One problem I've had is, when I ask people what they do, they give me a mission statement which says they communicate, facilitate, coordinate—I don't know what the hell they're talking about. I want to know what do you do, what ideas you have, what experiment you're doing, what real thing you're trying to do. So I think to be able to say to Congress: The mission of NIH is to do great science to further human health—that's fine. A more detailed mission statement I don't think is all that useful.

Varmus' own lab

I knew from day one that I couldn't take this job if I didn't have a lab. First of all, I couldn't just close down my lab. There are 20 people in it. Number two, I don't expect to do this job forever. In 3 or 5 or 10 years from now when I stop doing it, I don't want to go on to a foundation presidency. I want to go back and do research. So I had to keep something up. And one of the pivotal moments in the recruiting process here was saying to Phil Lee and Donna Shalala, "I can't do this job unless I have a small lab." And they're saying, "Great!" So I had to decide whether this is realistic. And I went around and talked to a lot of people who had seen other directors in action. I talked to other directors, and I found that everybody had something that was fairly time consuming that I probably wasn't going to do.... Dr. Healy had a family back in Cleveland. She traveled to Cleveland every weekend. I don't have to do that.... I'm going to spend an hour or two every day, perhaps more time on weekends, looking after my lab group.

Conflict of interest?

[Varmus was asked whether his running a lab within NIH could pose conflict-of-interest problems. His eight-person lab, focusing on oncogene research, will be housed in a division of the National Cancer Institute.]

There's no way to avoid that entirely. I've tried to protect myself as much as possible ....[NCI's board of scientific counselors] will look at my lab. They will write a report. I don't have control over those reports. If my lab's doing poor work and is not productive and they say they want to shut it down, they can shut it down. That's fine with me. If I'm not producing, it should be shut down.

How long a term?

It's a little hard for me to say at this point, but I do think an argument can be made for a fixed term, a 6-year term, I would say would be the way to go. Uncouple it from the election....How long I do it I think will depend in part, of course, on whether I enjoy the job, but also on whether I'm able to continue to do some research while I'm doing this job.

–Eliot Marshall

Invader Threatens Black, Azov Seas

The invasion began in 1982. Stowaways lurking in the ballast water of a ship traveling from the coast of the Americas disembarked at a port somewhere in the Black Sea. The alien intruders lay low, vigorously reproducing in their hospitable and enemy-free new home. Then, in the late 1980s, the aquatic army emerged in force.

The invaders, jellyfish-like, tentacled creatures called ctenophores, provide a dramatic example of how damaging intruding exotic species can be: The creatures appear to have devastated local fishing. "This is clearly one of the most outstanding global invasion stories in the last 50 years," says invasion expert James Carlton of Williams College in Connecticut (*Science*, 2 July, pp. 34 and 78). The presence of the ctenophore, called *Mnemiopis leidyi*, is now prompting affected countries to look at strategies for controlling the invader—and it has touched off a debate over whether they should risk trying. "*Mnemiopsis* is one of the hottest issues that has broken out in the last few years in marine biology," says John Caddy of the Mediterranean Fisheries Commission in Rome.

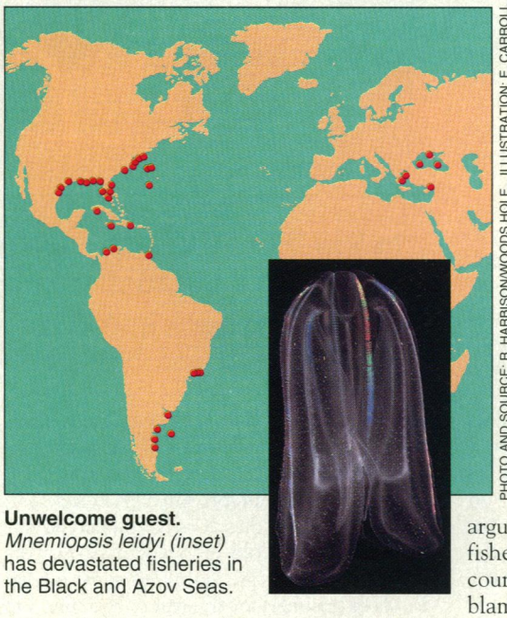


PHOTO AND SOURCE: R. HARBISON/WOODS HOLE ILLUSTRATION: E. CARROLL

Unwelcome guest. *Mnemiopsis leidyi (inset)* has devastated fisheries in the Black and Azov Seas.

