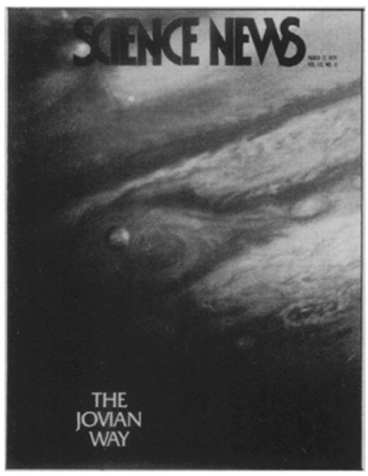
# Science News of the Year

*This is a review of important science news stories of 1979 as reported in the pages of* SCIENCE NEWS. *The references after each item refer to the volume and page number in which the main article on the subject appeared in* SCIENCE NEWS *(Vol. 115 is Jan.-June; Vol 116 is July-Dec.). Where several references exist, the news developed and was reported in more than one issue. Back issues or, when out of stock, copies of articles are available for 50 cents each by writing to* SCIENCE NEWS, *1719 N Street, N.W., Washington, D.C. 20036*

## Space Technology




• In a year rich with new planetary discoveries, the most striking was clearly the Voyager 1 spacecraft's detection of active volcanoes on Jupiter's satellite Io (115: 165). In March and July flybys, Voyagers 1 and 2 also revealed details of the Jovian atmosphere and magnetic field, rings around the planet, evidence of tectonics on Ganymede, fissure-like streaks covering Europa, widespread cratering on Callisto and a host of other findings. 115: 147, 164; 116: 19, 35, 263

• Pioneer 11, the first spacecraft ever to pass close to Saturn, survived two trips through the planet's ring plane to reveal additional ring structure, one or more previously unknown satellites, an atmosphere far less dramatically featured than Jupiter's and a magnetic field whose axis is unexpectedly aligned with the planet's axis of rotation. 116: 163, 181, 373

• A first global "look" at the haze-wrapped surface of Venus was provided by the radar of the Pioneer Venus orbiter (115: 100, 231, 294, 372), which also detected lightning (115: 100), as scientists continued to piece together information about the atmosphere (116: 345) from earlier probes.

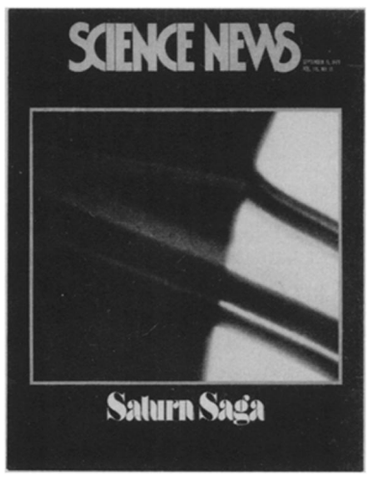
• Three of the four Viking spacecraft sent to Mars in 1976 continued to operate throughout the year, studying storms (115: 276), the effects of water (116: 108) and other phenomena, as scientists planned to keep the orbiter and two landers operating into 1980. 116: 231

• A new record for human beings in orbit was set by Soviet cosmonauts Vladimir Lyakhov and Valery Ryumin, who boarded the Salyut 6 space station on Feb. 26 (115: 135), eclipsed the old 139-day mark on July 14 (116: 39) and finally returned to earth on Aug. 19 after 175 days aloft (116: 132).

• The U.S. space shuttle experienced a variety of developmental and managerial problems that delayed its first orbital flight from 1979 at least until late 1980. 115: 132; 116: 5, 212

• The huge Skylab space station created considerable furor before finally reentering the earth's atmosphere on July 11 (116: 39), leaving a trail of debris across Australia to the Pacific. 115: 71, 85, 309, 387, 422

• Major satellite launches during the year included Magsat (116: 327), for measuring the earth's magnetic field; SAGE (115: 117), for monitoring aerosols and gases in the atmosphere; NOAA-6 (116: 87), a weather-watcher that scans land, sea and air while monitoring incoming solar radiation and relaying data from sensors on earth's surface; Anik-B (115: 25), a Canadian communications satellite equipped with six 12- and 14-Gigahertz channels in addition to the usual lower-frequency ones in hopes of widening the bandspace available for growing communications traffic; and SCATHA (115: 71), designed to study the potentially damaging effects of electrical charges that build up on satellites at high altitudes.




