

## AERONAUTICS

## To Launch "Talking-Moons"

► A SATELLITE communications system capable of handling "vast amounts of routine traffic" will be launched in about a year, Rear Adm. John E. Clark, deputy director of the Defense Department's Advanced Research Projects Agency, told the World Congress of Flight meeting in Las Vegas, Nev.

Adm. Clark said this would free surface communications for top priority messages. The Atlas "talking satellite" launched in December, was the forerunner of this type of satellite.

Adm. Clark revealed that ARPA has issued orders for "development of a highly sophisticated version of this system" with a research and development period lasting at least five years.

"The satellites will be launched by IRBM-type boosters into 300- to 500-mile orbits," he said. "The system itself will have a communications capacity equivalent to 20 continuously available 100-words-per-minute teletype channels."

A later phase of the program will be the orbit repeater system. This phase will provide satellites capable of receiving and retransmitting messages on an instantaneous basis from 3,000- to 22,300-mile orbits. An ICBM-type booster will be employed to

develop a capability to launch the instantaneous repeater payload into a stabilized 24-hour orbit at a 22,300-mile altitude. At this altitude, the satellite will maintain its position over a given point on the earth.

This repeater system will provide intercontinental point-to-point communications, ground-to-air and ship-to-shore communications, and broadcast-type communications to ground and mobile units on an instantaneous basis. Optimum performance will be achieved by placement of three or four satellites around the equator at equal distances. Adm. Clark said that this system will represent a breakthrough in terms of military communications capabilities.

He also mentioned other satellite projects on which ARPA is engaged. One is the use of a satellite as a navigational aid in the same way that stars are used, with the important difference that the artificial moon's radio signal will be available day and night in any weather. First tests of this system will be in mid-1959, with operational units in a few years. A third program is designed to gather weather information, particularly cloud cover data. A fourth is the use of satellites for an early warning system, presumably for defense against ballistic missiles.

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## BIOLOGY

## Study Life in Antarctica

► A RING of teeming ocean life, thousands of miles in circumference, encircles the frigid Antarctica. It is a self-fertilizing, self-supporting aggregation of plants and animals with a membership varying from near-microscopic plankton to sea birds to whales.

The plankton life within the area is about 14 times richer than that in the tropical seas, reports Carl R. Eklund, research analyst with the Army's Polar Research Division, Arlington, Va.

The reason for this proliferation is somewhat controversial, but it appears to have something to do with the movements of ocean water in the Antarctic Convergence, an area from ten to about 50 miles wide encircling the Antarctic at a radius of approximately 2,000 miles with the South Pole in the center.

Some scientists believe the various flows of water meeting at the convergence tend to cause a sinking, leaving plankton at the surface. Other scientists think there is an up-welling of water carrying nutrient phosphates and nitrates up from the depths to nourish the green plankton. A combination of the sinking and up-welling is another plausible theory.

The convergence water is lower in temperature than the waters to the north by three to eight degrees Fahrenheit and it has a slightly lower salt content because of the cold, fresh water coming from glacial icebergs. Ideal living conditions for plankton result.

Mr. Eklund described parts of the area as so thick with phytoplankton that the water is green. Sometimes the small plants, caught in ship filters, smell like freshly cut grass. The phytoplankton serves as food for tiny sea animals known as zooplankton, which in turn are eaten by fish, birds and other sea-going animals.

Mr. Eklund said some areas of the convergence are colored red where red krill abound. These shrimp-like creatures are a major dietary staple for most of the larger animals.

The richness of the waters is not only evident in the red and green colorations. Thousands of birds may be seen wheeling over the feeding "grounds." Mr. Eklund hauled more than 100 cod-like fish out of the water in one hour with a simple fishing rig.

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## PHYSIOLOGY

## Mosquito's Bite Is Aimed At Chemicals in Bananas

► MOSQUITOES bite humans to obtain two chemicals that are produced by bananas, a Philippine researcher reports.

It is not blood itself that mosquitoes crave. It is the small amount of serotonin and norepinephrine in the blood that is vital to the life span of this summer pest, Dr. Eusebio Y. Garcia of the College of Medi-

cine, Manila Central University, has reported.

In fact, Dr. Garcia suspects mosquitoes are more attracted to persons who eat foods containing these chemicals. He bases this conclusion on three facts: bananas contain considerable amounts of the two compounds; mosquitoes were less interested in humans who stopped eating bananas; one hour after eating bananas, urine analysis revealed high amounts of waste products that are formed when these two chemicals are used by the body.

Mosquitoes can detect those individuals who have eaten foods containing these chemicals by using their antennae. Banana odors are even present in the perspiration of those persons who eat them, Dr. Garcia explains.

The researcher labeled the two chemicals as the "life blood" of mosquitoes and other blood sucking insects such as fleas and body lice. The functions of these compounds in the mosquito exceed those of hormones that regulate the activities of organs in man.

In fact, these two substances are the main biological factors that make insects fly, eat, breathe, sense their surroundings, reproduce and jump to a height of two feet, Dr. Garcia suggests in the *MD Journal* (Feb.).

Female mosquitoes are equipped with a puncturing device that can penetrate the skin and draw blood. Males have no such equipment to gather these important chemicals, and rely on the amount allotted them at birth. Thus, the female of the species lives an average of nine days while the male survives the adult stage for an average of a few hours, just long enough to participate in the cycle of reproduction of the species.

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## AERONAUTICS

## Flight Plans May Be Filed In Phone by Year 2000

► AVIATORS may be able to file a flight plan in the year 2000 simply by inserting a card in the telephone and pressing a button.

That's the forecast of John W. Grewell, deputy chief of systems planning division, Federal Aviation Agency. He told the World Congress of Flight in Las Vegas that machine analysis will determine route and altitude information. Machines will do the job after being told variables such as point of departure, destination, fuel aboard, and take-off time.

Computers will analyze the weather, perform proposed flight within the machine, consider all pertinent stored information, and requirements peculiar to the movement and compare it with other proposed flights taking place at same time.

Then the computers will answer the question of how best to accomplish the flight without conflict with other traffic. To do this, they will consider mission of the operation, existing separation standards, navigational and communication capabilities and airport capacities. Then the results would be relayed to the individual in chart form.

Conceivably the chart could then be used to set up navigational equipment, trigger required communications contacts, and activate other automatic system functions.

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