While there's still doubt about whether an effort can or should be mounted to control *Mnemiopsis*, there's no question that the ctenophore has taken over in the Black and Azov Seas. Russian fishery experts have documented that at times 95% of the Black Sea's wet weight biomass can be attributed to this ctenophore, notes David Aubrey of the Woods Hole Oceanographic Institute (WHOI), who directs the international Cooperative Marine Science Program for the Black Sea. "That's a huge domination," he says. So huge that it may have led to the precipitous decline of fishing catches in the Black and Azov Seas during the past 5 years. Although many local fisheries had already been flagging for two decades because of severe pollution problems, they have plummeted since *Mnemiopsis* emerged as a pest. In the Azov Sea alone, catches have dropped by an estimated 200,000 tons.

The voracious ctenophore is the leading suspect. It devours—even beyond its capacity to digest—huge quantities of zooplankton, small crustaceans, and the eggs and larva of fish. In short, it not only kills fish directly, but also indirectly by depriving them of food.

The cost to Black Sea fisheries from *Mnemiopsis* is estimated at $250 million; in the Azov, fisheries have simply shut down.

The decline has brought local fishery experts and ecologists together with colleagues worldwide to try to find a solution to the problem. For example, the United Nations Environment Program has formed a working group to study *Mnemiopsis*. But any effort to control the pest faces formidable political challenges as well as scientific ones. For instance, six countries—Bulgaria, Turkey, Rumania, Russia, Georgia, and Ukraine—border the affected waters, and in Russia alone, there is little harmony on the issue, says WHOI ctenophore expert Richard Harbison. Members of the Russian Academy of Science argue that pollution is the chief cause of the fisheries decline, he explains, while the country's Committee of Fisheries places the blame for their woes squarely on *Mnemiopsis*.

Even the United Nations has been slowed by internal bickering over which programs or agencies should take the lead. Adding to the pressure is the prospect that any campaign mounted against *Mnemiopsis* may serve as a model for repelling future aquatic invaders affecting multiple countries. "It's an interesting test case in terms of the biopolitical decisions of pursuing [a control] strategy. This is not the last [ctenophore] invasion in the world," explains Carlton.

To combat this particular invasion, there are four options—none of which are particularly appealing or risk-free. One is to use pesticides, an unlikely alternative since they could cause greater harm than good by killing other species. Another notion is the introduction of a *Mnemiopsis*-specific disease. The problem: Very little is known about ctenophore illnesses. Parasites are a third option, but the one known parasite, an anemone that feeds off *Mnemiopsis*, causes little harm to the ctenophore and can bloom it-

self—a potential concern since its sting causes an intense reaction among swimmers.

The fourth option, favored by Harbison and others, is to find a *Mnemiopsis* predator they can introduce into the Black and Azov Seas. Off the coastal waters of the Americas, the ctenophore is apparently kept in check by a few specialized predators, but the diversity-poor seas—the Black Sea contains only 47 families of fish—have nothing that preys on the ctenophore. That's why it's difficult to imagine the problem will naturally cure itself, says Harbison. As a result, in work funded by the National Science Foundation and the Seaver Institute in Florida, he is looking at ctenophore predators in *Mnemiopsis*' Atlantic habitats. He would like to find a fish that is commercially useful, for instance. Then, he says, "even if they can't check the ctenophore completely, at least they might create a new fishery.

Others are searching the Mediterranean, into which *Mnemiopsis* has recently emigrated from the Black Sea and where new fisheries may be threatened. There, Stanislav Volovik, a fishery expert in Russia and Harbison's co-worker, likes a different predator, members of another ctenophore family, the *Beroe*. A crucial unanswered question, however, is whether the *Beroe* can survive in the lower salinity of the Black and Azov Seas.

Still, ecologists worry that introducing one exotic marine species to control another could open a Pandora's box. An introduced predator may harm other fishing stocks, for instance. "We're dealing here with a discipline that doesn't exist: marine biocontrol. I'm always hesitant about releasing a novel species into an environment," warns Carlton.

Harbison agrees that such wariness is warranted, but responds that the decision to introduce a predator can come later. Meanwhile, let's be prepared with a good candidate. "Even if we don't do anything, we should do the research. These fishermen are bringing up empty nets. Let's get moving now," he challenges.

