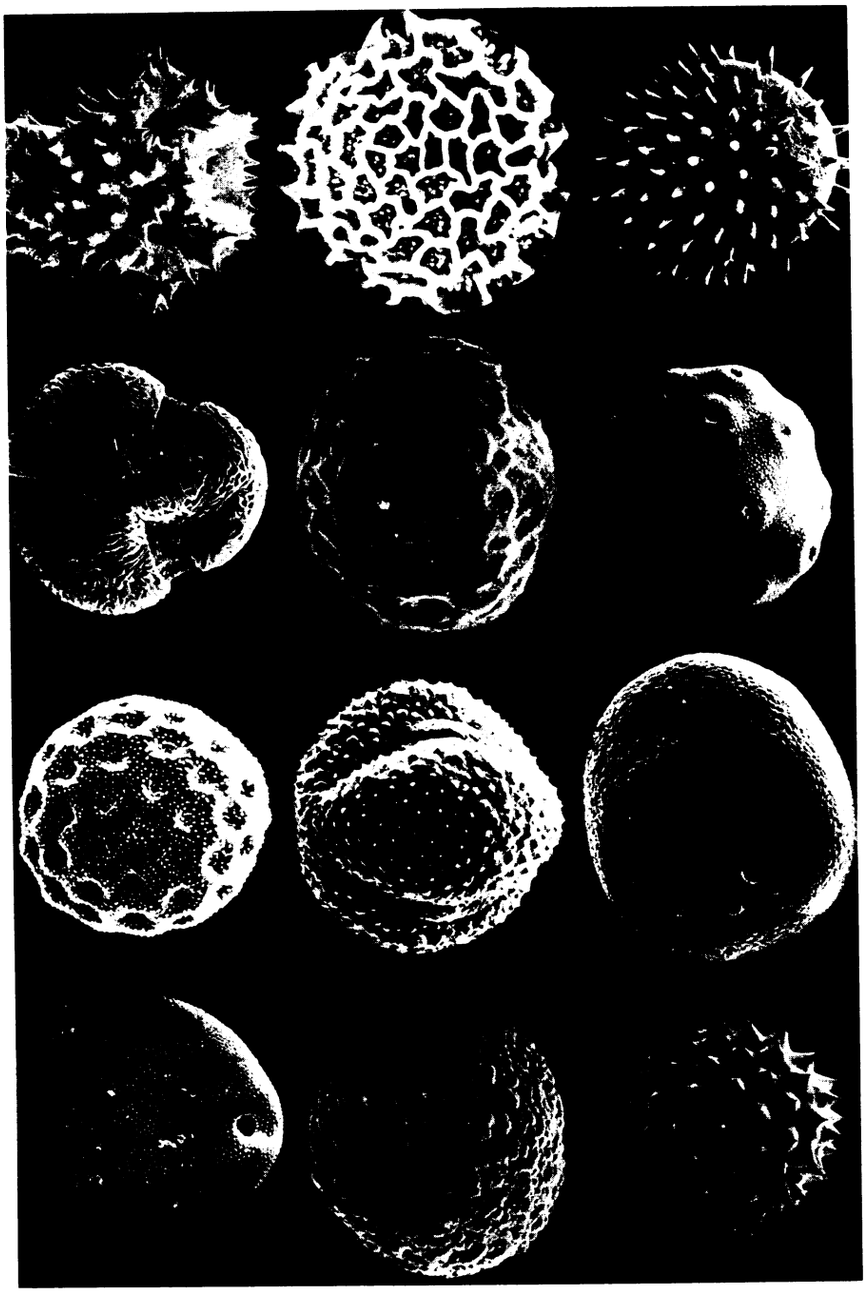

Maybe these are what have been bothering you

Sneezing a lot lately? These photographs, taken under a scanning electron microscope at the Smithsonian Institution National Museum of Natural History, show the culprits that cause so much discomfort to hay-fever sufferers.

