SPACE

# Cradle of the Space Age

**A trip around Cape Canaveral, the sprawling space-age installation from which astronauts are launched, is reported by Tove Neville.**

➤ AN ATLAS ROCKET, gleaming in the early morning light and waiting to carry an astronaut around the earth, is a far cry from the first missile fired from Cape Canaveral.

The first firing from the now world-famous Cape was a German V-2 with a WAC-Corporal second stage on top. The rocket was shot up on July 24, 1950, under the most primitive conditions. It was fueled directly from tank trucks, and an old Army tank was used as the blockhouse controlling the flight.

Now the Cape, a 17,000-acre piece of Florida real estate, employs about 11,000 persons and keeps close to 2,000 contractors busy at all times. The Cape is part of the Atlantic Missile Range (AMR), called the "world's largest shooting gallery." It is station number one of 14, including tracking stations in south Florida, on Grand Bahama Island and in the South Atlantic.

The Atlantic Missile Range extends southeast from Cape Canaveral 9,000 miles, going beyond the Cape of Good Hope on the southern tip of Africa and into the Indian Ocean. The AMR, managed by the Air Force, employs many thousands of persons, from military and range personnel to ditch diggers, and is worth about one billion dollars.

Launching a rocket today is a complicated business requiring huge gantry towers to erect the missile when it is brought onto the launch pad after at least one month's extensive check-out of all its parts and systems.

The gantry envelops the erected rocket and is used as a work platform and for further checking. The Cherry Picker, a structure with an elevator device, is used as "stairway" for astronauts, if one is to ride the rocket. Under the one-and-a-half-story ramp and test stand area of a launch pad are supply systems for the rocket, telemetry and electrical systems, and monitoring equipment for testing the rocket's "innards."

Close to the test stand are storage tanks for the lox (liquid oxygen), or other oxidizer, and fuel for the rocket, brought from plants located nearby on the Cape site.

Underneath the rocket itself, a most ingenious contraption called a flame bucket, consisting of a depression with water inlets, begins spouting water up toward the rocket bottom five minutes before the blast-off. This kind of deflector is used for all large missiles so the blast-off flames, which are as long as the rocket itself, will not bounce back at the rocket.

The Cape site between the launch complexes and industrial plants is an overgrown low jungle of scrub palmetto abounding in all sorts of wildlife including the treacherous rattlesnake. When seen from a distance, the bright red gantry towers project into the blue Florida sky like tiny toys made from last Christmas' construction kit for "little engineers." As the spectator comes closer, he feels dwarfed by each structure, even though hundreds of yards away.

The landmark of the Cape today is the 310-foot gantry for the huge Saturn booster recently sent on its first test flight by an impressive 1,300,000 pounds of thrust. This tower can be seen 20 miles out at sea, fishermen claim, and is believed to be the tallest structure on wheels in the world. Next to the tower, the new Saturn gantry is being built for the advanced model scheduled to send men around the moon in about five years.

Before this great feat can be accomplished from the new launch pad, many tests of the Saturn will have to take place at this giant center built exclusively for rocket testing. To go farther into space and for landing on the moon, a new tract of 80,000 acres will be acquired on Merritt Island across Banana River from the Cape.

The 36 launch pads already built at the Cape are arranged in what seems a logical sequence along the beach going generally from the small to the bigger and the biggest. On entering the Cape site from the south, the visitor first sees the Polaris site and harbor facilities where the Polaris test firing ship, Observation Island, anchors. In the harbor U.S. Navy submarines pick up test missiles and taken them out to sea to launch.

North of the Polaris complex, the Army Pershing missile is launched. Beyond that is the site of the Jupiter rocket which launched the U.S. space age with the Explorer I on Jan. 31, 1958. The satellite is still in orbit.

It was also the Jupiter which on May 28, 1959, carried the space monkeys Able and Baker 300 miles above the earth for a 1,500-mile flight in which they experienced 38 g's without ill effects.

The Blue Scout Air Force missile site is close to the Jupiter site. Next to it is the Redstone complex where suborbital manned and chimp shots were launched.

