

BACTERIAL MENINGITIS

Appeal to Thwart Deadly Outbreak

Fearing a repeat appearance of a rare strain of bacterial meningitis that killed 1500 people last year in Africa, the World Health Organization (WHO) last week issued an urgent plea to drugmakers to make an effective vaccine available at reduced cost. The most common forms of meningitis can be

W135 strain will return this winter, says WHO spokesperson Iain Simpson, but if it does, the organization doesn't want to be caught empty-handed. The only vaccine available against W135 is a tetravalent preparation that also staves off three other strains. But at a cost of at least \$4 per dose, the vaccine—which is in routine use for military recruits and travelers from wealthy countries—is out of reach of vulnerable countries in Africa, which can afford to pay at most about \$1 per dose, according to WHO.

Even if the price were slashed, there would not be enough of the tetravalent vaccine to respond to a large epidemic. In a severe outbreak, some 3 million doses would be needed; at the meeting, drug companies estimated that only 2 million doses are available, says Simpson. "If there are one or two small outbreaks, that might be enough. If there is one large outbreak, we wouldn't even be close."

On 4 October, following negotiations with WHO and other officials, the drug giant Glaxo-SmithKline offered to produce a new triple-action vaccine against W135 and two common strains,

A and C, for \$1 per dose. But there might not be enough time to get the new vaccine ready for winter. It would have to receive regulatory approval in Belgium, where it would be manufactured, and in countries where it would be used. That could take months, says Daniel Tarantola, WHO's director of vaccine development. And financing is far from certain. "We do not want to overstate our hope," he says.

WHO began talks with vaccine manufacturers in late spring, Tarantola says, but received little positive response until last month. Some observers question the strategy of vaccinating after an outbreak starts. Mass vaccination campaigns before an epidemic could save thousands of lives a year, asserts John Robbins, a vaccine expert at the National Institute of Child Health and Human Development in Bethesda, Maryland.

He and several colleagues have been

pushing WHO to launch mass campaigns immediately to protect more people and drive down the tetravalent vaccine's cost. "There is a primary rule about vaccines: If you want to make it cheap, use it," Robbins says. "No manufacturer will be able to store enough vaccine and deliver it within the time frame required to stop an epidemic."

Tarantola and others at WHO say that such a strategy would work only with a conjugate vaccine that elicits a stronger and longer-lasting immune response against a range of strains. Such a vaccine is under development but won't be ready for several years, Tarantola says. In the meantime, health officials in Burkina Faso and the rest of the Meningitis Belt can only hope that they are luckier this year than last.

—GRETCHEN VOGEL

HERPETOLOGY

100 Frogs A-Leaping For Biodiversity

While many herpetologists have been scrambling to understand why frogs, toads, and other amphibians are declining worldwide, one research team has been cataloging more than 100 new species, all from one postage stamp of a rain forest in Sri Lanka. On page 379, Christopher Schneider, a systematist at Boston University, and his colleagues describe their discovery of this biodiversity hot spot, increasing the number of known frog species on the island of Sri Lanka fivefold. "It's quite amazing [that] they have found this incredible diversity," comments David Wake, a herpetologist at the University of California, Berkeley.



Ample anurans. Biologists have discovered this and more than 100 other new frog species in Sri Lanka's rain forest.



Victims of an ill wind. Dry winter winds help spread *Neisseria meningitidis* (inset), triggering yearly epidemics that sicken tens of thousands of children in Sudan and other countries south of the Sahara.



prevented with inexpensive, readily available vaccines, but the only vaccine that protects against strain W135 costs \$4 to \$40 a dose—far more than most African countries can afford.

At last week's emergency session in Burkina Faso, officials were pessimistic about staving off another epidemic of W135 without help from the world's largest drug companies. If a major outbreak of W135 were to strike again, WHO says, there would not be enough vaccine doses available at any price.

Outbreaks of bacterial meningitis plague Africa's so-called Meningitis Belt every winter as dry winds blow south from the Sahara, spawning dust storms that irritate the lungs and leave people vulnerable to the airborne bacteria. Last year, W135 hit with a vengeance, killing 1500 people in Burkina Faso. Most of the victims were young children. The death toll tells only part of the story: One in 10 survivors suffers brain damage, deafness, or limb amputation.

It's impossible to predict whether the rare

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In 1993, Rohan Pethiyagoda used his own money to found the Wildlife Heritage Trust in Colombo, Sri Lanka. He and his colleagues began a census of Sri Lanka's disappearing wildlife, systematically searching the 750 square kilometers of remaining rain forest, which once covered 15,000 square kilometers. To his surprise, he kept finding frogs he couldn't identify.

Pethiyagoda first showed the animals to frog systematists. They estimated there might be 200 new species, based on the morphology and other characteristics of 1000 specimens. Subsequent genetic studies reduced that number to 120 or so. Claims of a vast number of new species are often greeted with skepticism, but the new data are compelling, say the researchers' colleagues. This work, which combines traditional and molecular approaches, "is right at the forefront of what work in biodiversity should entail," says Roy McDiarmid, a systematist at the U.S. Geological Survey who is based at the Smithsonian National Museum of Natural History in Washington, D.C. Adds Wake, "The molecular data gives a certain validation to the assertion that these things are really different species."

