military bureaucracy. If anything, they are welcomed. An example on the Soviet side is the odd fact that new Soviet missiles seem to be born as quadruplets. In the 1960's the Soviet Union deployed the SS-7, SS-8, SS-9, and SS-11 missiles; the 1970's generation are the SS-16, SS-17, SS-18, and SS-19 missiles. In the 1980's the Soviets plan to deploy another generation of four new missiles, according to some public remarks by Defense Secretary Harold Brown. Why always in fours? U.S. experts say that the organization that designs Soviet missiles has four separate design bureaus, and that each is allowed to design a new generation, once the current generation is off the drawing boards and deployed.

On the U.S. side, enthusiasm for ICBM improvements was illustrated in a series of articles in *Aviation Week* magazine in 1976, which discussed how a new Command Data Buffer system would improve the ability of the commander of a field of ten missiles in their silos to retarget the missiles. Whereas soldiers from the command center that operates the ten missiles previously had to deactivate the missiles and get in a truck and drive to the silo to retarget them, the new system made it possible to do this electronically in much less time. Probably reflecting Air Force enthusiasm for the improvement, the articles discussed the many conveniences of the new system, without mentioning its impact on overall U.S. ICBM capabilities. For, by enabling quick retargeting of U.S. missiles, the change enhanced the ability of the United States to fight out and try to win a nuclear war and moved the land-based ICBM force one step farther from the "mutual assured destruction" role that is official doctrine.

Another feature of the improvements listed above is that, by and large, they are relatively cheap, and so attract little attention from Congress and the arms control community, who monitor defense budgets as a way to find out about important developments. A case in point occurred when, having successfully obtained R & D money for the NS-20 guidance improvements, the Pentagon sought in the fiscal 1977 budget to obtain funds to implement the programming change that would reduce the Minuteman CEP down to 750 feet. When researchers for the Federation of American Scientists (FAS) tried to find evidence in the budget for this dramatic change, they could find no line item in the budget devoted to it: funds requested for the NS-20 guidance system procurement were merely $4 million. Although the FAS and other arms controllers opposed the implementation of this improvement, they did not succeed, perhaps because the changes were too cheap to alarm those congressmen concerned with cutting defense spending.

So the technology creep that is transforming U.S. and Soviet strategic missile accuracy has foiled not only arms controllers but perhaps official negotiators seeking more formal limits. The next article will discuss the present dilemma: whether the proposed SALT II treaty, the plans to redesign the land-based ICBM force to avoid a Soviet attack, and other policy options can resolve the resulting military and political problem.

—DEBORAH SHAPLEY

Defense Scientists Differ on Nuclear Stockpile Testing

A technical disagreement of considerable political moment has arisen publicly among defense scientists. The question is whether nuclear testing is essential to assure confidence in the reliability of the national stockpile of nuclear warheads. The answer could critically affect the prospects for a nuclear test ban treaty, which are now more promising than at any time in the last 25 years.

Long the Cinderella of arms accords, the comprehensive test ban could do more than any other treaty to place a technological brake on the arms race between the United States and the Soviet Union. The ban would also be a timely step toward preventing the proliferation of nuclear arms among other countries. On the other hand, it poses certain perceived risks for those responsible for maintaining and improving national nuclear stockpiles. The Soviet Union's desire to delay China's acquisition of nuclear knowledge may underlie Russian interest in a treaty. In a significant concession, the Russians last year agreed in principle to forego peaceful nuclear explosions.

President Carter responded on 20 May this year by instructing his negotiators to seek a 5-year comprehensive test ban with the Soviet Union. But the decision set off a round of bureaucratic in-fighting, with the Pentagon and the Department of Energy pushing for a treaty of 3-year duration along with a statement that testing would resume thereafter if a satisfactory permanent agreement had not been reached.

As part of the effort to persuade the President to reconsider, Secretary of Energy James Schlesinger, whose department supports the two nuclear weapons design laboratories, visited the White House on 15 June. He and the two laboratory directors, Harold Agnew of Los Alamos and Roger Batzel of Livermore, reportedly spent an hour and a half telling Carter of their objections.

Opponents of the proposed treaty were given a helping hand at hearings held on 15 August before the House Armed Services Committee. A staff member reportedly furnished a list of questions in advance to a Department of Defense witness but not to representatives of agencies supporting the President's position. The Pentagon representative betrayed his prior knowledge by reading out his answers to the supposedly spontaneous questions.

Another backscenes interagency brouha-ha at the hearings devolved about testimony given by the Department of Energy. All agencies were meant to share written testimony beforehand with a group known as the "backstopping committee." Ructions and ill-feeling were caused by the failure of the Department of Energy to do so. Donald Kerr, the department's Assistant Secretary for Defense Programs, says he had no prepared testimony to share; he spoke from notes and was in any case summarizing testimony given at a previous hearing in March.

In Moscow, Kerr's testimony is understood to have seemed sufficiently inconsistent with the Administration's position that the Russian negotiators at Geneva were instructed to inquire about its significance. Kerr's remarks also alarmed supporters of the test ban nearer home. His testimony seemed in general drift, if not in specific detail, to contradict the White House's expressed desire for a test ban accord. Without certain tests,

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Kerr told the House committee, "confidence in the U.S. stockpile, in our best judgment, would degrade. Entire weapons systems would have to be deleted from the force structure, systems for which we now see no adequate alternative. . . ."

