Smithsonian Center: A Phenomenon in Its Own Right

Robert Citron, the mustachioed and highly mobile director of the Smithsonian Institution's Center for Short-Lived Phenomena, was dictating a letter near the wall-sized map of the world in his office in Cambridge, Massachusetts. He had just returned from a trip to Houston, where he was advising Mission Control on pictures the Skylab crew should take in various of their 71 orbits—pine beetle infestations in North America, an oil spill in a Hungarian river, an eruption of the Kilauea volcano off Hawaii. He would be off to San Francisco that afternoon.

Meanwhile, like the conductor of an unseen orchestra, he recited the day's planetary events. "We've got three oil spills going on right now," he observed —in Hungary, Australia, and the North Sea—as well as five volcanic eruptions, the birth of a new island off Japan (information relayed with the pride of a zoo keeper announcing the birth of a gorilla), a meteorite fall in Colorado, and three or four massive insect infestations. In the previous 2 weeks, he added, there had been a squid stranding in New Caledonia, a bird kill in Spain, a seal stranding in the French Pacific, a cyanide spill in the Gulf of Mexico, and sundry volcanic rumblings.

For the past 6 years, the center has been listening to and passing on to scientists the earth's cryptic messages, relayed through its shiftings, eruptions, and outbreaks of bizarre behavior among its flora and fauna. The center boasts in its "state of the earth report," called "The Pulse of the Planet," that even the dour Soviet Academy of Sciences noted that "some say this is the greatest scientific information service" ever created. True or not, the center itself seems to have established itself as a permanent phenomenon.

A few oil spills and bird kills are not what really make the center jump. Sometimes the radio room in the center's seven-room headquarters takes on the air of a war room during an attack —as it did, for example, during the earthquake that brought down Managua last December. All the city's lines of communications had been cut, and while Howard Hughes was scurrying out to the airport to see if the runway was smooth enough for a take-off, the center was getting information from a ham radio operator in Managua who was operating a portable set from his car. The news was relayed to disaster centers around the world.

The idea of a global headquarters to relay instant information on short-lived events had been brewing for some time before its establishment in 1968 and received added impetus from the colossal birth in 1963 of Surtsey, the new volcanic island off the southwestern coast of Iceland. Scientists appreciated the continuous flow of accurate information they got from Icelandic scientists and thought it would be nice if it happened more often. So Sidney Galler, then assistant secretary for science at the Smithsonian, set to work and came up with the idea for a global Center for Short-Lived Phenomena. The name has a quaint Renaissance ring to it, but in fact such a center could not have been effective without relatively recent developments in worldwide telecommunications, transportation, and portable, reliable scientific equipment.

At any rate, the center started with a bang, as it were. Citron, a photographer and amateur scientist, was called back from his job of setting up field research stations in Africa and installed in a room with a secretary and two telephones. They immediately began relaying information on the birth of another volcanic island, which boiled out of the sea in the Metis Shoals north of Tonga. The island subsided under the sea within 58 days, but not before volcanic activity had been witnessed, photographs taken, and samples gathered.

The center has grown rapidly since then and now has nine employees, nine telephone lines, six private and governmental teletype circuits, a radio room, and the services of the computers of the Smithsonian Astrophysical Observatory, in whose quarters it is housed.

Citron refers to the center as a "science news service," but things seem a little more fun than the term implies, what with Dave Squires, the staff's geographer, plotting assignments for Skylab on a wall-sized map or inspecting an 8-pound package of volcanic pumice airmailed from the South Pacific.

The center has some 2300 correspondents around the world who call, write, or telegraph reports of events—natural and unnatural—in their parts of the world. Most are scientists; the rest are a mélange of librarians, museum people, technicians, airline pilots, and amateur scientists. Phenomena are divided in four categories: geophysical, astrophysical, biological and ecological, and "urgent" anthropological or archeological finds. The basic purpose is to alert field researchers of fast-breaking events in their areas of expertise so they can get to the scene before the phenomena have subsided.

