

OCEAN DRILLING

Higher Costs, Accident Imperil Plans

The Integrated Ocean Drilling Program (IODP) has hit rough waters. A spike in the demand for oil-drilling equipment and services has added 20% to the cost of a planned extreme makeover of the program's former workhorse, the drill ship *JOIDES Resolution* (*Science*, 23 December 2005, p. 1890). By happenstance, the funding squeeze comes as the program's future flagship, the new Japanese drilling ship *Chikyu*, sustained damage to one of its key drilling components during a shakedown cruise off the Japanese coast. "It's tough going at the moment," admits Bill Ball of the Joint Oceanographic Institutions, which is managing the modernization of the *JOIDES Resolution* for the U.S. National Science Foundation (NSF).

IODP's predecessor, the Ocean Drilling Program, was for 2 decades the world's premier effort to explore beneath the sea floor (*Science*, 18 April 2003, p. 410). In 2003, the U.S., European, and Japanese members of the consortium reorganized the program and began preparing for the arrival of the \$550 million *Chikyu*, which is equipped with a second pipe, called a riser, that allows it to drill deeper holes and in areas near oil and gas deposits (*Science*, 11 March 2005, p. 1552). Both the *Chikyu* and the renovated ship, which NSF leases from an oil-drilling company, were to begin scientific drilling in the fall of 2007.

That schedule now appears impossible to meet for the refurbished ship. For \$115 million the NSF vessel, which will be renamed, was to get a 30-foot hull extension that provides 50% more lab space and bigger and better accommodations. The ship is also slated for enhanced instrumentation and drill capacity and faster, more fuel-efficient operations. Now NSF officials must figure out how to either get the most for the budgeted amount or pay for the \$25 million overrun by cutting back on another big-ticket construction item. "Any increase has to come from the major research equipment and facilities account, not from the

research account," explains Margaret Leinen, head of NSF's geosciences directorate.

The clock is ticking as NSF awaits a report on how much can be done to improve the ship's capabilities without stretching the hull. The renovations were supposed to have gotten under way this month at a facility in Singapore, and NSF is paying tens of thousands of dollars each day the ship is tied up. Although work can begin on improvements unrelated to the extension, Leinen stresses that NSF must make a decision "as soon as possible." In the meantime, she says "we definitely won't be making" the target date of

Still standing. The crew of the *Chikyu* hopes to repair a storm-damaged part of its drilling equipment while at sea.



November 2007 to resume operations.

As for the *Chikyu*, officials at the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) are hoping to fabricate or buy a replacement for a rod that's part of a device to prevent blowouts when the ship drills into a volatile formation. It got bent when the ship was caught in a sudden storm earlier this month with its drilling equipment deployed. Asahiko Taira, director-general of JAMSTEC's Center for Deep-Earth Exploration, says the damage is minor and the bent rod will be replaced at sea.

The *Chikyu* must then rush off to drill for oil off the coast of eastern Africa. Taira says the commercial job will allow the agency to meet rising operating costs while still training the crew and gaining drilling experience in various geologic environments. "We will have this ship ready for scientific drilling in September next year," he vows. **—JEFFREY MERVIS**
With reporting by Dennis Normile in Tokyo.

Don't Catch Some Rays

With plans for 6-month moon missions, NASA needs to look harder at the effects of radiation on astronauts, their spacecraft, and their lunar base. That's the conclusion of a new report from the National Academies' National Research Council (NRC), which warns that the radiation could damage astronauts' bodies as well as electronic equipment on board. Rather than trying to solve the problem by over-designing a moon base with too much shielding—an expensive prospect—NASA could save money by determining the extent of the threat through existing data sets and tools regularly used by solar and space physicists. The NRC panel urges human-space-flight planners and radiation researchers to work together.

—ANDREW LAWLER

Sicily Center Iced

Italy's new budget zeroes out a \$410 million Biomedical Research Center in Palermo, Sicily—a joint project planned with the University of Pittsburgh Medical School for studies of regenerative medicine, medical imaging, and computational biology (*Science*, 14 April, p. 177). Funding was promised by former prime minister Silvio Berlusconi, who was defeated in the April national election. Recruitment for a staff of 600 was well under way when word arrived this month that the government will back out, says Bruno Gridelli, director of the ISMETT organ-transplantation research center in Palermo, which was to host the project. The cancellation, he says, "represents a substantial loss" for Sicily. Now the medical school will look for other partners.

