

masers were under study for use in computers, instead of electronic tubes or transistors. A new kind of laser was generated by passing electricity through a semiconductor.

The advanced development of photo reconnaissance from the air and the use of so-called "spy" satellites for military purposes was emphasized by U.S. intelligence in the Cuban crisis in October. Both conventional photographs made through special aerial cameras of improved design and infrared photographs have developed significantly for use in surveillance from both the air and space. No part of the globe that needs watching will be hidden from any nation with the means of such aerial reconnaissance.

A major field of research deals with photosynthesis or the harnessing of the sun's energy for practical purposes. As a first step in developing more effectively the chemistry of photosynthesis in harnessing and possibly industrializing it, scientists in a few laboratories have studied intensively the process of conversion of solar energy into food in the living plant. Discoveries relating to the electronic aspects of the final stages of the photosynthesis process in plants may be utilized in the future to solve more completely the puzzle of how the plant operates and future years may look back upon 1962 progress as an important step forward. The primary act of conversion of energy in photosynthesis was found to involve the separation of negative electrons from the positive "holes" electrons leave behind when they move.

Genetic Code Research

Progress in understanding the genetic code of the life-building chemicals, DNA and RNA, indicated that in the near future there will be attempts at changing heredity even in human beings. Nobel prizes of the year increased to 11 within a period of four years those that were given for molecular biology and chemical genetics.

By several different processes, the conversion of brackish water or salt sea water to fresh water was pioneered during the year in a number of government-subsidized plants. Enough progress has been made to foresee in the future a competitive cost that will allow such conversion to be undertaken practically in some water-scarce areas such as southern California.

Because of its bearing upon racial integration, discussion of the origin of man and various races was renewed. There were anthropological resolutions during the year which stated that there is no scientifically established evidence that Negroes are biologically and innately inferior to whites. This has significance to the racial integration efforts in the United States and the impending conflict between new Negro-dominated republics of Africa and white-dominated areas, such as South Africa, practicing segregation.

The ancestry of man, known from relatively meager skeletal remains in Africa, Asia and Europe, underwent a constant appraisal because of new studies and new discoveries. Under development was the

possibility that the Neanderthals were an ancestor of modern man rather than a dead branch on the *Homo sapiens* family tree. While scientific communication with Communist mainland China is difficult, there may have been discoveries of fossil men which would have bearing upon the question of human ancestry. Africa produced a 14-million-year-old fossil that may prove to be in man's ancestry.

In the wake of the very successful International Geophysical Year and its stimulation to research on man's side of outer space, plans were made during the year for ambitious and well-funded inquiries into the oceans and the crust of the earth. The Indian Ocean survey, a joint effort of many nations, was inaugurated. A new inquiry into the upper crust of the earth, supple-

menting the daring attempt already underway to drill down to the core of the earth, was proposed.

Upon the model of the International Geophysical Year, the preparations were made for the International Year of the Quiet Sun in 1963-64, during which 36 nations will conduct a program of solar research during this minimum in the 11-year cycle of sunspot activities.

Man's continuing battle with the insects, which, if allowed full sway, would prevent much of modern agriculture, was given new attention and emotional content by the publication of a book which argues that damage is being done by the use of the insecticides necessary to insure food production.

• Science News Letter, 82:397 December 22, 1962

GENERAL SCIENCE

1962 Science Review

Detailed highlights of achievements of the year reported and compiled by Science Service as a record of an eventful period of science, research and technology.

ANTHROPOLOGY AND ARCHAEOLOGY

Missing Link in Origin Of Man Believed Found

Teeth and palate fossils of a 14-million-year-old creature, closer to the family of man than that of the apes, were found in Kenya, Africa, and pronounced a link in the origin of man.

Neanderthal man, long believed an apelike creature from a dead branch on man's family tree, was found to be a probable partial ancestor of modern man.

Six new kinds of fossil men were unearthed in Communist China, providing information about the years between 1,000,000 and 10,000 B.C.

Excavations at Yunque (San Gabriel), New Mexico, revealed that this site, at the junction of the Rio Grande and Chama Rivers, was the first permanent European settlement in the U.S., 78 years before the Pilgrims landed at Plymouth Rock.

An electronic computer was used to date Babylonian clay tablets by determining the positions of the sun and planets for the period between 601 B.C. and 1 A.D.