The pollen grains are from left to right, top to bottom: dandelion, bougainvillea, hibiscus, box elder, American elm, black walnut, saltbush, sagebrush, Johnson grass, pecan, white oak and giant ragweed. They are magnified 1,800 to 3,400 times actual size.

Pollen is the male sex cell of a flowering plant encased in a tough, durable wall or exine that protects the cell on its journey from stamen to stigma. This transfer, made by animal, wind or water, is necessary for the completion of a flowering plant's life cycle—for seed and fruit production. The pollen grain is one of the most indestructible structures found in nature.

The number of hay-fever producing plants is small. They tend to be wind-pollinated, produce large amounts of pollen and have toxins that cause allergenic reactions. The most significant hay-fever plants, in terms of allergenic reactions they produce, are those members of the grass and daisy or aster family. Not only are they very abundant but they produce large quantities of buoyant pollen.

Sun dances for Skylab: Scientists elated, puzzled

The sun is popping out all over, keeping the Skylab astronauts hopping and solar scientists in Houston near stages of exhaustion trying to keep up with all the activity.

In the last three weeks of the current 27-day solar rotation period there have been 24 active regions, two giant "X" type X-ray flares, dozens of smaller and medium-sized flares, and resulting geomagnetic storms, auroras and shortwave radio interference on earth.

The two whoppers, the "X" flares which happened Sept. 6 and 7, elicited all kinds of sun dancing by the scientists monitoring the Skylab telescopes in Houston. Both flares were big events and released 10 times more X-rays than anything yet observed by the Skylab crew, but the flare of Sept. 7, called a "proton flare," created more visible chaos on the sun. "That's a big daddy," quipped the astronauts. The flare released a tremendous amount of material, 10 times the mass of the earth, and sent protons traveling toward earth at 30,000 miles per second. The first protons were detected by earth-orbiting satellites within 30 minutes of the start of the event. The event itself lasted two hours; the effects on earth lasted more than 48 hours. According to Joseph Herman of the National Oceanic and Atmospheric Administration, the flare caused power-line disturbances at the northern latitudes. It produced enough energy to supply all energy needs for earth (including electricity, coal, gas) for the next 500 years and enough energy for electricity for the earth for the next 10,000 years. The energy release was equivalent to 100 million times that which caused the great San Francisco earthquake.

All this is an enigma to the scientists. The sun is supposedly now in the quietest period of its 11-year cycle of activity. Activity on the sun is measured by the size and number of sunspots, and by that criterion the sun is now as active as sunspot maximum. "We just didn't expect to see this much activity," says E. M. Reeves of Harvard College Observatory. "The flares of last August (SN: 8/19/72, p. 119) were unusual for this time period," says James E. Milligan of the Marshall Space Flight Center. "But at least last August's activity was limited to just one region. Now the active regions are popping out all over the place."

How do the scientists account for all this? "No one really knows," says Milligan. "The sun is just blowing its top."

So far the Skylab 2 astronauts have spent more than 230 hours observing

the sun—50 hours more than scientists had expected for this second mission. Scientists in Houston are manning the telescope consoles 24 hours a day, analyzing pictures from the first Skylab mission and planning for the last Skylab mission.

It now appears they will have a rest —at least from the current sun—for awhile, as the sun is nearing the end of this activity cycle. "We hope our old friend the quiet sun is coming back," says Milligan. □

Misinterpretation of the vitamin E facts

Vitamin E, the food freak's cure-all, has been the subject of clinical controversy for several years. Proponents claim that large daily doses of vitamin E can cure or prevent a variety of ailments. Opponents argue that adequate amounts of the vitamin are available in the usual diet and that supplemental doses produce no beneficial effects (SN: 1/15/72, p. 44). Now the National Research Council has come out against supplemental or megavitamin doses of vitamin E.

