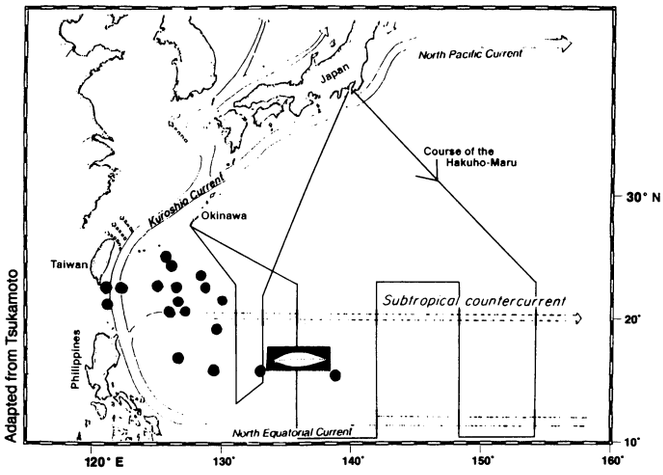

This map of the Pacific shows the locations of previous catches of leptocephali (dark circles), the course of the 1991 research trip by the Japanese and the spawning grounds (leptocephalus drawing).

they based their decision on very circumstantial evidence. "They decided to fish like bandits, at night, just south of the salinity front," Miller says. "That's where our best chances would be."

This concentration of efforts in one place represented a big gamble. Because the schedule called for the ship to end the first leg of its cruise at Okinawa four days later, there wouldn't be time for the ship to backtrack if they failed to find eel larvae. On the second leg, the ship would head much farther west. "If we didn't succeed on the first leg, it would have been a disaster," says Miller. "We would have covered all the territory where all the previous research had suggested the larvae would be."

After midnight, the scientists set up a net as they had 60 times before during the previous 19 days. Forty-five minutes later, they hauled it in and began culling key living specimens. While sorting through bowls of the leptocephali brought to the ship's lab, they found one very tiny eel larva. Noritaka Mochioka of Kyushyu University, an expert in identifying larval fish, took it over to a microscope to count its muscle segments, called myomeres. The number of myomeres distinguishes species: Indonesian leptocephali have about 10 fewer myomeres than the 112 to 118 typical of Japanese larvae.

"He eventually concluded that it was an *Anguilla japonica*," Miller says. "It was the first one and it was small." That announcement had an eel-ectrifying effect, bringing applause from the researchers.

"Ten millimeters is quite significant for Japanese eel biology, so that is very exciting," says Tsukamoto. That specimen was half the size of the previous record smallest. Finding more larvae that size would mean the team had closed in on the spawning grounds. They caught only three more that night, but the next evening, their second tow netted 39.

Thus began what the scientific crew came to call "the longest night." The researchers next sent down a complex apparatus that opens and closes different nets at different depths. From their catches at different levels, the scientists decided to concentrate their towing at about 75 meters, a depth where their sampling had yielded the largest numbers. It turned out to be a good decision, because in one tow, they caught 280 Japanese eel larvae. "That's surprising, that [such] very dense aggregations exist," Tsukamoto says.

Miller missed this action, being one of those assigned the task of sorting through the mess of tiny, transparent creatures and identifying the larvae under the microscope. "All I saw were continuous buckets of plankton and trays of leptocephali," he recalls. "I didn't know how we were going to process them all."

About 800 Japanese eel leptocephali passed under those microscopes before the sun rose and the animals could no longer be caught. By then the ship needed to head full speed to its next preassigned sampling spot. "The integrity of the [schedule] would not be sacrificed for anything," Miller says. So even though the size and number of larvae indicated the Japanese had found where eels first began their long, complex lives, the ship did not linger.

Ten days later, the *Hakuho-Maru* began sampling again at spots hundreds of kilometers west. "We never caught more than 10 to 15 [larvae] in any tow ever again," says Miller. A typhoon also forced the ship to alter its course, so the scientists couldn't hit other regions where they thought currents might have carried larger, older larvae.

None of that mattered much. "The magnitude of our success was so great that everyone was in pretty good spirits," says Miller. "It was an extremely historic cruise from the Japanese perspective."

And from his, too. "In the Sargasso there was a feeling of frustration and disappointment," he says. "In the Pacific, there was a feeling of accomplishment and satisfaction." □

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Trash to Cash: New Business Opportunities in the Post-Consumer Waste Stream — Susan Williams, Ed. This report from the Investor Responsibility Research Center surveys the three major alternatives to landfill waste disposal — recycling, incineration and composting — and details the business opportunities, incentives and obstacles that exist in these fledgling industries. The report also profiles the companies and associations involved in these disposal ventures, describes the technology available and identifies leading users of recycled material in the various recycling industries. IRRC Inc DC, 1991, 317 p., charts & graphs, paperback, $35.00.