safety procedures to help fill in forms quickly. One enforcement official says he believes things will get better as researchers and officials gain experience with the law and with each other. "Right now, understanding between scientists and officials isn't what it could be," he says. "Some acceptance, and a collegial atmosphere, needs to be developed."

Ernst-Ludwig Winnacker

For Winnacker, who advised parliament while the law was being drafted, such measures are necessary but not nearly enough. He is collecting stories of the problems faced by scientists and will present them at a parliamentary hearing next month in an attempt to have the law amended. He also hopes to persuade enforcement officials to reduce the paperwork required for S1 applications down to a page or so. But Gerd Hobom, chairman of the Central Commission for Biological Safety (which administered the old guidelines) and professor of molecular biology and microbiology at the University of Giessen, is skeptical of Winnacker's chances: "The bureaucrats live from administering this thing," he says pessimistically.

That leaves the more radical group of scientists who are convinced that drastic measures are necessary. One possibility under discussion is a challenge to the law's constitutionality. Bujard, one of the supporters of this approach, argues that the right to teach and to carry out research without interference is guaranteed in the German constitution, and that the new law and the way it is being enforced violate this right.

Whether or not the constitutional challenge is successful, Bujard is convinced that the situation can improve only if scientists take a strong public stand. His recent experiences on a committee that evaluated East German science have strengthened his conviction. "I see a parallel with other periods in history where scientists didn't show enough *Rückgrat* ['spine']," Bujard says. "We scientists cannot go along with every irrational demand of a politicized bureaucracy." ■ PATRICIA KAHN

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Asian Gypsy Moth Jumps Ship to United States

Since the first European gypsy moth landed on Massachusetts soil in 1869, this pest has munched its way through the forests of New England—devouring oak, birch, poplar, willow, and other hardwoods. How did it get here? Unfortunately, science was to blame. The first moths were hand-carried from France by a scientist, Leopold Truvelot, who planned to breed them with silkworms to make a hardier silk-spinning hybrid. But in mid-experiment, a windstorm knocked over a cage, freeing the moths. Today the descendants of those original immigrants have gone as far south as West Virginia and as far west as Ohio and Michigan, where they have become a horror story for gardeners and the timber industry.

WILLIAM WALLNER/USFS

No two alike. *Genetic variability of the Asian gypsy moth is shown by these three distinctly colored larvae.*

Now comes the sequel, as U.S. Forest Service scientists brace for the arrival of a relative, the gypsy moth of Eastern Asia. Eggs from the Asian strain of *Lymantria dispar* apparently came to the West Coast last year as unwelcome cargo on board grain ships from ports in the Asian part of Russia, a region where the moths are common, and a severe outbreak is under way.

The special threat of the Asian moths stems from the fact that, unlike their female North American counterparts, females of the Asian strain can fly long distances. U.S. Forest Service research entomologist William Wallner, who has traveled to the Soviet Union six times in the past decade to study ways to control the pernicious pest, explains the problem this way: The Asian female "zips right along with a payload of 600 to 700 eggs and will fly in to lay its eggs just like a stealth bomber."

Indeed, they've been dropping their payload in Seattle, Portland, and Vancouver, British Columbia, ever since they first took shore leave last May—apparently in Vancouver. In that port, Agriculture Canada inspectors found several thousand eggs on board the *Angara*, a Soviet ship out of Nahodka. And the really bad news was that by the time the inspectors found the eggs, many already were hatching—and larvae were blowing toward shore. So far, 20 males of the Asian strain have been trapped in seven locations and identified by Cornell University geneticist Richard Harrison using mitochondrial DNA sequencing. (Only males have been detected because the traps are baited with the female's sex pheromones).

The problem isn't just that the Asian females travel so far—it's also that their larvae devour a broad range of trees in Asia: At last count, they had an appetite for more than 500 species of plants, including conifers, such as larch. And that's an ill omen for the Northwest's timber industry, based primarily on conifers, such as Douglas fir, larch, and spruce. When the moths turn to birch, alder, willow, and poplar, they could imperil endangered species being protected from the threatened timber industry—those trees form an important part of stream and riverbank habitats that are home to several endangered species.

Denver Burns, station director of the Forest Service's Northeastern Forest Experiment Station, says: "The U.S. Department of Agriculture has plans to go forward with pest control efforts, but the Forest Service is not sure that normal pest control strategies will work." Although the relatively slow-spreading North American strain can be controlled with a biopesticide, *Bacillus thuringiensis* (Bt), or a virus that homes in on the species, the Asian strain is more diverse genetically and may have better defenses. Next month, Forest Service entomologists will begin testing Bt on Asian gypsy moths held in quarantine in Massachusetts.

But even if the pesticide strategy works, it won't be easy to find the flighty Asian females. By the time a male population is detected, the stealthy female moths will have moved to new sites to lay their eggs. Says Wallner: "My concern with the new species is that we could see a faster spread." That means far larger areas would have to be sprayed. And that's not the only concern. In the native strain, the males are mobile—and entomologists fear that newcomers will mate with the moths that are already here to produce a horde of hybrids in which both males and females can get around. ■ ANN GIBBONS