Misleading claims and misinterpretations of research data are responsible for the widespread popularity of vitamin E, said the new Committee on Nutritional Misinformation of NRC's Food and Nutrition Board in a report issued this week. The report explains that artificially induced vitamin E deficiency produced sterility in male rats. Some researchers concluded from this that vitamin E was a fertility drug. Similar deficiency experiments with other lab animals produced a variety of symptoms that vitamin E was supposed to cure. But, says the report, "Careful studies over a period of many years attempting to relate these symptoms to vitamin E deficiency in human beings have been unproductive." □

Cells with four or more nuclei

Ordinarily cells have only one nucleus each. But geneticists have found that when dividing cells are put in the presence of a chemical called cytochalasin B, the cells can acquire two or more nuclei apiece.

Michael H. L. Snow of the Institute of Animal Genetics in Edinburgh has now found that cytochalasin B can be used to produce mouse embryos containing four nuclei per cell. Some of these embryos were successfully implanted in foster mothers, divided further and lived to the time of birth.

These results represent considerably greater development of four-nuclei cells than has been achieved after cell fusion or other treatments in mammals. The Scottish geneticist reports his achievement in the Aug. 24 NATURE.

Snow flushed two-cell embryos from the oviducts of mice on the second day of pregnancy and put the embryos in a culture of cytochalasin B for 11 or 12 hours. The embryos divided into more cells, and the cells contained more than one nucleus. A number of embryos divided into cells with eight nuclei each. One embryo divided into cells with 16 nuclei each. About 40 percent of the embryos reached the blastocyst stage, where an embryo is ready to implant itself in a uterus and become a fetus.

Snow transferred blastocysts containing cells with four nuclei each into the uteri of foster mother mice. Most of the blastocysts did not continue to develop to the time of birth. Having four nuclei per cell appeared to limit their ability to divide into more cells. But some of the blastocysts did continue to develop, and three mouse fetuses were alive up to the time of birth. All of the blastocysts that grew in the womb were normal but one. Its wall failed to close so that its viscera were externalized.

Snow concludes that having four nuclei per cell tends to keep an embryo from developing. But if an embryo does manage to develop, having four nuclei per cell does not necessarily work genetic damage. □

Man-made catastrophe averted at Heimaey?

A possibly catastrophic explosion that could have demolished an entire town was averted by a single day early this year when scientists realized that hot lava and cold water, like gasoline and alcohol, are a risky mixture.

During the spectacular eruption of the Heimaey volcano near Iceland, the underwater lava flow was threatening to block the island's harbor. A plan was suggested to set off some high explosives near the flow, in hopes that rapid mixing with the seawater would thicken the lava and slow it down before it could reach the harbor mouth. The Icelandic Government, the Icelandic Coast Guard and the U.S. Navy were all prepared to help with the project, when it occurred to someone that they might be getting more than they had bargained for.

When a single cubic centimeter of lava is cooled from a typical temperature of 1,100 degrees C. to 100 degrees C., according to Thorbjorn Sigurgeirsson of the University of Iceland and S. A. Colgate of the New Mexico Institute of Mining and Technology, more than 2,000 foot-pounds of energy are released. With the huge volumes of water and lava available at Heimaey, they report in the Aug. 31 NATURE, the resulting pressure might have been enough (as they realized in the nick of time) to keep the lava and water mixing to the point of a major explosion.

This, they theorize, may have been just what triggered the titanic blast of Krakatoa in the South Pacific in 1883, which was heard 2,500 miles away, spewed ash around the world and registered on seismographs for months afterward. The same mechanism may account for several heretofore unexplained industrial explosions in which molten metal came into sudden contact with water.

At Heimaey, they report (no doubt with a shudder), "the energy released might have come to between two and four megatons. Naturally the experiment was called off." □

Sulfur monoxide found in interstellar space

The 22nd molecule to be detected in interstellar space, the first in about a year, is sulfur monoxide. Its discovery in the constellation Orion is reported by Carl A. Gottlieb and John A. Ball of the Harvard College Observatory.

The new molecule is the fifth sulfur-containing substance to be found. Since it contains oxygen it will be useful in attempts to infer the abundance of oxygen in space, and thereby to learn something about the chemical processes forming the interstellar molecules. □