Briefings

edited by FAYE FLAM

Shooing the Screwworm Fly

Some deft political maneuvering has made it possible for the U.S. Department of Agriculture (USDA) to help Libya eradicate a potentially devastating insect pest. Since last December, the Food and Agriculture Organization (FAO) of the United Nations has been dropping 40 million sterile male screwworm flies (*Cochliomyia hominivorax*) per week over Libya to control the spread of this dangerous fly, whose larvae feed on living flesh and can kill both livestock and humans.

Nasty bite. *The screwworm.*

Although the FAO is orchestrating the $40-million program, the USDA is providing the flies. Because a tense political climate prevents the department from dealing directly with Libya, it is selling the flies (at cost) to the FAO. And even that took an act of Congress; before last year it was illegal to make such technology available to Colonel Muammar al-Qaddafi's regime (see *Science*, 13 July, 1990, p. 117).

The flies are bred in a plant in Mexico and flown by chartered jet to Libya, where they are released in infested areas. The sterile flies outnumber the fertile ones by approximately 10 to 1, and fruitless mating should eventually wipe out the flies.

The strategy was developed in North America, the home of the screwworm, which in the past has caused all sorts of headaches for U.S. cattle ranchers. But after 2 decades of releasing sterile males, USDA scientists have finally won the battle against the pest. Just last February, the United States and Mexico declared that the screwworm had been eradicated from both countries.

Meanwhile the fly got a foothold in North Africa. According to FAO statistics, cattle infestations grew at an alarming rate throughout 1990, rising from 371 new cases in May to nearly 3000 new cases in September. After the eradication program started, the number of new cases dropped dramatically, and only six cases have been reported through April of this year.

Better Dead in Lead

During a ground-penetrating radar scan of a colonial cemetery in St. Mary's City, Maryland's first capital, an anomalous set of blips appeared. In November 1990, preliminary excavations revealed the source: three anonymous lead coffins, believed to hold exceptionally well-preserved 17th-century Marylanders. Now historians and scientists are lining up to study the contents.

"Preservation can be truly astounding" in lead coffins, remarks Henry Miller, director of research for Historic St. Mary's City. The metal provides an unusually good seal, retaining evidence that disappears from ordinary burials in fabric shrouds or wooden coffins. And that could provide a unique window on the world of 300 years ago.

One thing is certain already: the coffins' occupants were people of high status. In England, Henry VIII and other notables had been buried in lead coffins even before the 17th century, but burial in lead was all but unheard of in 17th-century America.

In an effort to identify the coffins' tenants, physical anthropologist Doug Owsley of the Smithsonian Institution and others plan to determine their sex, age, and height and perhaps even reconstruct their faces. Members of Maryland's founding family, the Calverts, are candidates, notes Miller.

Owsley and scientists at NASA's Langley Research Center and elsewhere hope to harvest other kinds of data from the dead. Before the coffins are opened, researchers will probe them with ultrasound, x-rays, and gamma-rays. Next, they will drill holes into each one in the hope of liberating trapped 17th-century air for chemical analysis. Finally, the coffins' contents—wood, fabric, and human remains—will undergo a battery of tests.

Miller hopes the long-sealed coffins will yield soft tissue, from which it might be possible to recover DNA and antibodies. These colonial biomolecules might offer valuable clues to any diseases the unknown Marylanders may have suffered from.

The multipronged coffin studies could begin as early as November, Miller says.

Brotherhood of Lions

A new study of African lions has found that brothers who band together in large prides show a truly lion-hearted brand of brotherly love: They often forfeit their own chances for fathering cubs to allow their brothers to succeed. But the altruistic siblings gain an evolutionary advantage from their sacrifice, says University of Minnesota ecologist Craig Packer, who led the study.

DNA fingerprinting of lions in the Serengeti National Park and in the Ngorongoro Crater of Tanzania revealed that brother lions who stick together in large prides stand a better chance of passing on their family's genes than do brothers who go their separate ways, even when they don't always do the deed themselves. "If the coalition is too large, some of the males will fail to breed," says Packer. But the success of other males in the pride more than compensates, because brothers share about half their genes.

These findings supply further evidence for "kinship theory"—the notion that relatives who act altruistically toward each other improve the odds that their family gene pool will survive, even though such behavior has a price for the individual. While this brand of altruism had been proven in ants, termites, birds, and wolves, it had not been demonstrated in lions.

Now Packer concludes that for lions, too, "fraternité is not egalité."

Animals Animals

Fatherly lion. *Others do without.*

A Brighter Forecast From Kuwait

U.S. scientists are coming back from Kuwait's oil fields with good news for the atmosphere. Airborne observations are putting a lid on scenarios that predicted smoke-induced catastrophes—such as a global climate chill, intense acid rain, or a failure of the monsoons in Asia. None of these now seems likely to occur, according to

Peter Hobbs of the University of Washington, co-leader of a research team that held a press conference upon its return to Washington, D.C. last week. "We do not expect that smoke from the Kuwait fires will have any significant effect on the weather or climate outside the Gulf region," said Hobbs, one of 27 scientists who flew over Kuwait in May and June collecting air samples.

