larly susceptible to MPTP insult as human brains: levels of dopamine decrease in the neostriatum and cells of the substantia nigra are lost (*6*). The obvious experiment was to dose the animals with pargyline before administering MPTP, in the expectation that the neurons might be protected. They were. The result is soon to appear in *Nature*.

Langston heard about Castagnoli's pargyline work from Heikkila, and, after first consulting with the UCSF workers, proceeded with the obvious experiment in squirrel monkeys, results of which are published in this issue of *Science* (page 1480). As expected, by inhibiting the activity of monoamine oxidase B, pargyline blocks the conversion of MPTP to MPP^+ and prevents brain damage. The buildup of MPTP in potentially susceptible areas of the brain unequivocally demonstrates that MPTP itself is not the toxic agent and that monoamine oxidase B activity is required for toxicity to develop.

Heikkila and his colleagues have probed further on the nature of MPTP as a substrate for monoamine oxidase by measuring the reactivity of almost a dozen structural analogs of the drugs. None of the analogs—made by removal or modification of the methyl group or the benzene ring—is as metabolically fitted to the enzyme as MPTP itself, an observation that is confirmed by separate work at Stanford and other laboratories. It is one of those cruel turns of fate that MPTP, the accidental contaminant of "synthetic heroin", is the most potent substrate of this important brain enzyme.

In parallel with all this work on the metabolism of MPTP have been various investigations into the sites at which MPTP binds in the brains of rats, mice, monkeys, and humans. When Jonathan Javitch, George Uhl, and Solomon Snyder of Johns Hopkins University School of Medicine produced autoradiographs of rat and human brain slices treated with radioactive MPTP, they had in mind that distribution of the drug might shadow that of some known transmitter—a very natural expectation (*7*). In their original publication, Langston had speculated on the possibility that MPTP might be hitting the binding site of a normal brain chemical, an "endogenous MPTP".

First, Snyder and his colleagues noted that MPTP binds with high affinity to areas known to be destroyed in people who take the drug, which was anticipated. But there is also some binding in normally unaffected areas, which is something of a puzzle. Most puzzling

First Look at the Deepest Hole

The first foreign visitors ever to visit the site of the Soviet superdeep Kola borehole were mightily impressed. "It is a stupendous technological achievement having no equal outside the U.S.S.R.," says Wilfred Elders of the University of California at Riverside, one of five Americans in the international party of about 45 that visited the hole last month. The Americans at least also voiced one disappointment. "It's not apparent that they've got much science out of it yet," says one visitor. Disappointing or not, the emphasis for the time being seems to be on technology and drilling.

One of the more impressive Soviet achievements is that their drillers have reached a depth of 12,063 meters without a single major problem. The relatively benign drilling conditions and the extreme care exercised by Soviet drillers have helped ensure such a spotless record. Such care does not ensure great speed. The drill bit can make 2 to 3 meters of headway for every hour of drilling, and an exceptional system of drill rig automation allows complete retrieval and reinsertion of 12 kilometers of drill pipe in 18 hours ("which is really hopping," according to one visitor). But 14 years have passed since drilling began and, according to one report, only 65 meters have been added since last December. American drillers contemplating a proposed 10-kilometer hole in the southern Appalachians are allowing only 3 years of drilling, which assumes that all will go well (*Science*, 29 June, p. 1418).

The recovery of rock samples from the entire length of the Soviet hole is another notable achievement. The effort to recover a complete core sample during drilling has returned samples of as much as 60 to 80 percent of the rock drilled, although recoveries during continuous coring at 12 kilometers are apparently about 20 percent. Some reports from visitors hold that 8 kilometers of rock core are now in hand. The effort to core continuously is impressive in itself, and the present rate of recovery in such hard rock would be respectable even at much shallower depths. Aside from providing bountiful material for crucial analyses, such as age determinations, the ambitious coring will simplify interpretation of results from instruments, called logging tools, that are lowered down the hole to record physical and chemical properties of the rock. American plans for deep-hole coring remain vague, but preliminary thinking has included coring during only about 10 or 20 percent of the drilling instead of 100 percent.

Those who heard about the Kola hole at the International Geological Congress in Moscow or traveled to the site on the postmeeting field trip came away with a high regard for Soviet technology and the Soviets' sheer determination to drill deeply, but they gathered disappointingly few details of the resulting scientific findings. "Everybody felt that we didn't get any details, any facts," says M. E. Bickford of the University of Kansas. That was despite the openness of their hosts and the obvious centerpiece position of the Kola hole at the meeting. Everyone had been intrigued by early reports of strange activity deep in the hole (*Science*, 29 June, p. 1420). But how were the great depths of reported fluid and gas influx determined? What geophysical techniques were used to survey the area? What are the interpretations of the 18 different logs used in the hole? All the uncertainty left many of the visitors assuming that much of the scientific work remains to be done as the technology and the drilling of the hole continue to be pushed ahead.

American scientists are eager to cooperate in the analysis of the cores. They made overtures at the meeting and will pursue the possibility through international channels, but the Soviets have not yet revealed their attitude toward cooperative analysis. If their ambitious plans are any indication, they may have their hands full in their own backyard. The second superdeep hole at Saatly near the Caspian Sea stands at 8260 meters following some drilling difficulties and, contrary to recent reports, will be deepened toward crystalline basement at about 11 kilometers. A web of geophysical profiles will connect 11 deep and superdeep boreholes as part of an effort to elucidate the geology of the U.S.S.R. and identify new mineral resources.

—RICHARD A. KERR