The center has picked up some 2000 subscribers (correspondents get their news for free) since its inception, who pay from $15 a year for weekly "event notification cards" to $250 for instant, round-the-clock telecommunications. (Subscriptions and other private funds cover about one-fourth of the center's annual budget, which has grown steadily over the years to $120,000. Federal money covers the balance.) Government agencies and private companies, as well as scientists and institutions, subscribe: in addition to the National Aeronautics and Space Administration, which is also advised on photo opportunities for the Earth Resources Technology Satellite, the Atomic Energy Commission gets baseline data on effects of various phenomena on animal populations for its research on the biological effects of radiation, General Electric's ocean sciences laboratory is notified of marine events, and Exxon is forwarded data on the world's oil spills. Citron believes the market for the center's services has still not reached its full potential—"You'd be surprised at some of the letters we get from prominent scientists who've never heard of us"—and his ambition is to make the center into nothing less than everybody's "global eco-alert center."

Although the center is trying to increase its volume of event reports, it is selective—an oil spill has to be 10,000 tons or more, an earthquake has to approach 7 on the Richter scale, and a pollution disaster has to threaten a rare or endangered ecosystem. An

event also has to be studiable. UFO reports have been received, but they do not count because they don't last long enough to be investigated. On the other hand, the comet Kohoutek is not a major concern because it was predicted. Early reports are sometimes misleading, as in the case of the "prehistoric sea monster" washed ashore that turned out to be a whale with a bone protruding from its head. Then, of course, there was the famous Malaysian "frog war," which turned out, on closer inspection, to be an unusually frenzied mating session occasioned by rains following a long drought when the frogs stayed celibate in their burrows.

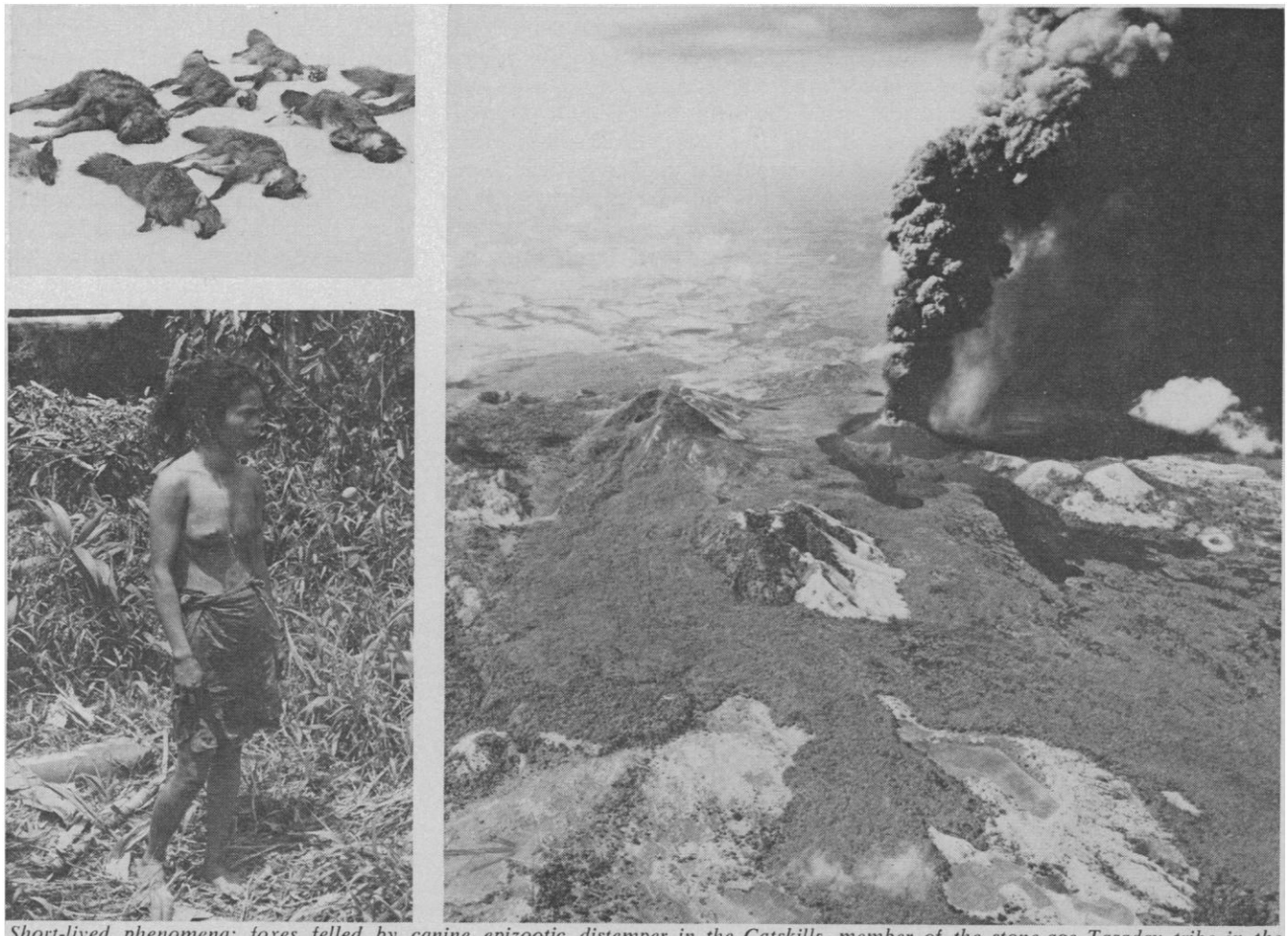
The center has become a great repository of scientific detective stories, some resolved and some not.* One such is the "Appalachian squirrel migration." Citron said he received a letter in the summer of 1968 from a man doing research on gray squirrels who said that every 20 or 30 years the squirrels go berserk and migrate for no known reason. The center paid little attention since the documentation appeared to be all second-hand. A week later, news came from a warden in the Great Smokies National Park that squirrels were on the move in unusual numbers. More reports came trickling in from all over the southeastern United States. In a few weeks, millions of squirrels were "irrupting" in all directions. A mass of squirrel carcasses was found blocking a reservoir drain, and one squirrel shorted out the entire electrical generating capacity of a small town (shorting himself out in the process).

