

BIOLOGICAL INVADERS

1834
What makes an invader?



1838
How England fought back



1841
Using invaders to fight invaders



"I am not concerned" about the safety of continuous cell lines. "But the data we have are not sufficient to satisfy me as a scientist." To learn more, says Egan, the FDA plans to join European regulatory agencies in supporting experiments, such as testing the cancer-causing potential of DNA fragments, that will help quantify the risks. It is all right to "make mistakes in calculations," the FDA's Andrew Lewis said at the meeting. "But if we make mistakes in terms of delivering products that are unsafe, the costs will be incalculable."

—GRETCHEN VOGEL

CLIMATE CHANGE

New Center Gives Japan an Arctic Toehold

FAIRBANKS, ALASKA—Japan and the United States have launched a \$32 million research center to plumb the consequences of climate change in the Far North. Late last month, researchers from the two countries gathered here on the campus of the University of Alaska, Fairbanks (UAF), to dedicate the International Arctic Research Center (IARC). Guided by representatives from several Japanese and U.S. organizations, the center plans to do "big picture, big science," says Gunter Weller, director of the Cooperative Institute for Arctic Research, an IARC partner based at UAF.

By compiling satellite data on everything from sea ice to vegetation patterns in the Arctic, where the effects of global warming are being felt first, IARC hopes to do some informed crystal-ball gazing. Most of the center's funding is expected to come from Japanese and U.S. agencies and universities. Besides supporting outside scientists, the center hopes to expand its 50-person research staff to 150 by 2005. The upshot, says Syun-Ichi Akasofu, IARC's U.S. director, will be clearer forecasts of global climate and of the ways perturbations in the Arctic might influence northern countries. "The ultimate purpose of IARC is to make it possible to predict global change," adds Taro Matsuno, director-general of Japan's Frontier Research Program, a key player at IARC.



Cold eye on climate. Arctic data can sharpen models, IARC's Akasofu says.

Climate models suggest that the Arctic is a good place for predicting climate changes, because global warming, stoked by rising levels of carbon dioxide and other greenhouse gases, should be amplified there. Higher temperatures melt permafrost—possibly liberating trapped CO₂ and methane, two greenhouse gases—and drive the boundary of permanent snow cover northward, eating away at a layer of white that reflects sunshine back into space. Both effects could feed back to spur global warming. Indeed, temperatures in many parts of the Arctic are already climbing faster than in regions to the south. Average annual temperatures in Alaska have increased 1 degree Celsius in each of the last 2 decades, whereas Earth's average annual temperature has increased less than 1 degree over the last century.

"People are seeing earlier breakup and later freeze-up of sea ice and warming of permafrost, and native people are talking about changes in wildlife," says John Calder, director of Arctic research at the National Oceanic and Atmospheric Administration, an IARC funder.

Changes in the Arctic may also be having effects at lower latitudes, a link that IARC researchers will probe. For instance, 6 years ago a quarter of Japan's summer crop of rice was wiped out during a frigid year that resulted from shifts in the Arctic atmosphere. Japanese researchers also worry that changes in Arctic Ocean circulation will further affect fisheries in the North Pacific and the Bering Sea, where disturbing shifts are already taking place.

Although both U.S. and Japanese officials say their governments are committed to the Arctic endeavor, which is an outgrowth of the "U.S.–Japan Common Agenda" signed by President Bill Clinton and former Japanese Prime Minister Ryu-

toro Hashimoto in May 1997, neither side has fully clarified how that commitment translates into cold cash. But the center's



Land of opportunity. New center hopes to woo scientists to study the tundra and other global warming hotbeds.

backers don't expect to have a tough time attracting funding or researchers: After all, IARC is a sleek new facility where the climate action is. "If you build it," Calder says, "they will come."

—BERNICE WUETHRICH

Bernice Wuethrich is an exhibit writer at the Smithsonian's National Museum of Natural History.

NSF AND NASA BUDGETS

Rhetoric Meets Reality On the House Floor

A full-court press by Administration officials and scientific groups to fend off attacks on science funding was no match for congressional budget realities last week. The House of Representatives passed a spending bill that imposes deep cuts in NASA's budget and erases a proposed increase for the National Science Foundation (NSF). The Senate has yet to act on the bill—a \$92 billion measure that funds housing, veterans' care, and dozens of independent agencies—and its fate is uncertain as Congress and the White House remain deadlocked over whether to lift tight caps on domestic spending or break their