The American Anthropological Association adopted a resolution stating that there is no scientifically established evidence that Negroes are biologically and in innate mental ability inferior to whites.

Archaeologists used instruments that measure slight changes in the magnetic field and electrical resistance of soil to investigate a wall of the ancient Greek city of Sybaris and some Etruscan tombs, without first unearthing them.

Pollen of fir trees in Shanidar cave in Iraq revealed that Neanderthal man of the area lived in a cold climate some 60,000 years ago, and in a considerably warmer climate some 45,000 years ago.

Ten thousand bamboo strips, inscribed with ink and brush, were discovered under desert sands bearing information about nomadic Chinese tribes during the Han dynasty some 2,000 years ago.

A prehistoric water system of ditches and

channels and a large reservoir, probably dug in 1150 A.D., were discovered in Mesa Verde National Park, near the southwest corner of Colorado, indicating that pre-Columbian Indians of the area knew more about hydrology than was previously believed.

Using infrared spectroscopy, scientists analyzed the dyes of textiles from around 135 A.D., located in caves near the Dead Sea, among the remains of a group of followers of Bar Kochba, who fought one of the last battles of the Jews against the Romans.

The ancient city of Gibeon reportedly had a civil defense system, consisting of an inner and outer wall, and a tunnel to a nearby spring by which to obtain water in the event of a siege.

ASTRONOMY

Gravitational Red Shift Of Sun Verified Directly

The gravitational red shift of the sun's radiation predicted by Einstein's general theory of relativity was confirmed directly for the first time, using a new technique relying on variations in the earth's gravitational field over a distance of several feet vertically.

Preparations were made for the International Year of the Quiet Sun, 1963-1964, a 36-nation program of solar research during sunspot activity minimum in the 11-year cycle.

Observations of the Zeeman effect with the British giant radio telescope confirmed the existence of the Milky Way's magnetic field, it was reported.

An intense source of X-rays was discovered in the region of the constellation Scorpius.

The mean distance from the earth to the moon was found, by three different methods, to be 238,866 miles, accurate within approximately one mile.

A new theory of the 11-year sunspot cycle held that it is due to the different rates of rotation of charged atomic particles in the sun.

Protoplasm, the stuff of living things, is possibly found on the millions of cool dark stars in the far reaches of outer space, a new theory advocated.

The birth rate of small stars in the Milky Way is lower now than it was long ago, a study of the amounts of metals in the atmosphere of 56 small stars within a few hundred light years of the solar system indicated.

America's biggest radio telescope, a 300-foot dish mounted as a transit instrument was placed in operation at the National Radio Observatory at Green Bank, W. Va.; a 150-foot dish was installed on the Stanford University campus in California.

The world's second largest radio telescope, a 210-foot saucer located 200 miles west of Sydney, Australia, began operation.

A study of how the sun might have formed from a cloud of interstellar gas indicates that the sun, when it was forming, had a radius several hundred times the distance (93 million miles) from the earth to the sun.

The planets of the solar system were formed from tiny dust particles accumulating around the sun as it passed through a vast dust cloud in space, it was suggested.

The high abundance of rare earth elements in certain stars was explained as due to localized regions of strongly magnetic stars having field strengths ten times greater than the star as a whole.

Observations of the red-shift of light of very distant galaxies indicated that the universe is slowing down in its expansion and may come eventually to a stop and begin contracting.

An observatory was started in Argentina, filling the need for a large observatory to measure accurately the positions of stars over an area amounting to about one-third of the sky.

Hydrogen was discovered on Saturn, upholding the theory that the planet is mainly hydrogen and helium like the youthful sun.

It was indicated by infrared spectra that the chunks of matter comprising the rings of Saturn are coated with frost crystals.

The world's largest solar telescope, forming a 34-inch image, went into operation at Kitt Peak National Observatory, near Tucson, Ariz.

On Feb. 5, Mercury, Venus, earth, Mars, Jupiter, Saturn, and the sun and moon were all within 16 degrees of each other in the sky, with a simultaneous solar eclipse!

A supernova was spotted in the constellation of Virgo.

Radar measurements showed that the moon's surface is likely to be 90 per cent smooth.

