

ner and Padman S. Sarma of NCI present further research demonstrating that RD-114 is mammalian and is not of previously known origin. They also imply that the virus is of human origin but want further verification.

Discussing RD-114 this week, Huebner (who has been extremely cautious about previous human cancer-virus claims) said: "This is a real virus. It is growing very well and five different laboratories are working intensely on it. All of them are finding what we found." Huebner even predicted that "in another four weeks there will be good evidence that this is a human virus."



Georgetown Univ.

*Stewart unveiling her candidate.*

Sarah Stewart at Georgetown is hoping for similar evidence. She has developed a cell line, also from human rhabdomyosarcoma, in which viruses resembling the C-type particles were observed. Her virus, however, did not come by way of a cat. It was activated chemically and is therefore less likely to be an animal contaminant. But the work is far from complete. Unlike the USC researchers, Stewart has not had her work duplicated or evaluated by other laboratories; and at present the necessary immunological studies have not been completed.

For these reasons Huebner feels that at this point all Stewart has are electron micrograph pictures of an unidentified body. "She won't let the cell line out to anybody and she wouldn't give it to us to study," he explains. And as far as he is concerned she still has to show that she even has a virus.

William Feller, Stewart's collaborator in the study, says "all indications point in the direction that it is a virus of human origin." And until one or the other group is proved wrong, both will continue to work with what they have for proof of a link between the virus and cancer. □

## Doubling rainfall during Florida's drought

Last spring, the National Oceanic and Atmospheric Administration conducted a large-scale cloud seeding project to try to alleviate a severe drought in Florida. The project was to seed clouds over a 4,800-square-mile target area north of Lake Okeechobee from April 1 to May 31 (SN: 4/10/71, p. 246). A network of 121 rain gauges would help assess results. The project's directors, Joanne Simpson and William L. Woodley of NOAA's Experimental Meteorology Laboratory in Miami, cautioned beforehand that seeding could produce only limited results. Drought conditions are the worst possible for seeding, and even under ideal conditions seeding efforts alone would be insufficient to end a drought. Nevertheless, they reported last week at the 7th Technical Conference on Hurricane and Tropical Meteorology in Barbados, their efforts more than doubled the amount of rain that might have fallen naturally from the clouds they seeded.

The results came despite numerous difficulties. During the two months of the project, seeding could be conducted on only 14 days. By the end of April, there had been no seedable clouds over the original target area. In addition, 4,000 acres of tomatoes had reached the stage when they are most vulnerable to damage by rain, and there were also air traffic problems. So a second target area, south of the lake and along the east coast of Florida, was established. There were fewer rain gauges in this area, but it had the advantage of being within range of the University of Miami's special radar which can estimate both intensity and location of rainfall.

Using the university radar, plus rain gauges and standard radar observations, the researchers estimated that seeded clouds throughout the entire experiment produced a total of 180,000 acre-feet of rain. Since radar usually underestimates rainfall, and since the gauge network was sparse, Simpson and Woodley believe the actual amount was higher.

The critical question, however, was what fraction of this rainfall could be attributed to seeding. Such a question is difficult to answer even under ideal experimental conditions, and the EML researchers were compelled by worsening drought conditions to seed whenever possible.

The estimates of seeding-induced rainfall were derived from several sources. The numerical model on which seeding operations were based makes some predictions about seeding effects under various conditions. Also, Simpson and Woodley have been conducting their experiments for several years, so that past experience gives some indic-

ation of the effectiveness of seeding. They have found, for instance, that a single seeded cloud produces about 3.3 times as much rain as a similar nonseeded cloud. Finally, rainfall from seeded cloud systems on a given day of the project was compared with that from the most intense nonseeded cloud system within 100 nautical miles of the Miami radar facility.

In what they term a very conservative estimate, the researchers say that seeding produced a rainfall increase of a little over 100,000 acre-feet. "This is almost certainly an underestimate." This volume of water is small compared to the shortage existing then in Florida, they point out, but "the benefit-to-cost ratio of the program was very high indeed." The final cost of the program was \$165,000. The dollar value of rainfall is difficult to assess, but using the southern Florida municipal water systems assumption of \$50 per acre-foot, the seeding program produced \$5 million worth of rain. Overhead sprinkler irrigation, widely used in Florida, costs \$108 per acre-foot. "Some of the seeded rainfall quenched Everglades fires and hence may have been much more valuable than these numbers indicate."

The researchers conclude that although cloud seeding does not produce enough rain to break a drought, their seeding techniques can help mitigate local effects of drought in Florida. □

## It's full speed ahead for Washington's Metro

In a rare action against its own leadership, the House last week voted 195 to 174 to override its own Appropriations Committee and restore a \$72 million appropriation for the Washington, D.C., Metro system—thus assuring that construction would continue on the subway system (SN: 12/4/71, p. 372).

The floor victory, supported by neither Republican nor Democratic leaders, was partly in response to President Nixon's personal intervention on behalf of Metro. But it may also have represented growing awareness of the problems caused by the automobile in urban areas.

In the meantime, in what might be a bellwether action for the rest of the nation, the District of Columbia Air Pollution Control Bureau continued to press for its goal of a 25 to 50 percent reduction in commuting autos from Virginia and Maryland. At the first hearings on the goal, held last week, there was no major opposition. The bureau is now negotiating with the Federal General Services Administration in an effort to reduce the number of auto-commuting Federal employees entering the District. □