

will be dropped (1,500 were dropped this fiscal year).

"We have curtailed several NASA activities which were important to the nation's space and aeronautics program," NASA Administrator James C. Fletcher said this week. "But despite these cuts, [we] have maintained a surprisingly strong program." NASA saved the 1975 Viking landers, the 1977 Jupiter-Saturn fly-bys and *OSO 1*. The second probe to Jupiter and a Mariner Venus-Mercury fly-by will be launched this calendar year. Skylab will be flown as well as the U.S./U.S.S.R. docking mission in 1975. Work on the space shuttle will continue, but at a slower pace.

Fletcher proudly announced two new starts for fiscal year 1974—Nimbus G, an experimental earth-oriented satellite directed at environmental pollution and oceanographic measurements, and LAGEOS, a new geodetic satellite for accurate measurements of movements of the earth's surface. Nimbus will fly in 1977; LAGEOS, 1976.

There was one hopeful note for NASA: Administration budget projections for fiscal year 1975 indicate NASA may be back "up" to \$3.2 billion. □

## Slayton chosen for Apollo/Soyuz mission

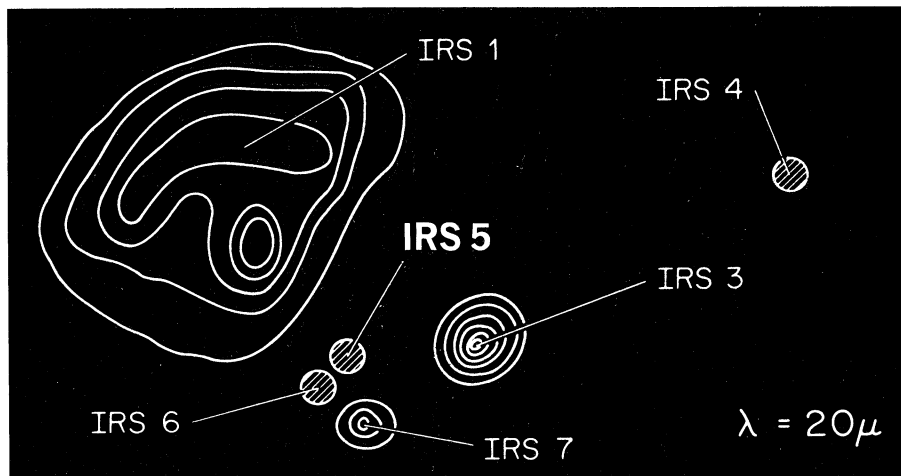
One of the original seven Mercury astronauts, Donald Kent (Deke) Slayton, was selected this week for the crew of the Apollo/Soyuz Joint Docking Mission. The U.S.-Soviet joint flight will be launched July 15, 1975. Thomas P. Stafford, veteran of Gemini 6 and 9 and Apollo 10 was named commander of the mission. Vance Brand is the third crew member. Brand is one of the few pilots from group five who has not flown in space.

Named to the backup crew are Alan L. Bean, Ronald E. Evans and Jack R. Lousma.

This summer the Soviet cosmonauts will go to Houston for a joint training session with the astronauts. In the fall the astronauts will train in the Soviet Union. The astronauts have been studying Russian.

Slayton is the only one of the seven original astronauts who has not flown in space. He was taken off flight status because of a heart irregularity just before his scheduled Mercury flight. The ailment disappeared in 1969, and he was subsequently placed back on flight status. He has been Director of Flight Crew Operations at the Manned Spacecraft Center in Houston and in charge of naming all space crews. The new crew, however, was recommended by Christopher Kraft, director of MSC. The flight is the last manned mission before manned shuttle tests. □

february 3, 1973



Hale Observatories

*A star is born, IRS-5, in one part of a large gas cloud in the galaxy.*

## An embryo star larger than the solar system

Clouds of dust and gas in the universe are the birth places of stars. These clouds contain vast quantities of hydrogen from which stars are formed. Ten years ago Eric Becklin found an object in such a cloud he thought to be a star being born. This embryo star or "protostar" is in the Orion nebula.

Now he, Gareth Wynn-Williams and Gerry Neugebauer, all of the Hale Observatories in California, report the discovery of an object emitting 10 to 20 times as much energy as the Orion protostar. The new object, called IRS-5 (Infrared Source 5), is emitting 30,000 times more energy than the sun and is larger than the entire solar system.

But its temperature is extremely low—only 170 degrees F. Normal stars have temperatures of about 5,000 degrees F. The new object is not associated with any visible source. It does coincide with a radio source emitting energy in the microwave region of the spectrum.

Becklin thinks the cold giant is in the process of collapsing under its own gravitational forces. It will become, in a thousand years or so, a much hotter, more compact and exceptionally bright star.

IRS-5 was found in a dense cloud of gas called W3, located about 10,000 light-years away in the Perseus spiral arm of the Milky Way galaxy. Wynn-Williams had been studying the hot hydrogen gas in the cloud for years. There was indirect evidence the cloud contained several fairly young stars (about 10,000 years old), but the dust in the cloud obscured the stars in the visible light. By using infrared detectors attached to telescopes, the researchers have now confirmed the presence of the young hot stars. In fact, one of them is only a few light-years away from the new object discovered. The bright star is hidden at the center of

the cloud, W3, behind the dust.

