FOREIGN POLICY & DEFENSE

The major problem with any broad new treaty, says Westervelt, is that, given the primitive state of electronic inspection devices, the Soviet Union could easily circumvent the terms of a "comprehensive" ban without detection. The closed nature of Soviet society adds to the problems of verification. Small underground tests, Westervelt believes, would pass without notice, enabling the Soviets to test and modernize their weapons systems.

In the United States, however, underground explosions could be easily detected. Inability to test new weapons as they come on line could cost the United States the "technological superiority" on which its defense posture now depends. During the 1958–61 moratorium on testing, for example, the United States added a new weapon to its stockpile. Elaborate calculations vouched for its effectiveness. When tests were finally conducted in 1963, the weapon's performance was revealed to be "totally inadequate."

Finally, Westervelt notes, strategic questions aside, testing is necessary for reasons of safety. Accidents happen—as when a U.S. B-52 bomber crashed with its nuclear bomb load in Spain in 1966. Fortunately, the design of American bombs prevented a nuclear detonation. But new designs require continual testing to ensure their effectiveness.

The Japanese Manhattan Project

"Nuclear Weapons History: Japan's Wartime Bomb Projects Revealed" by Deborah Shapley, in *Science* (Jan. 13, 1978), 1515 Massachusetts Ave. N.W., Washington, D.C. 20005.

The U.S. effort to make the atomic bomb during World War II—via the Manhattan Project—was prompted by fears that Nazi Germany was nearing completion of its own nuclear weapon. But unbeknownst to the United States, says Shapley, a *Science* staff writer, the Japanese too were working on an atomic bomb.

According to recently published documents and diaries, the Japanese effort began in the early 1940s and was headed by Japan's leading physicist, Yoshio Nishina. The Japanese had closely followed developments in the field in Europe and America, and had assembled much of the hardware—including five cyclotrons—necessary for construction. However, says Shapley, because of lack of manpower, money, and uranium, the project was "probably doomed from the start."

Research on the atomic bomb in Japan stalled in 1943 after a colloquium of Japanese scientists determined that construction would be impossible even for the United States during the war.

The revelations cast new light on several historical controversies. In November 1945, U.S. occupation forces deliberately destroyed all five of Japan's cyclotrons. An outraged U.S. scientific community pointed to this incident as evidence that the military was "insensitive" to the needs of science, and the subsequent debate fueled a successful drive to keep American research and development in civilian hands. It now appears that destruction of the Japanese cyclotrons stemmed from fear

of Japan's potential nuclear capacity.

The new findings also call into question the arguments of historians who contend that dropping a second bomb on Nagasaki in August 1945 was unnecessary. In their view, the earlier Hiroshima bomb had broken the Japanese will to fight. But, according to Shapley, after the Hiroshima bomb was exploded, physicist Nishina was summoned to Tokyo and asked first whether the bomb had been atomic, then "whether Japan could have one in six months."

Back to Basics

"The Navy's Clouded Amphibious Mission" by Vice Adm. Robert S. Salzer (Ret.), in *Proceedings* (Feb. 1978), U.S. Naval Institute, Annapolis, Md. 21402.

During World War II and the Korean conflict, the U.S. Navy repeatedly carried out major Marine amphibious landings against stiff opposition ashore. This capability has all but disappeared; instead, the Navy has deployed small "amphibious ready groups" (four to five ships, 2,000 Marines) in the Far East and the Mediterranean to show the flag and deter would-be troublemakers.

However, writes Salzer, the deterrent value of such small "gunboat diplomacy" units is now questionable. Even Third World nations have jets, antihelicopter and antiship missiles, and well-armed ground forces. The Navy's 30,000-man total amphibious force is costly and its few big helicopter-carrying assault ships, like the *Tarawa*, are highly sophisticated; but the fleet cannot now provide enough sealift and supporting gunpower to duplicate, say, the Marines' famed Inchon landing of 1950.

Back to basics is Salzer's plea—with reliance on the merchant marine, and enough sealift for a Marine division (of 20,000 men) in each ocean. The Navy, he says, still needs to be able to "hold, occupy, or if need be wrest from unfriendly hands the bases from which critical ocean areas could be dominated."

Will the MX Missile Fly?

"U.S. Strategic Deterrence at the Crossroads" by Edgar Ulsamer, in *Air Force* (Dec. 1977), 1750 Pennsylvania Ave. N.W., Washington, D.C. 20006.

The Carter administration's record on defense issues—including reportedly "lopsided" concessions at SALT and cancellation or deferral of several strategic weapons systems—has created confusion and uncertainty in U.S. strategic planning, argues Ulsamer, an *Air Force* senior editor.

The "zigzag" decision to cancel funding for the manned B-1 bomber, Ulsamer writes, has renewed congressional doubts about the wisdom of recent Carter administration changes in U.S. defenses. The administration contends that deployment of the low-altitude, air-launched "cruise" missile will be sufficient to uphold the "air power" leg of the