

... dust: alternating strata of frozen water and wind-blown Martian surface material, winters and summers on an alien world. In some places, one of the higher strata can be seen to dip downward, cutting off the layers beneath while new layers form on top of it. "That," says Carr, "is the kind of thing we're looking for in these pictures, because [it] tells us that there was a climatic change." There may, in fact, be no better place on the planet to try to find out whether, as has been suggested by some researchers, the climate of Mars has had, on a billion-year scale, its ups and downs. "We may well be able to determine . . . to what extent there have been climatic changes in the past," Carr says, "and even at what time these climatic changes took place." □

Soviets abort Soyuz space mission

The latest attempt by the Soviet Union to send two cosmonauts to the orbiting Salyut 5 space station ended in failure on Oct. 16. Soyuz 23, carrying Lieut. Col. Vyacheslav Zudov and Lieut. Col. Valery Rozhdestvensky of the Soviet Air Force returned to earth after a malfunction prevented it from docking with the Salyut.

Soyuz 23 landed in Tengiz Lake near the city of Tselinograd in Kazakhstan at 8:46 p.m. Moscow time or 48 hours after it had blasted off from the launching station at Baikonur. The splashdown, which took place during a blizzard, was apparently not intentional, but an emergency necessity, according to the latest reports. The Soviets have usually landed their cosmonauts by parachute on hard ground; splashdowns are a specialty of the American space agency, but NASA's splashdowns take place in tropical waters, where snow and temperatures of -17°C are not probable hazards. Amphibious craft aided in the rescue of the cosmonauts. Apparently it took some time to find them since reports of their safe recovery were delayed several hours. □

PCST members

President Ford has named nine members to the President's Committee on Science and Technology Policy (PCST), which will conduct a two-year study of federal science support, chaired by Simon Ramo (SN: 8/21/76, p. 116).

The members are: William Baker of Bell Labs, vice chairman; Otis Bowen, governor of Indiana; W. Glenn Campbell, Hoover Institution, Stanford University; Edward David, Gould, Inc.; Elizabeth Leduc, Brown University; Fritz Russ, Systems Research, Inc.; Charles Slichter, University of Illinois; Charles Townes, University of California; W. Bradford Wiley, J. Wiley and Sons, Inc. □

First ban on porpoise killing imposed

In one of the most dramatic actions taken in the long series of disputes over how best to protect potentially endangered animal species, the National Marine Fisheries Service this week exercised for the first time its authority to stop entirely the killing of porpoises in connection with tuna fishing. The agency maintains that the action is necessary to comply with provisions of the Marine Mammal Protection Act of 1972; but American tuna industry spokesmen counter that the ban may only shift more business to foreign fishermen, and not help the porpoises at all.

For years, tuna fishermen have relied on the porpoise to help locate schools of yellowfin tuna, which last year accounted for 60 percent of the American tuna catch. As the porpoises prey on the yellowfins, they are sometimes caught in the long nets hauled behind fishing trawlers. The nets keep the porpoises from surfacing for so long that they drown. The Fisheries Service has set a quota of 78,000 porpoises a year that may be killed in this way, and when that limit was reached this week, it instituted a ban for the rest of the year.

Theoretically the tuna fishermen could still go after bluefin or skipjack tuna that do not associate with porpoises, or they could try to locate yellowfin schools that had not yet attracted porpoises. But August J. Felando, general manager of the American Tuna Boat Association told SCIENCE NEWS that these are hardly viable options this late in the season. Although the catch has been quite good this year, he says, rising costs of production mean that unless the fishermen are allowed to continue catching yellowfin the quickest way they can, they will lose money.

Perhaps the critical factor is the uncertain effect the ban will have on foreign fishermen. The Fisheries Services has imposed an embargo on *any* tuna caught after this week through following porpoises. Foreign companies must have certification by their governments that their tuna exports to the United States fall within these restrictions. But Felando points out two weaknesses in this scheme: First, other nations do not have the ability to monitor their vessels carefully enough to make the certification meaningful, and second, past threats to impose embargoes have sometimes run afoul of other political considerations and have been aborted.

The ban may simply be a "windfall for foreign operators," concludes Felando, resulting in higher prices for American consumers and threatening the very existence of the United States tuna fleet.