The Soviet Union has announced plans to build the largest telescope in the world, set up on one of the summits of the Northern Caucasus, surrounded by other equipment as part of a proposed institute of theoretical astronomy.

Cosmic radiation from outer space travels millions of light years before reaching the earth, observations of photography plates exposed in a high-altitude balloon 136,000 feet in the air showed.

A bright comet, Seki-Lines, was discovered on Feb. 4 by an amateur Japanese astronomer, and again, independently, two days later by an American in Phoenix, Ariz.

A strange-appearing comet, believed to be caused by reactions with solar particles while still 240 million miles from the sun, was observed.

The sun carves out a cavity in space by creating a solar wind of charged particles that reaches out to distances twice as far as from the sun to the earth.

The most accurate measurements so far obtained showed the distance to Andromeda Galaxy is 2.2 million light years.

The earth's outer atmosphere at about 400 miles high was found to change density in tune with the sun's 11-year cycle of activity.



University of Illinois

SPIRAL ANTENNA—*The logarithmic spiral antenna developed by Prof. J. D. Dyson (right) in University of Illinois antenna laboratory is a key factor in the university's big new radio telescope. The arrangement of these antenna was planned by Prof. Y. T. Lo (left). By combining variable spacing of the units and variable coupling of the antennas to the receiver, a pencil-like receiving beam is obtained.*

BIOLOGICAL SCIENCES

Infective Virus Made From Dormant Molecules

An infective virus was manufactured from four large non-living molecules—adenosine, guanosine, cytidine and uridine triphosphates—that were isolated from infected plants cells.

The primary act of conversion of energy in photosynthesis was found to involve the separation of negative electrons from the positive "holes" electrons leave behind when they move.

Scientists succeeded in eliminating the need for light in a key energy-transforming reaction of the photosynthetic process, replacing the light energy with a chemical source.

A fuel cell whose bacteria use electrical charges instead of solid foods was reported.

A microbiologist proved that microscopic plants such as algae have circulatory systems, using a film that shows how liquid passes through tiny plants.

Life-like chemicals, palmitic and stearic acids, were reported found in rocks two and a half billion years old.

Daring experiments in human heredity were forecast as a result of partially breaking the genetic code of the life-building chemicals, DNA and RNA, respectively deoxyribonucleic acid and ribonucleic acid.

Histone was found to be the chemical key that tells the body's hereditary carriers, the genes, when to start reproducing themselves.

Sterile male screwworm flies were factory-produced in Texas as part of an artificial barrier to eliminate the livestock pests.

Thirteen species of American birds including the whooping crane, the California condor and the American ivory-billed woodpecker may soon be extinct, a Government scientist reported.

Two kinds of bacteria were found to be capable of surviving in a simulated Martian atmosphere.

Proteins and amino acids existing side by side were found to be the most likely materials of the first life on earth.

Fossil spores of 650 species and pollen grains of 56 new morphological genera were found in rocks up to two billion years old in the Soviet Union and Europe.

Chlorophyll-protein 666, a substance that, with sunlight, makes living organic material from chemicals, was discovered.

A three- to five-year International Biological Program with biologists from 32 nations was slated to begin after 1965.

A group of new organisms, accidentally discovered in soil samples, may link fungi and bacteria.

Ant sounds—snapping of joints, scraping of feet and rapping mandibles—were heard and recorded for the first time by humans.

Most North American fish secrete a substance when they are attacked or wounded that warns the rest of the fishes.

Warming the water around mosquito eggs turned potential males into females.

Research on a bacterium of the intestinal tract showed that human tissues and bacteria have the same rate of cell reproduction.

A bacterium that, injected into white mice, allowed them to withstand large amounts of radiation, was discovered.

The virgin queen honey bee attracts male bees with perfume-like chemicals from glands in her head, scientists reported.

Mutant plants of *Marchantia polymorpha* that cannot live without the addition of essential amino acids or vitamins were developed, thus permitting genetic studies of a type not previously done in higher green plants.

Bacteria left in the Antarctic at the beginning of the century were found alive.

The first radiation effects on the mammalian nervous system were observed in sleeping rats that awakened 12 seconds after low-level exposure to ionizing radiation.

A chemical that causes low germination and poor seedling development in clover and alfalfas was discovered, a step in efforts to improve pasture and forage legumes.

