

munity mental health centers and shutting thousands of people through with a sure-fire analysis of the mental health of the patient, his family and his society. Possibly, the psychiatrist says, a kind of television eye could be set up in the home to pick up interactions between family members. Information could then be fed directly into a computer for diagnosis.

• Defense analysts have been schooled in thinking about the unthinkable and have calculated the relative advantages and disadvantages of

higher and lower levels of annihilation.

From this kind of speculation it is no great leap of imagination to the peace games of the "Iron Mountain" report. A peace game is a computerized technique that will "revolutionize the study of social problems." With it the Iron Mountain analysts can calculate the effects of a moon landing on elections in Sweden or the impact of a draft law change on real estate in Manhattan.

We have the means, says the anonymous author. "It's in a primitive phase, but it works." ♦

BACK IN THE FURROW

Atomic Explosions for Peace Rescheduled

With the rescheduled Gasbuggy test due to take place this week, the Atomic Energy Commission's peaceful explosions program, Plowshare, seems back in the furrow.

A flurry of recent activity in the Plowshare program has included proposals for two tests that, like Gasbuggy, would use nuclear explosions to free recalcitrant natural gas from underground deposits; another to form an underground reservoir to store gas, and tests to free shale oil and break up copper ore.

All the proposals followed joint AEC-industry feasibility studies.

"From the outside," says Plowshare assistant director William L. Oakley, "it may look like the program has been languishing and is just now coming to life. But actually we've been working pretty hard. There's a lot of preparatory work to these programs, and they just are coming to fruition all at once."

Gasbuggy, originally scheduled for Nov. 14, was postponed because water leaked into the emplacement near Farmington, N.M., and test directors wondered if the cement shell had developed a crack.

After finding the shell intact, they decided the explosive could be put in the wet hole, and the water could be forced out by the cement added to the emplacement to tamp it down.

As in the oil shale and copper experiments, the natural gas test is designed to break up hard rock formations that make the resource hard to recover.

The natural gas could be drawn off directly. Shale oil, in the form of solid hydrocarbons, would be decomposed by igniting the broken shale and driving the oil to a pool at the bottom of the rubble, from which it could be pumped up.

Copper would be dissolved, or leached, from the rubble by percolating dilute sulfuric acid through it and then re-

covered from the solution without the expense of mining and crushing the ore.

"Copper leaching isn't new," says Oakley. "The technology is known, and so is the technology of nuclear explosives. It's a matter of getting the two technologies together to see if they fit."

Apparently they do, since the feasibility studies resulted in formal industry proposals to go ahead with the project. The AEC is now studying the proposals.

Meanwhile, the most spectacular application of nuclear explosives, for excavation of canals and harbors, is languishing in the doldrums of international politics.

Project Cabriole, scheduled for last February, was one of six cratering experiments planned to develop the technology of blasting nuclear holes where they would do the most good, particularly in digging another Panama Canal. But the test was postponed indefinitely to avoid complicating negotiations of both the Latin American Nuclear Free Zone pact and the atomic non-proliferation treaty (SN: 5/13).

The AEC requested, and got, money to perform the test during fiscal 1968. Along with authorization of the money, the Joint Atomic Energy Committee tartly complained of the "inconsistency of offering to other nations something which is not now available (cratering technology) while at the same time and in the same context postponing the effort to develop the promised technology."

Despite this encouragement, the Cabriole experiment remains under continuous interdepartmental review.

And the deadline this year, as last, is April, when spring grazing lands near the Commission's Nevada Test Site northwest of Las Vegas will become vulnerable to short-lived but deadly iodine 131 fallout which could affect dairy cattle.

FOOT-AND-MOUTH IN BRITAIN

Grounds for Slaughter

Foot-and-mouth disease, a malady that affects only cloven-hoofed animals such as cattle, sheep and pigs, is not primarily a killer. It causes sore gums that make eating difficult and painful, and blistered feet. Farmers and other livestock owners, however, hold the disease in such terror that it might seem to be death itself.

It spreads like wildfire. It can be carried by almost anything—other animals, human beings, birds, the wind, automobile tires. Most importantly, it leaves the livestock virtually worthless (SN: 9/22).

In 1923, a foot-and-mouth epidemic swept Britain and resulted in the deaths of more than 128,000 animals. Yet it is likely that only a small percentage of that number had actually contracted the disease, and few if any of those actually died from the virus that causes it. The animals were slaughtered, killed in countryside programs to keep the disease from spreading. If even one animal on a farm was found to have the disease, every cloven-hoofed animal on the farm was killed and either buried or burned.

The technique is effective. It wiped out the disease from the U.S. in 1929, Canada in 1952-53 and Mexico in 1947. Australia (with 50 percent more cattle than Britain and five times as many sheep), New Zealand, Japan and Central America all use it.

But since mid-November, Britain has been in the grip of its worst outbreak of foot-and-mouth disease in this century, and so much livestock has been slaughtered that farmers are clamoring for the alternative—vaccination. Almost 200,000 animals have been killed since the first sign of the disease on a Shropshire pig. The owners are compensated for the animals by the government at market value, except for animals that are already diseased, in which case the compensation is zero.

Livestock shows, horse races and even a cross-country automobile rally have been canceled to prevent the spread of disease. On Nov. 19 a ban was imposed on the movement of livestock throughout England and Wales; five days later all of Scotland was quarantined. Neighboring farmers have been avoiding each other like the plague. Farms suspected of harboring the disease and their neighbors within 10 miles have been issued "standstill orders," prohibiting any movement of livestock. Within a diameter of 20 miles beyond that, any movements of cloven-hoofed animals require a special, and hard-to-get, permit.

By the beginning of last week the