At the peak of this activity, the center kept in touch with 71 biologists, mammalogists, and research institutions and distributed daily reports to 121 biological correspondents around the world. At first, scientists surmised the squirrels were starving, but autopsies belied this. The final explanation they hit upon was that, owing to a vast population expansion, squirrels were going farther and farther from their original haunts to find and bury food and had become disoriented and panicky. What appeared at first to be an inexplicable and unprecedented phenomenon turned out to be neither, although this one was on an unusually grand scale.

Whale beachings—a notable case being the stranding of 150 false killer whales in Florida in January 1970—are another mystery. Certain marine mammals occasionally beach themselves en masse; even when they are towed back to sea, they return. One theory is that, when the animals get in shallow water too close to shore, their sonar systems go out of whack and they stampede like cattle. But behavioral theories (for example, do they have lemming-like instincts?) are impossible to test, and it will be years before enough data are collected to supply the full answer.

It is sad and ironic that newly discovered tribes rate as "short-lived phenomena," but the fact is that their cultures begin to decay the moment contact is made with an outsider. Some observers believe that such tribes

* D. Shepard and J. Shepard, *Earthwatch* (Doubleday, New York, 1973), $8.95. *Earthwatch* details many of these stories.



Short-lived phenomena: foxes felled by canine epizootic distemper in the Catskills, member of the stone-age Tasaday tribe in the Philippines, and the Cerro Negro Volcano erupting in Nicaragua.

should not be included in the alert system because broad international publicity will attract curiosity seekers. But others maintain that, if the right people are notified first, measures can be taken to protect these tribes from disease and governments can be pressured into protecting them from exploitation.

There appears to be little doubt that the center is filling a gap that needed to be filled. While it is not necessarily the first agent to pass on the news of a major event, it has created a more systematic means of communication among scientists and scientific institutions throughout the world than previously existed. News travels faster and gets to the right people sooner. And, as only a quasi-governmental organ, it is free to make contacts where it chooses. The center has contacts in 138 countries, and although the People's Republic of China does not participate, reports are regularly sent to a handful of top Chinese scientists.

