

SCIENCE NEWS of the Year

This is a review of important science news stories of 1984 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. 125 is Jan.-June; Vol. 126 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 one dollar each by writing to SCIENCE NEWS, 1719 N Street, N.W., Washington, D.C. 20036.

Anthropology & Paleontology

- Fossils recently discovered in northern Kenya suggested that the orangutan, rather than the chimpanzee, might be the best living model of animals that were ancestral to humans and apes. 125:41
- Over 50 delicate fossils that have played an important role in evolutionary theory were brought together for a one-of-a-kind exhibit at the American Museum of Natural History in New York City. 125:198
- Anthropologists uncovered a 5-million-year-old jaw fragment in Kenya that they say is the oldest well-dated specimen from a human ancestor. 125:230
- Scientists located an ancient drainage system under the Sahara Desert that had been revealed by a special radar device on the space shuttle. They uncovered artifacts at the site that provide clues to how early humans migrated from Africa to Europe. 125:244
- In Wyoming's Wind River Basin, paleontologists unearthed the largest and best-preserved collection of 50-million-year-old fossils ever found. 126:213
- The most complete skeleton of an early human ancestor ever found was discovered in Kenya. The young male *Homo erectus* died about 1.6 million years ago. 126:260

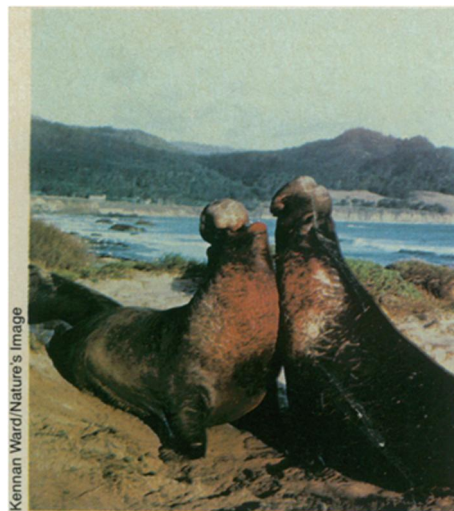


National Geographic Society

- A 1,500-year-old Maya tomb—untouched and perfectly preserved—was uncovered in northeastern Guatemala. Artifacts in the chamber provide a look at the Maya world during the period from A.D. 300 to 900 (125:326). Other scientists reported that the Maya traded obsidian more extensively and along more routes than previously thought. 126:55
- For the first time scientists were able to see through the rocky filling that obstructs the examination of some fossil skulls. Their tool: newly devised software used with a computerized tomography (CT) scanner. 126:260
- Paleontologists concluded that a series of animal tracks on a slab of sandstone, dated at 310 million years old, belonged either to the earliest known reptile or a transitional creature between amphibians and reptiles. 126:293
- An ancient dwelling uncovered on Cyprus provided a glimpse both of life in a fourth-century Roman city and of the earthquake that leveled Mediterranean outposts around A.D. 365. 126:100

Behavior

- Daily marijuana use among high school seniors was found to have fallen by nearly half over the last five years, according to an annual nationwide survey, but the number of students who have used illicit drugs remains substantial. 125:103
- When academic material is well learned in the first place, much of it is stored and can be remembered for at least 25 years even if it is never used, concluded a psychologist who tested a variety of subjects for their memories of Spanish learned in high school or college. 125:149
- Legal blood alcohol levels may not be good indicators of drunkenness. Scientists found that some people are impaired at levels below the legal limit, while others act sober despite being legally drunk. 125:171
- Northern elephant seals live a somewhat bizarre, if biologically successful, lifestyle that scientists observed to include polygyny, ritualistic violence, high infant mortality and, apparently, rape. 125:120
- The distinct stress responses of bold, impulsive squirrel monkeys and low-key, methodical titi monkeys provided clues to human stress reactions and psychosomatic illnesses. 125:234
- A national sample of Vietnam veterans reported more behavioral and emotional problems six to 15 years after serving in the war than did other young men from similar social backgrounds. The severity of these problems is being debated. 125:261
- Several groups of researchers reported that a series of subtle symptoms observed in some schizophrenics who have substantially recovered may be warning signals that the disorder is about to worsen. 125:311
- A study of quick-tempered, competitive Type A individuals found that they can greatly reduce their risk of suffering heart attacks by changing their behavior with the help of psychological guidance. 126:109
- Social scientists reported that problem solving and personal interaction in a computer conference differ markedly from the same processes in groups meeting face-to-face. 126:122



