activities complete the treatise.

Although the book is packed with graphs, tables and other data it is fully readable and quite exciting. It comes to the conclusion that although the largest casualty toll in an all-out nuclear war (into which any use of nuclear weapons by superpowers is likely to escalate) would be from the effects of blast, heat and initial radiation, fallout would add immensely to the numbers of dead and injured. Civil defence measures which may provide some protection against blast would be less effective against local fallout due to the length of stay in shelters which would be necessary.

In addition, global fallout would cause cancer and genetic effects all over the world. "Mankind is confronted with a choice: we must halt the arms race and proceed to disarmament or face annihilation".

By all means read this book! I cannot think of any better buy to anyone worried about the future of this world.

J.K. Miettinen

Robert Nield. "How To Make Up Your Mind About the Bomb?" Andre Deutsch, London, £2.65, 144pp.

Robert Neild has written an excellent primer about whether or not Britain needs nuclear weapons. He disentangles the complex arguments about deterrence into a few simple propositions with which one can agree or disagree. The propositions have to do with the relative value and probability of 'being at peace', 'being occupied' or 'being

Hiroshima'd'. Once the propositions are set out so clearly - free from the obfuscation, rhetoric and emotional appeal that usually wrap up this subject - it is almost impossible to agree with those propositions that are essential to support the concept of deterrence and the case for British or American nuclear weapons in Britain.

This book also includes extremely useful, basic descriptive material about the present level of nuclear weapons, the effects of nuclear weapons, the debates about strategy and the state of arms control negotiations. The chapter on the history of British nuclear weapons is of particular interest and contains much new material. It shows how decisions about nuclear weapons were taken, right from the beginning, by a tiny handful of ministers in total secrecy; on the whole, Labour Governments, which were, in particular, responsible for the original decision to go ahead with the A-bomb in 1947 and the decision to modernize, at great cost, the Polaris warhead during the 1970s, were worse than Tory Governments. And it suggests, in effect, that British democracy and national independence were, so to speak, subjugated to the requirements of nuclear weapons in Britain, both those that were independently owned and controlled and those that were owed and controlled by the United States. There are two fascinating maps in the chapter. One, showing American bases in Britain, is reproduced from an article by Duncan Campbell in the New Statesman. The other is a Soviet map of British and American bases originally published in a Soviet military journal. The density and spread of these bases will come as a shocking revelation to most readers of this book.

Although the book is about British nuclear weapons, the basic arguments are no less applicable to other countries. It serves both as a readable introduction to the issue surrounding nuclear weapons and as a tool for clarifying the thoughts of those more familiar with the subject.

Mary Kaldor

OBITUARIES

Professor Karoly Vas died at the age of 62 on 22 November 1981. He was a corresponding member of the Hungarian Academy of Sciences, and a distinguished expert in the food sciences. He was chairman of the Hungarian National Pugwash Committee and attended several Pugwash Conferences.

Professor Walter Heitler of Switzerland has died on 15 November 1981 at the age of 77. Professor Heitler was a theoretical physicist whose research work on chemical bonding and publications on the quantum theory of radiation brought him international repute. He held professorial posts in Bristol, Dublin and Zurich. He attended the 10th Pugwash Conference in London.

We regret to announce the deaths of Academician Eugenyi Fedorov (USSR) and Academician F. Sorm (Czechoslovakia). Their obituaries will be published in the next issue of the Newsletter.

CALENDAR AND AGENDA FOR FUTURE MEETINGS

Calendar - 1982

19-23 February	Pugwash/UNESCO Symposium on "Scientists, the Arms Race and Disarmament", Ajaccio, Corsica, France.
12-14 March	Ninth Workshop on Chemical Warfare, Geneva, Switzerland, (this meeting has been transferred from Prague, Czechoslovakia).
18-21 May	Symposium on "Nordic Initiatives for Arms Limitations in Europe", Oslo, Norway.
26-31 August	32nd Pugwash Conference, "The Current Danger of Nuclear War: the Russell-Einstein Manifesto after 25 Years", Warsaw, Poland.
September/October (tentative)	Symposium on "An International Agency for the Use of Satellite Observation Data for Security Purposes", France.
November (tentative)	Symposium on "The Arms Race and International Law", Helsinki, Finland.
December (tentative)	Sixth Workshop on Nuclear Forces in Europe, Geneva, Switzerland.

AGENDA

Pugwash/UNESCO Symposium, Corsica, France, 19-23 February 1982

This Symposium was designed to review the draft of a Pugwash/UNESCO book (edited by Professor J. Rotblat) for the United Nations Second Special Session on Disarmament (UNSSOD II). The contents and authors are given below:

1. Role of Science and Technology in promoting the Arms Race
   - 1.1. Dynamics of the Nuclear Arms Race - Francesco Calogero (Italy)
   - 1.2. Other Weapons and New Technologies - Karlheinz Lohs (GDR)
2. Role of Scientists in the Arms Race
   - 2.1. The Dilemma of Scientists in the Nuclear Age - Engelbert Broda (Austria)
   - 2.2. Scientists as Advisers to Governments - Herbert York & Allen Greb (USA)
   - 2.3. Scientists in opposition to the Arms Race - Vasily Emelyanov (USSR)
3. Movements of Scientists against the Arms Race
   - 3.1. National Movements)
   - 3.2. International Movements) - Joseph Rotblat (UK)
   - 3.3. Peace Research Institutes)
4. Social Responsibility of Scientists
   - 4.1. Basic Principles - John Ziman (UK)
   - 4.2. Scientists in the Contemporary World - Ivan Supek (Yugoslavia) & Ignacy Malecki (Poland)
   - 4.3. Scientists, Governments and Public Opinion - Mark Oliphant (Australia)

5. Measures to encourage Scientists to be actively concerned with Disarmament

   5.1. Use of Science and Technology for Arms Control and Peace Keeping - Bernard Feld (USA)
   5.2. Peace Research - Bert Röling (Netherlands)
   5.3. Education for Disarmament - Swadesh Rana (India)
   5.4. Social Consciousness and Education for Disarmament - Sergei Kapitza (USSR)

6. United Nations Activities

   6.1. The Second Disarmament Decade - Olu Adeniji (Nigeria)
   6.2. UN Special Session on Disarmament in 1982 - Alfonso Garcia-Robles (Mexico)

Ninth Pugwash Workshop on Chemical Warfare, Geneva, Switzerland, 12-14 March 1982

1. Developments in CW since the Eighth Workshop (April 1981).
2. Major problems concerning the achievement of a CW Convention (or Treaty) analogous to the BW Convention of 1972.

   a. Technical procedures for monitoring the destruction of declared CW stocks;
   b. Technical and other procedures for fact-finding in the event questions regarding compliance arise;
   c. Identification of commercial chemicals, including precursors, which are of particular significance from the standpoint of a CW prohibition;
   d. Others.

32nd Pugwash Conference "The Current Danger of Nuclear War: the Russell-Einstein Manifesto after 25 Years", Warsaw, Poland, 26-31 August 1982

1. Problems and Prospects of Nuclear Arms Control and Disarmament.
2. Contemporary Issues in European Security.
3. Controlling Destabilizing Weapons Technologies.
4. Nuclear Proliferation.
5. Resources and Security.
6. Arms Acquisition and Economic Development in Developing Countries.
7. Current Conflicts.
8. Responsibility of Scientists for the Arms Race and Disarmament.

"Nordic Initiatives for Arms Limitations in Europe", Oslo, Norway, 18-21 May 1982

1. Military activity in Northern Europe.
2. Proposals for a Nordic nuclear weapon-free zone.
3. Other arms control measures.

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