A natural leaf and fruit drop promoter, abscisin, was found in immature cotton bolls and may be used to develop more effective chemical defoliant.

Scientists learned from electron microscope pictures that each living cell has an outer layer of complex sugar compounds, which aid in some cases in the selective uptake of substances by the cell.

A biochemical system that can manufacture specific proteins was prepared, thereby giving information on the human genetic message system.

A new chemical discovery protects plants against long dry spells by closing the stomata, or pores, inhibiting evaporation of the water from the plant.

A colony of fresh-water clam shrimp, thought extinct for 83 years, was found in a trap on a Woods Hole, Mass., golf course.

Scientists are now able to study virus formation in plant cells with a recently isolated immature form of tobacco mosaic virus.

A genetic pollen restorer that will make male-sterile wheat fertile was found; it is considered the "missing link" in producing hybrid wheat.

To determine family relationships in plants which have no blood, plant protein patterns were distinguished with tests using the circulatory systems of laboratory animals.

The vital fruiting hormone, florigen, was found to be a steroid in the same chemical class at sex hormones in animals.

CHEMISTRY AND PHYSICS

Progress Made in Finding Atomic Nuclei Structure

The discovery of new nuclear particle, the "f-zero," indicated a possible new way of looking at nuclear structure, in which no particles are elementary, but the same one manifesting itself in continuously changing forms.

Besides the "f-zero," other particles were discovered, named eta, rho and zeta mesons; none of the four live long enough to escape from the nucleus although their existence is clearly inferred from resonances in the angular distribution of the pi mesons that emerge from the excited nucleus. The existence of an alpha meson seemed assured.

A team of researchers has discovered that there exist two types of neutrinos, each of which has its anti-particle, one connected with mu mesons and one with electrons, rather than only one kind of neutrino as previously thought.

Three international teams of scientists, in the United States, Switzerland and France, discovered one of the last predicted anti-particles of matter, the anti-Xi-minus, or anti-cascade hyperon.

Many elements, previously thought not superconducting, may become so when made sufficiently pure, as was found for molybdenum and iridium.

Continuous operation of a ruby optical maser was achieved for the first time although gas masers had previously operated continuously.

A gas phase laser, using a mixture of helium and neon, was made commercially available.

A new kind of laser in which an intense beam of light is generated directly by passing an electric current through a semiconductor was achieved at several laboratories, and continuous operation accomplished.

Laser light, a thin red shaft, was bounced off the moon.

Five new gaseous optical masers, each using a single inert gas, were developed, providing a total of 14 new frequencies of coherent light.

Yttrium iron garnet (YIG) was found to be an exceptionally efficient transmitter and transducer of acoustic energy.

The General Problem Solver was programmed to solve different types of problems in much the same way that humans do, using the same basic set of instructions.

It was observed that methane containing the triple weight hydrogen, tritium, is formed in the fireball resulting from hydrogen bomb explosions.

A new type of nitrogen nucleus, the heaviest yet found, was created, indicating the possibility of making hypernuclei that correspond to all normal nuclei.

In experimental production of an important source of vitamin A, beta-carotene, citrus molasses or citrus pulp by-products can replace the expensive component, beta-ionone.

A lightweight, balloon-borne instrument for detecting the intensity of gamma radiation at very high altitudes was developed, tested and used, thus eliminating the need to bring fission debris samples to earth for laboratory analysis.

The first simple compound of xenon, one of six inert gases of the helium family, was prepared as a solid crystalline material, xenon tetrafluoride, a chemical reaction previously thought impossible.

A quick method for separating insecticide residues from milk and other food products, using florasil, was developed.

A basic advance in the theory of light, showing how light can be treated as radio waves are in every radio and TV set, was reported.

A new alloy more resistant to chemical corrosion than any present commercial alloy has been

developed to resist the acids used in dissolving atomic wastes.

The taste of milk bought in grocery stores was found to be affected by the fluorescent lamps commonly used in display cases, even when the milk is stored in cardboard cartons.

The Nobel Prize in Chemistry was awarded to two British scientists, Drs. Max Perutz and John C. Kendrew, for their work in mapping the structure of two body proteins, hemoglobin and myoglobin.