Kennan Ward/Nature's Image

Chemistry

- An industrial accident that killed thousands of people in India focused attention on the toxicity of a group of widely used chemicals called isocyanates. 126:372
- Two chemists found a simple, versatile method for synthesizing optically pure organic compounds. 125:229
- Chemists designed and synthesized a three-part molecule that mimics the first steps of photosynthesis. 125:132
- One researcher presented evidence in support of his hypothesis that the first proteins on earth formed from the reaction between water and polymerized hydrogen cyanide (125:247); another reported that simple proteinoid microspheres could show electrical activity. 125:408
- An Israeli scientist rediscovered a blue-purple dye from a Mediterranean shellfish. The Bible directs that this dye be used for the tassels of ritual prayer shawls. 126:148

- An artificial membrane that transfers electrons in complete darkness was expected to help scientists simulate more accurately the electrical processes that go on within a cell. 126:101

- German scientists added element 108 to the periodic table of the elements. 125:249

- A group of chemists constructed a chemical device that behaves like a solid-state transistor. 126:198

- Chemical analysis of pigments contributed to determination of whether certain 18th-century silks originated in China or in Europe. 126:199

- A new conducting polymer that could act like an electrolyte in a solid-state battery was developed. 126:326

- Researchers found that the addition of a small amount of polysilane to the starting materials may simplify the production of a variety of polymers. 125:249

- Lead-iron phosphate glasses showed promise as a material for immobilizing radioactive waste. 126:214

- The ability of sulfurous air pollutants to corrode metal was found to be increased in the presence of sunlight or ozone. 125:295

- The National Research Council reported that complete health hazard assessment is possible for only about 2 percent of the more than 60,000 chemicals in use in the United States and no toxicity data are available for about 70 percent of these chemicals. 125:153

- Data extending from 1950 to 1980 indicated that there is a significant increase in illness and deaths several years after the worst point in an economic recession. 126:7

- Studies suggested that genetically transmitted sensitivity to the neurotransmitter acetylcholine may predispose some people to manic-depression or other mood disorders. Scientists will know within a few years whether a special skin test can predict who will develop manic-depression. 126:68

- Mental disorders affect about 29 million people over the course of six months, according to a nationwide survey. 126:212

- Alcohol, opiate and cigarette withdrawal were shown to be characterized by similar changes in brain chemistry that create a psychological craving for drug use. 126:310

- Scientists taught two dolphins to understand imperative sentences made up of hand gestures and computer-generated sounds. Dolphins' language abilities remain controversial, however. 126:346

Biology

- New tests that directly identify parts of genes were readied for the clinical diagnostic market — for detecting disease-causing organisms and hereditary disorders. 126:104

- Zoo curators applied novel techniques for analyzing the genetics of captive animal populations, such as the Siberian tiger, and adhered to new breeding guidelines. An innovative program of inbreeding was credited with saving the U.S. captive population of Speke's gazelles. 126:232,250



- Captive-bred golden lion tamarins were trained in wilderness survival skills and released into a reserve in Brazil. These animals were the first zoo-reared primates of an endangered species to be released. 125:140; 126:389

- Gene analysis of the T cell receptor, an elusive protein important in the body's response to tissue transplants, infectious agents and tumors, revealed surprising similarities with antibodies. 125:166; 126:388

- Plants genetically engineered to be resistant to an antibiotic were shown to pass on their acquired trait to succeeding plant generations. 125:139

- A novel insect collection method revealed many new species in a survey of the Peruvian tropical forest canopy. 125:344



- Scientists replaced the genetic "on-off" switch of a cancer gene and were able to control when and in what tissues it caused tumors in mice. 126:180

- A segment of gene, called the homeotic sequence, was identified in insects, other segmented invertebrates and vertebrates. Scientists proposed that genes containing this sequence play a role in directing embryonic development. 126:21

- Experiments combining embryonic cells produced patchwork animals that have some characteristics of sheep and some characteristics of goats. 125:135

- Gene fragments more than 100 years old from a salt-preserved pelt of an extinct zebra-like animal were successfully analyzed. 125:356

- Despite previous reports to the contrary, a sophisticated genetic analysis showed that mother bats predominantly nurse their own pups, rather than nursing indiscriminately. 125:148

- A new tool for biotechnology, recombinant RNA, was expected to extend biologists' abilities to study genes and cell processes and to produce rare proteins. 125:23

