genome of the silkworm *Bombyx mori*, which may shed light on pest moths and butterflies. An international consortium was formed 3 months ago, and Kazuei Mita of the National Institute of Agrobiological Sciences in Tsukuba, Japan, has done some preliminary work on the genome, but funding is not yet forthcoming.

The USDA's internal research arm, the Agricultural Research Service (ARS), budgets some $60 million for agricultural genomes. But about two-thirds of that goes toward protecting genetic diversity important for agriculture. Most of the remaining money goes to genomics research on domestic animals and crop plants, says Leland Ellis, ARS program leader for genomics and bioinformatics: "Right now there is zero for insect genomes."

Other federal agencies also come up short. The Department of Energy has decided to focus on organisms involved in energy production, bioremediation, or carbon sequestration, says DOE's Ari Patrinos—and insects don't fit the bill. Likewise, the National Science Foundation, which over the past 4 years has spent $215 million on plant genomics, won't tackle insects, warns NSF's Chris Cullis: "We'll not be able to fund the sequencing of an aphid no matter what damage they are doing [to plants]." The National Human Genome Research Institute (NHGRI) plans to sequence the genome of a sister species of *Drosophila*. But, says NHGRI director Francis Collins, "unless it applies to human health, NHGRI is not likely to get involved."

To improve the funding situation, the entomology community needs to pull together and garner the support of farm commodity groups much the way the National Corn Growers Association worked to get funding for plant sequencing (*Science*, 23 October 1998, p. 652), says Ellis. Otherwise, says Purcell-Miramontes, "very little is going to happen."

–ELIZABETH PENNISI

ITALIAN RESEARCH

Mirage of Big Budget Boost Evaporates

CAMBRIDGE, U.K.—Italian scientists are up in arms over government plans to drastically scale back a promised increase in science funding in 2002. More than 5000 researchers have signed a petition opposing legislation before Parliament that would eliminate all but $200 million of a scheduled $900 million boost. The new budget "will simply ruin the possibilities for Italian scientists," argues Nobelist Rita Levi-Montalcini, former director of the Institute of Cell Biology in Rome.

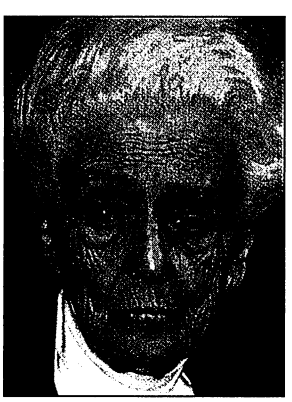
Scientists had expected to receive $8.2 billion in 2002, up 12% over this year's spending. But that promise was made by Giuliano Amato, whose government was replaced after elections last May. The new administration, headed by Silvio Berlusconi, has made science one of the biggest losers in a review of its predecessor's spending plans. The government puts a positive spin on the change, noting that it doesn't shrink current levels. "There will be no cuts for universities and research" next year, says Guido Possa, vice minister at the Ministry of Education, Universities, and Research.

Italian scientists are unimpressed. In the newspaper *La Repubblica*, Levi-Montalcini last week accused Berlusconi of "betrayal." "They don't care," adds Renato Dulbecco, an Italian-born Nobel laureate at the Salk Institute for Biological Studies in La Jolla, California. The new budget numbers, he says, will have an immediate effect in preventing the country's National Research Council (CNR) from replacing researchers who retire from its staff.

Italy can ill afford such policies, say scientists. The country's research spending stands at 1% of the gross national product, compared to the European average of 2.2%, according to a petition from the Italian Association of Doctoral Students protesting the 2002 budget. The group warns of a "lost generation" of young talent driven away by poor funding.

The 2002 budget will "ruin the possibilities for Italian scientists."

—Rita Levi-Montalcini



Funding isn't the only issue that has scientists fuming. One member of Parliament, Marcello Pacini, has proposed privatizing the CNR, arguing that the private sector would do a better job of supporting research. Scientists are hoping to knock down such an idea before it finds its way into legislation. Dismantling central planning, insists CNR president Lucio Bianco, would spark a crisis in Italian research.

