# BIOMEDICINE

## Positive estrogen spinoff

Postmenopausal estrogen replacement therapy has been linked with increased risk of uterine cancer (SN: 1/3/76, p.9), but it may also protect against fatal heart disease, according to a study reported by Ronald K. Ross and colleagues at the University of Southern California School of Medicine in Los Angeles in the April 18 LANCET.

Ross and his co-workers examined the possibility of a link between postmenopausal estrogen replacement therapy and heart disease in 133 women who had died from heart disease, 133 living control subjects and 124 deceased control subjects. The women who had died from heart disease were found to have had significantly more heart disease risk factors, such as high blood pressure or cigarette smoking, than controls. However, they had used postmenopausal estrogen replacement therapy significantly less often than had controls.

"If the protective effect of estrogen replacement therapy on risk of fatal ischemic heart disease is real," the researchers conclude, "this benefit would far outweigh the carcinogenic effects of estrogens."

## Heroin and cancer pain

Heroin hasn't been used to relieve pain in U.S. cancer patients since 1924 because of fear that patients would become addicted to it. However, the favorable experience of the British in using heroin to relieve cancer pain prompted William T. Beaver and Philip S. Schein of Georgetown University's cancer research center to conduct a scientific trial to see exactly how heroin stacks up against morphine in easing cancer pain. (Because morphine is a less potent narcotic than heroin, it is available to U.S. cancer patients.)

Forty-eight cancer patients with moderate to severe pain received single injections of morphine and single injections of heroin. Neither the nurse-observer nor the patients knew which drug was being given at any particular time. The patients then rated each drug for pain relief. They rated heroin to be two and a half times more potent than morphine, Beaver and Schein reported in New Orleans at the recent annual meeting of the American Society for Clinical Pharmacology and Therapeutics. What's more, none of the patients experienced euphoria after getting heroin or morphine. Thus, heroin appears to be no more addictive to cancer patients than is morphine and considerably more effective in relieving pain.

## Thalidomide's modus operandi

Thalidomide was identified 20 years ago as a cause of birth defects in humans, but the means by which it exerts its damage is still unknown. Now Gary B. Gordon and colleagues at Johns Hopkins University School of Medicine in Baltimore provide at least a partial answer in the April PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES. The villain is not thalidomide per se, they say, but a toxic breakdown product of it, called arene oxide.

Because humans, monkeys and rabbits get birth defects from thalidomide but rats do not, the researchers reasoned that differences in species susceptibility might be due to differences in the way different species break down thalidomide. Still other evidence implied that thalidomide might break down into arene oxide, implicated in the formation of birth defects. So Gordon and his co-workers attempted to see whether thalidomide can be metabolized to a toxic arene oxide and whether species susceptible to thalidomide break thalidomide down into a toxic arene oxide, unlike unsusceptible species. They report that this is the case. So "a toxic arene oxide may be involved in the teratogenicity of thalidomide," they conclude.

# SPACE SCIENCES

## HEAO-3: New researchers sought

The HEAO-3 satellite, third in the National Aeronautics and Space Administration's High-Energy Astronomy Observatory series, was launched on Sept. 20, 1979, to record gamma-ray and cosmic-ray emissions. The device is well past its planned six-month lifetime and still on the job, so NASA is now looking for scientists who would like to serve as HEAO-3 "guest investigators" to pursue research ideas of their own.

The opportunity is not limited to U. S. researchers, but is open to scientists and graduate students in universities and laboratories throughout the world. The Guest Investigator program will be coordinated by HEAO-3 project scientist Thomas A. Parnell of the Space Sciences Laboratory at NASA's Marshall Space Flight Center in Huntsville, Ala. There is no cutoff date for submission of proposals, although the first review of proposals is scheduled to take place next month. Subsequent reviews will probably be held periodically over the next two years.

## HEAO-2: The end at last

As HEAO-3 purrs on, its predecessor, an X-ray astronomy satellite known as HEAO-2, has finally come to the end of its successful career. The end was not due to a crippling malfunction — the device simply ran out of the control-gas supply that was used to keep it properly pointed in space. Launched on Nov. 13, 1978, HEAO-2 carried what NASA described as the world's largest focusing X-ray telescope, as well as an array of imaging and analytical astronomy instruments. By the time it finally ran out of gas this April 25, the satellite had exceeded its planned operating life by nearly 150 percent, conducting thousands of studies of X-ray-emitting stars, supernova remnants, galaxies and quasars. It is expected to reenter earth's atmosphere and burn up sometime next year.

## IRAS: A milestone

Over the years, there have been satellites placed in orbit to study the sky by visible light, ultraviolet light, X-rays, gamma rays, cosmic rays and radio waves. The next NASA venture into astronomy from space will look through yet another wavelength window: infrared. The Infrared Astronomical Satellite (IRAS), to be launched in the summer of 1982, will carry only a single scientific instrument — a 60-centimeter infrared telescope, designed to survey the entire IR sky, mapping perhaps a million IR sources, identifying previously unknown phenomena and studying emissions that may date from the beginnings of the universe.

This month, the telescope is being sent to the Netherlands, where it will be mated with the Dutch-built IRAS spacecraft. (NASA built the telescope and will manage the international project; the United Kingdom will handle telemetry and tracking.) And for IRAS officials, the simple act of delivering the telescope is a milestone, because of the difficult development process whose end it symbolizes.

One of the goals of IRAS is to study the ubiquitous background radiation believed to be a remnant from the original "big bang" that began the universe's present expansion. This emission represents a "source" with a temperature of 3K (only 3° above absolute zero), which means that the detectors of the IRAS telescope must be colder still if they are to measure it without masking the faint signal with "thermal noise." The IRAS answer is to cool the telescope detectors with liquid helium, striving for an operating temperature of 2K in space — but which made a difficult task of testing and building the system on earth.

In its planned one-year operating life, IRAS will perform two complete surveys of the sky, after being launched by an expendable (non-shuttle) booster from California.