- Scientists developed the "first reliable method" of artificially incubating and hatching eggs of the common iguana. 126:87

- New products synthesized with recombinant DNA included the reproductive hormone chorionic gonadotropin (125:72) and the human blood clotting substance called Factor VIII. 125:276; 126:340

Computers & Mathematics

- A new method for solving linear programming problems not only proved to be a major theoretical achievement but also promised to speed up the solving of these problems, which come up frequently in business and industry. 126:408

- Mathematicians at Sandia National Laboratories set a record for the longest "hard" number ever to be factored. 125:20, 171

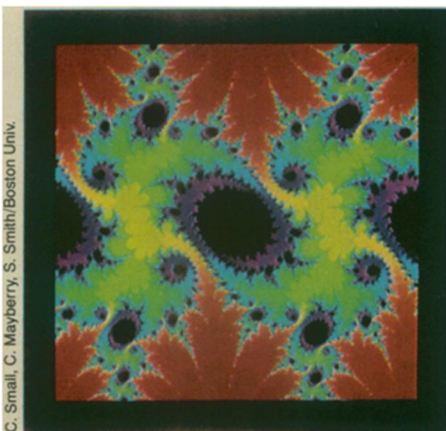
- A National Academy of Sciences study called for increased funding for mathematics research, citing more than a decade of neglect. 125:71, 392

- A mathematician proved that encryption schemes based on a frequently used form of the "knapsack" problem are not secure. 126:330

- To the surprise of many mathematicians, one of the most famous problems in mathematics, the Bieberbach conjecture, was solved. 126:165

- A new result in graph theory, which concerns the way in which arrays of points can be connected, clarified when graphs can and cannot be drawn on a given surface. 125:278

- Mathematicians and other researchers are discovering that even simple mathematical expressions can behave in unexpected ways that shed light on the way chaotic physical processes work. 125:328, 340



C. Small, C. Mayberry, S. Smith/Boston Univ.

- Japan's fifth-generation computer project ventured into new computer designs and concepts and forced other countries to mount significant research efforts to meet the challenge. 125:330, 346, 378

- An American Bar Association survey indicated that computer crime poses a large and significant problem. 125:390

- A computer programming scheme that allows lists or tables to rearrange themselves as they are used promised more efficient ways of searching for information. 126:170

- Supercomputers began to play an increasingly important role in scientific and engineering research, and various groups pushed for greater access to such machines. 126:200

Earth Sciences

- At over 50 sites worldwide, scientists discovered high levels of iridium and other elements rare on earth but abundant in extraterrestrial bodies (125:213). Glassy spherical particles formed at high temperatures and quartz crystals aligned under high pressures were also found (125:197). Since these discoveries were made at a number of discrete clay layers where paleontologists had also found evidence for mass extinctions of earth life every 26 million years, it was postulated that comets periodically pelt the earth, killing off whole species. Theories proposed to explain what triggers the comet showers include a sister star to the sun and the periodic passage of the sun through the Milky Way or the galactic plane. 125:116, 250, 388; 126:134, 279

- In addition to the droughts, floods, avalanches and mass destruction of sea life (125:262) brought on by the 1982-83 El Niño episode, scientists discovered some species that thrived during the event (126:228). Record-breaking winds associated with El Niño were linked to a slowdown of the earth's rotation. 125:20

- Geophysicists used sound waves to map the crust and mantle at the edges of continents in order to learn how continents rift apart and new seafloor is created. 126:364

- Three hydrothermal seafloor vents were discovered along the Mid-Atlantic Ridge (126:246). Sea life was found at the base of a Florida escarpment. 126:374

- The Great Salt Lake in Utah rose to record levels, inundating local residents with a whole range of problems. 125:172

- Satellite measurements confirmed that solar ultraviolet light enhances the production of stratospheric ozone (126:205), and a National Research Council report concluded that ozone concentrations in the upper atmosphere are less vulnerable to human activities than previously thought. 125:134

- A layer of sooty haze was found to be warming the Arctic faster than expected. 125:47