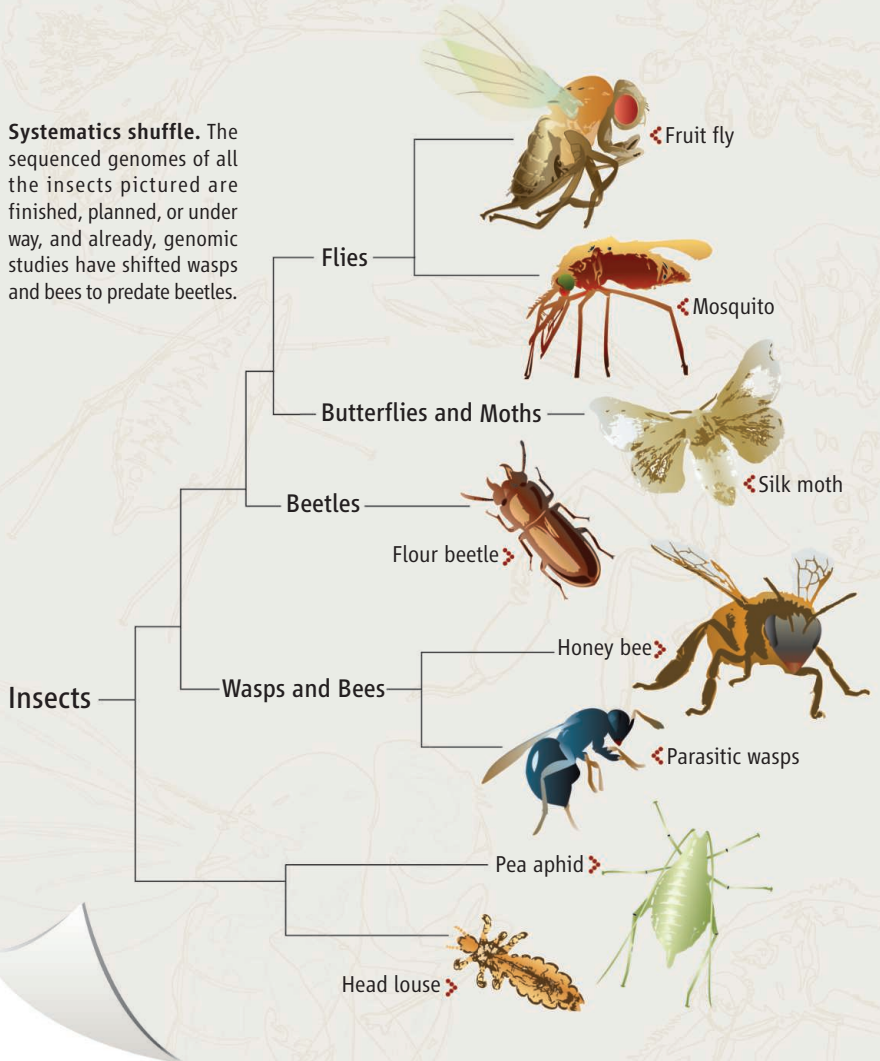
—JACOPO PASOTTI

Chinese Genomicists Target Cancer

The \$10 million Cancer Genome project, announced last week, marks China's first large-scale research program targeting a specific clinical disease. The program focuses on variations at the structural genomic and sequence levels, epigenomics, and transcriptomics, says Yang Huanming, director of the Beijing Genomics Institute. The program will carry out research into cancers that are prevalent in China, which could include lung, liver, stomach, and esophageal cancers. U.S. National Cancer Institute official Daniela Gerhard calls the project "a good idea," noting China's unique tumor samples. Although China is a partner in the international Human Genome and HapMap projects, Gerhard says the United States will wait for more details before considering partnering on the latest effort.

—GONG YIDONG

Systematics shuffle. The sequenced genomes of all the insects pictured are finished, planned, or under way, and already, genomic studies have shifted wasps and bees to predate beetles.



result, despite their geographic proximity, “the two European groups are the most different on Earth,” says Whitfield.

