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The Trilateral Agreement: lessons for biological weapons verification

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In late 1989, Dr Vladimir Pasechnik, a key research director of what turned out to be a clandestine Soviet biological weapons (BW) facility, defected to the United Kingdom. This eventually led to an attempt by the UK and the United States to end the secrecy surrounding the Soviet BW programme, which was in violation of the 1972 Biological and Toxin Weapons Convention (BWC), and to ensure that all such activities in the successor state, Russia, were verifiably ended. This effort was formalised in the so-called Trilateral Agreement on biological weapons concluded by the UK, the US and Russia in 1992.

The Trilateral Agreement failed dramatically, as Russia proved unwilling to acknowledge and fully account for either the former Soviet programme or the BW activities that it had inherited and continued to engage in. This included refusing access by American and British inspectors to its military biological sites.

The lessons learned during the process contributed indirectly to the strategy of the UN Special Commission on Iraq (UNSCOM) between 1991 and 1999 in seeking the biological disarmament of Iraq. They were also factored into British thinking on the design of compliance measures for the BWC verification protocol that was being negotiated between 1995 and 2001.

The failure of the trilateral initiative has implications for future attempts to design verification procedures for the BWC, the development of confidence-building measures, the conversion to peaceful uses of facilities that were (and may still be) a part of the Russian programme, and the redeployment of biological warfare scientists and technicians. It also demonstrated the difficulty of applying traditional arms control principles to dual-use facilities—those capable of being used for both peaceful and military purposes.

Pasechnik's defection occurred during the turbulent final years of the Soviet Union, which dissolved in December 1991. Russia became an independent state and inherited the Soviet role of depositary of the BWC. Soviet President Mikhail Gorbachev presided over this transition until Boris Yeltsin assumed the presidency of Russia in June 1991. This was a complex political environment in which to investigate an illicit Soviet BW programme. In particular, it tended to moderate the political pressure that could be applied to further the investigation. On the other hand the investigation could not conceivably have taken place at all in earlier times.

Prelude to the agreement

The West had become sensitised to a Soviet biological weapons programme in 1979 in the aftermath of the inadvertent release of anthrax spores from a biological weapons factory at Sverdlovsk (now Yekaterinburg), but no concerted international response was initiated. By the mid-1980s the UK and the US had acquired an impressive catalogue of intelligence information which raised concerns that after 1975, when the BWC entered into force, the Soviet Union had begun an offensive BW programme. However, it took the defection of Pasechnik to provide sufficiently credible intelligence information about the nature and scale of activity to attract the attention of high-level American and British policy makers. This led to American President George Bush and British Prime Minister Margaret Thatcher directly challenging President Gorbachev with the information. As the three depositary states for the BWC, with special responsibilities and obligations, it seemed imperative that they should co-operate to resolve this serious compliance issue as expeditiously and transparently as possible.

Between 1990 and 1992, the US and UK put considerable diplomatic and political pressure on the Soviet Union, and then Russia, to admit that it possessed an offensive BW programme. In 1990, in response to that pressure, President Gorbachev invited American and British representatives to jointly visit facilities associated with Biopreparat, where Pasechnik had worked. Biopreparat was established in 1973 as a 'civilian' cover for offensive BW research, development and production within the Soviet Ministry of Health.

Extensive diplomatic and technical negotiations were required before the British–American team could be dispatched. Details which required negotiation included

the duration of site visits, conditions of access, site definition, recording conditions, vaccination requirements, the number of facilities to be visited and team size. It also required the host side to provide an outline definition of the sites so that appropriate preparations could be made. The precise facilities to be visited were also agreed at these meetings. Unfortunately, the protracted negotiations allowed the Soviet authorities time to 'clean up' and develop 'legenda' for the establishments.

Four All-Union Scientific Research Institutes were visited in January 1991:

- the Institute of Immunology, Chekhov;
- the Institute of Microbiology, Obolensk;
- the Institute of Molecular Biology, Koltsova; and
- the Institute of Ultrapure Preparations in Leningrad (later St Petersburg).