About the only ray of hope that both the Fisheries Service and the Tuna Association can agree on is a family of new nets designed to help porpoises escape unhurt. By using a finer mesh near the top, which is more easily detected by the

porpoise's sonar and is too small to catch on the porpoise's nose, the rate of porpoise killing can be reduced by as much as two-thirds. But these are still experimental and may have to be enforced through international treaty.

In the final analysis, the current ban does illustrate a growing commitment toward protecting threatened species, but it also highlights the increasing complexity and cost of wildlife conservation in sensitive commercial areas. □

Quake prediction council set up

The U.S. Geological Survey this week announced the establishment of a five-member Earthquake Prediction Council to review data that could warn of an earthquake and to recommend issuance of any prediction. It is the first federal group of its kind to be set up in the United States. The USGS said it considers the action a major step toward development of a system for the orderly and effective issuance of earthquake predictions. The agency has statutory responsibility for warning of geologic catastrophes where possible.

The council's work will begin at the first indication of new data that could lead to a prediction and ends if a prediction is not formulated or if a recommendation to issue a prediction is sent to the USGS director. He then would issue the authorized prediction.

The scientists on the council are Jerry P. Eaton (its chairman), Robert Wallace, Peter Ward, Robert Page and Jack Evernden. All are at the agency's Menlo Park, Calif., earthquake studies office.

V.E. McKelvey, director of the USGS, emphasizes that there is yet no operational capability for reliable earthquake prediction but says "such a capability is possible in the near future." □

Agencies to ban fluorocarbon sprays

The Food and Drug Administration (FDA) last week proposed elimination of nonessential uses of fluorocarbon propellants in foods, drugs and cosmetics. The FDA regulates about 80 percent of products now sold in aerosol containers. During the phaseout, the agency will require a warning on cans to alert consumers that the contents include a fluorocarbon that damages the environment.

Under the new Toxic Substances Control Act (SN: 10/16/76, p. 244), the Environmental Protection Agency may ban fluorocarbon propellants for products other than foods, drugs and cosmetics.

The FDA's proposal was in response to a recent National Academy of Sciences report (SN: 9/18/76, p. 180). The NAS panel concluded that fluorocarbon propellants are depleting the ozone layer in the earth's stratosphere, but that more research is needed to accurately determine the extent of depletion, which could range from 2 to 20 percent in the next hundred years. The NAS report recommended no regulatory action be taken before up to two years of further research.

But FDA Commissioner Alexander M. Schmidt said knowledge of the exact rate of ozone depletion won't change the ultimate regulatory situation. "Without remedy, the result [of fluorocarbon use] could be profound adverse impact on our weather and on the incidence of skin cancer in people," Schmidt wrote to the Council on Environmental Quality. "Even a 2 percent ozone depletion from 'unessential' uses of fluorocarbons is undesirable."

The details of the FDA plan will be announced in mid-November. □

The Kirlian effect: A flash in the pan?

Multicolored flares, sparks, twinkles, bubbles and flashes emanating from the human body—and they can be recorded by the process known as Kirlian photography, one of the most colorful phenomena to be investigated in recent years. The process is simple. In a typical Kirlian device, the object to be photographed is placed between two metal plates. A photograph is obtained when a large electric potential is applied. The explanation for the weird-looking photographs may be just as simple, but numerous exotic explanations have been put forward. Kirlian photography has been linked to almost everything from astral projection and acupuncture to pheromones and extrasensory perception (SN: 9/29/73, p. 202).

More mundane explanations have also been offered but were often overshadowed by the exotic. William Tiller of Stanford University, for instance, suggested that the Kirlian phenomenon is related to corona discharge—a luminous, low-current gaseous discharge occurring in the atmosphere at electric field strengths below the threshold for spark breakdown. John O. Pehek, Harry J. Kyler and David L. Faust, working at Logical Technical Services Corp. in New York, have followed up on this line of research. Their lead article in the Oct. 15 *SCIENCE* concludes: "Photographic images obtained by the Kirlian technique are principally a record of corona activity during an exposure interval. Most of the variations in the images of the corona of a living subject who is in contact with the photographic film can be accounted for by the presence of moisture on or within the subject's

surface." A number of subjects were photographed under a variety of conditions and differences were recorded. But, say the researchers, "By controlling the availability of moisture at the fingertips

... we have been able to replicate many of the changes in images of corona whose significance has been debated." Not a colorful explanation, but one that may throw water on Kirlian photography. □

Huntington's disease: An animal model

Huntington's disease is one of the most devastating neurological disorders. The celebrated folksinger Woodie Guthrie was one of its victims. In the early stages of the disease he started walking lopsided, and as it progressed he flew into rages. Gradually he lost his ability to talk, read and walk. He could communicate with his wife and children only by flailing an arm at printed cards marked yes or no. He died in 1967, after 15 years of such agony.

