suggests that the use of placebo control groups in the developed world should end. "We're very pleased," says Harvard University epidemiologist Karin Michels, who, along with her colleague Kenneth Rothman, has long argued against the widespread use of placebos in clinical trials. "We really see this as a big success."

The FDA says it's studying the revised document and doesn't have an official reaction yet. But Temple, associate director for medical policy in the agency's Center for Drug Evaluation and Research, says it will be hard to live by the letter of the declaration and carry out trials that meet the FDA's demands for scientific rigor. "The answer is not clear," he says. Human agrees: Adhering to FDA guidelines could mean violating the new Helsinki document. But the FDA isn't always right, Human suggests: "Bob Temple and the FDA are one voice. But we are a global organization, and this was a consultation from one side of the world to the other."

The new document contains several other provisions aimed at strengthening the patient's position. For instance, it asks researchers to divulge to participants how the trial is funded and whether they have any conflicts of interest. Such disclosures are rarely required now.

Another surprising provision, some say, is that the new document asks that all study results, "negative as well as positive, should be published or publicly available." "That is really wonderful news," says Kay Dickersin, who directs the Center for Clinical Trials and Evidence-Based Healthcare at Brown University in Providence, Rhode Island. Currently, trials showing that a drug has no efficacy are often buried, says Dickersin. Researchers don't get around to writing them up, journal editors don't want to waste space on them, and pharmaceutical companies don't want to publicize their failures. The result of this so-called "publication bias" is often an unrealistically rosy picture of a drug's efficacy, which the new declaration may help prevent, says Dickersin.

It isn't clear that any of these new principles will be widely accepted, however, because the declaration doesn't have the power of law. "But you have to start somewhere," says Human. "This is an ethical document. What we hope is that it will be adopted in many national regulations and legislation."

–MARTIN ENSERINK

ARCHAEOLOGY

Paintings in Italian Cave May Be Oldest Yet

Traces of what could be the world's oldest known cave paintings have been found in northern Italy. Stone slabs bearing images of an animal and a half-human, half-beast figure were uncovered during excavations by an Italian team at the Fumane Cave northwest of Verona. The slabs, painted with red ochre, had apparently fallen from the cave roof and become embedded in floor sediments previously dated to between 32,000 and 36,500 years ago. That would make the images at least as ancient as some found in the Grotte Chauvet in southern France—the current record holder at 32,000 years—and possibly even older (*Science*, 12 February 1999, p. 920). More important, cave art experts say, the new paintings bolster other evidence that humans engaged in sophisticated symbolic expression much earlier than once thought.

Symbolic find. Red ochre drawing (18 cm long) resembles figures found in France and Germany from the same period.

"This is an extremely exciting discovery," says archaeologist Randall White of New York University. Cave art expert Michel Lorblanchet of the University of Toulouse in France agrees. "The Grotte Chauvet has shown that we already had a very elaborated art" by 32,000 years ago. With Fumane, Lorblanchet says, "we now have confirmation."

Moreover, White and Lorblanchet say that there is little reason to doubt that the paintings are as old as the Italian team claims. "The [radiocarbon] dating is even better" than at Chauvet, Lorblanchet says. At Chauvet, very small samples of charcoal drawings were taken directly from the cave walls—a tricky technique that is prone to error. Although the inorganic red ochre paintings at Fumane cannot be dated by similar techniques, radiocarbon dates from plant and animal remains buried in the cave floor sediments where the art was found "are practically sure," Lorblanchet says.

Fumane Cave, which has been under excavation since 1988, had already revealed rich evidence of occupation by early humans, including stone tools. The painted slabs were discovered last year but kept a closely guarded secret until this week. Paleontologist Alberto Broglio of the University of Ferrara, who co-directs the dig with geologist Mauro Cremaschi at the University of Milan, told *Science* that the paintings were covered with a thin layer of calcite that made them difficult to see. This summer an Italian art restorer removed much of the calcite. Although the team has not yet figured out what the images on three of the slabs represent, the other two appear to depict some sort of four-legged beast and an 18-centimeter-tall human figure with the head of an animal—which Broglio says is similar to images often seen in more recent caves and called "sorcerers" by cave art experts.

Lorblanchet says that the finding of a sorcerer at Fumane "does not surprise me," because a similar motif—a strange hybrid of rhinoceros and human—has also been found at Chauvet. Another spectacular example, a statuette of a human with a lion's head dated to at least 30,000 years ago, was uncovered in southern Germany in 1939. With the discovery at Fumane, White says, "we now have this image in three different places during this early time period."

This concurrence has cave art experts re-

CREDIT: A. BROGLIO

ally excited. "It is one thing to represent a horse, but another thing to represent something that is a figment of the collective imagination, something that doesn't exist in reality," says White. "People had ideas about the world that were abstractions, which we can only describe as religious. We are looking at a widespread belief system that is very ancient." –MICHAEL BALTER

ECOLOGY

Plant Invader May Use Chemical Weapons

In Montana and other parts of the northwestern United States, an imported purple-flowered plant called knapweed grows so thickly that it looks as if ranchers are cultivating it as a crop. Yet in the Caucasus foothills of the Republic of Georgia where knapweed is native, this plant is so uncommon that plant ecologist Ragan Callaway of the University of Montana in Missoula had to enlist the help of local botanists just to find any at all.