## Astronomy

• There is no polarization evident in the cosmic microwave background radiation, but some anomalies have been found even as its blackbody character was demonstrated to improved levels of accuracy. 115: 37, 260; 116: 4, 229

• A definite number for the flux of neutrinos from the sun was reported, and, being far smaller than theoretical prediction, prompted plans for new experiments to find out what is wrong. 115: 103

• The existence of planets orbiting several pulsars was suggested. 116: 388

• Antiprotons were found in the cosmic rays for the first time. 116: 277

• SS433, a stellar object in our galaxy, was found to be astrophysically peculiar and was much studied. 115: 277, 357, 403; 116: 25

• Evidence for the largest supercluster of galaxies in the universe has been discovered. Its existence seems to go back to the beginning of the universe, thus complicating cosmologies that propose a smooth big bang. 116: 421


• The Multiple Mirror Telescope, a radically new desgin for an optical telescope, and a possible model for the future, began operations. 115: 324

• The sun was found to vibrate mechanically at a period of 160 minutes, which would facilitate energy transfers not con-

templated in traditional solar theory and is another factor putting that theory into question. 115: 270

• A double or twin quasar was discovered and hypothesized to be an example of "gravitational lens effect." 115: 389; 116: 324

• British astronomers found that microwave ovens interfere with the operation of radiotelescopes. 116: 422

# Biology


• The gene for the human form of growth hormone was introduced into bacteria by recombinant DNA techniques, and the bacteria produced the hormone. 115: 39; 116: 22

• Mitochondria, both in yeast and human cells, were found to use a variation of the genetic code, which had been thought to be universal. 116: 185

• The first study resolving individual atoms in DNA surprised scientists with a new, strikingly different DNA conformation in which the helix spirals to the left instead of to the right. 116: 420

• Two proteins essential for tumor initiation by animal viruses were characterized and found to be similar to normal cell products. 115: 344; 116: 89

• Mice that are the genetic offspring of an embryonic cell, rather than of an egg and a sperm, were created by replacing genetic material of fertilized eggs with nuclei from cells of older embryos. 116: 68

• Fusion of two egg cells in the absence of sperm created a mouse embryo. 116: 116

• Genes prepared with recombinant DNA methods and transplanted by micromanipulation functioned in laboratory-grown mouse cells. 116: 260

• The common song sung by all humpback whales in an area was found to change progressively from year to year, with the animals introducing new material and phasing out old. 115: 26

• Magnetite, or lodestone, was identified in heads of pigeons and also in north-swimming bacteria, where it acts as a compass. 115: 278

• Botanists found a hormonal antidote to aging in soy plants. 115: 166

• Sexual behavior in male dogs was triggered with a single chemical isolated from volatile material released by female dogs in heat. 115: 394

• Experiments to assess the risk of recombinant DNA research accidently creating an epidemic indicated that such a scenario is unlikely. 115: 150

• The language of bees was found to contain arbitrary conventions allowing bees to specify locations even when the sun is not visible. 116: 342

• Researchers pondering the origins of life came up with an airborne rather than earthbound model and found the "oldest terrestrial organics known" in 3.83-billion-year-old rocks. 116: 101, 183

# Chemistry

• Rare isotopes of carbon and oxygen were isolated by inexpensive methods employing chemical reactions to distinguish small differences in magnetic properties. 116: 200

• Two analytical methods using laser flashes allowed investigation of combustion and also of fast reactions involving biological and crystalline material. 115: 324, 406

• Novel salts were synthesized that use simple electrons, rather than ions or ionic groups, as the anion. 116: 427

• A new spongy material that swells after exposure to light was synthesized. 115: 7

• Search for a new antimalarial drug turned up a class of chemicals, called thiosemicarbazones, that are effective against a wide variety of diseases. 115: 280

• Color vision was found to depend on the charge distribution of the molecule that absorbs light in photoreceptor cells. 116: 427