Despite their protests, scientists aren't optimistic about their chances. Indeed, many regard the budget retrenchment as a fait accompli, predicting its passage later this month without significant changes. "It is difficult to think of hope," Dulbecco says.

–BEN SHOUSE

SOCIAL PSYCHOLOGY

Reality TV Puts Group Behavior to the Test

CAMBRIDGE, U.K.—Two British scientists are preparing to take advantage of the popularity of "reality TV" to recreate a notorious psychology experiment in which students played the roles of prisoners and guards. Skeptics, including the researcher who designed the original experiment at Stanford University in 1971, fear that the BBC production could rerun the abuses that brought it to a halt after 6 days. But the researchers say that the show offers an excellent opportunity to answer pressing questions about the psychology of racism, oppression, and terrorism.

The Stanford experiment, conducted by psychologist Philip Zimbardo, took place in the basement of the psychology building, which had been converted to look like a jail. Immersed in the situation, the 9 prisoners and 9 guards quickly internalized their assigned roles, the guards becoming brutal and the prisoners at first rebellious and then utterly compliant. Even the researchers acted more like wardens than scientists, suspecting that the prisoners were faking anxiety to gain early release and helping the guards thwart a rumored jailbreak. The experiment, planned to run for 14 days, was stopped after a colleague objected to its brutality.

The study demonstrated the influence of group pressure on individual behavior. Other experiments during the 1970s confirmed the power of social context. In one, subjects stayed in a room that was filling up with smoke because others seemed unconcerned; in another, they obeyed a lab-coated scientist's orders to deliver what they thought was an electric shock to a human subject. The specter of these disturbing experiments has prevented further realistic, large-scale tests of group psychology.

Then along came reality TV, which puts people in artificial situations for sheer entertainment value. Stephen Reicher of the University of St. Andrews, U.K., and Alex Haslam of the University of Exeter, U.K., accepted an offer to create a show with a stronger experimental basis. "This is a piece of science being filmed," says Reicher, who with Haslam will select 15 people to be as-

CREDIT: PLINIO LEPRI/AP PHOTO

Too real. Strip searches and delousing helped student "guards" assert power over "prisoners" in a 1971 experiment.

CREDITS: (TOP TO BOTTOM) PHILLIP ZIMBARDO; GEMINI OBSERVATORY

signed the role of either guard or detainee. The researchers have chosen a setup similar to Zimbardo's but with a less oppressive atmosphere and safeguards such as independent observers and clear boundaries for subjects' behavior. The BBC will televise the results, but the researchers retain control of the experiment's design and presentation.

Reicher and Haslam say this is a unique chance to test "social identity theory," which posits that group identity can override individual personality in shaping behavior. Dominic Abrams, a psychologist at the University of Kent in Canterbury, agrees: "It is rare that one gets an opportunity to simulate a powerful situation." And in the wake of the 11 September attacks, there is an urgent need for such research. "We don't have to be part of a terrorist cell to gain insight into the psychological processes involved with terrorism," he says.

Large-scale social psychology studies can cost hundreds of thousands of dollars, Abrams says, and TV companies may be the only source of funding. Haslam says safeguards alone will cost more than $100,000, but he and the BBC declined to disclose the overall budget for the program.

Although crews have not yet begun filming, Zimbardo and others have expressed concern that entertainment will be the overriding factor in carrying out the experiment. "There is no question in my mind but that the BBC and their consultants are hoping for something dramatic to erupt, to make it riveting for viewers," Zimbardo says. He says he declined the BBC's offer to participate because of the danger to the research subjects. Excessive precaution could also doom the experiment, says Peter Collett, a retired University of Oxford psychologist who consulted on the reality TV program *Big Brother*. "If we don't get the phenomenon that Zimbardo observed, then the whole thing is pointless," he says.

Reicher and Haslam insist there is a middle ground between cruel and dull. For one, the study will tone down the power imbalance between prisoners and guards through variations in housing, dress, and status, with the hope of exploring questions Zimbardo left open. For example, they will examine whether groups can have positive effects and if the results might also apply to milder social situations, such as relationships between employers and employees.

