

the United States is head of the Russians in missile production and development.

**TELLS OF LEAD.**  
 "Our information is that the Russian capabilities in this field are limited," Russell said. As for the race to produce a missile with intercontinental range, he said:

"The very thought of hydrogen bombs or guided missiles training on a country is frightening, but I think we are ahead."

Senator Jackson, Democrat of Washington, a member of both the Senate Armed Services and the Senate-House Atomic Energy Committees, also had significant comment after listening to secret testimony by Air Force Secretary Talbot and General Nathan Twining, Air Force chief of staff.

Jackson said United States capacity to deliver atomic

but still supersonic—intercontinental missile, the Northrup B62 Snark, has been tested. The Snark has an Allison J71 jet engine, thus would have to remain within the earth's atmosphere for the oxygen required for combustion.

**READY FOR TEST.**  
 Northrop Aircraft recently reported that test facilities for the Snark were in place at the missile range which extends from Cape Canaveral, Fla., more than 1,000 miles into the Caribbean Sea.

Still another intercontinental missile, the North American Navaho, probably will be considerably faster than the Snark, since it has a ram-jet engine.

The Aircraft Industries Association has announced that twenty-six missile types are "in project status."

Talbot told the committee: "We believe the early development of a ballistic missile

sites carrying atomic, or even atomic, warheads will be electronically guided to their distant targets. Ballistic rockets will plunge from space toward their targets, carrying with them the means to wipe out a city or an entire industrial area.

This means it's theoretically possible that atomic bombs could be delivered on targets within the United States—or against likely objectives in an enemy country—without resort to conventional aircraft which, presumably, would set off warnings in advance.

The tremendous impact of such weapons is underlined by the Atomic Energy Commission's announcement this month that H-bombs now available to this country could imperial life in an area up to 7,000 square miles around the blast site. If an H-bomb of this type were exploded in Washington, for example, populations as far away as 190 miles in a downwind belt which might be as much as twenty miles wide would be seriously threatened by radioactive particles thrown off into the atmosphere.

**GRIM BACKGROUND.**

Against this grim background the United States is allocating an increasing share of its defense budget for missile development—and production now in progress shows plainly the big role slated for guided missiles in any future war.

While guided missiles have dramatic possibilities as offensive weapons, they also have great potential for defense. The Army's Nike (pronounced nye-

years of effort, and is just hitting its stride in producing concrete results."

Defense department spokesmen say that while there has been some duplication between the services and some competition on the part of one service to get ahead of another, our guided missiles program has been constructive and highly productive. One official adds:

"We are now at a payoff stage in the development of guided missiles."

The armed forces have formally announced these missile projects:

**Army**—The Nike; Corporal guided missile; the Honest John unguided rocket and the longer range Redstone, all of which are designed for launching from surface batteries against airborne targets.

**Navy**—The Regulus and Terrier, both ship launched missiles and the Sparrow, fired from aircraft at other targets in the air.

**Air Force**—The Matador, a

have been tested. It's an eight foot missile with a five mile range and a speed of more than 2,000 miles an hour.

The ship launched anti-aircraft Terrier has been tested on the battleship Mississippi and is being installed on two cruisers. It's almost fifteen feet long, and only a foot in diameter, has a top speed of around 1,500 miles an hour and a reported maximum range of ten miles.

The surface-to-surface Regulus has been tested successfully on submarines as well as on cruisers and carriers. It's essentially a swept wing pilotless fighter, about thirty feet long, powered by jet engines with auxiliary rockets for takeoff. It has a range of several hundred miles and travels at supersonic speeds.

The Navy also has other missile projects under way about which little is known. They include the Bendix Talos surface-to-air missile, the Fairchild Petrel and Eastman Kodak Dove, both air-to-underwater missiles, the Gorgon V air-to-

# U.S. Lags in Training Engineers, Dean Says

By DR. JOHN R. DUNNING  
 Dean of the School of Engineering,  
 Columbia University  
 (Written expressly for International  
 News Service)

NEW YORK, Feb. 26.—(INS)—All of us know that modern war depends on technical brainpower. Some of us know that maintaining a secure peace depends on technical brainpower, too.

Despite a critical need for this brainpower, despite record high salaries for engineers and scientists, America is lagging far behind Russia in training young men and women in these professions.

Last year Russia graduated 51,000 engineers. America graduated 19,000. Even more serious is the fact that their carefully worked out program is increasing all the time while ours is actually fading out.

If war should break out now, we could not catch up with Russia in educating vital brainpower for several years in spite of an all-out national program to do so.

**BATTLE ALREADY LOST.**

While we presently have a slight edge over Russia in the number of scientists and engineers in our labor force, even this will be wiped out in the next two or three years. Here, too, nothing we could do would keep them from pulling ahead of us.

In this sense, we have already lost the battle for technical brainpower.

The plain fact is that public opinion today does not foster a desire in young people to be engineers or scientists. This is in marked contrast with Russia, where the surest road to fame and fortune is through science and engineering. America has not had an engineer-hero since Goethals built the Panama Canal.

Russia's engineering education seems to be at least equal to ours. Children are tested for aptitudes and accomplishments, and those who show promise in science or engineering are given state paid training.

The Russian scientist and engineer enjoys a remarkable degree of freedom. He has free access to foreign publications and may have a good translation of an American technical paper before some American engineers are able to read it.

The Russian program is a matter of national policy. It is ironic that this policy was made because the early Communist leaders desired to copy the impressive accomplishments of America. We may be approaching the time when pupil outdoes his master.

We cannot, with our population, meet the Russians in terms of total manpower. We can meet them in terms of quality.

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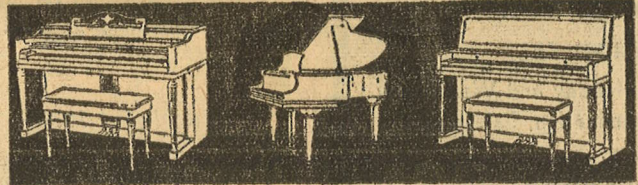
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