and his group relied on the fact that diamonds sometimes contain tiny inclusions of other minerals like garnet, which show up as spots of color in an otherwise colorless matrix. These minerals, in turn, contain small amounts of radioactive trace elements (such as samarium-147, which decays into neodymium-143). By comparing neodymium isotope ratios found within the minerals with present-day ratios, the researchers came up with an age of 3.2 billion to 3.3 billion years.

Usually, it is possible to conclude only that inclusions are older than their host mineral. However, sometimes the crystal form of the silicate mineral trapped within a diamond resembles the internal structure of a diamond more than its own natural pattern. This indicates that the diamonds and their silicate inclusions probably formed at about the same time.

—I. Peterson

Further attack on gene-splice tests

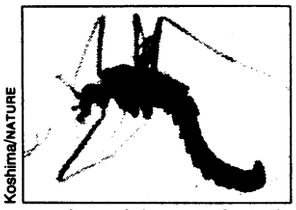
Private companies have not been prohibited from doing field experiments in which genetically engineered organisms are released, although a recent court decision at least temporarily prohibits the National Institutes of Health from allowing university researchers to undertake such tests (SN: 3/26/84, p. 325; see also page 61). Private companies were exempted from the ruling because they come to the NIH "voluntarily" for guidance; the institute has no legal authority over their actions, the court ruled. But Jeremy Rifkin of the Washington, D.C.-based Foundation on Economic Trends, the plaintiff in the suit, argued that *all* privately and publicly funded field tests of genetically engineered organisms should be banned until the NIH does a formal assessment of their potential impact on the environment. Now Rifkin is making plans to go back to court with a new argument.

The licensing agreement the private companies have signed with Stanford University for the use of the basic gene-splicing techniques includes a provision that the companies adhere to the NIH guidelines, Rifkin says. Therefore their coming to NIH for approval of experiments is not voluntary, he argues. "The private companies are more bound by law than the universities," he claims.

NIH and Stanford representatives say that Rifkin's arguments are wrong. Among the objections they are expected to raise in court is that the licensing agreement only states that the companies will comply with the physical and biological containment standards of the NIH guidelines, but makes no mention of field tests. They also are expected to argue that a private agreement between a company and a university does not extend NIH's authority.

—J.A. Miller

New bug comes in from the cold



Koshima/NATURE

Scientists scanning the surface of a Himalayan glacier for signs of life have uncovered a new species of insect that thrives in frigid climes that dip as low as −16°C.

While some Antarctic insects are known to survive even colder temperatures, most "winter over" in the larval stage of development, and save adult activities for the spring thaw. But during his month-long stay at the Yala glacier north of Katmandu, Shiro Koshima of Kyoto University in Japan spotted more than a thousand adult representatives of a new species of Chironomid midge, a flightless cousin to the mosquito. "In view of the fact that temperatures in this range normally cause cold stupor, even in Antarctic insects, this finding is amazing," Koshima reports in the July 19 NATURE.

More than 99 percent of the midges Koshima found strolling along the ice surface were single females, while most of the males and mating pairs remained in cozier crevices created by melting snow. The insects apparently feed on tufts of bacteria and algae that crop up on grains of mud in the snowmelt. Exactly how the midges manage to stay warm and active in winter remains to be determined, though overcoats may safely be ruled out. Simply getting in out of the cold may play a role; the midges seem to prefer daytime wanderings, and return to their snow caves at night. Some previously studied species of cold-adapted insects are known to make their own anti-freeze, supercooling their bodies but never freezing, while others literally freeze for the winter, and start circulating again in the spring.

—D. Franklin

Giving the business to ancient Maya trade

The advanced Maya civilization of Middle America disappeared 500 years ago, but this has been a good year for scientists studying what life was like during the Maya's heyday, the Classic period from about A.D. 250 to 900. In May, the National Geographic Society announced the discovery of an untouched 1,500-year-old Maya tomb that contains a cornucopia of revealing artifacts (SN: 5/26/84, p. 326). To top that off, three Canadian anthropologists report in the July 27 SCIENCE that obsidian, a volcanic rock prized by the Maya for its sharp cutting edges, was traded more extensively and along more routes than previously thought.

The Maya's two major sources of obsidian in the highlands of what is now Guatemala were at the hub of an intricate distribution network, say researchers Paul F. Healy and Bernie Walsh of Trent University in Peterborough, Ontario, and Heather I. McKillop of Northeastern Archaeological Associates in Port Hope, Ontario. They suggest that obsidian from the two sites, El Chayal and Ixtepeque, as well as other sources, was transported in canoes throughout the lowlands of Guatemala, southern Mexico, Belize and the Yucatan Peninsula by multiple routes.

Until now, many Maya researchers assumed that obsidian was traded along two major routes, one winding inland from El Chayal along several large rivers, the other stretching from Ixtepeque to the Caribbean and then up the coast.

But in a trace element analysis of 13 obsidian samples recovered from Moho Cay, a small island in the Caribbean just off the coast of Belize, the investigators identify 12 of the samples as originating at El Chayal. The artifacts date to A.D. 400 to 700. Trace element ratios, arrived at through special X-ray and neutron activation procedures, vary characteristically for obsidian from El Chayal and Ixtepeque.

This suggests, say Healy and coworkers, that "El Chayal was a major obsidian source for coastal as well as interior Classic Maya lowland sites." Islands such as Moho Cay probably served as "trade nodes," they add, where the long dugout canoes of the Maya could pull in so that paddlers could rest and exchange goods for trade. Moho Cay is ideally situated at the mouth of the Belize River to handle trading canoes.

Classic Maya civilization brought great advances in the arts, sciences and agriculture and provided fertile ground for a complex trading system, Healy told SCIENCE NEWS. There were hundreds of large ceremonial centers in Middle America at the time, each containing hundreds of thousands of people.

Aside from obsidian and ceramic objects, most other Maya trading goods have deteriorated over the years, says Healy. "The materials from the highlands may have been traded for lowland goods available in the rain forests, such as hardwood products, animal skins and woven cotton goods, but these objects don't survive for anthropologists to study," he explains.

Although the Maya largely traded among themselves, there may also have been some export-import business, Healy adds. He just returned from Belize with some granite artifacts that date from the Classic period and were probably obtained from non-Maya sources. Trace element analysis may uncover the origin of the stones, he says, which were used to grind foodstuffs.

—B. Bower