

lowship was over, he moved on to Australia.

In the late 1950s he failed to arrive at a New York Academy of Sciences meeting where he was slated to present a paper; his visa request had been denied by the U.S. Government.

"Edman, like most young Europeans, had some leftist leanings during his school days in Sweden," says one U.S. scientist. "When McCarthyism came in, such Europeans stayed out."

Although scientists believe Edman would no longer be barred from the U.S., red tape apparently lies behind his refusal of frequent invitations to come here.

"Our country has some strange laws," one man explained. "In order for Edman to get in, he'd have to go through both the Swedish and Australian governments before tackling the State Department. He just doesn't think coming here is worth all that."

Currently, Dr. Edman is working on the structure of Bence-Jones proteins that come from cancer patients. Immunologists hope to find out how these proteins differ structurally from normal proteins and how they manage to bypass the body's immune system.

Eventually, scientists hope to move from structure analysis to protein synthesis with implications for correcting genetic defects, eliminating some forms of cancer and designing new drugs far more selective in their action than today's products. But with the exception of insulin, a short 51 amino acid compound, proteins have not been synthesized.

Insulin synthesis was first reported by Red Chinese scientists in November 1965. Since then, German and American scientists have duplicated their results, but synthetic insulin still is not available commercially.

Dr. Moore predicts another protein, ribonuclease, will be synthesized within the year, but its full structure is already known. Edman's sequenator will lead to more.

Czechoslovakian scientists are the only ones who have built a replica of the protein machine, Dr. Moore says. But researchers in Baltimore, Boston, Chicago, Washington and New York are working on it. "I think there are some ways to simplify the sequenator," Dr. Moore says.

The protein sequenator, mass-produced, would cost about \$15,000. ♦

A significant number of even the more successful Negroes—those with white collar jobs and at least a high school education—are "emotionally prepared for violence as a strategy to end the problems of segregation, exploitation and subordination," says Dr. Murphy.

Adding to the difficulty is the problem of double backlash. Black nationalists, for all their implacable stance, remain a minority among ghetto residents. But whites are generalizing militancy to all Negroes, and people in the ghetto resent it, and resent the whites for it, says Dr. Hadwen.

He believes as well that "we are seeing a white reaction that is very bad." After Watts, many Los Angeles whites were able to maintain an understanding view. But that ability is cracking too.

As one Los Angeles woman said, "If this riot starts to happen again, we should give one warning and then drop a bomb."

In Dr. Hadwen's view, it is not likely to happen again in Watts. The area is depressed, psychologically and economically, he says. Much destruction was never repaired and in many areas more than half the businesses are closed.

"Watts people are aware of how much damage the riot did," he says. "Only the young men are at all interested in starting another."

Despite their pessimism, however, sociologists do have advice to offer cities.

Dr. Spiegel's group studied six—Cleveland, Dayton, San Francisco, Pittsburgh, Akron and Boston, 6,000 people in all—and found that the ghetto attitude toward local government was a most important, if not the most important, measure of grievance.

"The evidence indicates that Negroes are not responding purely and simply to the actual steps a city is taking, but rather to the emotional attitude of the local administration," he says.

Either a city takes a get-tough attitude, or it says more complacently, in effect, "Look at all we are doing for you." Neither attitude is any good, comments Dr. Spiegel.

Ghetto residents know that problems are difficult and long range, he says. If an administration is frank, gets down to the ghetto and keeps informed, the anger is less. Dr. Spiegel took Detroit to task on this score. Much of the talk to the effect that Detroit had few grievances was simply propaganda, he says, and Negroes perceived the insincerity.

After city attitudes come the multitude of other problems—employment, education, etc.—that vary in seriousness from city to city. Each has its specific source of trouble, says Dr. Spiegel. In San Francisco, it was lack of jobs; in Boston, it was segregated schools.

RACIAL DISORDERS

Negro Militancy: A Complicating Dimension

Two years ago, Negro grievances seemed the cause when violence flared in Watts, Los Angeles' Negro ghetto. This year, as city after city boils, sociologists are no longer certain. The grievances still exist, but there is another factor.

Negro militancy has grown considerably stronger in the past two years, not necessarily in numbers of militants, but certainly in influence, according to reports from sociologists in the West, Midwest and East. The new dimension makes the task of forestalling violence in American cities immeasurably more difficult, and the social scientists seeking cause and cure are feeling more and more pessimistic.

American cities do not erupt purely out of a militant spirit. The ghetto grievances are real—lack of jobs, segregated housing and schools, squalid slums, insensitive city administrations, insulting police officers and the rest. And no sociologist is willing to declare a city free of those conditions, whether it's Detroit, Newark, Cleveland or San Francisco. Professor of Sociology Theodore Hadwen at the University of Southern California puts it, "A lot of us have nothing very new to say. Most of us feel we have said our piece. The problems remain."

"The only new thing," says Dr. Hadwen, whose familiarity with Watts antedates the riot there, "is the role of black militants."

The question now facing the nation is: With rising black militancy will a city erupt no matter what its level of grievance and no matter what steps officials take to sooth resentment?

"That's possible," says Dr. John P. Spiegel, director of the Lemberg Center for the Study of Violence at Brandeis University. "I tend to think it might be the case."

Measures, from Presidential commissions like the one President Johnson formed after Detroit exploded to municipal efforts like one undertaken in Washington, D.C., to forestall trouble, may be ineffective, even if they accomplish everything they set out to do in terms of eliminating grievances.

Dr. Raymond J. Murphy, professor of sociology at the University of California, Los Angeles, expresses similar gloom. "I'm pessimistic," he says. "It may well be a case of too little and too late."

Dr. Murphy and Dr. James M. Watson, also of UCLA, recently concluded a study of 600 ghetto residents in Los Angeles and found that rioting is not a simple reflection of economic distress.