Equally cruel, the disease is inherited and usually does not show up until age 30 or 40. This means that the victim may have reproduced by the time the disease is evident and has already passed on a 50-50 chance of inheriting it to the children. Two of Woodie's children have since developed Huntington's, and three more live in fear of getting it—29-year-old Arlo, a folksinger in his own right and already the father of three, 27-year-old Joady and 26-year-old Nora. The shadow of Huntington's also looms over 5,000 other families in the United States.

At present, no treatment can halt the progression of Huntington's, and even tranquilizers can provide symptomatic relief for only a third of patients. However, three Johns Hopkins researchers—Joseph T. Coyle, Robert Schwarcz and Robert Zacazk—do offer a glimmer of hope to Huntington's victims and potential victims. They have found an animal model for the disease, a model that has not been available before, since the disease only occurs in humans. This finding sets the stage for unlocking the secrets of the disease and finding an effective treatment for it. Without a model, researchers have had to rely on human autopsy material to study the disease, and they have been reluctant to try new drugs on patients that have not been tested in animals first.

A major site of Huntington's disease damage is the basal ganglia of the cerebrum. This is also the major site for Parkinson's disease, which leads to rigidity of muscles, tremor and difficulty moving—effects that are the opposite of the uncontrollable limb movement of Huntington's. Back in the 1960s, researchers identified the neurological basis of Parkinson's. Brainstem nerve axons that innervate the basal ganglia die, and the axons no longer provide the basal ganglia neurons with the neurotransmitter, dopamine. This discovery gave researchers the idea of giving L-Dopa, a precursor of dopamine, to Parkinson's patients in hopes that it would compensate for the dopamine deficiency in their basal ganglia and thereby eradicate the symptoms of the

disease. L-Dopa provided dramatic improvement and is today the major treatment for Parkinson's.

Huntington's chorea, however, has long been known to consist of another basal ganglia abnormality—death of the neurons that comprise the basal ganglia rather than of the brainstem axons that innervate the basal ganglia. Two years ago, E.D. Bird and L.L. Iverson of the University of Cambridge and T.L. Perry and co-workers of the University of British Columbia found that this loss in basal ganglia neurons is accompanied by a dramatic loss in the two neurotransmitters that these neurons make—acetylcholine and gamma aminobutyric acid (GABA). Coyle and his co-workers set out to find a drug that, when injected into the basal ganglia of experimental animals, would produce the same kind of damage seen in the basal ganglia of Huntington's victims—death of the basal ganglia neurons and a decrease in the neurotransmitters they make.

The drug they tried was kainic acid. It has the ability to kill neurons, and receptors for it are limited to neuronal cell bodies and not axons. By injecting it into the basal ganglia of animals, they hoped to kill the neurons comprising the basal ganglia, but not the brainstem nerve axons innervating the basal ganglia, thereby reducing acetylcholine and GABA in the basal ganglia, but not dopamine, present in the basal ganglia courtesy of brainstem axons. Basal ganglia neuronal death and a decrease in acetylcholine and GABA, they anticipated, would then lead to the neuropathological characteristics of Huntington's.

They injected the drug into the basal ganglia of rats. It met their expectations beautifully, triggering neuronal death, a decrease in acetylcholine and GABA but not in dopamine or the behavioral changes resembling Huntington's chorea. "This procedure," they conclude in the Sept. 16 *NATURE*, "could provide an animal model for the study of the disease."

Now that researchers have a model for Huntington's, Coyle says, they can test different drugs on animals and can use the model to better understand the degeneration underlying the disease. Scientists can also use the model to look for some biological marker of the disease. If such a marker is found, it might then be used to identify Huntington's victims before they reproduce, or even to identify human fetuses with the disease, thereby giving parents the option of aborting a baby with Huntington's. □