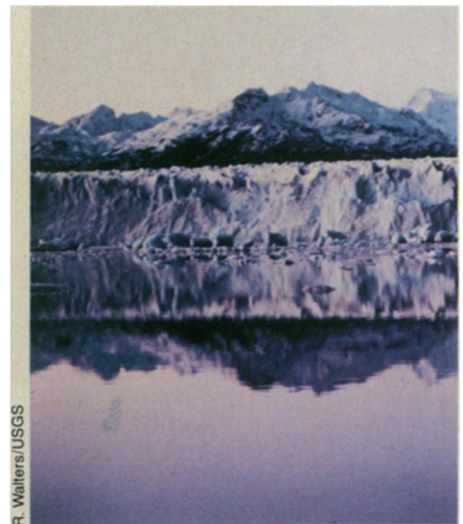
- The 1982 violent eruption of El Chichón, an obscure volcano in Mexico, was found to be just one in a series of major eruptions occurring at intervals ranging from 350 years to 650 years. 125:309

- Two theories arose to explain the ascent of magma from the earth's mantle (126:324). From the richness of its magnesium oxide content, scientists inferred that komatiite lava splashed over the earth's surface with the ease of water 2.5 billion years ago. 125:294

- Deposits of manganese, cobalt, nickel and other minerals in concentrations much larger than expected were dredged from the Pacific Ocean floor within the U.S. Exclusive Economic Zone. 125:9

- Islands made of freshwater ice, floating on saltwater lakes, were observed for the first time. 125:297

- Columbia, the last of Alaska's great tidewater glaciers, was beginning a dramatic retreat that will cut its present size in half in the next 30 to 50 years. 125:36



R. Walters/USGS

- By estimating the cooling and subsidence rates of old continental margins, scientists pinpointed the breakup date of the supercontinent that existed before Pangea. 126:328

- A geologist found that since 1855 a disproportionately large number of major earthquakes in the northern segment of the San Andreas fault have occurred in the springtime. 125:73

- The differing rates at which heat and salt diffuse through water were found to create the intricate convection patterns in lava flows, oceans, solar ponds and stars. 125:90

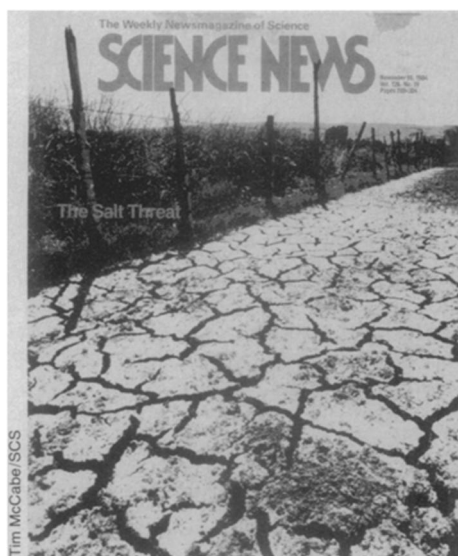
- The distribution of deep earthquakes that mark the movement of the subducting Pacific crustal plate revealed that the plate grows thicker and shorter as it descends into the mantle. 125:103

- Diamonds were estimated to be at least 3 billion years old, putting the stones in company with the oldest earth materials still in their original form (126:54). Geologists melted the face of a diamond with a powerful infrared laser. 126:164

Environment

- The first attempt to quantify global erosion rates estimated that cropland losses exceed new soil formation by 25.4 billion tons per year. 126:212

- Though technologies are available to control soil salinity — a leading cause of desertification — socioeconomic and political problems continued to prevent their widespread adoption. 126:298,314



- A National Academy of Sciences panel of acid rain researchers agreed that acid rain can acidify lakes and identified key factors indicative of a lake's sensitivity (125:164). The federal government, however, decided more study was needed before controls could be implemented. 125:392; 126:58

- Scientists determined that new research on the dynamics of fires and combustion plumes will be needed to resolve what are now the most intractable uncertainties associated with the "nuclear winter" hypothesis. 126:186, 204, 397

- A near-total phaseout of lead in gasoline was prompted by new health and socioeconomic data showing that the costs of this fuel additive far outweigh its benefits. 126:71

- A new study found that skin absorption of organic chemicals may frequently constitute the primary route of human exposure to these water pollutants. 125:309

- A report from a nonpartisan environmental group contended that the Environmental Protection Agency lacked the funds and staff to enforce laws designed to protect people from toxic substances (126:36), while Congress passed legislation that closed some loopholes in hazardous waste law. 126:71

- As evidence of the pervasiveness of ethylene dibromide (EDB) in the food chain was demonstrated, the U.S. government took measures to restrict its remaining uses and to search for less toxic alternatives. 125:46, 89, 138, 151, 153, 349