All were part of Biopreparat, supposedly as part of the Ministry of Medical Industry. The sites were chosen because they had been well known to Pasechnik and recent detailed information had been obtained about them. All undertook fundamental and applied research devoted to the creation and enhancement of effective biological weapons and the development of novel bacterial and viral agents.

The visits did not go without incident. At Obolensk, access to parts of the main research facility—notably the dynamic aerosol test chambers and the plague research laboratories—was denied on the spurious grounds of quarantine requirements. Skirmishes occurred over access to an explosive aerosol chamber because the officials knew that closer examination would reveal damning evidence of offensive BW activities. At Koltsova access was again difficult and problematic. The most serious incident was when senior officials contradicted an admission by technical staff that research on smallpox was being conducted there. The officials were unable to properly account for the presence of smallpox and for the research being undertaken in a dynamic aerosol test chamber on orthopoxvirus, which was capable of explosive dispersal. At the Institute of Ultrapure Preparations in Leningrad (Pasechnik's former workplace), dynamic and explosive test chambers were passed off as being for agricultural projects, contained milling machines were described as being for the grinding of salt, and studies on plague, especially production of the agent, were misrepresented. Candid and credible accounts of many of the activities at these facilities were not provided.

In October 1991 a meeting was held in Moscow to discuss the reciprocal visit of a Soviet delegation to the US and UK. In the event the UK was not asked to host a visit. The Soviets designated four sites of concern in the US:

- the Baker Test Facility, Dugway Proving Ground, Utah;
- the United States Army Medical Research Institute for Infectious Diseases (USAMRIID), Fort Detrick, Maryland;
- the National Centre for Toxicological Research, Jefferson, Arkansas (Pine Bluff Arsenal); and
- the Salk Institute, Government Services Division, Swiftwater, Pennsylvania.

Three were military sites which had contributed to the American offensive programme at various times between 1946 and 1969. The fourth was a government contractor which provided vaccines for military use. A Soviet team visited the sites in December 1991, observed by a small British team. The Soviet side saw evidence of the American offensive programme before 1969, including dilapidated BW storage bunkers, agent production fermenters and derelict weapons-filling lines at Pine Bluff; pilot-scale agent production capability and partially dismantled aerosol test chambers at Fort Detrick; and functional weapons test grids at Dugway.[1] They thus claimed that the US had a mothballed capability—an obvious attempt to match US and UK concerns about the active Soviet capability.

While the visits were obviously unsatisfactory for both sides from a variety of perspectives, it was commercial and defence confidentiality that proved to be the dominant issue rather than the visit process itself. Time constraints meant that detailed investigation of key issues was not attempted on-site. In the course of the visits in Russia it was impossible to deal with documents, sampling was a matter of contention, discussions were stilted, site access was constrained and quarantine restrictions were arbitrarily applied. Formalisation of the process was required, especially after the profound political changes in Russia in 1991–92, to prevent the exercise from collapsing. The result was the Trilateral Agreement.

The agreement

The 14 September 1992 Trilateral Agreement took the form of a Joint Statement on Biological Weapons by the governments of the United Kingdom, the United

States and the Russian Federation, issued after a meeting in Moscow between senior officials on 10 and 11 September 1992.[2] It reaffirmed the three states' commitment to full compliance with the BWC. It also noted that Russia had ceased offensive BW research, dismantled weapon production lines, closed test facilities and dissolved the department in the Ministry for Defence that was responsible for the offensive BW programme. It acknowledged that President Yeltsin had ordered an investigation into activities at the Institute of Ultrapure Preparations.

Russia agreed to accept visits to any *non-military* biological site at any time to remove ambiguities, subject to the need to respect proprietary information; provide information about the dismantlement of its programme; and clarify information in Form F[3] relating to past BW activities submitted to the UN as part of the politically binding BWC confidence-building measures agreed in 1991. Prominent scientists would be invited to participate in any investigation into BWC compliance.

Six trilateral working groups were to be established to consider the following:

- visits to non-military sites (subject to proprietary rights protection) to review measures to monitor compliance; to review potential modalities to test such measures; and to examine the physical infrastructure of the biological facilities in the three countries to determine whether there was specific equipment or capacity that was inconsistent with their stated purpose;
- co-operation in biological defence;
- ways of promoting co-operation and investment in conversion of facilities;
- the exchange of information on a confidential, reciprocal basis concerning past offensive programmes;
- the provision of periodic reports to legislatures and publics describing biological research and development (R&D) activities; and
- the encouragement of exchanges of scientists at biological facilities on a long-term basis.