• The potent cockroach sex stimulant was synthesized chemically. 115: 295

• The synthetic estrogen DES was found to be chemically transformed in body tissues, and therefore may cause cancer as a traditional carcinogen, rather than as a growth stimulator. 115: 326

• Chemists synthesized spectinomycin, an antibiotic produced by soil microorganisms and important in gonorrhea treatment. 115: 280

• More schemes were proposed for using chemistry to convert solar energy to electricity and other useful forms of power. 115: 245; 116: 216

• Scientists found a new class of derivatives that are less toxic than vitamin A, but still protect laboratory animals from certain cancers. 116: 200

• The first naturally occurring polyester was discovered; it is a waterproof lining that protects the eggs placed in damp earth by *Colletes* bees. 115: 329

• Scientists identified more metabolites of vitamin D and investigated therapeutic uses for those previously known. 115: 181


Reunion and Introduction for Chinese Chemists

# Medicine

• A successful first step in human cloning was reported by Landrum Shettles of Randolph, Vt., then hotly disputed by Pierre Soupart of Nashville, Tenn. 115: 101, 131

• The U.S. Department of Health, Education and Welfare ended its four-year moratorium on funding test-tube baby research, but the prospect of more *in vitro* fertilized babies raised some yet-to-be-answered legal questions. 115: 183, 358

• Soviet findings that enzyme injections could regenerate nerves in the spinal cords of paralyzed rats were not duplicated by U.S. researchers. Nonetheless, there was increasing evidence that central nerve regeneration is possible. 115: 326; 116: 199, 277

• Brain chemistry research continued to advance, revealing, among other things, that the brain contains a peptide 200 times more potent than morphine and 50 times more potent than beta-endorphin; that nerve receptors for enkephalins are separate from those for morphine; and that beta-lipotropin, a parent for many brain proteins, derives from an even larger molecule called "31 K." 116: 100, 342, 422

• Forty percent of all children diagnosed for acute lymphocytic leukemia, a once


highly fatal form of cancer, could be expected to be cured — constituting one of the great success stories of 20th century cancer research. 115:133

• A National Cancer Institute panel recommended that modified mastectomies should replace radical ones for early breast cancer and even for some breast cancers that have spread. 115: 389

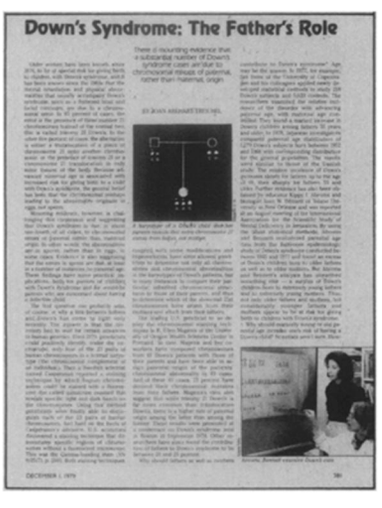
• Chemical carcinogens in air, food, drugs and workplaces do not pose as much of a threat to human health as do self-imposed chemical carcinogens, a number of cancer scientists concurred. 115: 411

• Microsurgery — surgery conducted under the microscope — was found to benefit patients with an increasing number of conditions. 115: 69, 237

• A number of Down's syndrome (mongolism) cases are due to chromosomal mixups of paternal, rather than maternal, origin, studies suggested, and hold implications for parents of Down's children and for couples concerned about conceiving a defective child. 116: 381

• The biological defect underlying obesity may have been found — a deficiency in cholecystokinin. 115: 57

• A synthetic analog of vitamin A — 13-*cis*-retinoic acid — showed a therapeutic effect on acne patients. 115: 118

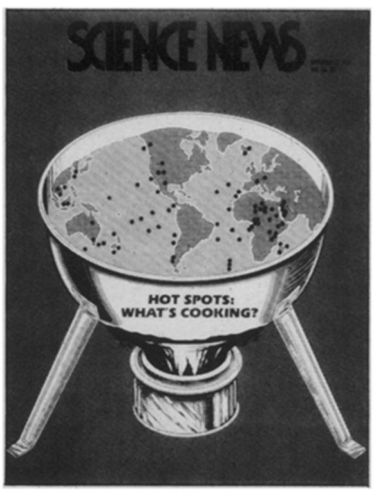



• Several novel approaches to treating herpesvirus infections — an experimental drug called two-deoxy-D-glucose and under-the-skin injections of commercially available flu vaccine — looked promising. 115: 375; 116: 5