- Subtle adverse health effects were found among veterans most exposed to Agent Orange (125:132); those most exposed also fathered more children with certain serious birth defects. 126:117

- Rats receiving lifelong low-dose microwave exposure developed higher-than-expected rates of endocrine abnormalities. 126:103

- DNA was demonstrated to resonantly absorb microwaves, thereby suggesting a possible nonthermal mechanism by which this radiation might cause low-dose biological effects. 125:248

- Rising concentrations of atmospheric carbon dioxide (CO₂) were found to enhance the growth of high-altitude trees (126:156) and could lead to elevated river levels, increased plant productivity and greater appetites of insects (126:309). The National Science Foundation reported that the increase in CO₂ levels can be slowed substantially through more efficient use of energy on a global scale. 125:47

- Caffeine and its chemical cousins appear to be natural pesticides with the potential for commercial exploitation. 126:229

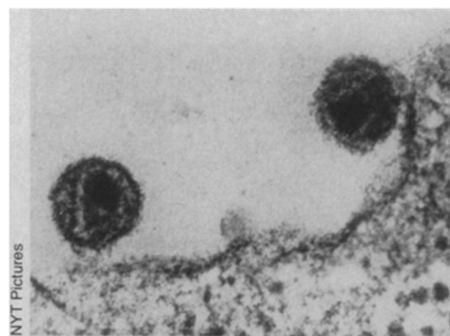
- Inhaling vitamin E may help the body defend itself from destructive photochemical oxidants in smog. 125:197

- San Diego, the largest city near the United States' largest telescope, decided to adopt low-pressure sodium lights, in order to minimize the light pollution with which Mt. Palomar astronomers will have to contend. 125:101

Medicine

- A variant of a retrovirus known to trigger a rare form of human leukemia was fingered over and over again as the long-sought cause of acquired immune deficiency syndrome (AIDS). The virus seems to trigger the disease as it is passed from victim to victim via semen or blood. Evidence also

emerged that many more people carry AIDS virus than contract AIDS, and that the organism is sometimes present in saliva, though scientists discounted saliva spread as a major mode of disease transmission. Several biotechnology firms cloned the virus — a preliminary step in developing a sensitive blood screening test — and the organism isolated from human blood was shown to transmit illness to chimpanzees. However, simian AIDS, a disease with similar symptoms that infected several monkey colonies last year, was definitively determined to be caused by a different organism. Meanwhile, the numbers of AIDS cases continued to jump (more than 7,000 U.S. cases reported, resulting in more than 3,000 deaths), with no signs of a successful treatment for the underlying disease in sight. 125:21,260,285; 126:6,54,121,164,261



- Doctors replaced the malformed heart of two-week-old "Baby Fae" with the living pump from a young baboon, drawing praise as well as criticism for reviving the practice of transplanting organs across species. The child died 20 days after surgery. 126:276,325

- William J. Schroeder, a 52-year-old Jasper, Ind., man, became the second artificial heart recipient. Surgeon William DeVries, formerly of the University of Utah, performed the surgery at the Humana Heart Institute in Louisville, the for-profit hospital where he had only months before relocated his artificial heart program when the commercial institution pledged to underwrite 100 such implants. 126:342

- The massive burns of two young brothers who were seared over 97 percent of their bodies were successfully sealed off with a living substitute covering grown in a laboratory dish from small samples of the victims' own skin cells. 126:102

- A vaccine against a virally caused cancer worked in monkeys, bringing human trials closer (125:324). The Japanese introduced a new whooping cough vaccine that they say has fewer side effects than the one currently used (125:73). A newly developed nose-drop vaccine against the most deadly form of influenza virus appeared to be more effective than the conventional vaccine in early human testing (125:215). And in other human trials, a genetically engineered vaccine against hepatitis B was used and

the first large test of a chicken pox vaccine was successful. 125:357

- The healthy birth in Australia of an infant who had spent her early weeks after conception as a lab-fertilized, frozen embryo encouraged researchers in the United States and Europe to repeat the procedure. The technique also raised ethical questions about how long embryos should be preserved and whether unused embryos should be made available for experimentation. 125:85,261

- A drug that lowered cholesterol levels in 3,806 men with a high-cholesterol disease also lowered the incidence of heart attacks in the group, prompting researchers to conclude that the general public should attempt to lower cholesterol intake, a sentiment echoed in an NIH consensus development conference. 125:38; 126:390