Apart from visits to non-military facilities, none of these ideas was implemented, primarily because the focus quickly centred on procedures for visits to military biological facilities.

The agreement also envisaged that a number of rounds of visits, in batches of four, would be conducted in all three countries. It was never clear, however, whether

there was to be equivalence between Russia on the one hand and the UK and US jointly on the other, or whether the three would be treated equally. In any case, regardless of the original intention, the number of sites of legitimate concern in Russia would eventually have created an imbalance in the process.

In order to accommodate the time needed to travel within both the US and Russia, each visit was to be on 24 hours' notice, but this was so short that for the inspected facility the visits were effectively no-notice inspections. (In practice, because of transport difficulties, a longer lead in time was sometimes provided, usually by giving notice on the Friday preceding a visit scheduled for the following Monday.) An 'expression of concern' formally delineating non-compliant features was to be provided by the visiting side at notification and on arrival at the site.

The trilateral working group on visits negotiated a proprietary rights agreement by 12 May 1993 which defined the visits procedure further. It required the receiving side to:

- arrange a briefing about the site by representatives of the facility, including on its current activity, the products manufactured and the research undertaken;
- ensure that staff were present and authorised to discuss past activity; and
- provide information on the site with reference to hazard and safety and medical requirements.

The agreement also defined limitations on the use of audio and video recording and sampling. The principles of 'managed access' were introduced, imposing significant limitations on the investigations.

The visits

Curiously, the first initiative under the Trilateral Agreement was not a visit to a facility but an invitation for the UK and the US to observe the Russian Commission of Inquiry into the work at the Institute of Ultrapure Preparations.

The commission was undertaken on the orders of President Yeltsin after a démarche by British Foreign Secretary Douglas Hurd and American Deputy Secretary of State Lawrence Eagleburger on 22 August 1992, following the receipt of further defector information on non-compliance and the involvement of the Institute. It met from 18–21 November 1992 and comprised senior Russian academics. The stated objective was 'to analyse the activities to see if any are in violation of BWC'.

In the event it was the American and British observers who actually asked the questions, while the Russian inquirers observed. The Russian observers from Biopreparat, the Ministry of Public Health and the Ministry of Defence played a passive role. The Commission of Inquiry concluded that nothing untoward was currently being done at the institute. The observers, on the other hand, were deeply frustrated at the nature of the work that was continuing at the institute and the superficiality of the inquiry.

Actual visits to Russian facilities were made in 1993/94 to:

- the All-Union Scientific Research Institute of Veterinary Virology, Pokrov;
- the Chemical Plant, Berdsk;
- the Chemical Plant, Omutninsk; and
- the All-Union Scientific Research, Institute of Microbiology, Obolensk (for the second time).

The sites were visited in pairs in October 1993 (Pokrov and Berdsk) and January 1994 (Omutninsk and Obolensk). The visits in January 1994 immediately preceded a summit meeting between American President Bill Clinton and Russian President Yeltsin, and their focus—particularly that of the visit to Obolensk—was to detect evidence of change, especially dismantlement and change of use.

Since the parties were entitled under the agreement to visit only four sites, a problem immediately arose, with regard to three of the four sites, as to how to define them. The facilities at Berdsk and Omutninsk shared locations with other organisations of concern. Ultimately a legal rather than geographic or functional determination prevailed, effectively denying the American–British observers the opportunity to fully explore contiguous facilities. Pokrov's relationship with an associated research institute was also denied. The Russians were prepared to allow access to contiguous sites but only if other sites were sacrificed.

Despite these restrictions, the visits to Pokrov, Berdsk and Omutninsk all revealed evidence of biological activity since 1975, such as large-scale production in hardened facilities, aerosol test chambers, excessive containment levels for current activity and accommodation for weapons-filling lines.