The reason for his optimism: Even at their highest, the plumes are not climbing above 5 to 6 kilometers, well below the stratospheric winds (at around 12 kilometers) that might sweep soot particles around the world and keep them airborne for months. Moreover, the particles themselves are hydrophilic rather than hydrophobic (attracting rather than repelling water), indicating they will form droplets and wash out of the atmosphere within days.

Another bit of encouraging news, according to Alan Bandy, a sulfur chemist from Drexel University, is that hydrogen sulfide, a lethal gas many feared would be present, was "completely missing." Nor was there as much sulfur dioxide (a precursor of acid rain) as expected. Bandy said that 400 kilometers downwind of the fires, the SO_2 had dissipated to concentrations of 1 to 10 parts per billion, an amount typically found in "large urban areas."

Even so, according to team co-leader Lawrence Radke, a staff scientist at the National Center for Atmospheric Research, "Kuwait is being painted black" by a "huge pall" of smoke and unburned oil droplets hundreds of kilometers wide. Hobbs said flying over the scene was "as near as I want to get to hell."

The high concentration of particles in the air (100,000 per cubic centimeter) presents a hazard for people living in the area. Petroleum compounds in the smoke also pose a health threat, but the U.S. team has not yet analyzed its air samples for toxicity.

The smoke may also wreak havoc with local weather. Hobbs pointed out that in Bahrain—250 kilometers away from the fires—this past May was the coldest on record in 35 years. And other long-term effects could still appear, he said.

U.S. Eases the Pressure on RU-486

The United States has apparently changed its position toward research by the World Health Organization (WHO) into RU-486, the controversial drug used to terminate pregnancy.

In recent months, U.S. officials opposed to the research had put considerable pressure on WHO, according to representatives of the advocacy group Population Crisis Committee (PCC). Last spring, for example, the State Department sent a letter to WHO asking for an accounting of U.S. funding going to the research. But at a late June meeting of WHO's Human Reproduction Program in Geneva, the U.S. government seemed to be backing off.

A U.S. representative at the meeting, Duff Gillespie, initially issued a statement warning that WHO could become embroiled in the controversy raging around RU-486 and abortion in general in the United States. "This visibility [of RU-486 research] could lead to specific negative consequences, even to pressure to reduce the United States contribution to WHO," he said.

Later at the same meeting, he followed with a more lenient statement: "The [U.S. government] has never asked WHO to stop all research on RU-486 nor have we informed WHO that we would cut off U.S. contributions to WHO should such research continue."

A representative of WHO says the organization will go on with its research program. Researchers will be looking beyond the role of RU-486 in triggering abortion, he says, to explore use of the drug to control fertility in other ways—as a constituent in birth control pills, for example.

Health Care: Teens Can Go It Alone

A substantial body of law—not to mention the natural inclination of most parents—assumes that children aren't capable of choosing their own medical treatment. It only stands to reason that minors lack the maturity and experience to make wise decisions.

But the Office of Technology Assessment (OTA) suggests in a recent report* that this common sense might not hold true after all—at least in the case of adolescents. After reviewing a series of studies on minors' health care decisions, the Carnegie Council on Adolescent Development—working under contract to OTA—said it "generally found few differences in health care decision making as a function of age for adolescents as young as 14 or 15 years of age."

The Carnegie Council selected seven "core" studies that compared adolescent responses to real and hypothetical medical dilemmas with those of young adults (generally aged 18 to 25). For instance, one study surveyed 75 socioeconomically diverse females between 13 and 21 who were having pregnancy tests. The researchers found that both the adolescents and the young adults in the group tended to consider the consequences of abortion with equal thoroughness and "quality" of reasoning.

The studies did tend to turn up one difference between adolescents and young adults: Adults more often seek independent second opinions. But most findings, OTA suggests, buttress arguments for lowering the legal age of consent for medical procedures (now 18 in most states).

**Adolescent Health—Volume 3: Cross-cutting Issues in the Delivery of Health and Related Services*, Office of Technology Assessment, U.S. Congress, OTA-H-467, June 1991.

Essence of a Smile

"One small muscle contraction can turn a lover's knees to jelly, a parent into a slave, and voters into automatons," observes University of Florida psychologist Cristiana Leonard in a paper appearing in the May *Psychological Science*. How, she wondered, does a smile work its magic?

To find out, she made a series of images of smiles as they developed on the faces of four women. She asked observers to rate the smiles by "pleasantness," then did some digital sleuthing for the underlying factor.

By dividing the images into many pixels and monitoring the way each pixel changed from moment to moment, she was able to quantify the evolution of each smile over time. The most "pleasant" smiles, it turned out, were those that crested fast and then leveled off.

People whose smiles don't follow that pleasing pattern have a genuine handicap, Leonard argues. "Kids who don't produce proper expressions often get ignored or abused by their parents," she says. "A lot of mental illness involves not being able to detect, decode, or produce these facial expressions." People with Parkinson's disease and schizophrenia, Leonard says, often suffer from such limitations. She hopes her studies might lead to tactics for helping such people regain a facility with facial expressions.