- The bare-bones genetics of neighboring cancer cells within the same tumor were shown to be different, potentially muddling both treatment and therapy (126:23), and a possible cancer-inducing change in just one of 40,000 "steps" or crosslinks in a single gene was found in lung cancer cells (125:102). A fast, inexpensive blood test for liver cancer was said to be a possibility within a year. 126:6

- Alzheimer's disease was found to be marked by a biochemical abnormality, though whether it causes or results from the disease is unclear (126:132). Nerve damage was pinned down to a particular area in the brain in Alzheimer's victims (126:167), and an experimental treatment involving a direct infusion of drugs into the brain showed preliminary success in halting progression of the disease. 126:263

- The first-year results of a five-year trial of radial keratotomy, an eye surgery technique that aims to free myopics from glasses, were announced. While the surgery was found to improve vision, side effects and concern for the long-range health of the eyeball kept researchers from giving it a full stamp of approval. 126:312

- Several extensive studies of the heart and blood system indicated that, overall, the benefits from exercise far outweigh the risks. Iron pumpers who use anabolic steroids to boost performance may also be raising their risk of clogged arteries, and exercise so strenuous that it interrupts regular menstrual cycling may put women athletes at increased risk for brittle bone disease, other studies showed. 126:38,69,138

- Decades after paralyzing battles with polio, survivors were coming down with new symptoms. But research indicated that the new muscle weakness or pain probably stems more from overloaded nerve cells or sedentary lifestyles than from a reactivation of the virus. 125:372

- Death came to 12-year-old "David," the child who spent all but the last two weeks of his life confined to sterile plastic chambers because of his affliction with "severe combined immunodeficiency" (SCID). The increasing success of bone marrow transplants in children with SCID and other blood disorders has eliminated further need to isolate such children in germ-free environments. 125:133

- Some researchers believe that what you eat can influence how you think (125:216). A debate-sparking study indicated that deficiencies in salt, in addition to low calcium, potassium and vitamins A and C, are linked to high blood pressure. 125:404

- Canadian researchers reported using the immunosuppressant drug cyclosporine to halt the progression of type I diabetes (125:375), while a preliminary study showed that careful control of blood sugar levels was not particularly helpful. 126:137

- The first transplanted ovary and fallopian tube from one woman to her identical twin sister showed signs of normal function, opening yet another possible treatment for some types of infertility. 126:276

- Scientists at the Centers for Disease Control traced a number of cases of human illness and death to hamburger from cattle fed low levels of antibiotics, amplifying a long-standing controversy about whether such use of the drugs poses a human health hazard by favoring strains of bacteria that are resistant to antibiotics. 126:119

- Victims of sudden infant death syndrome (SIDS) were found to have a dramatically higher level of the neurotransmitter dopamine than children who died of other causes. 126:165

- Interferon showed promise in early tests against multiple sclerosis (126:231) and proved useful in treating an immune system cancer. 126:294

Physics

- Strange events, inexplicable by the current standard model of theory, appeared as a result of high-energy proton-antiproton annihilations at the CERN laboratory in Geneva. 125:85,276; 126:292

- The "top" quark, the last of six "flavors" of quark, was found at CERN. 126:21

- A new variety of superconductivity, heavy-electron superconductivity, which seems to depend on electrons bound fairly closely to the atomic nuclei of a metal rather than on the metal's conduction electrons, was reported. 125:212

- A form of radioactivity in which atomic nuclei emit particles heavier than alpha particles was found. 125:69

- A soft X-ray laser was developed. 126:278

- The Hall effect, the first quantum mechanical phenomenon to occur in fractions of its basic quantum, exhibited a new spectrum of fractions. A theory was devised to explain them. 126:116

- Anomalons, which are thought to be highly reactive fragments of atomic nuclei, were the subject of both positive and negative reports. 125:118,405

- An ultradense state of nuclear matter was formed in collisions of one nucleus with another. 125:279

- Experiments seemed to confirm that quarks in atomic nuclei can at least partially escape from the protons and neutrons that contain them, contrary to what theory had expected. 125:279

- Experiments with polarized protons showed that the direction of a proton's spin affects the strength of the force it feels when it collides with another proton, contrary to theoretical expectations. 126:5

- Researchers found a way to improve the resolution of the light microscope. 125:262

- The race to develop permanent magnets made from rare earth materials was proceeding full speed ahead. 125:212

