Rasmussen, chief USDA veterinarian in Utah. Painstaking examination of a vast variety of tissues from the sheep showed no abnormalities.

Nor did poisonous plants seem to be to blame. Investigators, looking for culpable flora, combed Skull Valley in vain. One noxious weed called halogeton has taken a heavy toll in the past, according to Utah State Agriculture Commissioner David Waldron, but it could never fit the killer's description. It is usually fatal only if the animal drinks water soon afterward, causing bloat, and the symptoms would be obvious. In addition, thousands of acres of the plant have been plowed under; there is not enough left in Skull Valley to do such terrible damage.

Adding to the mystery was the fact that the affected sheep seemed to be limited to a fairly well-defined area. "There are sheep to the north and sheep to the south," says Waldron, "and they're doing fine." Even more curious is the fact that sheep were the only animals affected. People—Skull Valley has a population of about 55—horses, cattle, rabbits, birds, rodents and other creatures showed no symptoms at all. Almost the only difference between the sheep and everybody else was that sheep are natural snow-eaters.

This seemingly innocuous fact again suggested Dugway as the source of the killer. State officials theorized that wind carried the droplets of nerve gas spray over the low Cedar Mountains then allowed it to settle on the snow that had fallen on previous days.

By this time the Army was just about ready to indict itself. "We fully recognize, with this occurring right on our doorstep . . . that we are highly suspect," admits Brig. Gen. William W. Stone, in charge of research and laboratories for the Army Materiel Command.

Yet the Army couldn't even make its own rap stick. The reason, says Gen. Stone, was that it simply could not isolate its own nerve gas from the bodies of the sheep. By this time, after some 10 days of sleuthing, scientists had managed to determine from urine and tear samples that the deaths were apparently due to an organo-phosphate compound similar to those used in nerve agents, as well as in several insecticides. Such compounds kill by blocking the action of a blood chemical called cholinesterase, whose job is to suppress another chemical that causes muscular action. Without this suppression, the muscle operates continuously, causing convulsions. Unfortunately, this was not enough to pin down the Army compound. Traces from the spraying were easily found and identified by the Army on its own test range,

UPI

Shepherd and mystery poison victim.

and should, officials say, have been just as easily identifiable in the sheep.

Another possibility raised last week was that the poison might have come from a chemical preservative used on seed grain that may have been fed to two herds of rams in the valley. A similar incident reportedly occurred in Turkey a few years ago. Even if such feed was used in the valley, however, it would have been virtually inaccessible to the sheep, which were at least six miles from one of the buckherds and 20 miles from the other. Waldron writes the idea off entirely. "I've heard quite a few ideas that I thought were silly," he says, "but I'd have to put that at the top of the list."

So Dugway still looks like the culprit. If it is, the Skull Valley incident is one of the biggest chemical-warfare-agent disasters in U.S. history.

RIOT REPORT

Deafening silence; deadly words

"Let your search be free. . . . Find the truth and express it."

Those were President Johnson's instructions, last July 29, to his National Advisory Commission on Civil Disorders.

The commission reported in early March, citing broad racism in white America as an underlying cause of civil disorder, calling for strategies for ac-

tion and massive expenditures of funds on race and poverty problems. Whether or not they found the truth may be an open question. But whatever they found failed to please their employer.

For weeks after the report's publication the silence from the White House was deafening. The report, by a prestigious, bipartisan panel headed by Illinois' Governor Otto Kerner, and built on the best information available from within and without the social sciences, was apparently unacceptable on three grounds—paralleling its major findings:

- Criticism of all of white America couldn't possibly be endorsed by the President in an election year.
- The call for action disregards the urban, social and poverty programs on which President Johnson leans as the basis of his domestic programs.
- No proposal demanding the expenditure of significant sums on domestic problems—as the riot commission does—could conceivably be palatable to a war-straitened Administration.

Last week, the Administration came down in a triple-barreled assault on the commission report.

First, Vice President Humphrey, addressing a convention of B'nai B'rith women in Washington, condemned as "close to a doctrine of group guilt" the commission's finding that "white society condones" Negro slums. "Let us not fall into the error," he declared, "of condemning whole societies. . . . Separatism in America is a minority movement led by white and black extremists."

This was followed by the President himself, who, to a conference of building and construction trade unions, cited the 24 health measures and 18 education bills passed during his Administration. "I sometimes wonder why we Americans enjoy punishing ourselves so much with our own criticism," he said.