• Cancer patients who externalize negative emotions live longer than do cancer patients who suppress such feelings, one more study showed. 116: 245

• One of the mechanisms that sets human puberty into motion appeared to have been found; it is an abrupt drop in melatonin, a pineal gland hormone. 116: 373

## Earth Sciences




• Researchers proposed that the earth's mantle, previously thought to be a well mixed pot, may contain an unmelted, primordial layer, and suggested a two-layer mantle model. 116: 372

• A new tool — the Hydraulic Piston Corer — recovered the longest, most complete sedimentary core yet. 115: 85; 116: 118, 374

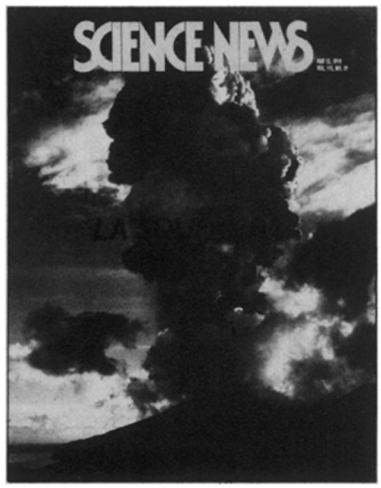
• Data from Central America indicated that it may have drifted piece-by-piece from the Pacific as North America and South America separated. 116: 341

• Seismic reflection data showed that the Appalachians formed by horizontal sliding rather than vertical faulting. 115: 374

• Timing and coordination made the eruption of La Soufrière one of the best documented volcanic events ever. One of its final eruptions was predicted based on earth tides. 115: 314; 116: 404

• Researchers proposed two theories — an extraterrestrial cause and the spillover of a fresh-water Arctic Ocean — for the mass extinction of hundreds of species 65 million years ago. 115: 356; 116: 356

• A previously undescribed continental plate called Armorica was proposed to account for the Atlantic-bordering mountain ranges. 115: 373




• New measurements showed the Palmdale Bulge is quickly stretching horizontally; revised measurements questioned whether it ever bulged vertically. 116: 404

• A fault, which may be related to quake activity in the New Madrid, Mo., area, was traced in Arkansas. 116: 310

• A well instrumented building damaged by the Oct. 15 Imperial Valley, Calif., quake provided the best data yet on structural quake response. 116: 310

• Ore-grade deposits were found on the East Pacific Rise, hints of the geyser-filled world there. 115: 152

• Additional evidence strengthened the link between ice ages and changes in the earth's orbit. 116: 324

• U.S. scientists reported that Soviet scientists successfully predicted a Nov. 1, 1978, magnitude 6.7 quake. 115: 169

• The "seismic gap" theory of forecasting earthquake-suspect areas gained strength as a Feb. 28 Alaskan quake set up the predicted precursory pattern for a major event. 115: 74, 185, 377

• Better measurements showed that the earth is lighter than previously believed — by 41.34 million billion tons. 115: 393

• Chinese scientists at last revealed some details of the devastating 1976 Tangshan quake. 116: 150

• Results from the DSDP's Leg 67 sent scientists to the drawing board for a different theory of converging plates. 116: 133

• The hot spot theory gained strength and hot spots were credited with forming many continental features. 116: 69, 88, 202

• Geological deficiencies were found in the federal nuclear-waste management program. 115: 183; 116: 47

• Failure to meet earthquake codes closed five nuclear power plants. 115: 184

• The last total eclipse of the century over North America took place April 30. 115: 137

# Behavior

• A scientific team from the United States and Sweden reported the first successful grafting of a functioning part of the brain of one animal onto the damaged brain of another. The transplants not only survived in several tested rats for months, but flourished in their "new" brains, which had been experimentally afflicted with Parkinson's disease. 115: 308

• Some schizophrenia cases were linked to specific brain structure abnormalities, such as enlarged cerebral ventricles and reversed hemisphere sizes. 116: 26