Science & Society

- A series of government actions eased some of the restrictions on the export or publication of scientific information and data, but tightened others. 125:117,199,360; 126:183,358

- Stockpiles of aging and largely obsolete chemical weapons should be destroyed as soon as possible, advised a study prepared for the Army. 126:340

- In a landmark ruling, the U.S. government was held liable for the "wrongful deaths" of nine civilian victims of fallout from nuclear weapons tested in Nevada. 125:308

- The Baby Doe rule, a law prohibiting hospitals and doctors from withholding treatment to handicapped newborns, generated considerable medical and legal controversy. 125:47,286,343; 126:25,245

- An unexpected out-of-court settlement in the Agent Orange class-action suit left more issues unsettled than it resolved. 125:314; 126:296

- The Supreme Court's decision to permit punitive awards in the Silkwood case is being interpreted as effectively offering states and private citizens a right to establish de facto regulation of nuclear safety. 125:74

- Federal courts granted an injunction to hold up a university experiment that would have constituted the first deliberate release of recombinant DNA into the environment. Industry gene-splicing experiments would not be affected. 125:325, 341, 356; 126:55, 61, 397

- Two California scientists were awarded their second gene-splice patent. The controversial patent covers recombinant DNA molecules containing foreign genes and any uses of such molecules in bacteria. 126:150

- American scientists, including the National Academy of Sciences president, continued their protest of the Soviets' treatment and exile of ailing dissidents Andrei Sakharov and his wife, Yelena Bonner. 125:373; 126:118

- For the first time in 30 years, China released detailed demographic data to the West, revealing a number of important population trends. 126:89

- The U.S. Synthetic Fuels Corp., created to help private industry build a substitute-fuel industry, faced scandal, criticism and attempts to cut its funds. 126:74,86

- A U.S. District Court ruled that scientific researchers are entitled to the same "limited federal common-law privilege" to withhold research notes from grand juries as journalists now enjoy. 125:297; 126:296

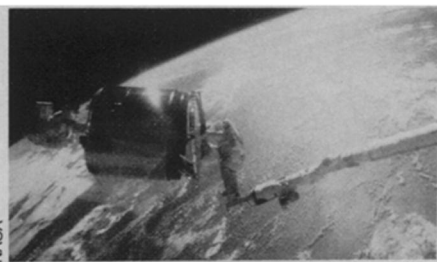
- The Reagan administration announced its intention to withdraw the United States from the United Nations Educational, Scientific and Cultural Organization (UNESCO), despite objections by many scientific groups. 125:55

- The Texas Board of Education repealed a 10-year-old rule requiring that textbooks present evolution as only one of several explanations for human origins. 125:246

Space Sciences & Astronomy

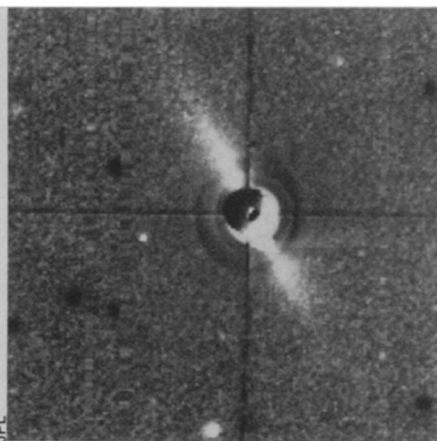
- The space shuttle, originally scheduled for 10 missions during the year (125:12), flew only five. But those included the first shuttle landing at Florida's Kennedy Space Center (125:100); the in-orbit repair of the Solar Maximum Mission satellite (125:228, 245); the maiden flight of the third shuttlecraft, Discovery (126:150); a flight of the

Synthetic-Aperture Imaging Radar system (126:247), whose predecessor surprised researchers by "seeing" through the sands of the Sahara (125:244; 126:186); and the salvaging from space for relaunching of two satellites that had been incorrectly orbited earlier in the year. 126:326



- President Reagan directed NASA to develop a permanently manned space station within a decade. 125:69

- The first direct detection of a "planet," or substellar object, around a star other than the sun was reported for the star VB8 (126:373). Three other stars — HL Tau, R Mon and Beta Pictoris (see picture below) — were reported as showing evidence of being surrounded by small solid particles that could be related to the formation of planets. 125:101; 126:244