Clean sweep. Knapweed is hard to find in its native land, but in Montana it colors the hills purple.

CREDIT: CATHERINE ZABINSKI/MONTANA STATE UNIVERSITY

Ecologists would love to know what explains the rollicking success of invaders such as knapweed, which in the United States is an aggressive, thistlelike weed that cows don't eat and ranchers and government agencies battle using herbicides. A traditional answer is that all the invaders' natural predators and pathogens have been left behind. On page 521, however, Callaway and colleague Erik Aschehoug offer a novel explanation for the success of invasive plants. By comparing how one species of knapweed, *Centaurea diffusa*, behaves with its natural neighbors and with foreign plant species that evolved separately, they found that the invader gains an edge in its adopted home not only by ditching its herbivores but also by wielding weaponry: chemicals exuded from its roots that hamper its new neighbors' growth.

The work is "important" because it could help predict which organisms will be successful invaders, says Kevin Rice, a plant population biologist at the University of California, Davis. "We haven't considered [such underground interactions] in the past." The finding that some plants use subsurface chemical warfare on foreign soil also suggests, says Callaway, that a popular strategy of fighting exotics—siccing insects from back home on the plants—may be even less effective than experts think.

To explore knapweed's underground maneuvers, Callaway and Aschehoug, now a plant ecologist with The Nature Conservancy in Ventura, California, began by pitting *C. diffusa*, or diffuse knapweed, plants against either American or Eurasian grasses in pots. The researchers found that the American grasses produced 85% less leaf and root mass when they were planted with knapweed, whereas knapweed's growth was unaffected. A more complex picture emerged when Eurasian grasses were planted with knapweed: The grasses' biomass dropped by 50%, and the knapweed's growth declined as well.

Callaway and Aschehoug suspected that knapweed's roots exude organic chemicals that stopped the Montana plants from absorbing nutrients. To test that idea, they added to their knapweed-grass pairs some activated carbon, which sucks up organic molecules. They found, Callaway says, that the addition "changed the balance of competition. The American grasses did better, and the Eurasian grasses did worse." Confirmation that knapweed interferes with the American grasses' ability to take up nutrients came when the team then injected the soil with a radioactive form of one potentially limiting nutrient—phosphorus—and tracked how much the various plant pairs snagged.

In the absence of the carbon, knapweed more than halved the amount of phosphorus captured by the American grasses; adding the carbon helped these grasses a bit. In contrast, the Eurasian grasses not only took up just as much phosphorus when grown with knapweed, but also appeared to pack weapons of their own: Adding carbon in the presence of knapweed drastically reduced the amount of phosphorus the Eurasian species took up, suggesting they had been pumping out chemicals that helped them

ScienceScope

Making Amends Following through on a promise made earlier this year, the U.K. government has handed out grants totaling $36 million to scientists who lost the contest for a valuable facility. Last March, the government announced that the $880 million Diamond synchrotron, which will produce x-rays for studying materials, will be built at the Rutherford Appleton Laboratory in central England near Oxford and not at the Daresbury Laboratory in the northwest (*Science*, 17 March, p. 1899). As compensation, the government promised new science funds for the northwest.

This week, a panel awarded the first nine grants, choosing from 52 proposed projects. The winners include a $3.6 million genomics center, a $3 million virtual engineering effort, and a $10 million imaging institute. The panel recommended further study of two other big-ticket items, including a $120 million advanced light source at Daresbury and a $25 million biopharmaceutical facility.

Some scientists think the funding is inadequate. Physicist John Dainton of Liverpool University, a member of the grants panel, said that the "compensation is just a drop in the ocean compared with the loss of a synchrotron."

Dedicated to History The leaders of Germany's top basic research organizations gathered in Berlin this week to dedicate a monument to the victims of Nazi-era brain research, just days after a historical commission released a preliminary report on biomedical science abuses during the Hitler era.

The new monument to "the victims of Nazi euthanasia crimes" marks the site—now on the campus of the Max Delbrück Center for Molecular Medicine—where scientists at the Kaiser Wilhelm Institute for Brain Research experimented on brains taken from Nazi victims, including the mentally disabled. At the ceremony, Max Planck president Hubert Markl said his commission's new report makes it clear that "directors, scientists, and lab assistants of several biomedical Kaiser Wilhelm institutes placed themselves in the service of a criminal regime." Max Planck succeeded the Wilhelm institutes.

Markl joined Ernst-Ludwig Winnacker, head of the DFG granting agency, and Detlev Ganten, head of the Max Delbrück Center and the association of German research centers, in calling for a full accounting of Nazi-era abuses. Winnacker said a new DFG panel (*Science*, 2 June, p. 1576) plans to share information with the Max Planck commission's ongoing inquiry.