The Thor site, slightly to the northeast where the Cape juts into the Atlantic, has been a busy one at Cape Canaveral, shooting satellites into the air with regular precision. The Thor, originally designed as a defense missile to shoot warheads 1,500 miles, was adapted to launch very useful, peaceful satellites.

These include the Tiros weather satellite, the Transit navigation satellites, the Echo I and Courier communications satellites, and the spectacular Pioneer V. Pioneer V, launched March 11, 1960, is now exploring the solar system and has an estimated life of 100,000 years. This satellite set the long-distance record for communication with 22,500,000 miles.

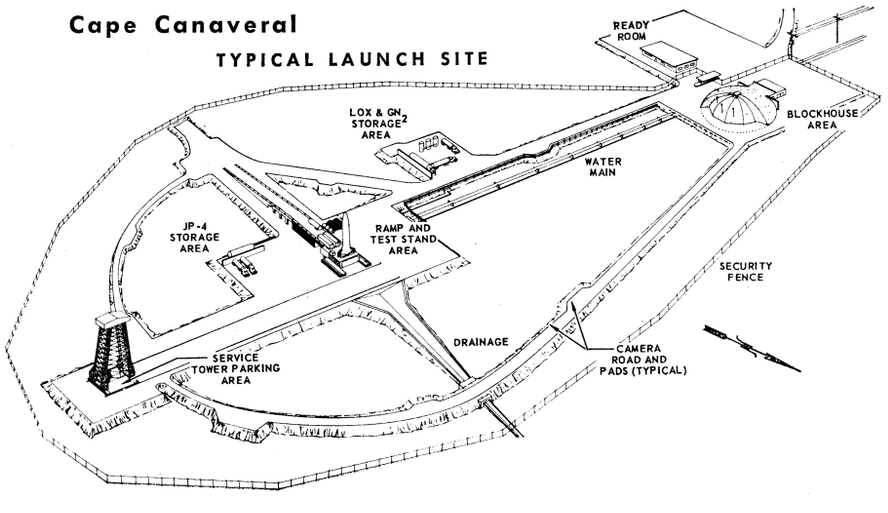
Next to the Thor site, the Minuteman defense missile, which can be fired from underground, is launched.

Farther up the beach is the Centaur complex. The Centaur is a new hydrogen-oxygen rocket, which will be used as an upper stage for the Atlas rocket and also for the Titan that will carry aloft the Dyna-soar space glider. North of the Centaur site are the four Atlas pads from which Ranger space probes and the orbiting chimp Enos were launched.

The Atlas-D for manned flight is a modified version of earlier defense models. Modifications include the abort escape system that allows the Mercury capsule to separate from the launch vehicle in an emergency. The Atlas-D also has a heavier "skin," or casing, in the upper section to

*(Continued on Page 125)*

**Cape Canaveral**



Viscount Cherwell—The Earl of Birkenhead—*Houghton,* 400 p., photographs, $5.95. Biography of the scientist who was Winston Churchill's personal advisor during World War II.

RADIATION BOTANY, Vol. I, No. 1—A. H. Sparrow, Ed.—*Pergamon,* 100 p., illus., annual subscription, libraries $20; individuals $10. Original articles and notes on research concerned with the effects of ionizing radiation on plants, and related fields.

ROCKETS AND SPACE FLIGHT—Hans K. Kaiser, transl. from German by Alex Helm—*Pitman,* rev. ed., 154 p., illus., $4.75. Summarizes developments in rocketry for general reader.

S-MATRIX THEORY OF STRONG INTERACTIONS—Geoffrey F. Chew—*Benjamin, W. A.,* 182 p., paper, $3.95. Frontiers in Physics Lecture Note and Reprint Volume, for physicists.

SELECTED PAPERS ON NEW TECHNIQUES FOR ENERGY CONVERSION—Sumner N. Levine, Ed.—*Dover,* 444 p., illus., paper, $2.85. Collection of 37 recent articles on thermoelectric methods, thermionic, photovoltaic and electromechanical effects, and on fusion.

SIR ISAAC NEWTON—H. D. Anthony—*Collier Bks,* 188 p., paper, 95¢. Reprint.

SIR THOMAS BROWNE: A Doctor's Life of Science & Faith—Jeremiah S. Finch—*Collier Bks,* 251 p., paper, $1.50. Reprint.