"Not only are these statements which undercut the President's policy," Senator Edward Kennedy said the following day, "but they amount to a gross misrepresentation of the implications of a comprehensive test ban for our national security. The fact is that a CTB can be achieved without any significant degradation of our nuclear weapons stockpile."

Kennedy's confidence in disputing Kerr, a 10-year veteran of Los Alamos, rested on the senator's possession of a letter from some equally experienced physicists who state that the continued operability of the nuclear stockpile can be assured without future nuclear testing. They are Norris Bradbury, former director of the Los Alamos Scientific Laboratory, J. Carson Mark, head of its theoretical division from 1947 to 1973, and IBM physicist Richard Garwin, a defense analyst who has been a consultant to the laboratory since 1950. The letter was also endorsed by physicist Hans Bethe, a senior adviser on nuclear weapons technology.

The Bradbury-Mark-Garwin letter, released by the Federation of American Scientists, is part of the counteroffensive by test ban supporters. Kerr, too, does not speak in a political vacuum; he represents the views of the two nuclear weapon design establishments, the Los Alamos Scientific Laboratory and the Lawrence Livermore Laboratory. Both are supported by the Department of Energy and both receive a substantial portion of their funds for the purposes that would be suspended or diminished by a comprehensive test ban.

Though the laboratories are interested parties, they also have legitimate worries in that it is they who have the responsibility for certifying that the warheads will work. When random sampling of the stockpile turns up a problem, the solution is often one that has been validated by previous tests, Kerr told the House committee. But "in cases where the needed correction cannot be certified on the basis of past tests, a very critical evaluation must be made which, occasionally, results in a decision that an additional test is required if the weapon is to be returned to the active inventory. In all such cases, without the test or tests required, certification of the weapon, at least as we have known it until now, would be impossible."

Bradbury, Garwin, and Mark, on the other hand, state in their letter that it "has been rare to the point of nonexistence" for a problem raised by stockpile inspection to require a nuclear test for its resolution. When such problems arise in the future, they can be approached by remanufacturing the part to original specifications or by replacing the nuclear explosive by one previously accepted for stockpile.

The Bradbury-Garwin-Mark letter is disputed by Robert D. Thorn, head of the weapons program at Los Alamos. None of the authors, he says, has detailed knowledge of nuclear stockpile problems or is familiar with the increasing sophistication of the last 10 years. Remanufacture is not always possible because materials become unavailable. "Try to buy a 1952 Chevrolet," says Thorn. Asked for examples of unavailable materials, Thorn says that some adhesives have been declared carcinogenic and other materials of a classified nature have disappeared from the market.

Thorn is concerned that he would lose his most valuable people if a comprehensive test ban made it impossible for them to test their designs. He agrees that a ban would freeze the Soviets into a position of inferiority in warhead sophistication, but only if the ban were observed. "Everybody here believes there ought to be an arms control of some sort, but the test ban treaty doesn't mean anything." Thorn believes the Russians would be able to conduct clandestine tests, whether underground, escaping seismic detection, or in deep space, such as by missions to Mars.—NICHOLAS WADE

California Court Is Forum for Latest Round in IQ Debate

Anyone who decides to get embroiled in the IQ debate soon finds him or herself in a bottomless morass in which the only way to get a toehold is ultimately to fall back on personal convictions. The IQ debate is intensely polarized. On the one side are those who think the tests are altogether worthless, or at best only relevant for white, middle-class subjects. On the other are those who believe they constitute the most accurate measure of learning ability yet devised.

No one has been able to come up with an unassailable explanation for why blacks get lower IQ scores, on average, than whites. The issues, only tenuously related to points of law, are too complex to be resolved in court. But court is where they are being debated these days.

In California, a federal judge is expected to rule shortly on the first major trial related to intelligence testing. It focuses on what is now the hottest area in the IQ controversy: the use of tests, usually in elementary school, for diagnosis and placement of children in classes for the mildly mentally retarded.* In California the label is EMR, or "educable mentally retarded." The particular test at issue is the individually administered Wechsler Intelligence Scale for Children (WISC, the most commonly used IQ test along with the Stanford-Binet). The children at issue are blacks, who are overrepresented in these classes, according to their proportion in the general population, by about 3 to 1 in comparison to whites. The EMR children, as opposed to the "trainable mentally retarded," a level lower, have IQ's ranging from 50 to 70.

The case awaiting a ruling is that of Larry P. *et al. v.* Wilson Riles *et al.* Larry P. is a pseudonym for one of a group of six black children allegedly misplaced in EMR classes on the basis of IQ tests. Wilson Riles is the state superintendent of public instruction, who is also black.

Larry P. *v.* Riles has been simmering for a long time. The case was initiated by some San Francisco Bay Area black psychologists in 1971. It finally came to trial

*General IQ testing in schools around the country has been on the wane in recent years and some states have outlawed the tests altogether. However, individually administered tests, which are regarded as more reliable than group tests, are still heavily relied on for diagnosing children who are suspected of being retarded or of suffering from various other learning disabilities.

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