

odors when none were present. The subjects also felt warm, another sensation reported by Cameroon survivors. Happily for the survivors, the AID report notes that no long-term health effects from exposure to the cloud have been found.

As for the geologic analyses, Lockwood and others say they have added many more data to their initial findings, but have not changed the basic conclusions. They believe the lake's carbon dioxide gas has a volcanic origin and had built up slowly in the lake over a long period of time. They still don't know what triggered the explosion, but they don't think a sudden volcanic eruption or an earthquake was responsible.

Without speculating on the cloud's triggering event, two British scientists have arrived at essentially the same conclusion. In the "News and Views" section of the Jan. 8 NATURE, S.J. Freeth of the University College of Swansea and R.L.F. Kay of the British Geological Survey in Wallingford estimate that about 200,000 metric tons of water and about 6,000 metric tons of gas were lost from the lake.

One volcanologist who has held somewhat different views about the cause of the Lake Nyos cloud is Haroun Tazieff, recently retired from the Center for Weak Radioactivity Research in Gif sur Yvette, France. According to Associated Press reports, Tazieff and his colleagues think the cloud was made up of steam, carbon dioxide and sulfur compounds that had been building up in a layer of groundwater heated by volcanic rocks far below the lake. These compounds reportedly were injected into the lake when the pressure of the steam eventually cracked the rock that had been holding it down.

Some U.S. scientists have argued against this theory by noting that lake temperatures were not elevated, its bottom did not appear to have been disturbed, there were no volcanic sulfides in the lake and no suspended sediments that might have resulted had steam rushed through bottom sediments. However, Lockwood says he and other U.S. scientists are reserving judgment because they have not yet seen Tazieff and his colleagues' evidence. Scientists from all the nations involved in studying Lake Nyos may be able to compare their data in February or March at a proposed meeting in Cameroon, according to Krumpe.

The critical question now, says Lockwood, is how dangerous the lake will be in the future. And one key to that hazard assessment is knowing how fast carbon dioxide is being added to the lake. The AID report assumes "that the injection is gradual," he says. "Tazieff would say that there was perhaps a more rapid influx of gas that triggered the event. But no one has evidence that bears on the rate of injection. So what's desperately required are more frequent measurements of the amount of gas dissolved in that lake."

— S. Weisburd

The fragile, creative side of nightmares

What kind of person has lifelong nightmares? In 1931, psychoanalyst Ernest Jones suggested that the repeated intrusion of these fearful dreams into sleep is related to an "anxiety neurosis" and massively repressed incestual wishes.

But recent investigations of lifelong nightmare sufferers, including one study reported in the January ARCHIVES OF GENERAL PSYCHIATRY, describe a personality profile marked by emotional vulnerability, sensitivity, creativity and often some schizophrenic-like oddities of thought and behavior. "It appears that the ordinary fears, feelings of helplessness and rage of childhood, which we probably all experience, 'get through' in these persons and enter into their dreams more than they do in most of us," say psychiatrist Ernest Hartmann of Tufts University School of Medicine in Boston and his colleagues.

The investigators studied 12 lifelong nightmare sufferers, 12 vivid dreamers who had no nightmares and 12 persons who had neither nightmares nor vivid dreams. Each group contained six men and six women aged 20 to 35 years.

The group with nightmares had much higher scores on several scales of the Minnesota Multiphasic Personality Inventory (an extensive self-report questionnaire) than the other two groups; the elevated scores indicated distrust and oversensitivity to others, feelings of being different, poor self-esteem and alienation from feelings. Nightmare sufferers also had more creative and complex responses to Rorschach inkblots, often including themes of anxiety, violence, paranoia and an unclear "personality boundary." An example of this last theme was describing an inkblot as "two women merging into each other."

But only one nightmare sufferer was clearly schizophrenic, say the researchers, and half of the nightmare group had no psychiatric diagnosis. Interviews and further projective tests uncovered no evidence of depression, an unusual number of fears, powerful hostilities, repressed sexual wishes or childhood trauma.

Compared with the other two groups, nightmare sufferers were more often unemployed or inconsistently employed. Those who were employed had occupations related to the arts and, according to Hartmann, often reported making use of their nightmares in their creative work. Marriages, sexual relationships and friendships of the nightmare sufferers were considerably more tumultuous than those of the control groups.

The results confirm prior observations of 38 long-term nightmare sufferers (SN: 5/24/80, p.335), says Hartmann. Similar but less severe personality patterns have been independently noted among people

with less frequent nightmares.

In contrast, war veterans experiencing frequent nightmares as part of a post-traumatic stress disorder have not been found to have the openness, vulnerability or schizophrenic-like problems observed among lifelong nightmare sufferers. People with night terrors, which are sudden arousals early in the night associated with fear and screaming, but with either no dream content or a single frightening image, also do not display the personality profile of the lifelong nightmare group, notes Hartmann.

The relationship of lifelong nightmares to schizophrenia and artistic creativity remains unclear, but Hartmann says the emotional vulnerability of nightmare sufferers may make them more vulnerable to mental disorders.

— B. Bower

Gene transfer in corn

Recent genetic engineering experiments with maize, or Indian corn, mark the first time a member of the grass family has been infected by a virus carried by the bacterium *Agrobacterium*. The procedure, called agroinfection, is the increasingly common laboratory technique used to transfer selected DNA into plants by adding that DNA to the DNA of *Agrobacterium*, then allowing the bacterium to "colonize" plants — which it does by transferring part of its DNA (including the foreign, "third party" DNA) into the host plant's own genetic material.

The success with viral DNA — which was used because, among other things, its effects are easily detectable — demonstrates for the first time that agroinfection is an efficient way to induce foreign DNA expression in corn cells. Moreover, the results, described in the Jan. 8 NATURE, extend the possibilities of using beneficial DNA — such as those that code for resistance to viruses — to genetically improve a plant family that includes all the cereal grains, sugarcane and many sources of animal feed.

Researchers at Friedrich Miescher Institute in Basel, Switzerland, and John Innes Institute in Norwich, England, used this method to infect plants with maize streak virus DNA. Characteristic symptoms of the disease appeared seven to 18 days after they inoculated seedlings with viral-DNA-bearing *Agrobacterium*. Normally, plants develop the disease only if the virus is intact and transmitted by an insect.

Scientists had generally thought that members of the grass family were not amenable to agroinfection, which is considered an efficient way to induce foreign DNA expression in whole plants.

— D.D. Edwards