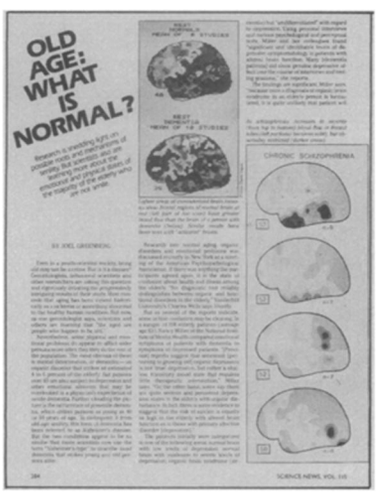
• Evidence that the brain may produce its own "natural Valium", or tranquilizing substance, was reported by researchers at the meeting of the Society for Neuroscience. Another study identified a group of natural substances that influences the brain chemical GABA, which in turn is believed to modulate Valium-related receptor cells. 116: 325, 345

• The brain also appears to produce its own version of PCP. The natural analog may somehow be involved in the regulation of thinking processes and the sensory system. 116: 276

• Legendary sex researchers Masters and Johnson surprised even colleagues when they reported in their book, *Homosexuality in Perspective,* that they could "reverse" or "convert" homosexual individuals to heterosexuals with just two weeks of therapy. 115: 275

• Genetic damage was observed as a direct effect of heroin use and, to a lesser extent, possibly of cigarette smoking. The damage appears reversible, however, upon withdrawal from heroin or the substitution of methadone. 116: 390

• Medical geneticist David E. Comings of the City of Hope National Medical Center in Duarte, Calif., reported he had pinpointed "the major gene in depressive disease." The finding, if confirmed, could be among the most significant in recent history. But other researchers have taken issue with Comings's procedures and interpretations, and the work has yet to be replicated. 115: 20




• A group of U.S. psychiatrists returned from an inspection tour of South African psychiatric hospitals for blacks with chilling reports of nearly inhuman treatment and physical conditions, including medical neglect to the point of death. 115: 340

• A little-known Russian psychiatrist, Etely Philippovich Kazanetz, boldly broke with tradition by publicly criticizing Soviet diagnostic practices. More significant, his critical study was published in one of the United States' most prestigious journals, the ARCHIVES OF GENERAL PSYCHIATRY, published by the American Medical Association. 116: 119

• The President's Commission on the Accident at Three Mile Island identified the temporary jolt to the mental health of plant workers and area residents as "the major health effect of the accident." 116: 326

# Anthropology & Archaeology

• The discovery of a previously unknown species of human—*Australopithecus afarensis* — was announced; the creature roamed what is now Eastern Africa from 2.9 to 3.6 million years ago and had characteristics of both man and ape. The find, however, was disputed. 115: 36, 196

• Footprints believed to have been made by *Homo erectus* were found next to prints of ancient hippopotamuses near Lake Turkana in northern Kenya. The prints, etched in a bed of volcanic rock dated at 1.5 million years old, were the oldest footprints yet found of a creature in the same genus as man. 116: 357

• The first known hybrid ape to survive was a cross between a male gibbon and a female siamang; the resulting animal, born of the mating at the Atlanta zoo, was called a siabon. 116: 40

• It was reported that, like human infants, baby orangutans seem to progress through the six developmental stages described by Jean Piaget. 116: 40

• Vervet monkeys were reported to be capable of giving specific alarm calls in response to the approach of snakes, eagles or leopards. 116: 357

• The discovery of the nine-foot-long shoulderblade of what may be the largest dinosaur yet found was announced. The bone, found in western Colorado, came from a Brachiosaurus that was estimated to have stood between 50 and 60 feet tall


and weighed about 80 tons. 116: 84

• Archaeologists from the University of South Carolina unearthed the remains of a 16th century Spanish fort and part of Santa Elena, the town it protected. The discovery was made on the Parris Island Marine base in South Carolina. 116: 139

• University of Paris researchers presented evidence indicating that Cro-Magnon may have migrated to Europe from the Middle East, while at least one group of Neanderthals appears to have moved in the other direction. 115: 132

