

ROCKETS AND MISSILES

No Lag in Missile Program

► **THERE IS NO LAG** in the United States missile program, the men behind the nation's missile launchings reported at Andrews Air Force Base, Md. The Russians lag behind the U.S. in the technique of miniaturization, and soon this country will be able to meet and surpass the Soviets' larger rocket booster capacity.

"There is nothing in our missile program about which the American people have to be ashamed," Maj. M. E. Griffith, chief for test operations for the Air Force Ballistic Missile Division at Cape Canaveral, Fla., said.

His statement was backed by Capt. Rob Roy, launch controller at Vandenberg AFB in California and test conductor for the Discoverer satellite series, and their top military officer, Lt. Gen. Bernard A. Schriever, Commander, Air Research and Development Command.

"We've never had a launch failure at Cape Canaveral," Maj. Griffith said. He defined "failure" in launch as not knowing precisely what happened.

"We have yet to launch a missile at Cape Canaveral that we have not known what happened to it," the man responsible for the launches of Air Force Pioneer

lunar probes, the paddle-wheel satellite, the mouse-in-space projects, and more than 100 other launchings explained.

The art of missile launching in the Air Force has developed to the point that "having them operational and functioning on schedule is 'old hat,'" Capt. Rob Roy said. "In fact, a launch no longer interferes with home dinner schedules," he added. A vehicle passed for launch can be made operational in 15 minutes.

This has been accomplished through rigorous tests that satellites and missiles must pass before being "graduated" to the launch pad. Each approved vehicle must be able to remember the information placed in its electronic components, communicate through telemetry, and react as commanded.

But it takes the longest 90 minutes in the space and satellite business before the launched vehicle completes one successful orbit and lets the men on the ground know by its voice from space that all is well.

The missile experts were part of a "Footsteps into Space" program presented at a meeting of the Andrews Air Force wives, most of them wives of men in the ARDC.

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GENERAL SCIENCE

STS Competition Begins

► **WITH THE OPENING** of the 20th Science Talent Search for the Westinghouse Science Scholarships and Awards, thousands of high school seniors will leap the first hurdle toward recognition in this famous annual program to discover America's most promising young research scientists. The examinations are given by teachers during December.

In high schools across the country aspiring students will be taking the challenging Science Aptitude Examination. They will finish writing and polishing reports on their science projects and will complete information forms asking about their activities and abilities. Their teachers will supply facts about their attitudes and accomplishments, and their principals will certify their academic records.

Completed entries for the twentieth anniversary of the Science Talent Search are expected to surpass all previous records in quality, it is predicted by SCIENCE SERVICE, which conducts the Search as an activity of its youth program. More than 28,000 sets of entry materials have been distributed upon specific request by educators for their most outstanding seniors.

The science aptitude examination is designed by Dr. Harold A. Edgerton, New York consulting psychologist, to measure ability in scientific thinking and reasoning. The two-and-a-half-hour test will be administered by educators in public, private and parochial schools in the United States

at any time up to Dec. 27, but all materials must reach Science Clubs of America headquarters in Washington, D. C., by midnight, Tuesday, Dec. 27.

Approximately ten percent of the students who fulfill all the entry requirements will be named members of the Honors Group and recommended to colleges and universities for admission and scholarship grants. From the Honors Group, 40 top winners will be selected to come to Washington for the Science Talent Institute, March 2 through March 6.

During the Institute the 40 winners will be interviewed and their potential ability further evaluated by a board of judges to determine the distribution of \$34,250 in science scholarships and awards provided by the Westinghouse Educational Foundation.

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Winning Science Fair Exhibits Travel to India

► **THE TOP BIOLOGICAL** projects exhibited at the 11th National Science Fair-International in Indianapolis last May will be part of the All-India Science Congress at the University of Roorkee, India, Jan. 2 to 9, 1961.

The science projects of Susan Brown of Austin, Texas, and Gary Botting of Peter-

borough, Ontario, Canada, the First Award winners in biological sciences at the National Science Fair-International conducted by SCIENCE SERVICE, will be an important feature of the large biological science exhibit to be displayed by the American Institute of Biological Sciences at the Indian Congress.

Susan and Gary were given special honors at the international science fair by the AIBS and were special guests at the Institute's Annual Meetings of Biological Societies in Stillwater, Okla. Some 2,500 American scientists attended the meetings at which Susan exhibited her work on a root growth factor isolated from bean seedlings and Gary showed the unusual crossbreeds of *Cynthia* moths which he had developed.

Susan is now attending the University of Texas, and Gary is a student at Peterborough Collegiate and Vocational School.

The All-India Science Congress, the largest scientific gathering in India, is attended each year by about 5,000 eminent Indian scientists and educators and by many visitors from other nations.

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VIROLOGY

Virus Growth Studied With Electron Microscope

► **WHAT APPEARS** to be the growth processes of viruses within a cell—from naked threads of nucleic acid to "full-clothed" rod-like viruses—has been revealed by electron microscope studies.

Drs. John M. Adams and David T. Imagawa of the University of California Medical School at Los Angeles, with Dr. J. R. Goodman of the Long Beach Veterans Administration Hospital Research Laboratories, studied three related viruses—measles, distemper and rinderpest.

When these, as well as other viruses, attack a living cell, new objects called inclusion bodies appear in the cell nucleus and cytoplasm.

The UCLA investigators examined these inclusion bodies, which have a characteristic pattern in cells invaded by each of the viruses, under the powerful electron microscope.

In certain stages of development, the pattern is one of randomly arrayed thread-like strands or filaments. In other stages, it is one of closely packed rods.

This evidence suggests that inclusion bodies are clumps of viruses reproduced in the infected cell.

The thread-like strands may be the immature virus, which consists only of its nucleic acid core. The dense rod-like pattern may represent clumps of mature or nearly mature viruses that have added a protein coat to their nucleic acid core.

The UCLA scientists said this technique of studying the virus within the infected cell may contribute valuable information to the knowledge of the "life history" of viruses. Other virus researchers have employed chemical and centrifuge procedures of extracting the virus from the cell and then studying it by electron microscopy.

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