LASSA FEVER

Studying a killer

In January 1969 an unknown virus was isolated for the first time from the sera of two nurses, who died, and from the serum of a third nurse, who recovered from a feverish illness of unknown origin. The three were Americans who had been working at a mission station in the village of Lassa in the Biu-Mubi region of Nigeria. Virologists at Yale University found that the virus was unlike any known one after a fourth patient, an ailing missionary, was brought back to the United States for treatment.

The infection, being called Lassa fever, involved almost all the body's organs. The virus produced fever as high as 107 degrees, mouth ulcers, a skin rash with tiny hemorrhages, heart infection and severe muscle aches.

Then in January 1970 further cases of a disease, with symptoms resembling Lassa fever, were reported from Jos, a tin-mining town in Nigeria almost 300 miles away. Ten of 20 Nigerian and American patients died from the disease, and doctors suspected almost immediately the disease was Lassa fever. Both outbreaks have a fatality rate approaching 50 percent, and both outbreaks occurred in January and February.

Subsequently, the Jos virus was identified as Lassa fever, and the plasma, drawn from survivors of the first outbreak and which contains the antibodies needed to fight the otherwise untreatable infection, is being used on patients in Jos.

Yale stopped work on the virus after a lab worker contracted the disease and died, but research will be continued at a new isolation laboratory at the National Communicable Disease Center in Atlanta.

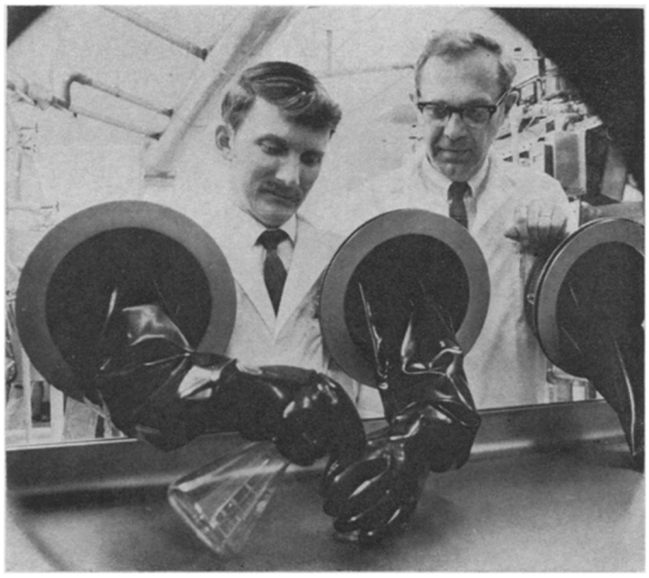
The virus will be frozen in sealed containers, packed in disinfectants and flown from New Haven, Conn., to Atlanta, where it will be hand-carried to NCDC. There Dr. Robert E. Kissling, chief of the NCDC's Virology Section, Dr. Brian Henderson and technologist George W. Gary will work with the virus under maximum precautions.

Dr. Henderson contends that even should the Lassa virus get out of the laboratory, it probably would not spread in the community. "It's not the kind of virus, like influenza, that can be passed while talking," he says.

Dr. Kissling says the Lassa virus is similar to other viruses carried by wild rodents. Doctors so far suspect that the disease was transmitted by an animal but what animal is not known. It is also believed that the patients can acquire the infection from one another, but only through more than casual contact.

Early research will be conducted with white mice; the aim will be to control the virus rather than to develop a vaccine. But the researchers will also be concerned with how the virus spreads, why it is so deadly and how long the incubation period is.

Other lethal viruses will be studied in the facility built for the Lassa studies. These are to include the Marburg virus —first identified in Marburg, Germany, —where 20 of 28 cases occurred in an outbreak that killed 7 of 31 victims in that country and in Yugoslavia about three years ago. Others will include the Machupo virus, responsible for hundreds of cases of Bolivian hemorrhagic fever, the Congo virus and the Crimean hemorrhagic fever virus. □



Kissling and Gary: glove boxes to handle a deadly virus.

NCDC

NAS LAMENT

Minerals aplenty; technology gap

Ten years ago, domestic mineral production accounted for four percent of the gross national product. It has declined steadily; now it stands at three percent. During the same time period the net value of mineral imports has tripled.

This raises the fear that the United States is heading toward mineral bankruptcy. But a two-year study by six panels of the National Academy of Sciences' Committee on Mineral Science and Technology finds that the country has plenty of mineral wealth left; it is just not being adequately exploited. "The state of mineral technology in the United States is wretched," concludes the committee, made up of scientists and engineers from industry and universities.

"We're running out of technology, not minerals," echoes Dr. Cyrus Klingsberg, executive secretary of the Academy. "There's plenty of mineral wealth around but not at an economic level" for exploitation by existing techniques.

As a result, many of the nation's resources, including waste materials, remain untapped. One such source is geothermal energy: the steam produced by water contacting hot underground rock (SN: 2/1/69, p. 113). It could be used to provide electricity or potable water. Although the Western United States has many such areas, little is being done to develop them, partly because Federal lands may not be leased for geothermal development and partly because of unanswered questions, such as how long the supply will last or the best place to drill a well. Without such knowledge a commercial geothermal venture would be financially hazardous.

But the same techniques that tell a petroleum engineer how much oil is underground could tell a utility company how much geothermal energy is underground and how best to develop it. From leaching copper out of waste tailings to the safe drilling of water wells, petroleum engineers with their knowledge of fluid mechanics and geology can be of assistance to other industries.

"We could offer them answers that aren't part of their technology," says Prof. Henry J. Ramey Jr., a petroleum engineer at Stanford University and a member of the mineral fluids panel. "But they don't use them. If they can be made aware, they would pick up the technology in a split second. It's really a problem of communications."

But the answer to the mineral problem goes deeper than just applying