And indeed, if a research team can live without NIH support, there's no reason for it to come to the gene therapy subcommittee at all. Take a company like Viagene, Inc., in San Diego. Using recombinant DNA techniques, researchers there are developing a way of inserting certain proteins from the AIDS virus into an AIDS patient's cells in the laboratory, and then injecting those cells back into the patient to stimulate an immune response to the virus. All this is being done with private financing. So although Douglas Jolly, scientific director of Viagene, says that the gene therapy subcommittee might provide useful advice, he concedes that it's not certain the team will seek RAC approval since it's the FDA that will determine whether Viagene has a marketable process.

And therein lies the rub for gene therapists like Anderson. While they're all for streamlining the process, they worry that even if the FDA has the ability to judge whether a protocol involving cutting-edge science such as gene therapy is safe and effective, the process will go behind closed doors since the FDA typically conducts its reviews in private. If an unsafe proposal should slip through—and the potential always exists for unexpected behavior from an inserted gene or the vector that carries it into a cell—the hard-won public confidence in gene therapy would vanish. At least in NIH's public forum, skeptical scientists can warn their colleagues or the public if they feel something is amiss.

The RAC and its gene therapy subcommittee have begun to look for ways to shorten the approval process. At last week's meeting the subcommittee formed a working group to identify which projects would no longer need close scrutiny. The subcommittee also considered but did not act on a proposal to combine the RAC and its subcommittee into a single entity, since the two committees perform much the same task with many of the same people.

But sometimes it's hard to know just what the subcommittee is doing. After railing for hours at University of Rochester researcher Scott Freeman for his failure to provide detailed answers to the committee's formal "points to consider" in his protocol—warning him and others that such a failure was intolerable—the committee nevertheless approved his protocol 7 to 1 with two abstentions. Even those interviewed by *Science* who voted for the experiment were at a loss to explain why they had abandoned their own rules. One person observing the meeting suggested the approval might have been associated with the fact that the meeting had dragged on for 9 hours, and the dinner hour was beckoning. Perhaps future reviews should be scheduled only for the morning. ■ JOSEPH PALCA

A Trap to Snare a Monopole

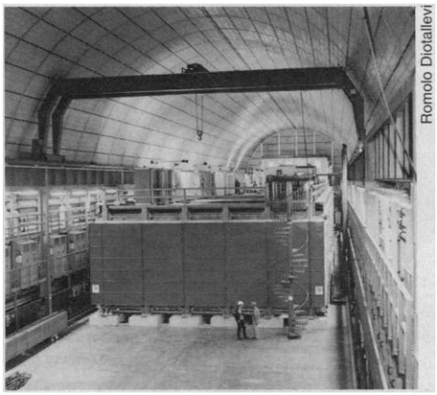
Deep inside Gran Sasso, a peak in Italy's Apennine mountain chain, physicists are waiting for the most massive elementary particle yet theorized to lumber in from outer space and reveal itself. If the search for this elusive particle, the magnetic monopole, is "a gambler's field," as one physicist calls it, then this group of scientists from the United States and Italy is betting big—to the tune of $20 million, the cost of the Monopole, Astrophysics and Cosmic Ray Observatory (MACRO), which has been under construction for 7 years and now stands ready for a monopole sighting.

"It's really a long shot, but a very important long shot," says University of Chicago physicist Henry J. Frisch, adding, "It would be the discovery of the century." More specifically, a monopole detection would be the first unequivocal sighting of a particle conceived as a solitary magnetic pole—a "north" without a "south."

Scientists can't make a monopole by cutting a magnet in half—each half is left with two poles. Nor can they conjure one up in an accelerator—the mass of a monopole is so great (about the same as a paramecium) that cooking one up from scratch would take too much energy. So physicists need to catch the strange beast to prove its existence.

The search amounts to more than a unicorn hunt, for the quest has high theoretical stakes for particle physicists and cosmologists. Grand Unified Theories (GUTs), which mathematically tie together the strong, weak, and electromagnetic forces, predict that the Big Bang created a slew of monopoles. Many of them would have annihilated themselves in the early universe, but GUTs insist that a few monopoles must survive. And if they do, the massive particles could help cosmologists out of their own theoretical bind, posed by the fact that the universe seems to contain a large helping of invisible—and so far inexplicable—mass. According to Caltech physicist Barry Barish, who codirects the joint U.S.-Italy detector, monopoles could account for "anywhere between 3% and 100% of the dark matter in the universe, depending on how many we find and how heavy they are."

Physicists have set off on monopole hunts before, only to be disappointed. In the 1960s and 1970s, they had high hopes that they could squeeze monopoles out of magnetic materials such as iron ore or moon rocks or detect their ancient tracks in flakes of mica. But after fruitlessly combing rocks for monopoles or their traces and making several efforts to create monopoles in accelerators, many physicists were ready to give up the chase. Then, on Valentine's Day 1982, using a coil of superconducting niobium wire, Stanford University physicist Blas Cabrera announced the discovery of what he thought was a magnetic monopole. But that seems to have been a false alarm. Having tried unsuccessfully for 8 years to record another monopole, Cabrera wrote in the 19 February 1990 *Physical Review Letters* that the find "should be discarded."



Romolo Diotallevi

The waiting game. *MACRO gets ready.*

So the burden of proof falls on MACRO, actually a collection of three kinds of detectors layered in a football field-sized mass of concrete and iron that, in addition to monopoles, will detect neutrinos, muons, and other exotic particles. Last month scientists fired up two of the detector's six sections, and they plan to complete the other four sections in the coming weeks. If a monopole does pass through any one of the detector's sections, which are cloistered underground to limit the background radiation, it should leave three separate marks: a flash of light in the liquid scintillation counters, a burst of ionized helium in the plastic streamer tubes, and a trail of cracks in the plastic track-etch detectors.

Scientists say the redundancy will prevent spurious detections. But the main reason physicists give MACRO better odds than previous efforts is its sheer size, about 1000 times bigger than Cabrera's desktop-sized detector. Says Richard Heinz, an Indiana University physicist working at MACRO, "We'll be the first detector that has a chance." ■ RICHARD STONE