The astronomers have also used the infrared detectors to measure temperatures and thicknesses of the dust in the cloud W3. Eventually, they say, the radiation in the cloud will cause the dust to disperse, allowing the new stars to be seen from earth. □

## Baboons too use tools

Since 1960, Jane van Lawick-Goodall, a protégé of the late Louis S. B. Leakey, has been studying the behaviors of chimpanzees in their natural habitat. Working in the Gombe National Park in Tanzania, East Africa, van Lawick-Goodall and her husband, photographer Hugo van Lawick, have received wide attention for their descriptive studies of animal behaviors—especially tool-making and tool-use among wild chimpanzees. But the tool-use studies are not confined to chimpanzees. In the Jan. 19 *NATURE* she, her husband and C. Parker describe two incidents of tool-use by free-living baboons in Gombe National Park.

To feed on the seeds of a certain fruit, baboons must break open a pod in which the seeds are surrounded by a white glutinous juice that dries to a consistency of rubber cement. When this food is in season the hair around the baboons' lips frequently becomes matted by the juice. Usually they attempt to remove the juice by rubbing their mouths against a tree or large rock. One three-year-old female, however, was observed picking up a stone and repeatedly and forcibly rubbing it across her muzzle in an attempt to remove the dried juice.

In a separate incident, an adult male of a different troop cut his lip during a fight. Blood and saliva ran down his

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chin. When the blood began to coagulate, the baboon looked around, picked up an old piece of corn cob and used it to wipe the blood from his lower lip. "Whilst we cannot draw conclusions from one episode," say the authors, "it is interesting that, although there were several stones nearby, this baboon selected a softer, more porous and generally more suitable material." Some baboons, it seems, have learned to use napkins.

Tool-use, using an object as a functional extension of the hand, claw, mouth or beak in the attainment of an immediate goal, is not entirely unknown among baboons. Previous researchers have noted that these primates break open hard-shelled fruits with rocks, use stones to squash scorpions before eating them and use sticks to stir up termite nests. In these reports, however, few details of the behaviors or the conditions under which they were observed are given. The van Lawick-Goodall studies, because of their long-term nature, are able to document the amount of tool-use by baboons and chimpanzees and to view tool-use within the context of a variety of behaviors and situations. "As knowledge is gradually accumulated about a variety of different monkey and ape species," says van Lawick-Goodall, "it is possible to trace certain evolutionary trends of increasing complexity, culminating in man." □

## Better X-rays for detecting cancer in tissues



Carangi et al/USC

*Electron radiograph (right) clearly shows stomach outline; X-ray does not.*

A new kind of X-ray device that visualizes soft tissue as well as bone has been developed by researchers at the University of Southern California and at Xonics, Inc., Van Nuys, Calif. It offers a clearer image of deep-body malignancies than is currently possible and should help in cancer detection. Because of its reduced cost, radiation dosage and processing time, it might also be suitable for mass screening of people with undiagnosed cancers, asserts Robert Carangi, USC director of radiological research and one of the researchers.

The process is electron radiography. It is almost identical to the conventional X-ray except that radiation passing through the body creates a flux of electrons in an imaging chamber in ratio to tissue density. An image is formed directly on a plastic or paper sheet inserted into the chamber, in less than 90 seconds, by-passing the conventional darkroom processing operation.

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## A 'geiger counter' for 20 trace elements at once

Trace elements are elements present in very small amounts in man, animals, plants and the environment. During the past decade or so, biologists have detected some 60 different trace elements in the human body. Some of them are not only beneficial but essential to health. Others may be harmless or detrimental (SN: 9/30/72, p. 223). Ecologists are detecting more and more trace elements in air, soil, plants and water, and a number of them appear to be industrial pollutants (SN: 9/11/71, p. 165). Undoubtedly as methods for detecting them become more sophisticated, scientists will learn more.

Investigators are able to detect only one trace element at a time in samples of blood, tissue, soil, water or other materials, using techniques such as atomic absorption or atomic fluorescence. But after nine years of work, V. A. Fassel, deputy director of the Atomic Energy Commission's Ames Laboratory in Iowa, has devised a technique that can determine concentrations of 20 to 30 trace elements in a sample of material within a minute. The technique is also more sensitive than available methods. It goes under the elegant name of "induction-coupled

plasma optical emission analytical system."

At a meeting of the American Chemical Society in Washington recently, the Ames, Iowa, chemist told how his system works. A sample, say of blood, is placed in the bottom of a device that looks like a two-inch torch. Being in aerosol form, the sample of blood is injected up the torch into the plasma. The plasma, which looks like a flame shooting from the end of the torch, is a gas hot enough to give off light and to free atoms and molecules into ions. As atoms of trace elements in the sample are ionized, they give off characteristic atomic spectra. A spectrometer-computer linked to the torch measures the intensities of the spectral lines. The intensities are translated into concentrations. This way the kinds and amounts of trace elements present in the blood are determined.

Fassel's system may link levels of trace elements in the body with types of mental diseases. Slight changes in the level of trace elements, he says, often predict the onset of an illness. The instrument is expected to become commercially available toward the end of the year. Cost: \$20,000 each. □