• After 100 years paleontological justice has been done, as the Carnegie Museum of Natural History in Pittsburgh replaced the head of their *Brontosaurus* skeleton with a streamlined version. In addition to assuring accuracy, the research that led to the change should settle debates about aspects of *Brontosaurus*'s life. 116: 314

# Atmospheric Sciences

• A National Research Council report put eventual stratospheric ozone depletion at 16.5 percent, more than twice the 1976 estimated rate. 116: 340

• Piston cores from the Antarctic indicated, contrary to current theory, that the southern hemisphere shows ice age-like conditions millenia before the north; the build-up of Antarctic sea ice may presage an ice age. 115: 22

• Acid rain, effects of which were noticed as far west as Colorado, became an official environmental issue as policymakers took action. 116: 244

• Policymakers were told that increased $CO^2$ and the "greenhouse effect" might not be a serious policy problem provided institutions remain adaptable. 115: 244

• David, the season's worst hurricane, was the first hurricane to be continually monitored in real time. 116: 166

• Stratospheric ozone was found to vary with the sun's ultraviolet output and the sunspot cycle. 115: 405

• The Southern Hemisphere's atmospheric circulation patterns were found to affect the Northern Hemisphere's weather sooner and to a greater degree than previously thought. 115: 390

• SAGE, a satellite that will measure stratospheric aerosols and gases — particularly ozone — was launched Feb. 18. 115: 117

• Evidence of human-caused air pollution — a sulfate haze — was found in the Arctic. Its source may be Europe. 115: 56

# Technology

• President Carter's long-awaited industrial-innovation package — aired in November — promised added help to small businesses. 116: 326

• Bonding atoms of radioactive wastes into the crystalline structure of a stable, synthetic host rock offered a possible solution for the problem of how to store high-level wastes permanently. 115: 199

• A revolution began in the design of electric motors. 116: 54

• Finding that humans can read voiceprints — spectrograms plotting the sound frequency of speech versus time — raised hopes that the profoundly deaf and even machines may one day be taught to do the same. 115:20

• Texaco, Inc., has developed a stratified-charge engine that without adjustments can run on anything from jet or diesel fuel to high-octane gasoline. 116: 344

• An optical reflector to conserve much of the radiant energy lost in metal-forging processes has been patented by Pyreflex Corp. of Buckfield, Maine. 116: 41

• An electrowinning innovation substituted the chemical energy of coal for much of the more costly electricity usually used to drive the process. 116: 188

• Bicyclist Brian Allen — who last year won a prize for the first human-powered flight — this year became the first to fly the English Channel under his own power. By year's end, NASA had decided to study a twin of Allen's channel-crossing vehicle — The Gossamer Albatross — as a possible low-altitude complement to research satellites. 115: 390; 116: 327

• A Scottish study of British nuclear-dockyard workers showed that one's blood may serve as a type of natural radiation dosimeter. 115: 133

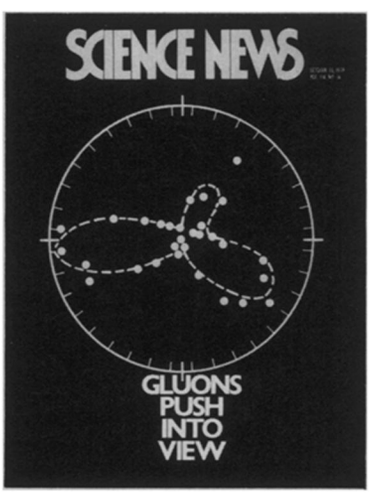
• Spinoffs of microwave IDs — designed to monitor the health of cattle — were perfected and may one day track pollutants, catch traffic violators and mechanically inventory almost anything. 115: 30


ENERGY CONSERVATION AND THE ELECTRIC MOTOR

• A hybrid — part incandescent, part metal-halide — light bulb began development by the General Electric Co. It's expected to be as bright as a typical 1,000 watt incandescent, but last five times longer. 116: 7

• Enzymes from a cow pancreas served as the basis for a photographic emulsion sensitive to ultraviolet light. 115: 121

# Physics




• Particle physicists came to believe they had really discovered gluons, the particles that are supposed to hold most everything together. 115: 262,296; 116: 151, 266

