

Hey, Pisces, what's your latitude?

Male-female relationships can be confusing, even when you're in the swim of things. But for those species where the offspring become male or female based on environmental — rather than genetic — factors, finding a member of the opposite sex is no beach party. Especially if you're a male silverside fish cruising the waters off South Carolina in June.

The silverside is a species whose ratio of males to females can be influenced by temperature of the environment during larval development, an example of the "adaptive sex ratio theory." Yet others in the species apparently have sex ratios determined only by genetic factors, with sex determined at conception. Which case of sex selection applies seems to be a matter of latitude, according to a report in the April 2 *NATURE*.

David O. Conover and Stephen W. Heins, of the Marine Sciences Research Center at State University of New York in Stony Brook, transferred fish embryos from various ocean sites to the laboratory to study the strange case of the silverside. Their previous field studies had suggested that, for silverside fish along the mid-Atlantic coast of the United States, most offspring become female if produced early in the breeding season, when water temperatures are lower. By the end of the season in June, when the water is warmer, the sex ratio shifts in favor of males. Allowing the females a longer growing period appears to increase their reproductive capability. In contrast, fish living in waters off Nova Scotia, for example, have shorter breeding and growing seasons, and maintain equal numbers of males and females despite fluctuations in water temperature.

Several thousand larvae were distributed among tanks of different temperatures and allowed to grow until sex could be determined. The researchers found a direct correlation between the amount of sex-ratio fluctuation and the water temperature, with the greatest effect seen among fish collected from areas with longer growing seasons. The smallest variation was seen among fish from Nova Scotia, an observation the authors attribute to the short season — during which there would be little advantage for such adaptability.

Roaches: Granted (transplant) immunity?

Hardly suave and debonair, the cockroach is a primitive kind of guy that nonetheless has survived more than 350 million years. But the pest may be more sophisticated than it's given credit for, according to University of Cincinnati scientist Richard D. Karp. That sophistication doesn't come from the cockroach's black tie and tails, but from its surprisingly advanced immune system.

In a report in the April *TRANSPLANTATION*, Karp says the insect's immune arsenal includes allograft immunity, the process responsible for rejecting transplants from donors of the same species. Previous work at the Cincinnati lab had shown that cockroaches produce antibody-like substances against venom of other insects. The ability to reject grafts, long observed in higher animals, is evidence that the insect also has cell-mediated immunity.

Biological diversity report released

Biological diversity is being diminished at an alarming rate, according to a report released March 31 by the Congressional Office of Technology Assessment. The report recommends a dual approach to conserving biological diversity, which is a topic of increasing concern (*SN*: 9/27/86, p.202). First, says the report, "on-site maintenance" should be used in parks and natural reserves to preserve their animals and plants. Also, seed banks and zoos should be used in "off-site maintenance" efforts, which would affect a narrower range of species. The report calls for more federal funding and accelerated specimen collection, as well as greater international cooperation.

Diane D. Edwards reports from San Diego at the 29th annual American Cancer Society science writers' seminar

The talking tumor's guide to surgery?

Using both a special probe that produces sound when held near a radioactive source and radioactively labeled antibodies against tumors, researchers at Ohio State University in Columbus are hunting for "talking tumors" during cancer surgery.

Surgeon Edward W. Martin reports that surgical patients are injected preoperatively with labeled antibodies against a substance produced by colorectal tumors. During subsequent surgery, the pen-shaped probe is passed along areas of the bowel, emitting noise when antibody-binding tumor cells are present. According to Martin, tumors less than 1 millimeter in diameter have been detected in some cases.

"We've added a new dimension [to finding a tumor]," says Martin. "We can see it, we can palpate it and now we can hear it." Preliminary studies in 54 patients showed a 76 percent success rate — where the margins of the tumor were accurately defined using the probe. Martin says that in one-third of his cases he is finding more tumor with the probe than he would have without the equipment.

The system is being studied with other types of cancer, says Martin. He adds that the probe, which can be inserted into body orifices, may replace some exploratory surgery. Martin, who emphasizes that the probe may assist the surgeon but cannot replace careful surgery to remove tumors, admits it is too early to determine whether the technique will actually improve cancer survival rates.

Cancer study patients being sought

Although the national incidence of colon cancer is decreasing, thanks to improved treatment, fewer than 1,000 of the 50,000 to 100,000 patients in the United States who may benefit from new approaches to treating colorectal cancer are enrolled each year in clinical trials used to evaluate the usefulness of those treatments. So says National Cancer Institute (NCI) director Vincent T. DeVita Jr., who calls the situation "a national disgrace."

DeVita says plans are under way at the Bethesda, Md.-based facility to start a massive national clinical trial of the newer treatments for colon and rectal cancers in postoperative patients.

NCI's Michael A. Friedman says the study will focus on the approximately 44,500 colorectal cancer patients who are not being cured by surgery, probably due to residual tumors. One group of patients, the control group, will receive conventional postsurgical treatments like routine radiation, while the test groups will receive new drugs or radiation regimens. Included in those new treatments will be those that have shown promise in smaller clinical studies, such as the drug 5-fluorouracil.

According to Friedman, about 98,000 new cases of colon cancer and 42,000 cases of rectal cancer will be diagnosed this year in the United States. With current surgical techniques, 44 percent of all colorectal cancer patients can be cured. But it is possible that an additional 6,000 colon cancer patients and 5,000 rectal cancer patients could be saved through use of newer therapies, says Friedman.

Despite the optimism generated among scientists by successful new treatments, Friedman says the inadequate number of cancer patients in clinical studies is limiting progress — and that this lack of subjects is a problem in cancer research worldwide. He suggests that earlier reports of shortcomings in newer cancer treatments have inhibited clinicians' interest in doing clinical trials.

Although not all patients are candidates for clinical trials, the NCI scientists, in cooperation with several research groups throughout the United States, hope to overcome the reluctance of many physicians and patients to participate in the studies necessary to prove treatment efficacy.