

were doing something nefarious, but to my knowledge there's no evidence whatsoever that that's what's going on."

Korotkevich's only comment to SCIENCE NEWS about the Novaya Zemlya plumes is somewhat cryptic: "Something like this could be observed in the vicinity of the Canadian Archipelago and Greenland, regions with almost the same geographic coordinates."

Matson, however, says NOAA images have not picked up any plumes coming from Greenland. "If this type of plume activity was occurring elsewhere we would have spotted it," he says. "Only these two cases have caught our eye."

Matson says he and a few other scientists are now kicking around the idea that the Novaya Zemlya plumes are caused by "orographic" effects, in which a mountain, or in this case a glacier, pushes air currents up, where they cool enough for water to condense into a cloud. He's testing this idea with the most recent plume, which was detected March 3 and which enabled NOAA scientists for the first time to monitor in real time the development of a cloud from either Novaya Zemlya or Bennett Island.

Clarke maintains that the methane hypothesis *could* explain the Novaya Zemlya clouds, although he says "it's less clear what the situation is [there]." In support of the methane idea, he notes that on the west coast of the northern island there is a very straight fjord,

suggesting a fault, that runs right through the area where the plumes arise. But Gregory Ulmishek, a petroleum geologist at Argonne (Ill.) National Laboratory and a Soviet emigrant, says the region is very tectonically complex, with thousands of faults. "So why don't we see plumes elsewhere?" he asks.

Both the Novaya Zemlya and Bennett Island plumes have whetted the scientific appetites of U.S. researchers. And the fact that their Soviet colleagues appear to have little clue to the cause of the clouds — or, if they do, are reluctant to say — has only intensified this curiosity. "We have all these hypotheses and remote sensing data," says Matson, "but we're really not going to know anything until somebody gets to Bennett Island and takes some ground measurements during a plume event."

Matson, Clarke and others are itching to mount a joint U.S.-Soviet expedition to Bennett Island. (Matson thinks it's unlikely that U.S. scientists would ever be allowed to visit Novaya Zemlya because it is militarized.) But the Soviet Union's Korotkevich doesn't appear as tantalized by the prospect. "The study of such phenomena has no practical value," he says, "as they are of a local nature and, therefore, do not deserve to be an object of international scientific cooperation."

So, for U.S. scientists, the cause of the plumes may remain clouded. □

NEW VERSION 3.0!

PUBLIC QUALITY CHARTS AND GRAPHS

from your IBM PC, XT, AT and HP or compatible plotter.

SIGMA PLOT™ software — \$350.

- Error bars
- Smooth Lines
- Clean diagonals
- Movable labels
- Log/semi-log scales

And Now!

- Multiple graphs per page
- Curve fitting
- Laser printer support

Load data from keyboard, ASCII or DIF files (including LOTUS 123).
Call or write for more information.

JANDEL SCIENTIFIC
MICROCOMPUTER TOOLS FOR THE SCIENTIST
2656 Bridgeway, Sausalito, CA 94965
800-874-1888 (outside CA)
415-331-3022 (inside CA)

News of the week continued from p. 199

Coming — dietary aids to prevent cancer?

Many studies have shown that a diet high in vegetables may offer some protection against cancer (SN: 6/26/82, p.422). Although there are a number of potential anticancer agents in vegetables — among them antioxidants like beta-carotene (SN: 10/1/83, p.217) — a growing body of evidence now suggests that the most potent protective effect may come from protease inhibitors. New studies in cultured cells and rodents indicate that these compounds, found in certain plants, may hold enormous promise as a food additive or supplement to prevent the development of human cancer.

At the Second International Conference on Anticarcinogenesis and Radiation Protection, held earlier this month in Gaithersburg, Md., Ann Kennedy of the Harvard School of Public Health's department of cancer biology in Boston reported on an investigation of these compounds. She and her colleagues found that certain of these plant compounds may be capable of neutralizing the effects of a wide range of carcinogens, from radiation and steroid hormones to potent components of diesel exhaust.

Found in plants' reproductive parts — including beans, rice and potatoes —

protease inhibitors are believed to provide these parts with natural protection against insect predation. But because they also block the activity of an enzyme responsible for the digestive breakdown of proteins, they gained the reputation of being antinutritious. Walter Troll of New York University Medical Center, a pioneer in protease-inhibitor cancer studies, notes with irony that "the Department of Agriculture has spent a lot of time removing protease inhibitors — from soybeans, for example — because they thought it [the removal] would make young children grow better."

Carcinogenesis is believed to be a multi-stage process. It's initiated with exposure to a carcinogen, which triggers long-lived changes in a cell. The process is advanced when the cell is subsequently exposed to a "promoting" agent — something that may or may not be carcinogenic by itself. Promoting agents that have been established in animals or in the lab, according to the researchers, include saccharine, dioxin and constituents of cigarette smoke. It is believed that cells that have been both initiated and promoted may at some future point, during cell division, undergo a spon-

taneous transformation to a cancer.

What Kennedy and her co-workers have found is that even brief exposure of initiated and/or promoted cells to minute quantities of certain protease inhibitors — such as the Bowman-Birk inhibitor derived from soybeans — not only prevented the transformation of those cells into cancers, but also "reprogrammed" their precancerous change back to the pre-initiation state. And the cells weren't fussy about the timing of treatment; anytime prior to cancer transformation blocked carcinogenesis. The only real limit to the effect appears to be the dose of the initiator/carcinogen. If it is too high, the protease inhibitor may reduce — not block altogether — tumor development.

Kennedy says some cancer researchers have labeled her findings "heresy," on the assumption that changes during cancer initiation were irreversible. Her research now suggests that both initiating and promoting changes are indeed reversible with protease inhibitors.

To understand how these compounds work, Kennedy and Troll are focusing on protease inhibitors' recently identified ability to inhibit the action of oncogenes. It is generally assumed that specific oncogenes must be activated for cancer to develop, Kennedy says. — J. Raloff