• Four years' observation of a pulsar led a group of astrophysicists to conclude that it is radiating gravitational waves in the amount predicted by Einstein. 115: 116

• Development of a successful wiggler magnet means a large increase in the research possible at synchrotron radiation laboratories. 115: 180

• More examples of fractional electric charge were reported by the team that claimed the first such discovery in 1977. 115: 38

• The first results from the 20-arm Shiva experiment in thermonuclear fusion by implosion of fuel pellets recorded up to 30 billion fusions in a single shot. 115: 391

• American physicsts who had been planning to use beams of electrons as drivers in implosion fusion experiments have decided to switch to light ions. 115: 197; 116: 375

• Neutrons produced in thermonuclear fusions were recorded from the Princeton Large Torus, the first evidence for large numbers of fusions in a magnetic confinement experiment. 115: 421

• Channeling radiation, a source of intense, directed X-rays, was demonstrated for the first time. 115: 311; 116: 389

• A "Rydberg" maser was developed, so precise that it can count individual photons and atoms. 116: 102

• Mammoth experiments are being set up to search for radioactive decay of the proton, one of the most radical overthrows of previous physical wisdom demanded by the new grand unified field theories. 116: 405

• A new algorithm that solves many previously insoluble problems in linear programing was developed by a Soviet mathematician. 116: 234

# Environment

• The newly formed Cabinet-level Endangered Species Committee refused to exempt the Tellico Dam from provisions of the act so that the snail darter might survive. Since that wasn't what Congress expected, it changed the law. 115: 55; 116: 230

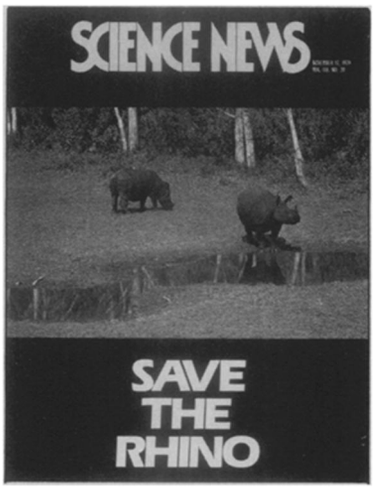
• The quality of natural resources in the United States, as measured by seven environmental indicators, has deteriorated over the past decade, according to National Wildlife Federation Studies. Only air pollution registered a net improvement. 115: 105

• The Mexican oil spill that hit the south coast of Texas in August continued to gush unabated after more than six months — the largest spill ever. 116: 99, 313, 405

• A hazardous-waste nightmare rivaling Love Canal in its magnitude was unveiled in Stump Gap, Ky., and dubbed the Valley of the Drums. Hoping to clean up such tragedies and prevent others, Congress proposed a massive superfund. 115: 68, 343, 348

• Ecologists are learning that to save the world's remaining rhinos they must first kill the market for its horn — a commodity worth its weight in gold. 116: 346

• Reports on the human-health effects of




exposures to ionizing radiation proliferated, beginning when a pair of British scientists reported signs that the supposedly conservative, no-threshold radiation dose-response model underestimates cancer risks in the low-dose range. 115: 44, 133, 278, 281, 310; 116: 22

• Not only do the fission products of radon — present in all uranium and hard-rock mines — appear to pose a greater cancer hazard to nonsmoking miners than to smoking ones (contrary to popular belief), but they also appear to provide more damage per unit of exposure at low doses. 115: 247, 264

• Psychiatric researchers have detected signs of a possible link between high levels of air pollution and certain emotional illnesses, including alcoholism. 115: 101

• Yields of soybean fields subjected to airborne sulfur dioxide — within legally permissible limits — can be cut 20 percent. 115: 169

• Antibiotics used to promote weight gain in livestock may reduce the antibacterial effectiveness of those drugs in persons who eat meat from the livestock. 115: 422

• Not only beer, but also Scotch whiskey, has been shown to contain trace quantities of nitrosamines, a known animal carcinogen. 115: 40; 116: 117

• Bees mistaking microscopic capsules of pesticide for pollen are being slowly and mistakenly poisoned. 115: 135

