mated 3,585-mile closest approach on Feb. 5, seemed to indicate that there is indeed an observable cloud structure to be studied. A thin haze, possibly in a layer with a distinct bottom, appeared to border the fluffball. Anything more varied than an unblemished disk would have been exciting, and one observer described the haze in the photos as covering "a broad range of gray through white." A polarized, ultraviolet filter, one of six filters on each of the spacecraft's two television cameras, showed "some definite structure."

Computer enhancement will be used to try to find more subtle variations, with other instruments aboard the spacecraft joining in the search. A radio occultation experiment, an improvement of one on Mariner 5, was able by moving its antenna to beam its signal to earth through the atmosphere at Venus' edge for all but 90 seconds of the 21 minutes that Venus blocked the line of sight. Besides revealing possible atmospheric strata, including an ionosphere, if there is one, changes in the radio signal will help refine past measurements of the temperature and pressure profiles down to the surface. The surface pressure is believed to be about 100 times that of earth, and the Soviet Venera 7 probe, which actually reached the surface and operated there for about 50 minutes, reported a temperature of almost 900 degrees F.

A major question involves the atmosphere's composition, which seems to somewhat resemble what earth's would be like if earth had Venus' heat to volatilize the carbonates in the land and the water in the oceans. There was one report, difficult to confirm so soon after the data had been received, of the presence of helium. Knowing the amounts of such light-weight gases could be valuable in reconciling differences in the temperature data from direct Venera measurements and Mariner 5's occultation experiment. There were also hints of water, significant in the light of recent earth-based studies indicating the presence of sulfuric acid droplets in the clouds, which presumably would take up most of the available free water.

The flight controllers monitoring and controlling the spacecraft were as jubilant as the scientists poring over its Venus data. The mission, which began with malfunctioning heaters for the cameras, grew increasingly suspenseful as a variety of problems appeared, capped by an over ambitious gyro which threatened to deplete the control gas which will guide Mariner to Mercury. Mariner not only survived, it proved to be steadier than the scientists had anticipated, minimizing possible "smear" in the photos. □

Chemical for immunity: Wide-ranging promise

Some 20 years ago immunologist H. Sherwood Lawrence found that when a chemical extracted from human lymphocytes that react against a specific foreign organism was injected into a person lacking immunity to the organism, it gives the person immunity against the agent and boosts his cellular immunity in general.

Lawrence's work was a turning point in immunological research. It showed that cellular immunity could be transferred from one human to another. He dubbed the chemical that transferred immunity "transfer factor."

One of the ironies of science is that obscure findings may resurface years later and have all sorts of repercussions. So it seems with transfer factor —as reported this week at the 4th Gustav Stern Symposium on Prospectives in Virology in New York City.

The resurgence of interest in transfer factor, Lawrence attests, has been due to several things. Because transfer factor is specific for a particular bacterium (virus or tumor antigen), it is largely without serious side effects, can be stored a long time and offers exciting therapeutic potentials. The factor transfers cellular immunity only—no antibody immunity—another plus in the treatment of problems requiring primarily cellular immunity, such as viral diseases and cancer. Many scientists no longer doubt the existence of transfer factor because it has been found in animals as well as in people. What is more, the factor, if properly prepared, can be transferred from humans to monkeys, from monkeys to guinea pigs, and so on—without dangers of cross-species rejection.

Transfer factor is being vigorously tried clinically, Lawrence reports. It is being used to restore to patients immunity against tuberculosis and against certain fungus diseases. The World Health Organization is planning a field trial to use the factor to treat patients with a kind of leprosy that usually does not respond to drug treatment. The Rockefeller Foundation is undertaking a field trial to give the factor to Puerto Ricans who have one of the world's most recalcitrant tropical diseases, schistosomiasis.

There are preliminary reports from France and Norway that the factor looks promising against a usually fatal slow-virus disease, subacute sclerosing panencephalitis. The factor is being tried on some patients with multiple sclerosis, again with promising preliminary results. It is also being tried on some patients with cancer—in Hong Kong, where a particular kind of cancer, nasopharyngeal carcinoma, is endemic, and on patients with Hodgkin's disease. The factor has apparently caused some tumor remissions.

The factor even appears to be effective against cancer that is presumably of viral origin. H. Hugh Fudenberg, an immunologist at the University of California Medical Center, San Francisco, and his colleagues determined that patients with a kind of bone cancer known as osteogenic sarcoma have little cellular immunity against their cancer. Yet, their relatives and members of their households have unusually good immunity against it. This suggests that they, like the patients, had been exposed to a cancerous agent, but that they had had tough enough immunity to fight it off, whereas the patients had not. So, Fudenberg and his team took a transfer factor from the relatives' and household members' lymphocytes and gave it to the cancer patient. As they hoped, the factor had a beneficial effect.

"Preliminary results using these methods," Fudenberg says, "have been dramatic in prolonging life in several osteogenic sarcoma patients . . . unresponsive to radiation, chemotherapy and so forth."

If transfer factor can do all these remarkable things—fight viruses, bacteria and fungi and reverse cancer—what is it? No one is really sure. Evidence coming out of some labs now suggest it is a polypeptide/polynucleotide complex. Other evidence suggests that it is a double stranded RNA polynucleotide. Or, Lawrence speculates, "It could be a unique molecule telling us about a new function of cells." □

Seventeen oil spills in North Alaska since 1969

On Jan. 29, at the Prudhoe Bay airstrip on the North Alaskan slopes, an 1,800-gallon storage tank ruptured, spilling 400 gallons of diesel oil. In this case, all the oil was recovered. But there have been other oil spills with less happy endings. Although construction will not begin until at least this summer on the controversial Trans-Alaska Pipeline, there have been at least 17 spills at facilities on the slopes since drilling began there in 1969.

The worst, in fact, occurred during the first summer, when a ruptured "bladder tank," operated by British Petroleum, dumped 40,000 gallons of oil onto the snow, some of which easily found its way across the intervening 150 feet to the Arctic Ocean. On July 26, 1972, another 10,000 gallons were spilled at a road camp of the Alyeska Pipeline Service Co., which will own and operate the Trans-Alaska Pipeline,