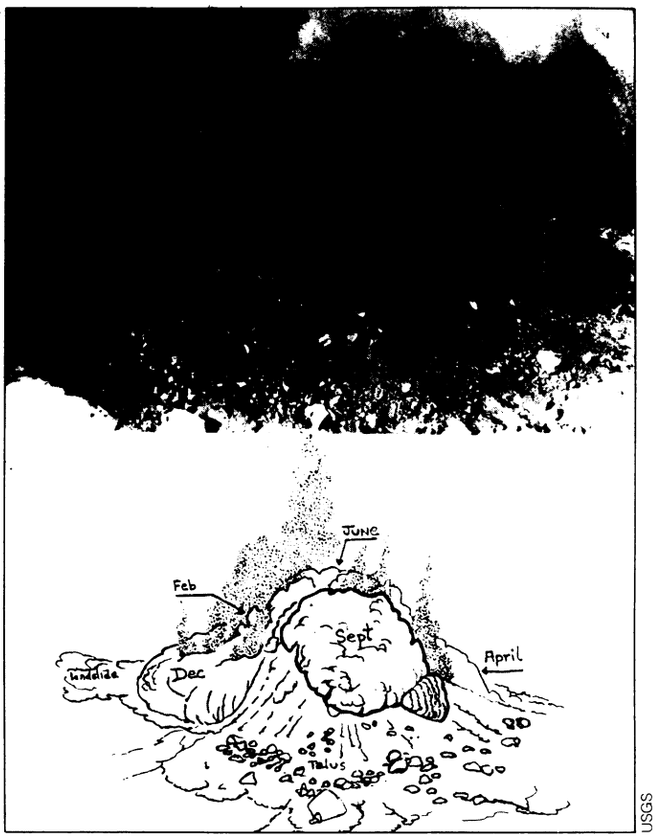
the market now, it has "serious limitations": It does not efficiently retain very polar or volatile pollutants, and it is relatively unstable, reacting with pollutants such as ozone and nitric oxides to form artifacts in the analysis. As a result, RTI researchers Anton Schindler and colleagues have been testing what they believe to be a more reliable family of polymers for pollutant analysis — the polyimides.

This chemical family consists of long-chain molecules formed by mixing various diamines and anhydrides (refer to the diagram). "Tenax is one fixed compound, but there are many, many polyimides," Schindler says. Therefore, different structures can be designed to more efficiently zero in on the various suspect pollutants in different workplace environments.

Although Schindler and co-workers have synthesized 60 such variations on the polyimide theme, only the handful that meet certain pollutant-adsorbing criteria have been chosen for further scrutiny. These most promising polyimides are thermally very stable — they will be heated to about 300°C to desorb the pollutants for analysis — and they do not generate artifacts that confound the pollutant analysis. Further performance tests — now on hold due to recent cuts to the U.S. Environmental Protection Agency budget — will determine the shelf-life of these polyimide cartridges and their ability in actual workplace settings. □

Mt. St. Helens: Making a slow comeback

Barring future violent eruptions of Mt. St. Helens, the cavernous pit left by the May 18, 1980 eruption may fill in someday. The eruption of September 5 and 6 —the fifth nonexplosive eruption since last December —added about five million cubic yards to the 20 million cubic yards of lava and related debris already filling the dome. The overall dome is about 450 feet high, 1,950 feet long and 1,600 feet wide, reports the United States Geological Survey. Although the dome surface is fairly cool, just a few feet below temperatures are as high as 1,500°F.



USGS

New outbreak of serious diseases focuses on homosexual men

A puzzling outbreak of at least two rare and serious diseases primarily among homosexual men has been documented by the Centers for Disease Control. "During the past 18 months, there has been a dramatic increase in Kaposi's sarcoma, *Pneumocystis* pneumonia and other serious opportunistic infections concentrated among homosexual men," James W. Curran of CDC said in Chicago last week at the Interscience Conference on Antimicrobial Agents and Chemotherapy. These diseases had been associated previously with patients having severe immune system deficiencies, for example patients with advanced cancer or those taking immunosuppressive drugs. Investigators suggest the new cases among otherwise healthy men represent an epidemic of immune system deficiency occurring for reasons yet unknown.

Of 152 cases of these diseases recently reported to the CDC, all but one occurred among men and 90 percent of these men were homosexual or bisexual, Curran says. Cases were reported from 15 states and two foreign countries, but the largest number originated in New York; 80 percent were from New York, California or Georgia. More than half the persons with *Pneumocystis* pneumonia have died, as have 20 percent of the person's with Kaposi's sarcoma. Among the recently reported cases the median age is 35 years. (Previously Kaposi's sarcoma had been considered a rare tumor affecting elderly men, in addition to immunosuppressed patients, and was seldom fatal.)

Eleven male patients, including six homosexuals, with *Pneumocystis* pneumonia were studied by Jeffrey B. Greene and colleagues of Bellevue Hospital in New York. Seven of the patients were identified as users of heroin, methadone or cocaine. Immunological examinations showed that the function of one class of immune system cells, T cells, was depressed in all the patients. Of the eleven patients, eight have died, either of the original disease, a relapse or a later, different infection. Green suspects an acquired suppression of the immune system led to *Pneumocystis carinii* pneumonia.

According to both Greene and Curran, there is no doubt that this outbreak is a new phenomenon. Despite active surveillance before 1980, only rare cases of Kaposi's sarcoma and of *Pneumocystis* pneumonia were reported in adults younger than 50 years of age whose immune systems were not suppressed by drugs or disease. Of the cases reported to the CDC, 75 percent were diagnosed in 1981 and the onset of illness occurred this year in about half the cases. Curran says, "There is a clear increase in deaths from Kaposi's sarcoma and *Pneumocystis* pneumonia since 1980, and there is no evidence that it is abating."

The concentration of cases among homosexuals remains a puzzle. One hypothesis is that homosexual men, because of a greater average number of sexual partners, are exposed to a wider variety of microbial agents than are other men. Some suspicion focuses on cytomegalovirus, an agent that seems to be transmitted sexually and that may depress the immune system. The CDC is currently conducting a national study of cases of *Pneumocystis* pneumonia, Kaposi's sarcoma and other serious unexplained infections along with matched controls in order to identify risk factors for these diseases.

"Studies of these syndromes should provide an opportunity to clarify our understanding of the relationship between environment, the body's immune system and the cancer process," Curran says. "Finally, if risk factors can be identified, there is a potential for prevention of Kaposi's sarcoma and *Pneumocystis* pneumonia." Meanwhile, he urges physicians to be alert for other indications of immune system suppression, especially among homosexual men. □