## Science and Society

• Vice-Premier Teng Hsiao-ping began a week-long tour of the United States by signing a five-year umbrella agreement spelling out rules for cooperative research and scientific exchanges between the People's Republic of China and the United States. 115: 83

• A United Nations summit conference on technology for the economic development of lesser developed nations made strides toward bridging the gap between North and South. 116: 126, 131, 148, 174

• An appeal of the government-imposed ban of its publishing an article on the hydrogen bomb spawned congressional investigation of how the PROGRESSIVE got access to supposedly classified data. 115: 360; 116: 247

• Signs that the world's population growth rate is declining at a dramatic rate came out of a World Fertility Study in July. 116: 86

• Saying that an earlier appeals-court decision ignored the Food and Drug Administration's sovereignty in determining a drug's safety and efficacy, the Supreme Court unanimously overturned a ruling that had permitted physicians to administer Laetrile to terminally ill cancer patients. Only a few weeks later, scientists reported perhaps the strongest suggestion yet of Laetrile poisoning. 115: 422; 116: 39

• More than 2,400 protesting U.S. scientists have gathered forces and pledged to cold-shoulder the Soviets until Russian dissidents Anatoly Shcharansky and Yuri Orlov are released from prison. 115: 168

• Fifty U.S. scholars began studies in the People's Republic of China. 116: 153

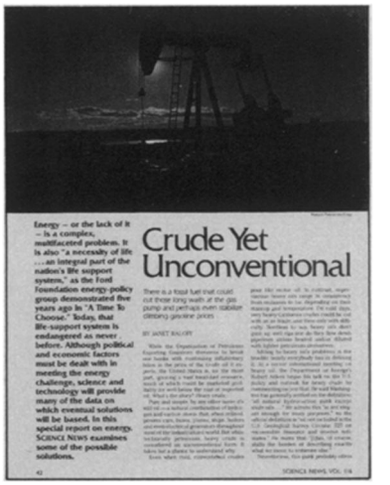
• Some 50,000 new readers are getting their SCIENCE NEWS in Chinese. As a foreign exchange, SN's editor brought back news of Chinese science. 116: 243, 275

• Exhibits, symposia, research and SCIENCE NEWS commemorated the 100th anniversary of the birth of Albert Einstein. 115: 210

• The Federal Trade Commission found coaching for the SAT — a college-entrance exam — could increase one's score. 115: 376


## Energy

• The most serious accident ever to occur in a commercial nuclear-power plant crippled the Three Mile Island #2 reactor. The result was a reemergence of safety as a major issue in the nuclear debate and a restructuring of the Nuclear Regulatory Commission. 115: 227, 292; 116: 45, 309, 405




• Two years after President Jimmy Carter first proposed his energy package for the United States, much of the enabling legislation was still mired in congressional debate. Hoping to free and restructure it, he offered a revised plan that included an energy-mobilization board and more support for synthetic fuels. 116: 38

• The President surprised and pleased solar-energy advocates with appointment of Denis Hayes as director of the Solar Energy Research Institute. 116: 84

• A small United Nations agency stimulated renewed interest in a domestic substitute for imported oil known as heavy crude. 115: 375, 387; 116: 42, 135

• Hard-won approval to build the nation's first commercial-scale plant to manufacture pipeline-quality gas from coal was given Nov. 15. 116: 357

• Three prestigious groups suggested where to look for energy problems and their possible solutions in decades to come. 116: 149, 199

• Nobel chemist Melvin Calvin found a Brazilian tree whose sap is pure diesel fuel. 116: 182

• Drilling along the East Coast identified extensive deposits of radiogenically heated geothermal water. 115: 312

• A wide range of alternative fuels are vying with gasoline to become the prime mover of U.S. cars and trucks. 115: 312, 404; 116: 41, 105, 173, 188

• Bacteria found in Yellowstone's hot springs was found to produce alcohol and may one day be harnessed for fuel production. 116: 317

• The University of Rochester's six-beam laser-fusion experiment — ZETA — reported progress in achieving conditions necessary to demonstrate breakeven power, a temperature of 67 million degrees and a 30-fold increase in fuel density, to 0.12 grams per cubic centimeter. 115: 392