The biggest category of event reports emanating from the center involves earthquakes, followed by volcanic eruptions. (Citron claims volcanologists thought there were only about 10 major eruptions a year, but since 1968 the number has been found to be closer to 20) and oil spills. The way things are going, man-induced dislocations will undoubtedly soon top the list. Appropriately enough, one of the center's major activities aside from its reporting network is the designing of a Global Environmental Monitoring System (GEMS 1), part of the United Nations environment program. Citron says the center, because of its unparalleled array of contacts, has been asked to help survey environmental monitoring programs throughout the world in order to assess the feasibility of setting up a comprehensive, internationally coordinated system, possibly to be located in Nairobi.

The center is also pulling students into its act through what it calls its International Environmental Alert Network, established last January. Some 50,000 students are plugged in, most of them in the United States, and program director John Whitman says their contributions accounted for 16 percent of the event reports sent out this year. Students are also being invited to contribute to field research projects, the first of which has been to collect samples of the *ma-dake* bamboo, a species that flowers and then dies once every 60 to 120 years. The samples are being forwarded for scrutiny to two Smithsonian botanists.

Nature holds the secrets close when things are running smoothly; it is the exceptional event—a meteorite fall, a volcanic eruption, a mass whale beaching, a worm invasion—that yields insights into the nature of the steady-state universe. And the center, as a collector of pieces of a vast, multidimensional puzzle, may help scientists press toward a deeper understanding of the order underlying all things.

—CONSTANCE HOLDEN

Energy in Britain: Shopping for a New Reactor

Europe has been hard hit by the energy crisis. More dependent than the United States on imports of Arab oil, most European governments are now facing up to the real prospect of a drop in living standards next year and a continuing heavy burden on their balance of payments produced by the increased oil prices.

In Britain the situation has been made a great deal worse by bans on overtime working by coal miners and electricity power engineers. Neither group can be persuaded to return to normal working because the government insists on maintaining its income policy—which means that neither miners nor power engineers can get enough to satisfy their members. A 3-day working week designed to make stocks of oil and coal go further is to be imposed by the government, thus underlining how serious the situation is.

If these problems were not enough, the government is also engaged in the process of selecting a new nuclear reactor system. The British nuclear power industry, weak at the knees after years of very mixed success, is turning to the United States for a technology to get it out of trouble. The candidate chosen, the light water reactor (LWR), is not perhaps everybody's idea of a savior, but there is no doubt that LWR's are now nearer than ever before to being built in Britain.

But the switch to American technology, if it happens, is going to be controversial. Already a whiff of the battle going on in the United States over the safety of the LWR has drifted across the Atlantic, and nuclear power safety has become an issue in Britain for the first time.

Environmental groups like Friends of the Earth, with volumes of technical material from their cousins in the United States, have made much of the running, but there are also engineers inside the nuclear industry in Britain who would regard the introduction of LWR's as deeply depressing and perhaps also dangerous. Despite occasional mishaps in British fuel reprocessing plants (one occurred only a few weeks ago at the Windscale plant) and a fairly serious reactor accident, again at Windscale in the 1950's, the British public has so far been successfully reassured on the issue of nuclear safety.

The initiative for building LWR's has come from Britain's largest utility, the Central Electricity Generating Board (CEGB), which provides electricity for the whole of England and Wales. (Scotland, as in many other things, makes its own arrangements.) There are signs that electricity consumption, after several years of sluggish growth, is about to increase at a steady rate of 5 percent a year.

Looking ahead a decade, the CEGB finds itself short of plants to meet this demand. Its total capacity today is 57,000 megawatts, which ought to be comfortably sufficient to meet the peak demand expected this winter of 44,500 megawatts. But a plague of problems with conventional generating capacity makes even this healthy gap between demand and capacity look alarmingly narrow. If the growth in demand does materialize and nothing is done about the CEGB's low plant availability, some new plants are going to be needed soon.