During their visits the American–British teams provided reports only to Washington and London, not to their Russian hosts. Final reports were made after departure

from the country. No assessment was made in-country by any of the three parties during visits. The reports on the visits, which are the only records of the process, were compiled in different ways. Before the Trilateral Agreement they had been compiled by 'rapporteurs' who were familiar with Soviet non-compliance and were able to provide a politically and technically focused account based on verbal accounts provided by the 'visitors'. After 1992 the team leaders wrote the reports, basing them on contributions from delegated team members. The products of both processes remain classified but were of good quality and remain valid today.

Return visits were made by the Russians to the US in February 1994 to:

- Pfizer US Pharmaceuticals, Vigo, Indiana;
- Pfizer US Pharmaceuticals, Groton, Connecticut; and
- the US Department of Agriculture's Plum Island Animal Disease Center, Greenport, New York.

In March 1994, they visited Evans Medical Limited in Liverpool in the UK.

The visit to Vigo confirmed that at the end of World War II the US had established capabilities for large-scale fermentation (for anthrax) and weapons filling, but the archaeological evidence was clearly of 1940s vintage. The facility had long ago become been dilapidated (although, unfortunately, it was not destroyed because of the cost involved). The visit to Pfizer Groton was undertaken the following week. Both visits were conducted on 48 hours' notice.

Although challenging and uncomfortable, the visits were unlikely to compromise commercial interests, but they created controversy which has had long-term ramifications. Pfizer was so concerned about the protection of commercial proprietary information at both locations that it took the personal intervention of Vice-President Al Gore before it would permit the visits to proceed. This raised the profile of the visits markedly and sent shock waves through the American pharmaceutical industry which still resound today.

The visit to Evans Medical was justified by Russian concern that it made anthrax; in fact it packaged anthrax vaccine produced elsewhere by another agency for use by British troops during the 1990–91 Gulf War, but was not doing so at the time of the Russian visit. The company, assisted by a joint team of advisers from the British Foreign and Commonwealth Office and Ministry of Defence, was able to

deal comfortably with Russian requests for access and to demonstrate that the site was not currently, and had not at any time been, engaged in activities prohibited by the BWC.

The meetings

Following the round of visits to facilities in the UK, the US and Russia, technical discussions were held in London and Moscow in mid-1994. The London meeting, held from 26–28 April 1994, discussed, among others, the following issues:

- confidential disclosure of past American, British and Soviet offensive programmes;
- an expression of concerns about current Russian activity;
- assessment of the trilateral visits undertaken;
- 'Rules of the Road' for future visits; and
- access to military sites.

The first indicators of the extent of the Russian side's willingness to co-operate were the Rules of the Road. These defined the conditions for the selection of sites and the operational procedures for assessing them, conducting on-site activity and recording information. Time limits on visits (two days), site definition (precluding access to all components of a geographical location) and the need for mutually agreed objectives for visits all constrained interaction between the visiting team and facility personnel, thereby limiting the openness and transparency of activity on site. The UK and the US also presented a confidential account of their former offensive activities, but Russia did not reciprocate.

On 11 and 12 October 1994 the three sides met in Moscow to discuss the past Soviet/Russian programme; the funding of Biopreparat projects; the Rules of the Road; commercial confidentiality; the definition of military BW facilities; access to biological facilities operated by the three states outside their territories; and the timing and number of visits. On this occasion Russia gave a presentation on its offensive activities. However, it significantly failed to match American and British expectations, calling into question the openness and urgency with which the Russian Government was addressing the issue.

On 15 October 1995 the commemoration of the UN's 50th anniversary in London provided an opportunity for the diplomatic principals of the three sides to meet. This resulted in the question of biological warfare sites that had been active before

1975 being added to the list of unresolved issues. But no other progress was made. The problem of access to relevant sites in countries other than those involved in the trilateral process, such as the other republics of the former Soviet Union besides Russia, proved insurmountable. No further meetings ensued and the process foundered as a result of a lack of collective resolve to continue. This was apparent from the last act in the process—an April 1996 letter from Russian Foreign Minister Yevgeniy Primakov to American Secretary of State Warren Christopher which went unanswered.