Dr. Lev Davidovic Landau, a Russian physicist, won the Nobel Prize in Physics for his studies of matter at very low temperatures, particularly the so-called "second sound" of liquid helium.

Computers are being designed using optical masers instead of electronic tubes or transistors.

Twenty-eight years of research by a joint industry-Government group resulted in development of a complete method for coordinating color names, color specifications and colors themselves.

Jupiter emits its bursts of long radio waves by acting as a giant energy exchanger that is driven by the sun but operates on the principle of electronic amplification of the maser.

Foods can be cooked at room temperature under the very high pressures found 100 miles beneath the earth's surface.

Biological materials could have formed on the tiny planets that later grouped to form the earth, it was suggested from a study of the abundances of elements.

Nuclear energy from a small, mobile nuclear reactor—the prototype called ML-1—was successfully converted into electricity, and another portable power plant, the PM-1, for use with radars was dedicated.

The nuclear ship, NS Savannah, made her first voyage under nuclear steam, and the first nuclear frigate, the Bainbridge, successfully underwent initial trials.

The 20th anniversary year of the first self-sustaining nuclear pile saw more than 500 reactors of all types in operation throughout the world.

Congress authorized building the world's largest nuclear power plant, called the New Production Reactor, at Hanford, Wash.

Experimental ground tests of the Kiwi-B-1B reactor in the ROVER program to develop nuclear rocket propulsion were completed with a static power run that marked the first use of liquid hydrogen as the propellant.

Both the U.S. and Russia continued tests of atomic and hydrogen weapons with underground and atmospheric explosions, including high-altitude detonations that created artificial radiation belts.

Development of a system to detect nuclear explosions thousands of miles in space was started in what is known as the Hotel phase of Project Vela.

In an underground nuclear excavation experiment, called Project Sedan, a midget thermonuclear device of about 100-kiloton yield was detonated 635 feet underground.

The first nuclear explosion in the Plowshare program to develop peaceful productive uses for atomic bombs was detonated in an attempt to convert the released energy into heat for power at a low cost for industrial uses and to produce radioactive isotopes, and was safely contained.

Dr. Edward Teller was named recipient of the 1962 Enrico Fermi award of the Atomic Energy Commission.

A new series of crystals that are both piezoelectric and fluorescent were synthesized.

The Cambridge Electron Accelerator, which will speed electrons up to energies of six billion electron volts—the highest in the world, went into operation.

Tests showed that electrons could be stored in a ring, a major step toward obtaining very

high energies by hurling beams of particles at each other instead of at a stationary target.

Site work was started on the two-mile linear electron accelerator.

ENGINEERING AND TECHNOLOGY

Machine 93% Accurate In Reading Handwriting

A machine was found to read actual handwriting with 93 per cent accuracy, its main difficulty being with the same letters causing humans the most trouble.

A new type of microphone that acts as its own amplifier and is at least four times more sensitive than the carbon telephone transmitter, the most sensitive microphone now in use, was invented.

A submarine cable repeater that will amplify 128 two-way telephone calls simultaneously has been developed to operate with an armorless cable that will be laid across the Atlantic Ocean in 1963.

A computer was developed capable of human speech via a recorded "memory" of several thousand words, which are selected electronically by a device that scans a printed card.

A machine was developed that simulates human speech, and can even sing a simple song.

The use of a computer to analyze certain characteristics of human palm prints indicated a new method for detecting the presence of some inheritable conditions.

A mobile radar and weapons control system, which is capable of directing both manned and unmanned intercepting craft and can be used anywhere in the world, was tested.

A two-channel television/telescope was developed in Russia that permits simultaneous study of different parts of the spectrum of the moon, planets and stars.

James Madison probably wrote the disputed Federalist Papers, computers have shown.

A 30-pound thermoelectric generator, small enough to be carried on a soldier's back was developed; it provides 150 watts of available power without moving parts.

Powdered, high-protein, easy-storing butter was developed.

Radio-guided directional parachutes were perfected for use in fire-fighting and similar applications.

An anti-static agent mixed into plastics before molding was found effective at achieving a permanent anti-static condition.

A new undersea research vessel that can work on the ocean bottom more than two miles below the surface, collecting samples with two remote-control exterior arms, was being built.

Tests were started on a new kind of suction anchor to hold objects to the ground without touching it, the reverse of the ground effect machine.

