have learned that their favorite fungus is an entirely new species with its very own genus. (The researchers named it *Taxomyces andreanae*, after codiscoverer Andrea Stierle.) They also learned that distantly related species of fungus couldn't produced taxol. Having resolved those questions, they moved on to the one that would be crucial if their find were ever to have any commercial significance: What if their fungus was incapable of manufacturing taxol when removed from its host?

Their concern was justified, since such an outcome isn't unheard of in fungi that live in a specific host. One example is a fungus that, when removed from its host—sugarcane—gradually loses its ability to produce a toxin that attacks sugarcanes. Mindful of this danger, Strobel's group stored their fungus on yew tree tissue. To their relief, over many fungal generations taxol production held stable.

Not all the news from Strobel's lab has been good, though. Cultures of the fungus so far produce only nanograms of taxol, while most other native wild strains of fungi that have been developed as drug sources started out producing milligrams of the target compound. Still, Arnold Demain, a Massachusetts Institute of Technology industrial microbiologist, argues that learning how to supply enough oxygen to the fungal cultures and improving the genetics of the strain are possible, and, depending "on who the sponsor is, and how much money somebody's willing to put into it," could produce a viable strain in about 5 years.

A hot commodity. That possibility had made the Montana group's fungus a hot commodity long before they'd even written their scientific paper. With a commercial payoff possible, in March 1992 the team filed patent applications on fungal production of taxol. In January of this year, Strobel and Roger Flair, president of the Bozeman-based Research and Development Institute, a nonprofit that handles Montana State University's patent negotiations, invited several pharmaceutical firms to negotiate licensing rights.

Among those bidding for the rights, *Science* has learned, are ESCAGenetics, Lederle Laboratories, Pharmagenesis, and the heavy hitter—Bristol-Myers. Since Bristol-Myers has a built-in conflict-of-interest where methods that might reduce the price of taxol are concerned, some researchers have tried to persuade Montana State to cut them out of the bidding. For the moment everyone's still in. But, as Flair says: "Our mission is not to let anyone quash this discovery." Given the discovery's potential, it's unlikely that anyone will be able to keep it down for long.

–Richard Stone

JAPAN

At Tokyo University, a Parting Shot

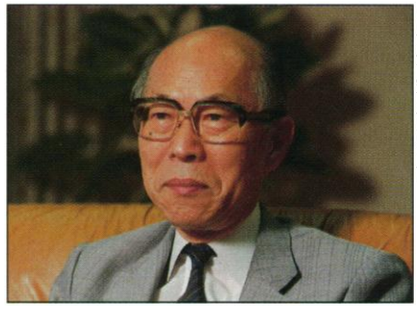
The recent retirement of the president of the University of Tokyo brought more than the usual warm, congratulatory sentiments. Along with warm feelings, departing president Akito Arima left behind a tough critique of the university's physics department, which he had commissioned from an international panel of scientists. Announced on 30 March, the report found that facilities at the university are "miserable and utterly unacceptable." The department's own structure and teaching style also came in for a stiff review.

Arima, himself a physicist, intended the report to be for the good of his university's physics department and other Japanese academic researchers. A long-time critic of the dismal funding levels and physical conditions at the national universities, Arima instigated the review late last year, expecting that the committee would echo his own complaints. The resulting publicity, he hoped, would goad the Ministry of Education, Science, and Culture (Monbusho) into finally doing something about Japan's neglected university system.

Arima opened his own department, the foremost in Japan, to scrutiny because he hoped its prominence would make the committee's findings all the more striking. The 10 prominent scientists—among them Jean Audouze, science adviser to the French government, physicist David Pines of the University of Illinois, biologist Sidney Brenner of Cambridge University, and several prominent Japanese researchers, including Nobel laureate Leo Esaki—agreed, calling the department "outstanding...in both quality and quantity of research output." It has achieved that status, says the report, "in spite of... handicaps and deficiencies" in research facilities and equipment and in teaching space.

The panel's criticisms of the physical plant were no surprise. Just last year analyses of conditions at the universities, published in special issues of *Science* (23 October 1992) and *Nature* (15 October 1992), prompted wrenching debates in Japan. But besides calling for more government investment, the committee identified some improvements the department could make on its own.

The panelists concluded, for example, that "the students' curriculum and research programs are too rigidly constrained, allowing little flexibility or freedom of choice. The interaction and communication within the department is also quite poor." Students should be given more freedom in their curricula, said the panelists; the best young researchers should be promoted quickly, and graduate students—most of whom have part-time jobs—should be awarded fellowships so they can concentrate on research. The committee also urged the department to open its doors to women and foreigners—there are none on the faculty—and internationalize itself by teaching some classes in English and encouraging students to travel abroad to conferences.



EISI MITAZAWA/BLACK STAR

Self-critic. Tokyo's Akito Arima.

This latest volley of criticism has shaken officials at Monbusho, says Ikuo Kushiro, the dean of the university's faculty of science, although the agency has not yet made a formal statement about the evaluation. Whatever the tone of the agency's response, however, Kushiro says a quick bailout for Tokyo and other universities looks unlikely in the face of Japan's deep recession.

Limitations on funds will also postpone some of the improvements suggested in the physics department, says Kushiro, including the creation of more assistant professorships and a substantial increase in the number of postdoctoral fellows. But he says the university will try to make the curriculum more flexible and encourage interactions between professors and students.

As the university and the government struggle to deal with the fallout from the evaluation, the Tokyo University faculty has just elected another researcher to succeed him: Hiroyuki Yoshikawa, an expert on intelligent manufacturing. To Genya Chiba, vice president of the Research Development Corp. of Japan, that move suggests that the university is serious about improving its research programs. "This is one of the first times that the presidency of [Tokyo University] has gone to people in technical fields two times in a row," says Chiba. And that departure from tradition in tradition-oriented Japan, says Chiba, may reflect the fact that faculty at Tokyo and other universities "feel that the universities are in the middle of a crisis." If so, it is a crisis Akito Arima's razor-sharp farewell message has only served to highlight.

–Fred Myers

Fred Myers is a science writer based in Tokyo.