Dr. James R. Hundley, sociologist at Michigan State University, seconds these comments, particularly in relation to the police.

There is usually a period of hours or even a day after a precipitating event before looting and burning gets underway, he says. That is the time city officials and police officers could use to settle specific complaints and very possibly offset a riot. But they must know who the ghetto leaders are. The truth is that most are ignorant of the ghetto, says Dr. Hundley.

Police, for example, are apt to either start rounding everybody up indiscriminately or hang around doing nothing while looters plunder under their noses.

In fact, the latter is what happened in both Watts and Detroit. In Watts, police officers not only stood around, but they indulged in catcalls.

Police training in race relations is only skin deep, says Dr. Spiegel. "It's a fraud." ♦

A RUSSIAN FIRST

A Maser in Orbit

Three years ago, the Mariner 4 spacecraft flew by the planet Mars and took 21 pictures of its crater-strewn surface. The photography took only 25 minutes, but broadcasting the images to earth required 10 full days. It was a miracle, in fact, that the signals reached their home planet at all, since by the time they got to earth their strength was down to one trillionth of a watt. Any stray bit of noise either from space or from the receiving equipment could have hidden them completely.

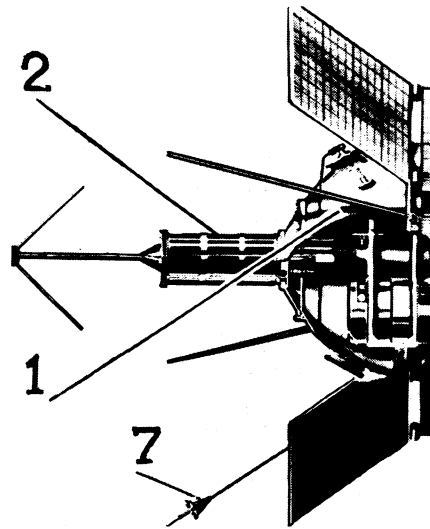
Communication from deep space is a difficult problem, and will become even more critical when men begin to travel farther away than the moon. The limited amount of power available on a spacecraft means that signals going millions of miles must either be sent very slowly or transmitted over a very narrow frequency band to ensure that they will reach their destination. Mariner 4 (like Mariner 5, which is now heading for Venus) had to cut its data transmission rate by 75 percent when it reached five million miles from earth, even to produce the incredibly weak signal that it did.

Now a paper published in the Soviet Union has revealed that 21 months ago the Russians took what may have been a large step toward solving the deep space communication problem—a step that has barely been considered by the U.S.

On Nov. 26, 1965, the Soviet Union

launched the 97th satellite in its catch-all Cosmos series, equipped with an instrument which had never been in space before: a maser. Maser, which is now such a household word among scientists that it doesn't even rate capital letters, stands for Microwave Amplification by Stimulated Emission of Radiation. Used in space communications—as it is in several U.S. ground stations, including the communications satellite link at Andover, Maine—a maser acts as an amplifier by adding energy to the incoming signal.

The maser's advantage over conventional electronic devices such as tubes and transistors is that it produces no noise of its own, which could mask



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Cosmos 97 and its maser (2)

the barely perceptible signals from space. Even the virtually inaudible hums and pops of the most expensive home high-fidelity system would become a deafening cacophony of roars, barks and crashes if amplified by the super-sensitive equipment of space communications. The source of this noise is usually heat, which causes uncontrolled electrons to come boiling off the cathode of a tube. Transistors have other problems. A maser, however, has neither the problems of the transistor nor, since it is a cryogenic device, the heat produced in a tube.

Cosmos 97 carried an ammonia maser, which emits its chosen frequency from oscillations in molecules of gas. Soviet author Z. I. Yur'yev says that the ammonia version has several advantages over ruby crystal masers for use in space, including simplicity, resistance to vibration, long lifetime

and compactness. A gas maser itself is hardly compact, but it does not require the huge magnet that can often make crystal masers weigh more than half a ton.

The Soviet experiment was allegedly designed as a first step, to see how well the maser would hold its intended frequency in space. "It was found to operate well at different altitudes above the earth, inside and outside the radiation belts, when illuminated by the sun and in the earth's shadow," says Yur'yev. The Russians measured the stability of the orbiting maser by repeatedly comparing its frequency with three identical masers on the ground.

If Cosmos 97's maser was indeed a communications experiment—the satellite burned up in the atmosphere last April—it could be part of plans for an orbiting relay station, to pick up signals from deep space probes before they are cut by earth's atmosphere, then retransmit them to the ground. However, there is another possibility. It was suggested by one maser specialist last week that "the communications angle could be just a big cover-up." The advantages of a maser-equipped relay satellite over a direct ground link would not be enough to justify the cost, he says. Instead, he believes, the Russians could have been measuring the Doppler shift of the maser's frequency as it whirled around the earth in order to obtain vital military geodetic information, such as the exact distance from Moscow to Washington. ♦

CLOUD SATELLITES

Camera's Eye Too Slow

Astronomers say they can see cloud satellites of earth in their appointed places—but photographs have so far failed to reveal them. The scientists hope to try again in the fall with faster film.

The attempt would be made from a jet airplane carrying cameras loaded with the newly available Kodak SO-166 film, which has been used successfully in dim light photography at ASA speeds of 6,000. Plans for the fall flight are, however, not yet definite.

Existence of equilibrium points orbiting earth in the same path as the moon was first postulated in 1772 by the French mathematician, Joseph Louis Lagrange. He calculated that there are five points in the earth-moon system, or in any two-body system in which stable equilibrium has been established (and where debris could accumulate). Only two such libration points in the earth-moon system have been re-