Other independent initiatives

Since the signing of the Trilateral Agreement a number of initiatives independent of the agreement have been undertaken, including exchange visits between the American and Russian intelligence services, military and commercial exchanges under the auspices of the International Science and Technology Center (ISTC) in Moscow,[4] and the American–Russian Cooperative Threat Reduction Programme. These initiatives have helped to build some confidence about the change of direction of the Russian programme and about the dismantlement of facilities and the retention of scientists associated with it. The initiatives have rarely, however, provided insight into past programmes or provided convincing verification of Russia's present compliance with the BWC.

The outcome

Despite the failure to determine whether Russia was in compliance with the BWC, the Trilateral Agreement was a significant achievement. Participation in one inquiry, three rounds of site visits and three technical meetings confirmed the accuracy and insight of Pasechnik's revelations in 1989 with regard to the sites visited and established confidence in his appraisal of other facilities and activities. The process also provided evidence of Soviet non-compliance from 1975 to 1991. It encouraged President Yeltsin's admission in 1992 of past Soviet non-compliance with the BWC and influenced his decision to drop the Soviet reservation to the 1925 Geneva Protocol which preserved the right to retaliate in kind if attacked with BW. The trilateral process was, however, a lost opportunity for Russia to demonstrate unambiguously its current compliance with the BWC.

The process did not allow investigation of all the facilities within Biopreparat which were (and remain) of concern, and did not extend to the military dimension of the programme, which still remains concealed. It did lead to the destruction and dismantling of some facilities and equipment at Obolensk and a change in the use at some Biopreparat facilities, including Berdsk and Omutninsk, although whether this was entirely due to the trilateral process is unclear.

The visits confirmed American and British intelligence assessments of Soviet-Russian non-compliance with the BWC after 1975, but did not provide the proverbial 'smoking gun'. The biggest challenge was maintaining political momentum and attention on the agreement. This became increasingly difficult in the mid-1990s, since it was competing with other sensitive policy issues with regard to Russia which were more likely to be resolved. The failure of the process to complete its mission means that serious concerns remain.

The intensely negative reaction of the Pfizer Corporation and subsequently the Pharmaceutical Research and Manufacturers of America (PhRMA) to the Russian visits to American commercial sites was a contributory factor in the American rejection of the draft verification protocol for the BWC in July 2001.[5]

Lessons learned

1. An accused party may react strongly to an allegation of non-compliance by demanding strict reciprocity. Reciprocity is a standard feature of inspections under arms control and disarmament agreements, but in this case, in the absence of internationally agreed procedures, it featured increasingly even though the UK and the US were essentially seeking a challenge inspection process, which is by its nature not reciprocal.

Initially, President Gorbachev's invitation to the US and UK to visit facilities of concern was unilateral and unreserved. By the time the initial technical meetings were held in late 1990, the Soviet side was indicating that it expected return visits in order to satisfy its putative concerns about Western facilities. Moscow undoubtedly had internal presentational reasons for doing this. A demand for reciprocity would also have helped secure acquiescence to inspections among facility directors and personnel suffering culture shock from being asked to open up their secret facilities to the gaze of foreigners. Nonetheless, the insistence on reciprocity was

the first step in the erosion of American and British confidence in the process, since it served to deflect the emphasis of the inquiry away from Russia and enabled it to make counter-allegations about Western activities. Reciprocity did, however, at least ensure that the process continued.

It was difficult to avoid reciprocity, but tougher negotiation to counter unfounded allegations might have prevented this route being followed.

2. A second lesson was the importance of intelligence information for the planning and conduct of on-site visits. In the absence of clear statements and disclosure of activities, visits relied on intelligence as the baseline by which to judge activity and the explanations provided by officials. The information provided by credible and knowledgeable defectors was crucial in reaching definitive conclusions. By the time of the trilateral visits to Russia a second defector, Kantajan Alibekov, had arrived in the US and his information proved of considerable value. Alibekov had been a deputy director of Biopreparat and had a better overview of activities within Biopreparat than Pasechnik.[6] He had also participated on the Soviet side in the (pre-trilateral) visits in the Soviet Union and US, and was able to confirm that there had been deception on the Soviet side both during and prior to the visits. The use of intelligence was invaluable in evaluating the credibility of the defector and the nature of the challenged sites. Intelligence, both satellite imagery and defector information, helped considerably in planning the subsequent site visits.

