



JET CAR TESTS GEAR—The bright red hot rod, powered by four jet engines, roars down a test track at 200 miles per hour or more. It pushes in front of its dead loads, which are slammed into arresting gear, testing the strength of the gear and its capability to absorb the energy of a landing jet fighter or bomber.

AGRICULTURE

Hunger to Cause Unrest

► THE MORE than 77,000,000 inhabitants of Russia's European satellites are going to be a lot hungrier this year than they were last year. And last year, although food consumption was not a famine diet, it was not satisfactory.

Poor harvests, mismanagement, a rapid buildup of cities and political unrest are all to blame, researchers at the U. S. Department of Agriculture said.

The poor food situation faced by the satellite peoples in Hungary, Poland, Czechoslovakia, East Germany, Rumania and Bulgaria spell more headaches for the Soviet Union. The Hungarian uprising will mean that other satellite nations will have to strain their larders to help out. This in turn will create further political unrest. A decrease in food supplies will mean an increase in discontent.

Here is how USDA's European Analysis Branch sees the future food situation in the Soviet Satellite area:

The 1956 grain harvest is down from last year.

Hungary faces a grim winter even if substantial relief is received. In addition, the rebellion in that country has disrupted the movement of supplies from surplus to deficit countries in the Red orbit.

If food consumption is to be maintained even at the unsatisfactory 1955-56 level, the

southern satellites and possibly the northern satellites will have to cut exports and/or increase imports.

Last year, the Government experts report, more or less pronounced shortages of meat, fats and dairy products plagued the urban consumer in all the satellites.

Rapid urbanization has been a cause of food shortages in Poland; in Czechoslovakia, per capita supplies in terms of calories were about the same as before the Second World War; the East German Government still maintains a far-reaching rationing system; Hungary and Bulgaria had to import wheat; and Rumania, although blessed with a bountiful wheat harvest, had flour rationing, brought on by excessive exports.

The shortages, the experts agree, stem from a number of causes, notably: low level of supplies, inability to make the food distribution system work and rapid urbanization. At the root of the food supply problem, they say, is the failure of the satellite nations to expand their output, which is still below the prewar average. In addition, agriculture has been hampered by the Red emphasis on heavy industry, a problem that plagues even Mother Russia.

Finally, the USDA observers report, satellite farming has suffered from a number of unfavorable growing seasons since 1950.

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BIOCHEMISTRY

Smaller Virus Pieces Discovered Infectious

► SCIENCE has taken a step closer to possible understanding of the chemical basis of virus infection and mechanisms of heredity, as the result of work reported to the New York Academy of Sciences conference on viruses and nucleic acids by Dr. Heinz Fraenkel-Conrat of the University of California virus laboratory.

Dr. Fraenkel-Conrat discussed two recent results of his work.

One, he gets virus infection with nucleic acid (NA) about one-twelfth the size of the unit previously accepted as necessary for activity. NA contains all the capacity for virus infection and genetic transmission.

Two, new work in which fragments of NA cause infection provides further insight into internal virus structure.

Dr. Fraenkel-Conrat and Dr. Robley Williams over a year ago reported first recombination of two apparently inert virus components—rod-shaped NA core and protein coating. Later he showed NA active all the time, so this component never was inert.

Finding a smaller NA unit capable of activity gives better chance some day of understanding infection and the hereditary mechanisms caused by chemical structure. The molecular weight of the smaller unit is 200,000. This helps define minimum size of the active unit.

Proving fragments of viruses are active has brought important revision of the internal virus structure. In earlier experiments it appeared broken viruses lost infectivity. Recently, however, Dr. Fraenkel-Conrat showed fragments are infectious. Particles one-third to two-thirds full rod length are the most infectious of the fragments, though not as infectious as intact NA.

It was formerly assumed that NA molecules must be intact to infect, since broken viruses appeared unable to infect. It was also assumed all NA strands ran full length of the virus rod and were all broken when virus fragmented. It is now believed that some NA strands may be rolled up like string and overlap. This would explain how in fragments some NA strands remain intact and therefore infectious.

Dr. Fraenkel-Conrat also showed that addition of metal chelating compounds, such as pyrophosphate, increase the efficiency of reconstitution and can restore 30% to 40% of activity in contrast to only one percent in early experiments.

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A unique *photographic machine* that controls individual development of each negative on a long roll of film is now ready for use.

A new *instrument* to prevent thinning out of the water flowing over Niagara Falls can pick up a microscopic 1/50th of a foot change in the level of Lake Erie which feeds the Falls.