

## ROCKETS AND MISSILES

# TV Eyes to Study Weather

Two TV cameras are scheduled to take pictures of the earth's cloud formation from a satellite 400 miles above the earth. Ground equipment will re-record the pictures.

BEFORE THE MONTH is out, two TV cameras in an American satellite should be making unprecedented pictures of the world's clouds and advancing man's knowledge of the weather.

The "weather eye," to be launched by the National Aeronautics and Space Administration, is called Tiros I. It is scheduled to be put into orbit from Cape Canaveral within a very short time. Its TV cameras are to make pictures unprecedented in coverage.

Pictures may be made in the New World as far south as the middle of South America and as far north as Canada. The satellite will weigh 270 pounds and be 42 inches in diameter and 19 inches high.

A circular orbit 400 miles above the earth is planned. Solar cells will convert sunlight into electrical energy to power the instruments.

The TV pictures will be recorded and

later broadcast when the satellite is over ground stations equipped to re-record the pictures. At the same time the ground stations will also instruct the satellite on when to take pictures during its next orbit.

One of the TV cameras is to take pictures of an area 800 miles wide. The other will concentrate on a 65-mile wide area within the larger picture area.

Launched by a Thor-Able vehicle, the satellite should have an orbit inclined about 50 degrees to the equator. It will transmit for 90 days. Then ground signals will stop the transmission.

The first Tiros will not contain infrared detectors, but Tiros II, planned for later in 1960, will contain these detectors.

The two satellites, which will spin, will be important experiments to further man's understanding of the weather he talks about but can do little to change—as yet.

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## SURGERY

# Clue to Grafts Hinted

UNDERSTANDING the basic mechanism in the human body's rejection or acceptance of grafts of skin or vital organs from another is advanced by a report from Dr. Franklin Ashley and Earl McNall of the University of California, Los Angeles.

They have elaborated the role of ribonucleic acid (RNA), in tolerance to grafts from others. RNA is the nucleic acid which translates genetic information. Even-

tually this RNA role may be clinically exploited.

When tissue of one subject is grafted to another, the recipient's system treats it as a foreign body. Somehow it senses substances in the graft tissue genetically different from its own. These substances are known as antigens because they cause the recipient to produce antibodies to fight the "invader." As a result the graft is

"killed" by the antibodies and sloughs off.

The UCLA researchers have evidence that the donor RNA itself is not an antigen but serves as a template in the manufacture of donor proteins within the recipient, which are antigenic.

By injecting purified RNA from the skin, spleen or liver of one animal, researchers can cause an antigen-antibody reaction in the recipient. This is apparently due to the recipient's reaction to foreign proteins manufactured by the injected RNA.

Furthermore they found that increased amounts of injected donor RNA resulted in an overwhelming of the antibody-producing mechanism (immune paralysis) so that it stops producing antibodies against the donor proteins.

Thus these grafts may be accepted. Injection of increased amounts of purified RNA from tissues of a strain of black rats into a strain of white rats resulted in 40% successful takes in skin grafts (black on white). Less than 10% of grafts are accepted in untreated animals.

Does this mean that injection of purified RNA from tissues of a potential donor into a patient will cause the patient to permanently accept a skin graft or transplanted kidney from the donor? No, at least not in the immediate future.

This finding, however, may be a step in this direction, the investigators say. But much work needs to be done before the findings can be successfully translated into practical, clinical results.

Collaborating in these studies were Dr. N. R. Dutt, Eugene Garcia and Robert Sloan.

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## TECHNOLOGY

## MHD Generator Uses Fuel—Runs for Four Minutes

THE FIRST sizable model of a fuel-burning magnetohydrodynamic (MHD) electricity generator has run continuously for four minutes and produced two and one-half kilowatts of power.

The new MHD generator produces electric power by passing a super-hot (about 4,600 degrees Fahrenheit), electrically conducting gas, called a plasma, between the poles of a powerful magnet.

This ionized-potassium gas, which substitutes for the copper wires in the rotating coils of a standard electric generator, then passes down a ceramic-lined tube at 1,800 miles an hour, cuts across the magnetic field and gives an electric voltage and current.

This particular model heats the plasma by burning a mixture of three pounds of furnace oil to eight pounds of oxygen. Previous MHD generators produced the necessary heat with an electric arc, thus simply changing one form of electrical energy into another. Older models could operate no longer than five seconds.

Accomplishment of the four-minute run, plus using fuel as an original source of energy, are considered major breakthroughs in the development of MHD generators, which may some day power space ships.

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**TIRE TANKS**—These Rolli-Tankers will haul liquid over any terrain. They measure 64 by 42 inches, carry 500 gallons of liquid each and can be towed by any vehicle. The U. S. Army Transportation Material Command has purchased 166 units from Goodyear.