3. There is a clear value in an unambiguous account of past BW activity being provided by BWC states parties, preferably in writing, although an oral presentation could suffice. In a confidential forum details that are inappropriate for open release can be disclosed, thereby minimising the risks of proliferation and providing valuable technical insights.

By contrast, Measure F in the 1991 confidence-building measures requires only that R&D after 1946 is accounted for and is too minimalist to provide a sound basis for assessment of the scale and achievements of a programme or discussion of full disarmament. Total and full disclosure is essential if there is to be real confidence that a programme no longer exists.

4. As in any arms control undertaking, clear technical objectives are required for an effective inspection regime. Within the overarching objectives there is a require-

ment to have a subset of observable and implementable goals, and this can be difficult to define in the absence of appropriate disclosure of non-compliant activities or indeed of apparently legitimate activity. All the sites visited in Russia were capable of being used for both peaceful and non-peaceful purposes. With the viability of institutes such as that at Obolensk markedly affected by Russia's economic downturn, conversion to legitimate uses had occurred for economic rather than arms control reasons.

5. True short-notice inspections are in practice difficult to achieve. Short-notice visits were undertaken in Russia to gain an understanding of current activity at the inspected sites. Being government facilities, they were clearly prepared for such visits. In the US, inspections of private industry were more truly 'no-notice'. Although the company concerned responded with great professionalism and allowed a considerable degree of access, the experience triggered a profound reaction.

6. The redeployment of BW technicians and scientists to legitimate civilian activity is strongly advocated by many of those concerned with Russian 'conversion' and BW disarmament. However, many senior directors of Biopreparat facilities who have been directly involved in illicit activity still remain in post. This calls into question the commitment of the Russian Government to terminating the programme.

7. Technical assessments of observations made in the course of on-site visits may be coloured by political interpretations based on other intelligence, which is to a certain extent inevitable when full accounts are not provided by the party being inspected. This certainly occurred in the case of Western assessments of Russian facilities. The consequence is that there is now a considerable divergence of opinion as to the extent and significance of the Russian programme and whether it is currently operational, dormant or incapable of mobilisation. Limited access techniques were practised in the course of these inspections, especially in 1992 and later. Essentially these failed because, for success, the level of co-operation has to be high. Constraints on full access are naturally viewed in conjunction with the explanations and accounts offered by the hosts for the 'hidden' resource. Abuse of managed access can create additional suspicion and concern.

8. Team composition and selection are important. The initial American–British team was the first ever to conduct BW inspections,[7] and their success was remarkable considering that, despite their individual professional knowledge and skills, they

had little arms control verification experience. The pre- and post-trilateral teams were limited to 15 individuals, including linguists and logistical support. Forging individuals with varying diplomatic, technical and intelligence expertise into a balanced and effective team was a challenge.

The teams provided by the UK and the US were capable of undertaking preliminary evaluation, but follow-up required a broader range of expertise and logistic support. The conditions encountered in the course of the visits were sometimes harsh and teams needed to be physically fit.

Key inspectors from all three countries were to become crucially involved in UNSCOM's attempt to disarm Iraq. The experience gained in the trilateral process by all of the parties proved invaluable in dealing with Iraq's wilful resistance to giving up its illicit weaponry.

Conclusions

The Trilateral Agreement is effectively dead and unlikely to be resurrected in its old format. In hindsight it was too ambitious; its disarmament objective deflected by issues of reciprocity and access to sites outside the territories of the three parties. Many subsidiary aspects were never addressed, especially those of benefit to Russia, like facility conversion and technical co-operation.

Russia's refusal to provide a complete account of its past and current BW activity and the inability of the American–British teams to gain access to Soviet/Russian military industrial facilities were significant contributory factors to the failure of the trilateral process. Biopreparat was at the periphery of the programme, providing an external veneer of respectability, as well as expertise, insight and resources and an ability to transfer technology into the military programme. An extensive account and appraisal of Biopreparat and its activities is still outstanding.

