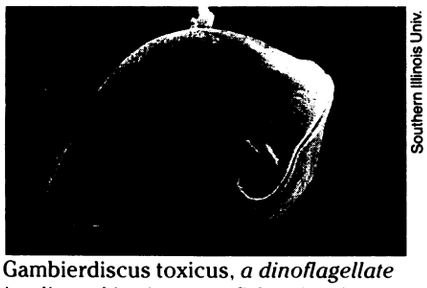

Southern Illinois Univ.

Gambierdiscus toxicus, *a dinoflagellate implicated in ciguatera fish poisoning.*

perceive cold as hot and vice versa). PSP, while less common, is more deadly; its victims suffer usually fatal paralysis. Both toxins lack effective antidotes.

Currently, the only way to prevent harvesting of poisonous seafood is to close catch areas seasonally or in response to an outbreak of a toxin-related disease. "Ciguatera and PSP are major impediments to the development of the U.S. fishing industry," says Ragelis. "They also present a serious threat to communities on small isolated islands, where people depend on seafood for protein and bulk."

But quarantines do not prevent contaminated seafood from being caught. Improved methods of preserving and transporting foods have turned the problem of seafood toxicity into an epidemiologist's nightmare, and precipitated complicated legal liability battles. "It's like not having a traffic light at a dangerous intersection," says Ragelis. "We have no way to monitor the harvesting of toxic seafood, so people just keep getting hit."

But now, using the relatively new technique of enzyme immunoassay (EIA), two scientists are creating methods to screen seafood for toxins as it is caught. "We're working with the FDA to develop a pokestick for fish," says Yoshitsugi Hokama, a ciguatera researcher at the University of Hawaii in Honolulu. "Basically, a fisherman could poke a fish and dip the stick in a series of reagents. If the stick turns blue, you don't eat the fish." Meanwhile, Patrick E. Guire of Bio-Metric Systems, Inc. in Eden Prairie, Minn., has begun field-testing a dip stick that works on a similar principle to detect saxitoxin in pulverized samples of shellfish.

EIA utilizes enzymes and monoclonal antibodies, which react with the toxin, to turn color. While researchers have found this assay just as sensitive as more commonly used assays, they say that EIA provides a cheaper and easier way to detect the concentration of single, specific toxins in solution. However, scientists now believe that ciguatera and PSP are not caused by single toxins, but by several closely related poisons. To be effective, the chemical assay kit must be specific enough to detect only toxic chemicals, but not so specific that it misses potential poisons. Both Guire and Hokama hope to overcome the problem of specificity soon, and to have their kits ready for market within the next few years. —*S. Steinberg*

Gamma ray quasar could be a shock

Astronomers have been working with invisible forms of radiation, radio, X-rays and gamma rays for anything from a few years (gamma rays) to 50 years (radio). But still the first thing they do when they find a new source of such radiation is to look for a visible object to identify with it. It is still a reflex to use the visible sky as a reference.

CG 195+ 04 is the catalog designation of the second strongest unresolved source of high-energy gamma rays known in the sky. "Unresolved" means it may lie anywhere in, and possibly all over, a rather sizable "error box" that represents the uncertainty in the locating ability of its detector, the COS B satellite. The job of identifying CG 195+ 04 with a compact radio or optical object means finding a plausible candidate within that error box. Now an identification with a quasar designated 0630+ 180, which is both a radio and an optical object, is proposed.

If the identification is correct this would be the second quasar known to emit gamma rays and the most luminous source of high-energy photons (gamma rays and X-rays) known. It would also be an argument in favor of a new theoretical model of quasars proposed earlier this year and "the first step toward identifying a potential source of the nucleonic component of cosmic rays." The identifying observations are reported in the Aug. 15 Astrophysical Journal Letters by A.F.J. Moffat of the University of Montreal and the University of Bonn, West Germany; R. Schlikeiser and W. Sieber of the Max Planck Institute for Radioastronomy in Bonn; M.M. Shara of the Space Telescope Science Institute in Baltimore, R. Tufts of Cambridge University in England and H. Kühr of the University of Arizona's Steward Observatory.

The quasar was first discovered with the Effelsberg radio telescope near Bonn and then further studied with a radio telescope at Cambridge. Optical observations were done with the Smithsonian Astrophysical Observatory/University of Arizona Observatory Multiple Mirror Telescope on Mt. Hopkins in Arizona. Detailed studies of the quasar's radio and optical spectra were made and compared with other quasars to prove that it in fact is one. It qualifies in all respects except for its gamma-ray luminosity, which is "spectacular." According to these observers the ratio of gamma-ray luminosity to luminosity at other wavelengths for this quasar is 100 times that for 3C273, the only other quasar known to emit gamma rays.

To account for 0630+ 180's gamma-ray luminosity, Moffat et al. refer to the theoretical model they call "a proton quasar." A model of this kind was proposed in the Astrophysical Journal earlier this year (Vol. 265, p. 620) by R.J. Protheroe and Demetrius Kazanas of the NASA Goddard Space Flight Center in Greenbelt, Md.

The standard model of a quasar assumes that a black hole in its center pulls in matter from the surroundings. The kinetic energy gained by this matter as it falls is somehow converted to the radiation astronomers record. This conversion will happen only if for a while somewhere along the way the velocities of the infalling particles are made random (instead of all being continually directed toward the center).

The standard model proposes that forces existing in the neighborhood form the infalling matter into a disk, the so-called accretion disk, and bumping and grinding in this disk randomizes the velocities. Protheroe and Kazanas propose instead a shock front composed of protons with relativistic energies. Such high-energy protons would have enough momentum to resist the pull of the black hole's gravity for long enough so that the shock front would be able to maintain itself if it had a continual source of new protons (the infalling matter). Fighting gravity with its momentum, constrained from the outside by the ram pressure of the infalling matter above it, the shock front would sit as a spherical shell around the black hole at a radius of about 10^{17} centimeters, roughly a tenth of a light year.

Some of these energetic protons would interact with the other matter nearby and produce pions, which would then decay, producing gamma rays. Some of them might also leak out and become cosmic rays. The model was designed to explain the gamma rays from 3C273, which the accretion disk model would not provide. One of the criteria for its success, Protheroe and Kazanas wrote, would be a showing that other quasars emit gamma rays. If 0630+ 180 and CG 195+ 04 are the same object, at least one such is now known. But there's a big hitch.

The error box of CG 195+ 04 is so large that several other radio sources and at least one other (nonquasar) optical source lie within it. To settle the identification definitively will require a future gamma-ray telescope with much better resolution than COS B. —*D.E. Thomsen*

Organ transplant drug OK'd

A drug that reduces rejection of kidney, liver and heart transplants has been tentatively approved by the Food and Drug Administration. Cyclosporine is expected to improve the success rate of transplants between unrelated persons (SN: 3/5/83, p. 150; 9/29/79, p. 215). The drug will be marketed as "Sandimmune" by Sandoz Pharmaceuticals of East Hanover, N.J. It was approved via a streamlined process — the application, including 123 volumes of data, was received just nine months ago. □