- A large belt of radiation attached to our galaxy was discovered. 126:20

- Two meteorites found in Antarctica by Japanese scientists showed strong indications of being only the second and third such rocks ever identified as having come from the moon (126:70, 264). Carbon-isotope data were added to the evidence that another Antarctic meteorite may have come from Mars (126:70), while a comparison of Antarctic and lower-latitude meteorites suggested that the materials from which meteorites have formed may have changed with time. 126:244

- A previously unknown radio emission recorded by the Voyager 1 and 2 spacecraft was suggested to possibly represent the first direct evidence ever detected from the heliopause, where the sun's magnetosphere interacts with the interstellar medium. 126:277

- The first pulsar in a galaxy outside our own and the third known to pulse in visible light was discovered. 126:196

- The first artificially generated ion cloud ever formed on the sunward side of earth's magnetic field was produced and studied by an international satellite series called the Active Magnetospheric Particle Tracer Explorers (126:52, 117, 197), which then set out to generate the first artificial comet on Christmas morning. 126:362

- The Canterbury Swarm, a new member of the solar system made of objects of mixed cometary-asteroidal nature, was suggested as responsible for several historic catastrophes. 125:405

- Stars in the Pleiades gave evidence for a previously unknown, short and puzzling stage of stellar evolution. 125:388

- Delay of light by gravitational fields, predicted by general relativity theory, may have been observed. 125:359

- A very bright gamma-ray source of unknown nature puzzled astronomers. 125:37

- Some cosmologists adopted the idea that the unseen matter in the universe is cold rather than hot. 125:396

- Cosmic string, a defect of space-time, was suggested as the nucleus around which galaxies formed. 125:294

- A record for human inhabitancy of space was set by Soviet cosmonauts Leonid Kizim, Vladimir Solovyov and Oleg Atkov, who returned to earth after 237 days aboard the Salyut 7 space station. 126:230

- The fifth Landsat earth-resources satellite, last of its kind under NASA plans at the time, was launched March 1 — 10 months earlier than formerly scheduled — for fear that Landsat 4 (still operating at year's end) faced an imminent breakdown. 125:150

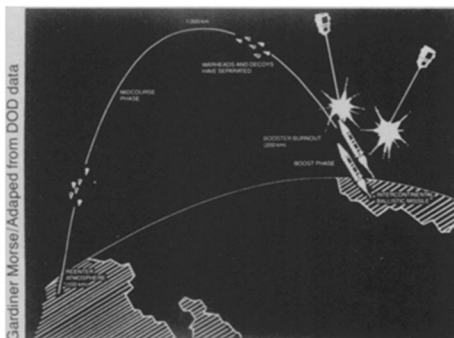
- The Soviet Venera 15 and 16 spacecraft continued their radar-mapping of the northern hemisphere of Venus. 125:180

- Responsibility for the Ariane rocket, Europe's competition for the U.S. shuttle's launch business, was handed over from the European Space Agency to a specially created private company called Ariane-space (125:150), which also saw the booster through the first launch of a more powerful version called Ariane 3. 126:86

- The UOSAT-B amateur radio satellite fell silent after only three orbits of the earth (125:150), but unexpectedly responded to attempted remedial commands after ignoring them for two-and-a-half months. 125:343

Technology

- Department of Energy officials conceded that their program for disposing of civilian, high-level radioactive waste, beset by complaints and delays, may not meet its goal of having a permanent repository operating by early 1988. 125:5
- A laser processing technique that deposits thin layers of silicon on surfaces may make possible the economical manufacture of integrated-circuit chips even in university laboratories. 125:165
- Cornell University physicists demonstrated the first in what may be a new class of solid-state lasers. 126:4
- The Department of Defense began its program to develop laser and particle-beam weapons as a defense against ballistic missiles. 126:26,42



- Research showed that recycling plastics is technically feasible, but finding suitable uses for the recycled material is difficult. 126:140
- Various techniques for protecting electronic systems from the effects of electromagnetic pulses were studied. 126:121
- AT&T Bell Laboratories reported the production of the most transparent optical fiber yet developed. 126:166
- Researchers at the University of California at Santa Barbara announced the development of the first powerful, tunable free-electron laser to operate in the far-infrared region of the spectrum. 126:237
- The Nuclear Regulatory Commission ruled that research reactors must switch from using highly enriched uranium to a nuclear fuel with a lower percentage of uranium-235. 125:213
- A simple, inexpensive silicon sensor that can log a year's worth of temperature data was developed. 126:86
- Researchers came up with a chemical method for alloying metals like tellurium and selenium. 126:376

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