Compared to the fruit fly and the mosquito, the honey bee has evolved at a glacial pace, Weinstock and colleagues report in the 26 October *Nature* paper. But compared to those two insects, certain gene families essential to the bee’s social lifestyle have expanded in size. In the November issue of *Genome Research*, Hugh Robertson and Kevin Wanner of UIUC report about 165 odorant-receptor genes in the honey bee genome, more than double what *Drosophila* and *Anopheles* have. This expansion makes sense, says Robertson, given the bee’s need to recognize kin and find suitable flowers. Honey bees also have multiple versions of a pigmentation gene, called *yellow protein*, that have been co-opted to make royal jelly, a nutrient-rich secretion that causes larvae to develop into queens, Ryszard Maleszka of Australian National University in Canberra and his group report in the same issue of *Genome Research*.

In a few respects, the honey bee shares more similarities with humans than with the other insects whose genomes have been

sequenced. It retains some 700 genes found in other organisms, such as nematodes, yeast, or mammals, that the fruit fly and mosquito have lost. Those genes are presumably ancient, found in the common ancestor of all the creatures and then lost in a few lines. Take some of the genes that drive the biological clock behind circadian rhythms. The honey bee has several clock genes that closely resemble mammalian clock genes yet are missing in fruit flies, says Guy Bloch of The Hebrew University of Jerusalem, Israel. At the same time, the honey bee lacks two of the fruit fly’s clock genes, says Bloch. *Drosophila* apparently grew to depend on one subset of an ancient cluster of clock genes, whereas bees and mammals depend on another.

Dozens of other findings have come out of this first round of exploration into the honey bee genome, says Weinstock. Still, he’s most excited about the long-term effect of this massive endeavor. “It’s very gratifying to see the biology coming alive right away. [But] it’s more than just teasing the biology out,” Weinstock says. “It’s getting the whole community up to speed in genomics.”

—ELIZABETH PENNISI

Blocked Cancer Study Published

A study of cancer death rates among U.S. computer-chip workers was published last week after IBM lost its legal battle to block the author from publishing it. Epidemiologist Richard Clapp of Boston University analyzed mortality data on 31,941 American IBM employees, many retired, who died between 1969 and 2001. He reported last week in *Environmental Health* that men and women in that group were 7% or 15% more likely, respectively, to have died from cancer than were those in an age- and sex-matched subset of the U.S. population. What’s more, men who worked at one of four U.S. chip- and disk-drive manufacturing plants faced significantly higher risks of death from kidney and brain cancer, and, for women, breast cancer.

Clapp did the study after being hired as an expert witness for the former IBM workers who were suing the company (*Science*, 14 May 2004, p. 937). IBM’s lawyers argued for almost 2 years that the study could be used only for litigation, but a New York district judge ruled in February that Clapp was free to publish it. “It feels great,” Clapp says. IBM spokesperson Chris Andrews says that “Clapp’s assertions are not backed by any credible science.” Epidemiologist John Bailar, scholar-in-residence at the National Academy of Sciences in Washington, D.C., says that “from what I know at present, there is an excess cancer risk.”

—DAN FERBER

Taking a Shot at Flu

After consulting with more than 120 experts, the World Health Organization (WHO) in Geneva, Switzerland, announced a plan this week to drastically shore up the world’s capacity to produce influenza vaccines—a measure that it says could save millions of lives if a flu pandemic strikes. Developing a vaccine that works is one challenge should a pandemic of H5N1 or another flu strain occur. Rapidly churning out enough of the vaccine to protect 6 billion people is even tougher. Currently, flu vaccine companies produce only 350 million doses of the seasonal influenza vaccine per year. That’s why the use of annual vaccine should be promoted and new factories built—especially in the developing world—while scientists look for vaccines that are more broadly effective and easier to make, the agency says. WHO is hoping that rich countries will finance the plan, for which it has almost no budget.

“It’s good that WHO is at long last speaking up on the production issues,” says David Fedson, a vaccine expert and former executive at Aventis Pasteur MSD who follows pandemic vaccine issues closely.

—MARTIN ENSERINK