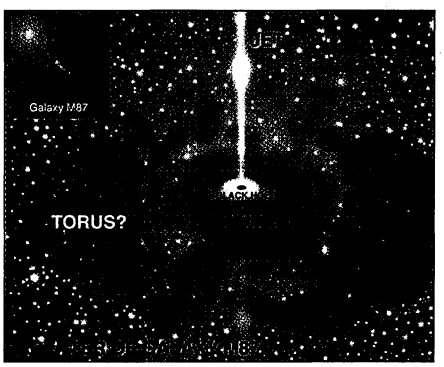
The dangers of Zimbardo's experiment and the trivializing influence of reality TV are the "Scylla and Charybdis" of the new project, Haslam says. Psychologists may differ on the potential perils of the study, but they agree on the importance of its goals. Viewers and researchers alike will have to wait until the show premiers next year to see if the partnership of science and television survives these treacherous waters.

–BEN SHOUSE

ASTROPHYSICS

Black Hole Blazes Away Without a Fuel Supply

The massive jets of supermassive black holes—plumes of gas and dust that extend for thousands of light-years from the centers of some galaxies—require considerable reserves of firepower. The most likely source is the giant doughnut-shaped cloud of gas and dust thought to surround such black holes. But scientists have now found that the black hole at the center of a nearby galaxy called M87 somehow maintains its jets without this vast stockpile of fuel. The apparent paradox has theorists baffled.



Black magic. The black hole at the center of galaxy M87 has a brilliant jet but apparently no torus-shaped gas-and-dust cloud to fuel it.

"The most directly puzzling thing is the 'Here we see it, here we don't' aspect," says Julian Krolik, an astronomer at Johns Hopkins University in Baltimore. "What is striking here is that active galactic nuclei of both greater and lesser power than M87, which also resemble M87 in many other respects, are wrapped in thick clouds."

Until recently, the energy-spouting center of M87—an elliptical galaxy 50 million light-years from Earth in the constellation Virgo—was thought to be a typical active galactic nucleus, powered by a typical supermassive black hole. However, last year astronomer Robert Antonucci of the University of California, Santa Barbara, noticed that the cloud seemed to produce surprisingly faint infrared emissions. But the observations left many questions about the cloud unanswered.

Then a team led by Eric Perlman, an astronomer at the University of Maryland, Baltimore County, observed M87 with the Gemini North telescope in Hawaii. In the 1 November *Astrophysical Journal Letters* Perlman's team reports that longer observations have provided a much clearer picture of the infrared emissions of M87's black hole. Comparing the emissions from the torus-shaped cloud with the energy coming from the jet, Perlman found that M87's torus-to-jet ratio was only about 1/1000 as great as those of other active galactic nuclei such as Centaurus A and Cygnus A.

Perlman's findings will force theorists to revisit their models to account for black holes without giant dust clouds, Krolik says. "This makes it harder to produce any model," he says.

–MARK K. ANDERSON

Mark K. Anderson is a writer in Northampton, Massachusetts.

GENETIC RESOURCES

Seed Treaty Signed; U.S., Japan Abstain

Delegates from 116 nations have agreed on a landmark treaty intended to ease exchange of seed collections held in the world's agricultural "gene banks." The United States and Japan were the sole holdouts, both abstaining from a final vote taken 3 November in Rome.

The agreement, formally known as the International Treaty on Plant Genetic Resources, mandates the free exchange among plant breeders of seeds from 35 crops, including major cereals such as rice, wheat, and corn (*Science*, 26 October, p. 772). Other crops, however, including soybeans, tomatoes, and peanuts, are not included in the treaty after nations with extensive collections insisted on maintaining national control. Many nations have adopted laws restricting the export of such "genetic resources" since the international Convention on Biodiversity entered into force in 1993.

Under the new agreement, any company that uses seeds from public gene banks to breed a new variety must pay royalties into an