

other down with a surgical antiseptic solution. The frogman will also clean the hatch area of the spacecraft with the same solution.

Precautions against back-contamination, however, will begin before the Apollo lunar module ever leaves the moon's surface. As much contaminated equipment as possible will simply be left on the moon, including the television camera, special overshoes that the astronauts will wear on the surface, the portable life-support backpack used during surface exploration and other items.

Once back in the LM, the astronauts will brush off all possible lunar dust, and when the LM rejoins the Apollo command module in lunar orbit for the trip home, the air pressure in the command module will be kept higher than that in the LM to keep any contamination contained in the LM.

During the trip back to earth, the three astronauts will permanently store their spacesuits to avoid prolonged contact with any lunar material that might remain, as well as vacuum the spacecraft.

The precautions are exhaustive, though some critics still worry that they may not be exhaustive enough. But if some strange bug from the moon does appear, what will the reaction be? Joy at the discovery of life on another world? Or fear?

10,000 RUSSIANS

Amantadine vs. Hong Kong flu

U.S. public health officials ruled last year, during the epidemic of the Hong Kong flu (SN: 11/2, p. 444), that the drug amantadine hydrochloride had not been proved safe for that disease.

Their Soviet counterparts were less cautious, and 10,000 residents of Leningrad demonstrated that the drug, made in the United States and stocked there on pharmacy shelves for other diseases, could have limited the U.S. epidemic.

U.S. drug laws that demand proof of efficacy and safety kept the Du Pont Company of Wilmington, Del., from advertising its amantadine hydrochloride (Symmetrel) as a preventive for the Hong Kong strain, though scientists believed it would be effective. It had been developed and approved as an Asian flu drug (SN: 9/2/67, p. 228).

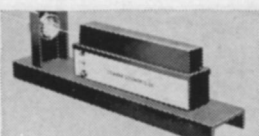
Meanwhile, researchers at the All Union Research Institute of Influenza in Leningrad purchased the amantadine from Du Pont last year and conducted extensive human trials in January and February when the Hong Kong epidemic peaked in that city. Dr. Anatoli A. Smorodintsev, director of the insti-

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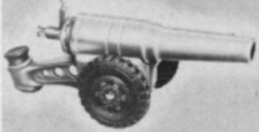
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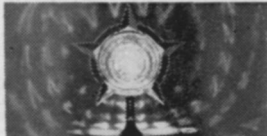
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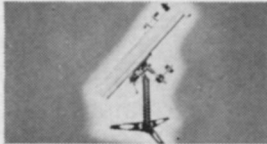
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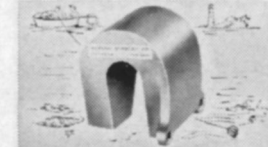
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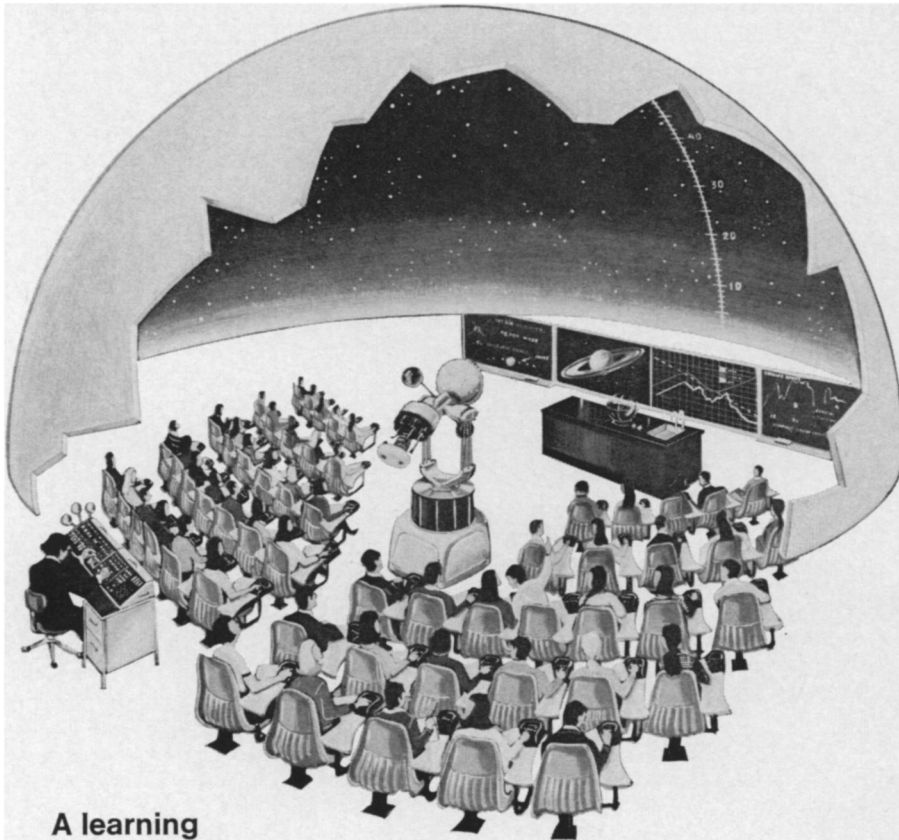
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tute, told the New York Academy of Sciences that in preliminary studies "Amantadine was found to prevent the development of clinical illness in 54.1 percent of 159 volunteers and to diminish the severity and duration of the symptoms in the remainder of the subjects." The volunteers were given amantadine 24 hours before they were exposed to Hong Kong virus.

On the basis of that evidence the Soviet researchers moved to expanded tests involving 10,053 persons in January. Half of them received amantadine, either in capsule form or as a syrup mixed with Coke or lemonade, every day for 30 days. The other half were given placebos or nothing at all. The drug-treated subjects experienced half the incidence of flu of the control half.

Dr. Smorodintsev reported to the academy's conference on antiviral substances that results were achieved with daily doses of 100 milligrams of drug given at bedtime and that virtually no side effects were noted. In the U.S. the daily dosage of amantadine is 200 milligrams—half the toxic dose—and side effects including insomnia, nervousness and lightheadedness have been reported.

Dr. Bruce Dull of the U.S. Public Health Service's Advisory Committee on Immunization Practices recommended against use of amantadine for Hong Kong flu because:

- Tests of its effectiveness against the Hong Kong strain had not been made.

- Side effects particularly affected the elderly for whom the flu was most serious.

- Daily doses were required.

At this point the committee has no plans to change its recommendation in advance of another outbreak which may come next winter, but it will review the Soviet evidence when it receives it officially. Dr. Smorodintsev says that the U.S.S.R. is considering buying 10 million doses of amantadine for use in Russia next year.

Amantadine begins working quickly with known effectiveness against the A2 Asian strain of virus. The Hong Kong virus is a variant of that strain.

Dr. Ernest Herrmann of the Mayo Clinic considers amantadine important because it demonstrates the usefulness of drugs against viruses. Previously vaccines were the major antiviral agents. "Amantadine," he says, "prevents A-strain viruses from entering cells and taking over their genetic machinery in order to make more viruses. Its specific mechanism of action is still unknown. One advantage of amantadine is that it is fairly weak and though it prevents illness it does not knock out the patient's immune response." ◇