And a day later, Wilbur J. Cohen, President Johnson's designee as Secretary of Health, Education, and Welfare, joined the assault on the commission's report as "oversimplified." Slogans, he said, throw no light on complex issues. Yet the report is taking hold. Though, initially, it was difficult for Governor Kerner to find a publisher, anticipating a print order of less than 100,000 copies, Bantam Books, which has sold a million copies, is going into another printing.

Nevertheless, the Administration attitude is regarded as the death of the report's revelations.

Dr. Nathan Caplan of the University of Michigan, whose studies of Detroit and Newark were relied on strongly by the commission, believes that if the President were to pick up and run with the report, the nation would have a chance to set a "whole new pattern of social relations."

Without the President, Dr. Caplan concludes, the document is "no more than a poignant gesture . . . a grand gesture of honesty." ◇

GERMS AND VIRUSES

Chromatography promises diagnosis before symptoms

By the time symptoms appear, most diseases are well along in their course. Some infections, like rabies, have gone too far to be cured.

Even after the first clinical signs show, identification of a disease organism may be a long process, with a lot of room for error. Symptoms of viral attack especially may be confused.

Scientists therefore have been working for some time to develop an early warning system for infections. The general approach has been to measure the body's level of immune response to the invading pathogen. Usually the body produces high levels of antibodies in advance of symptoms.

The major disadvantage of this approach is that the disease is still relatively far along by the time abnormal antibody levels can be detected. And the bioassay on which this detection process depends does not have the inherent sensitivity of several chemical assay methods.

While the feeling among biologists is that a purely chemical approach to the problem is beset with more difficulties than are worth fighting, it is finding some takers. A team which includes a chemist and a microbiologist, working under an Air Force contract, has produced a gas chromatographic technique which, a team member says, may lead to detection and identification of foreign organisms days or weeks in advance of the onset of clinical signs.

A report on the technique was given at an Office of Aerospace Research Applications conference in Washington by J. R. Gould of the General Electric Co. He is working with Drs. Martin Alexander of Cornell University and James E. Smith of Syracuse University. Gould and Dr. Alexander four years ago theorized that bacteria could be identified by the kind and amount of their metabolic products in the bloodstream.

Biologists, skeptical of the chemical approach, nevertheless would welcome it—if it works—as a revolution in diagnosis, epidemiology, classification of microorganisms and a variety of other applications. But while they consider Gould's work a laudable effort, they feel he is bound to run into difficulties.

In essence, diagnosis of a pathogen by the disease symptoms it produces operates on the principle proposed by Gould and Dr. Alexander. The metabolic products of the microorganisms are the toxins which produce the symptoms; characteristic metabolites produce characteristic symptoms. The problem is that the body is a much less sensitive detection system than the gas chromatograph, reacting visibly only after the infecting organism has become widespread in the system.

Gould's approach has its own hurdles to cross. One of these is that the blood contains a welter of metabolic products. The research team has shown that it can differentiate pure cultures of 32 different strains of bacteria on the basis of metabolite signatures.

Whether or not these signatures can be picked out of the blood of a living animal is another matter, especially considering the fact that there may be more than one foreign organism present.

Gould reports that the group has been able to obtain correlation between the chromatogram of canine hepatitis and blood from a dog infected with the disease. This is just one instance, however, and the researchers knew in advance they were looking for hepatitis.

More difficult still is an extension of the method to detection and identification of viruses. Viruses do not metabolize by themselves, and thus to get any kind of standard signature a tissue culture of the organism must be prepared. The viruses which have invaded the cells induce the cells to produce new or altered enzymes. These enzymes then produce a pattern of metabolites that is different from the signature of the uninfected tissue. It is hoped the difference will be specific enough in its nature to identify the virus.

However, the tissue used in the culture and the conditions under which the culture is prepared have a great effect on the standard signature. Even with a consistent standard there is no guarantee that the virus will behave the same way in a living body. After all this there is still the problem of picking out the viral signature.

Results of work with horses indicate there may be reason for optimism nonetheless. Three animals inocculated with equine infectious anemia (EIA) showed two metabolite fractions neither of which had been seen before. The chromatograms show the fractions appearing three days after inocculation, peaking five days after, and going back near zero by 20 days after. Fever, the first clinical symptom, appeared on the 24th day. This, however, Gould calls relevant, but preliminary, data. But he is not sure enough to call it a correlation.