The political cost of the Trilateral Agreement was high. It demanded attention when the US and Russia were busy attending to other political consequences of the demise of the Soviet Union. It will require political pressure at the highest level for any Russian BW transparency and/or disarmament process to recommence, whether with the UK and the US or with the UN or some other international organisation. Convincing new intelligence will be required to rekindle political interest and impetus for resolving the Russian BW issue, although earlier intelligence still stands.

Covert non-compliance with the BWC is easy because verification procedures are not in place. Any attempt to develop BW verification procedures involving field and facility investigations should address the issues raised by the investigations in Russia, as well as initiatives of the ISTC in Moscow, the UNSCOM experience and inspections undertaken by other arms control agencies. Site access dilemmas, commercial confidentiality and legitimate defence requirements will have to be taken into account and managed access procedures refined to ensure that assessment of site activity can be made with confidence.

Other initiatives, particularly those aimed at redeploying weapons technicians to civilian industry, are useful in reducing the opportunity for Russian development and production of BW but do not provide information of the quality and range required to make it possible to certify compliance. It is of considerable concern that the senior research directors of facilities that contributed extensively to the Soviet/Russian programme remain in control.

In certain respects the investigation of the Soviet/Russian programme parallels that by UNSCOM in Iraq. Both countries wholly denied non-compliant activity and undertook concealment and deception until a significant defector provided credible accounts of an illicit programme. Thereafter a partial acknowledgement of a programme was made, but serious concerns about retained capability remained. It is remotely possible that both countries have truly terminated their programmes, but failure to co-operate fully and account for past and current activities, particularly at military installations, ensures that distrust remains.

The trilateral process could be resurrected but would require considerable refocusing and modification, and its adversarial legacy would not be conducive to progress. It is far more probable that an American–Russian bilateral arrangement could be put into place.

Should a verification mechanism or protocol for the BWC eventually be established, the portents are that it will be incapable—at least under any investigative procedure devised so far—of determining whether Russia has permanently relinquished BW. An attempt could be made to have the UN Security Council authorise an inquiry under Article VI of the BWC, although it is likely that Russia would veto that. After the experience of UNSCOM, with its remarkably intrusive inspection regime, there is little prospect that even a remotely similar regime could be established for verifi-

cation of a Russian BW programme. It really rests with Russia to demonstrate compliance to an international audience through the uncomfortable process of a total admission of past and current activities.

The trilateral process achieved many successes but was not allowed to take all the steps which could have dispelled suspicions and uncertainties about Russia's BW programmes. The precedent has been important, but if similar circumstances ever arise again the states concerned know that they will have to do better.

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Endnotes

[1] These open-air testing sites were used to evaluate dissemination of potential BW agents and were part of defensive efforts in the context of the 1990–91 Gulf War.

[2] The text is available at http://projects.sipri.se/cbw/docs/cbw-trilateralagree.html.

[3] Form F relates to past activities in offensive and/or defensive biological R&D programmes after 1 January 1946. The confidence-building measures were agreed at the Third BWC review conference in 1991.

[4] The primary objective of the International Science and Technology Center (ISTC) is to give weapons scientists and engineers, particularly those in Russia who possess knowledge and skills related to weapons of mass destruction or missile delivery systems, opportunities to redirect their talents to civilian activities. The centre was developed to counter the threat of a 'brain drain' from the Soviet Union to countries wishing to acquire nuclear, biological or chemical (NBC) weapons.

[5] See Marie Chevrier, 'The Biological Weapons Convention: the protocol that almost was', in Trevor Findlay and Oliver Meier (eds), *Verification Yearbook 2001,* The Verification Research, Training and Information Centre (VERTIC), London, December 2001, pp. 79–97.

[6] For his memoirs see Ken Alibek (with Stephen Handelman), *Biohazard: The Chilling True Story of the Largest Covert Biological Weapons Program in the World Told by the Man Who Ran It,* Arrow Books, London, 2000.

[7] Technically, the Western European Union (WEU) was the first to conduct such inspections (technical information visits), in West Germany during the 1950s and 1960s under the 1948 Brussels Treaty (amended 1954). See Stockholm International Peace Research Institute (SIPRI), *The Problem of Chemical and Biological Warfare: CB Disarmament 1920–1970, vol. 4,* Almqvist and Wiksell, Stockholm, 1971, pp. 224–225.