The new species fall into two groups. One consists of just five species, all of which lay eggs in foam nests on leaves, rocks, or branches suspended above water. Once big enough to be out of danger from many aquatic predators, the hatched tadpoles slide off into the stream or pond below. But most of the newfound frogs are "direct developers" whose young never get their feet wet. These eggs incubate individually in leaf litter instead of foam nests, and they hatch as miniature adults, skipping the tadpole stage altogether. This water-free lifestyle "gives species a lot more latitude," McDiarmid explains, and "lends itself to geographic isolation and speciation."

Schneider thinks that these frogs have escaped the fate of other amphibians because disease, ultraviolet light, and other potentially deadly influences appear to be most dangerous to water-based young. "By skipping the aquatic [stage], they may bypass a life stage when they are most vulnerable," he suggests.

But there seem to be some dangers even these direct developers have not escaped. Co-author Kelum Manamendra-Arachchi of the Wildlife Heritage Trust traveled to museums containing specimens similar to the newly discovered ones, looking to confirm his species designations. He found many frogs—perhaps 100 species—that had been collected from Sri Lanka more than 100 years ago that were not among their current finds. "It means a huge number of species must have gone extinct already," says Wake, most likely because so much of the island's rain forest has been lost.

Therein lies the challenge for biodiversity's champions, says Paul Speck, president of the Arlington, Virginia-based Amphibian Conservation Alliance. "We're at a very precarious moment," he says; "there are a lot of species still out there [and] there is the opportunity to save many of them, but we need to act quickly."

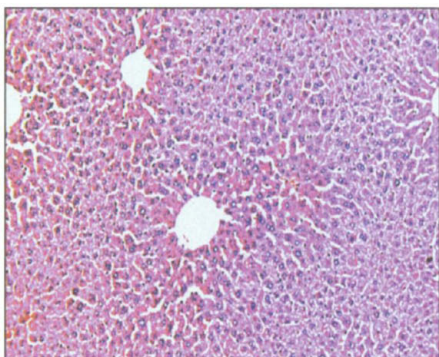
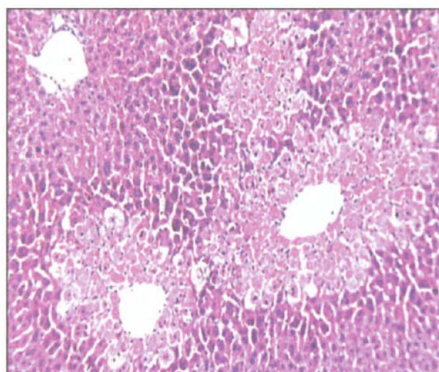
—ELIZABETH PENNISI

TOXICOLOGY

Protecting Liver From Painkiller's Lethal Dose

Last week a committee of the U.S. Food and Drug Administration recommended that medicines containing acetaminophen, a commonly used painkiller sold under the brand name Tylenol and in many over-the-counter cold and flu remedies, carry stronger warnings about its dangerous side effects. Every year in the United States overdoses of the painkiller cause acute liver failure in as many as 800 people, one-third of whom die as a result. New results help explain just how acetaminophen harms the liver. They may also provide a target for treating liver failure due to overdoses of acetaminophen and perhaps of other drugs as well.

On page 422, a team led by David Moore of Baylor College of Medicine in Houston, Texas, reports that the so-called constitutive androstane receptor (CAR) plays a central role in bringing about the biochemical



Protective effect. Liver cells die (pale areas) when exposed to high doses of acetaminophen (top), but a CAR inhibitor protects against such damage (bottom).

ScienceScope

Misconduct Aftershocks Bell Laboratories is moving to clear the wreckage created by the misconduct of its one-time nanoscience star, Jan Hendrik Schön. Officials at the Murray Hill, New Jersey, lab said this week that they are withdrawing six patent applications that are based on Schön publications, which an investigating committee has concluded contain fake data (*Science*, 4 October, p. 30). The lab had already asked U.S. and foreign patent offices to put the applications on hold, pending completion of the investigation. Lab parent Lucent Technologies had once hoped the patents, which involve novel transistors and electronic switches, might become cash cows.

Anger in Italy The heads of Italy's 107 research institutes are protesting government plans to cut science budgets and redirect ongoing reforms. Their strongly worded letter last week to Guido Possa, the government's vice minister for research, escalates a controversy that began last summer, when researchers attacked a leaked government plan to revamp Italian science (*Science*, 16 August, p. 1106). Now, they fear that a rumored 10% cut in the National Research Council's \$500 million budget would virtually eliminate \$50 million for new projects—along with about twice that amount in matching funds from other sources. Possa had not responded to the letter as *Science* went to press, but he told researchers earlier that he would meet with them next month.

Canadian Student Aid Canadian Prime Minister Jean Chrétien's swan song to his country contains an ode to graduate researchers. Last week Chrétien promised to boost spending on graduate studies and research in his first "Speech From the Throne" since this summer's announcement that he would retire in February 2004. His words lend support to a proposal by the nation's three granting councils for a 10-year, \$2 billion program to help train young academics, although Industry Minister Allan Rock says that details await the new budget, due out next spring.

"There's a need for more money per student and more students," says Canadian Institutes of Health Research president Alan Bernstein. "There's 25% more people doing research than there were 2 years ago, and they all want good students and postdocs."

Any expansion, however, must find room in a tight government budget. And Chrétien's ability to set the political agenda is also in doubt after a de facto coup by former Finance Minister Paul Martin forced him to declare his pending departure.