–John Travis

CHEMISTRY

Alchemy Altercation at Texas A&M

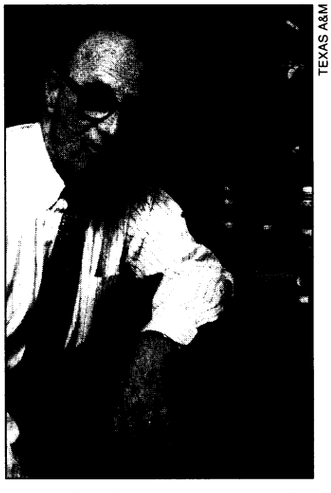
Four years ago it was cold fusion, now it's alchemy, and members of the Texas A&M chemistry department say enough is enough. In a letter released last week, 11 full professors called on their colleague John Bockris to resign and remove the "shadow" he has cast over the department. Bockris, however, claims his research into transmuting various elements into gold is serious, potentially very valuable science.

Bockris, an electrochemist with a reputation for important but often unconventional research over the past several decades, was one of the most ardent supporters of cold fusion after Stanley Pons and Martin Fleischmann—an old friend of Bockris'—announced their fusion-in-a-test-tube results in March 1989. Teams working under Bockris claimed not only to have reproduced the excess heat production that Pons and Fleischmann reported in cells of heavy water but also to have generated large amounts of tritium in some of the cells—evidence that fusion or some other sort of nuclear reaction was taking place.

But as the tide of scientific evidence turned against cold fusion, other researchers at Texas A&M began to question Bockris' results. A few even wondered if someone had intentionally spiked some of his cold fusion cells with tritium (*Science*, 15 June 1990, p. 1300). Later, an internal review at Texas A&M concluded that the tritium was most likely due to an impurity, not spiking, but criticized what they concluded was a "breakdown of scientific objectivity" that affected a number of cold fusion researchers at Texas A&M, including Bockris (*Science*, 14 December 1990, p. 1507).

Now that lack of objectivity has struck again, say many of Bockris' colleagues. According to newspaper reports and interviews with Texas A&M faculty and staff, including Bockris, the story began in spring 1992. That's when Bockris got a call from Joe Champion, a self-described researcher and inventor from Tennessee who said he had a method of turning silver into gold. Most scientists might have hung up the phone, but Bockris had a good impression of Champion from an earlier incident—Champion had proposed a method of producing cold fusion with radio waves, a claim that Bockris had looked into—and he decided to investigate Champion's new idea. It didn't hurt that Champion produced an investor who offered a $200,000 gift to Texas A&M to support Bockris' efforts to reproduce this transmutation.

For the next several months, Champion was in and out of Bockris' lab, instructing Bockris and his assistants in the finer points of the alchemical process. During this time, Bockris says, Champion instructed Bockris' postdocs in two transmutation techniques, one of which was a "total failure." But the second, which involved mixing potassium nitrate (a constituent of gunpowder), carbon, and various salts and then igniting the volatile mixture, produced measurable amounts of gold, Bockris claims. Once Champion left, however, Bockris' group could no longer get the technique to work.



TEXAS A&M

Under fire. Texas A&M chemistry professor John Bockris.

Bockris' colleagues were uncomfortable with this project, which flies in the face of conventional nuclear chemistry. But that discomfort turned to alarm, says chemistry professor Albert Cotton, as details emerged about the other participants in the alchemy scheme. Late last year, according to newspaper reports, Champion was jailed in Phoenix, Arizona, on criminal fraud charges in an unrelated case. Then in May, chemistry department head Michael Hall discovered through a newspaper article that Bockris' benefactor, William Telander of San Diego, had been charged by the Securities and Exchange Commission with selling $7.8 million in fraudulent and unregistered securities to 380 investors. The university then froze the remaining funds, about $32,000, in the account that held Telander's contribution to Bockris; university officials are waiting to find out if the money belonged to investors in Telander's securities scheme.

For his part, Bockris says he believes chemical transmutation of elements may indeed be possible, but he says he never thought commercial production of gold by these methods would be feasible. Bockris told a local newspaper that he had been "working on carbon to iron" and told another reporter that such transmutation could be "the greatest advance in modern science."

The chemistry department is divided over what should be done, says Hall. Cotton and the other 10 signers of the letter (out of the department's 38 full professors) are pushing Bockris to leave because of the "allegations regarding the integrity of your research and, in this case, the source of your funding." Others, Hall says, defend Bockris' right to pursue any kind of research he wants as long as he obeys university regulations. The university has begun an inquiry into the whole affair to see if those regulations were obeyed and, in particular, to understand how a well-respected research university came to accept a $200,000 gift for an investigation into alchemy.

–Robert Pool