THE STRUCTFRE AND BIOSYNTHESIS OF MACROMOLECULES: Biochemical Society Symposium No. 21—D. J. Bell and J. K. Grant, Eds.—*Cambridge,* 132 p., illus., $5.50 Survey of the structure and formation of giant molecules of living matter.

A SYNTHESIS OF EVOLUTIONARY THEORY—Herbert H. Ross—*Prentice-Hall,* 387 p., illus., $10. A scholarly attempt at a unified theory of evolution, from cosmic dust to the most complex biological communities, the biomes.

THE THEORY OF FUNDAMENTAL PROCESSES: Lecture Note Volume—R. P. Feynman, ed. by H. T. Yura—*Benjamin, W. A.,* 172 p., paper, $3.95. For physicists.

VOLCANOES: In History, In Theory, In Eruption—Fred M. Bullard—*Univ. of Texas Press,* 441 p., illus., maps, $7.50. Geologist summarizes for the general reader what is known about volcanoes.

THE WORLDS AROUND US—Patrick Moore—*Collier Bks,* 128 p., illus., paper, 95¢. About possible life on planets. Reprint.

YEARBOOK OF ASTRONOMY, 1962—J. G. Porter and Patrick Moore, Eds.—*Norton,* 216 p., illus., paper, $2.95. A new reference book geared to the needs of the active amateur astronomer.

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# Cradle of the Space Age

*(Continued from Page 117)*

provide added support and protection.

The skin is so thin that it will not support itself without internal pressures. These pressures are supplied by bottled nitrogen "bled" into the rocket by a truck at the launch pad and by bottled helium in the vehicle during flight.

Next up the beach from the Atlases are the Titans, then the giant Saturn pad.

Some pads are being used constantly at Cape Canaveral, others are now inactive because the missiles have passed the testing stage and are operational. All air-breathing missiles, such as the Matador, Bomarc, Mace and Snark, are gone from the Cape. The Bomarc is still being tested elsewhere, however.

More than 100 Polaris, 50 Thors, 40 Titans and 80 Atlas rockets have soared into the skies from the Cape.

During the last four years, 66 launches sent U.S. satellites successfully into space, most of them from Cape Canaveral. Sixty-three hurled payloads into earth orbit while three sent satellites spinning around the sun. Some payloads had more than one satellite aboard, bringing the total number of earth-orbiting satellite packages to 67, the National Aeronautics and Space Administration reported.

The U.S. score in space is impressive in number, and in scientific achievement has added greatly to man's understanding of the world he lives in and the space around the earth. It compares more than favorably with the 16 USSR launches, which include two manned orbital shots and other spectaculars, among them two solar probes and one lunar impact vehicle.

Canaveral is today a magic word that stands for the last frontier, catching the imagination of thousands who watch from the white sand beach and the gaily colored motels when a launching is scheduled.

A Cocoa Beach drug store clerk, when asked if she went out to watch the launches, said, "We always do. No one ever comes into the store during the shot anyway. They are all out watching."

A taxi driver had this comment, "People get used to it after a while, but if there is a man in that thing up there, you can bet they are out to watch it go."

An Air Force colonel reminisced about some of the unusual shots from the Cape.

There was the Polaris that broke into two pieces, one of which fell close to the pad, the other landing in the Banana River. This IRBM (Intermediate Range Ballistic Missile) was forever after known as the IBRM—the Into the Banana River Missile.

Another Polaris veered off unexpectedly after launch, went over a hangar where many persons were standing and landed in the brush where it burned up. The security police had to rush out to shoot about 45 rattlesnakes slithering out on the road from the burning brush.

The colonel also told of the Jupiter that started off, then turned directly at the photographers' stand where busy cameras were trying to follow it. In a picture taken by one photographer the rocket showed up from the front tip as a perfect circle coming straight toward the camera. The camera man was not hit.

As another sidelight he related that the old cemeteries on the Cape, from times when civilians lived in the area, are given perpetual care. Relatives are allowed to visit the graves by checking at the security gate. Thus the past is not forgotten by the men who are shaping the space age of the future.

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