August 1989, virtually no progress was made on any of these key issues. In a situation, therefore, where there was growing uncertainty about the prospects for START, the September meeting between foreign ministers James Baker and Edward Shevardnadze at Jackson Hole, Wyoming, took on added significance. After the meeting both sides took the view that the meeting had broken the logjam and confirmed the feasibility of a START agreement in time for a mid-summer 1990 summit in Washington. In relation to the outstanding issues, the Jackson Hole meeting produced a series of new proposals and agreements in principle.

## **MOBILE MISSILES**

Throughout the START negotiations the United States has expressed grave concerns about the feasibility of verifying mobile missiles in the event that they were included in a permitted ceiling on ICBMs. US concerns have centred on the difficulties involved in locating and counting mobile missiles. For example, rail-mobile missiles, as well as stored mobiles, can be easily hidden and yet quickly prepared for operation. Proposals for verification, therefore, have sought to restrict the deployment areas of mobile missiles. They have also attempted to facilitate national technical means of verification. For example, there might be a requirement to open shelters at stipulated times in order to permit satellite observation.

The United States has nevertheless been skeptical about the reliability of such methods, and has therefore sought a total ban on mobile missiles. In the course of the Bush strategic review, Richard Burt informally suggested a modified proposal to ban mobile missiles which are MIRVed — that is, just those that are equipped with multiple, independent warheads. He argued that these weapons constitute a much larger potential to conceal warheads and thus pose a much greater verification problem than do single-warhead mobile missiles.

While verification of mobile missiles is undoubtedly a difficult technical problem, a comprehensive ban has been predictably resisted by the Soviets since they have already commenced deployment of two new systems — the single warhead SS-25, and the eight-warhead SS-24. Moreover, unlike the United States, the largest fraction of existing Soviet warheads are on fixed, land-based ICBMs, and therefore vulnerable to counterforce attacks by highly accurate US missiles such as the MX and the Trident D-5. At Jackson Hole the United States indicated that it was willing to withdraw its ban on mobile missiles in START, conditional on congressional funding of US mobile missiles. The two sides also agreed to continue work on the verification of mobiles.

## SEA-LAUNCHED CRUISE MISSILES

Throughout the START negotiations SLCMs have constituted one of the core intractable disputes between the two parties. In principle, the Soviet Union would like to count all SLCMs with a range over 600 kilometres in the warhead ceiling of a START treaty; the United States proposes to exclude SLCMs entirely from the agreement, arguing that nuclear tipped SLCMs cannot be reliably distinguished from conventional ones. The United States plans to deploy a force of about 4,000 SLCMs, of which some 800 might be nuclear. In its view, not only is the verification problem too complex, but Soviet proposals, involving, for example, on-board inspection, are intended to constrain US conventional as well as nuclear naval capabilities.

The 1987 Washington communiqué took a modest step towards compromise on this issue by committing the two sides to an agreement on SLCMs outside the 6.000warhead ceiling. Thereafter, little progress was made on what that ceiling might be, or on how to verify it. In July 1989, in the context of various proposals for verification regimes, the Soviet Union conducted an unusual experiment in the Black Sea in co-operation with a private US group, the Natural Resources Defense Council, which had previously been involved in a co-operative programme to monitor Soviet nuclear weapon tests. In the Black Sea test Soviet and US scientists measured the radiation emitted by a nuclear tipped cruise missile on board a Soviet warship, seeking to establish that the nuclear missile could be distinguished from nearby conventional warheads. The measurements were taken by helicopter and from a neighbouring ship to establish that intrusive on-board inspection would not be necessary to verify a ban on nuclear SLCMs.

Although the experiment was successful, it was clear that it was also limited, since no attempt had been made to shield the nuclear weapon from detection. Official US reaction remained skeptical, while the Soviets argued that more sophisticated equipment would overcome attempts at deliberate concealment. In August 1989 the two senior negotiators, Burt for the United States and Yuri Nazarkin for the Soviet Union, presented their respective views to the Conference on Disarmament in Geneva. Reflecting, perhaps, the unwillingness of the administration to consider a ban on nuclear SLCMs, Burt reiterated the administration's view that there was still no effective way to verify limits on the production and storage of SLCMs. Nazarkin, by contrast, described a comprehensive verification procedure. In this approach monitoring posts would be set up at factories to verify the production of missiles. A tagging system would be used to identify missiles and facilities established to distinguish conventional from nuclear SLCMs, which would be deployed only on certain identified classes of submarines