

quished family that included the American novelist, James Branch Cabell and according to legend an Indian princess. The Civil War impoverished the family and Dr. Gantt was educated by his mother in a one-room, wood-heated schoolhouse.

Since he opened his Pavlovian Laboratory in 1932 at the invitation of the late Adolf Meyer, well-known psychiatrist from Johns Hopkins, Dr. Gantt's research has led away from simple reflexology.

Pavlov considered that the conditioned reflex always acts as a balancing mechanism—a means by which the organism maintains equilibrium in the face of its environment. By contrast, Dr. Gantt has found that body systems react differently to conditioning. Some, such as the heart, can be thrown off balance by conditioning. He terms this characteristic "schizokinesis." How many systems are so susceptible to environmental stress is not known. Dr. Gantt is now charting the action of the kidney.

Another curious phenomena goes under the name "effect of person." Petting a dog can lower its heart rate by half, even while the animal is experiencing an electric shock, says Dr. Gantt. The mere presence of a human in the room may have the same effect.

Throughout nature this effect of person can be seen, he says "Freud gave it names like mother transference, but I don't believe it is that all the time." The beneficial impact of one individual on another may simply be the effect of person.

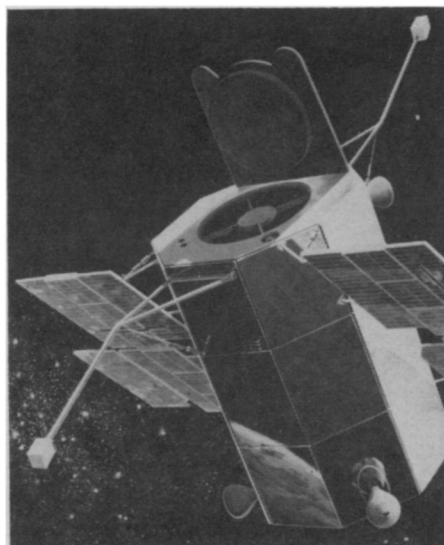
Asked how far the body-mind relationship can be taken, Dr. Gantt says he believes there is an unbridgeable chasm between the two. Some mental effects may never be objectively measured in the brain or the body, since "living organisms are more delicate than any instrument ever made."

The energy that produces mentality, emotions and consciousness could be so low that it cannot be measured even theoretically.

"Pavlov says we should talk only by measurements—that we should stay on the purely objective level. There is reason to believe from my work that the objective does not measure everything. If you want to regulate habits, change gastric secretion, we are learning how to do it. But you should know that you are not really dealing on the subjective level with the emotional and intellectual experiences of an individual. The two should not be confused. The mind can never be equated with any physical measurement. It can be correlated, but whether it can always be correlated in every detail is an open question."

OA0 Gets a New Look

"The Orbiting Astronomical Observatory," says Congressman Joseph E. Karth, chairman of the House Sub-



NASA

OA0-2: better luck this time.

committee on Space Science and Applications, "has probably been the least successful of all the unmanned space flight programs."

More than three years behind time when it finally got off the ground on April 8, 1966, OA0-1 lasted less than two days before going on the blink. With the aid of some skillful scientific doctoring, however, the program may be back on the road to recovery. And astronomers may get an unprecedented look at the universe.

Project officials at the National Aeronautics and Space Administration's Goddard Space Flight Center and Grumman Aircraft Engineering Corp., prime OA0 contractor, have started on a series of major spacecraft changes which they hope will permit future OA0's to reap the program's vast potential scientific harvest.

OA0-1's key problem was with the device that controlled the charge and discharge sequences of the satellite's batteries, allowing them to overheat until they failed. This unit is being extensively redesigned. Another trouble spot was in the satellite's star trackers, optical devices that enabled it to aim its instruments at different parts of the sky with great precision. The trackers built up an electric charge which, in the vacuum of space, allowed them to arc like fluorescent lights, knocking out delicate telemetry equipment. Called a corona discharge, this phenomenon will also be eliminated in future flights.

On OA0-2, the battery sequencer will be changed to connect each spacecraft battery in parallel, while still permitting the device to sense the condition of each battery and charge them individually.

Besides star-tracking, arc-proofing and improved stabilization, other changes being made include expanded command memory, logic changes, addition of a tape recorder for expanded data storage, backup telemetry to prevent data loss due to shorts and expanded ground monitoring displays.

The number of people assigned to the OA0 program has nearly doubled since OA0-1 failed.

Now scheduled to blast off in July 1968, OA0-2 will carry a Smithsonian Astrophysical Observatory experiment utilizing four telescopes equipped with photometers to map the sky in the ultraviolet range. A University of Wisconsin experiment, also flown on OA0-1, will include one 16-inch and four eight-inch ultraviolet telescopes and two ultraviolet spectrometers (see p. 504).

OA0-3, scheduled for a 1969 launch, will carry a Goddard 38-inch-aperture telescope to obtain ultraviolet spectral data on stars, nebulae and galaxies with a resolution down to two angstroms.

OA0-4, to be launched in 1970, will fly a 32-inch reflecting telescope for Princeton University to study the composition of interstellar material and to obtain high-dispersion ultraviolet spectra of stars with resolutions down to 0.1 angstrom. Other OA0-4 telescopes will study the X-ray emission of stars and nebulae.

"We visualize the OA0 not as a program which will be completed at the end of these three approved missions, but as a program which will continue to be the backbone of the NASA space astronomy program for years to come," says NASA space science chief Homer E. Newell.

As a supplement to the OA0 program, NASA last week announced plans to build a \$9 million Small Astronomy Satellite for launch in 1969 to map stars emitting X-rays. Data from the SAS could lead to the selection of the more interesting radiation sources which could be studied in detail by more sophisticated spacecraft.

Two prime sources of X-ray energy are the Crab Nebulae, which is the remnant of an exploded star, and the constellation Scorpio. X-ray emissions from Scorpio have been found to be at least half as strong as the sun.