Jolts of electricity were found to increase the efficiency of methane bacteria in treating sewage in laboratory experiments.

A microwave amplifier with the lowest noise performance ever achieved was built, its over-all noise temperature being 60 degrees Kelvin at 6,000 megacycles.

By placing an alloy of bismuth and antimony in a magnetic field, scientists were able to greatly improve its ability to convert heat directly into electricity, thus opening up applications for low-temperature electronic refrigeration.

Synthetic quartz with virtually the same acoustic quality as natural Brazilian quartz can now be grown quickly and economically by treating the hydrothermal solution with small amounts of lithium.

A fiber optics image dissection camera was developed that can take a sequence of 75 X-ray

pictures at a speed of 400,000 frames per second and still produce good resolution.

A p-n junction made of gallium arsenide was devised for use as a very sensitive thermometer at temperatures near absolute zero.

A new method for rapidly growing large beryl single crystals was developed.

Inert gas takes the place of vacuum in a new method of electron beam welding, surrounding the weld metal and eliminating the expense of enclosing the entire workpiece in a vacuum.

A new process allowed the making of color prints at home in only three minutes, with only two processing solutions.

A fabric covered with 24-karat gold, developed to protect personnel handling Space Age rocket fuels, was found to have the most effective combination of heat reflectivity and chemical inertness yet known.

The addition of a benzene compound to hydrocarbon liquids such as oil provided protection against fallout during storage.

Transparent plastic armor, developed by the Army, is tough enough to stop shrapnel and deflect bullets and can be used also for helmet lenses, flak suits and canopies for low-flying planes.

A chemical heating system that is energized by moisture in the wearer's breath was developed for arctic wear, spacesuits and other cold-weather clothing.

A new device developed to help frogmen in murky waters perceive nearby objects, indicates the distance by the tone of sound waves bounced from the objects.

The world's first atomic buoy, powered by a nuclear generator that is fueled with strontium-90, began operating at Curtis Bay, Md.

An isotope-powered generator was placed on the Atlantic Ocean bottom to act as an electronic navigational beacon.

A communications system that can automatically and simultaneously instruct hundreds of pilots, in flight, from multiple transmitter sites around the country was developed.

The increased amount of radioactivity thrown into the atmosphere by atomic bombs since 1945 was found useful in providing a short-term dating method, using measurement of carbon-14.

Protection of newly seeded grass waterways was achieved by using glass fiber mats.

Permanent attachment of dyes, starch and other finishing materials to cotton can be achieved in a single chemical reaction with derivatives of divinyl sulfone that have the ability to react with cellulose molecules.

GEOPHYSICS

Radiation Belt Created By High-Altitude Test

A high-altitude nuclear test by the U. S. caused formation of an artificial radiation belt of geomagnetically trapped electrons; lifetime of the particles and the belt's effects on radio astronomy observations were in dispute.

Fossil "animals" two billion years old were discovered.

A plan to launch some 2,000 balloons that would circle the earth high in the atmosphere as satellites of satellites to survey the world's weather was under study.

A mathematical model was made to show for the first time why the Gulf Stream meanders.

Compilation of the first tape library of earthquakes, nuclear blasts and other disturbances causing earth vibrations was begun using a system linking a digital computer and a seismograph.

Meteoric dust particles up to 100 million years old were found deep in the earth layers of California.

How and why the world's weather behaves as it does was being tackled by a new U. S.

Weather Bureau research facility using one of the most powerful computers yet built, called Stretch.

Precipitation is much heavier than usual during the week following the new moon and full moon, particularly on the third to fifth days following both the new and full moon, a statistical investigation of the records of extreme rainfall from more than 1,500 stations in the United States during the past 50 years showed; Australian records showed the same lunar effect on extremes of precipitation.

A system of space satellites and scientifically advanced cameras was planned to measure the positions of many islands and continents early in 1963 with very high accuracy.

Information from the Explorer VII confirmed the fact that the earth has a halo of helium surrounding it in a shell nearly 1,000 miles thick, starting some 600 miles above the surface.

An artificial model of the cloud formations characteristic of hurricanes was made in a "dishpan."

The Russians announced plans to drill five holes, six to nine miles deep, into the earth's crust.

The United States drilled a test hole on land as part of its preliminary drilling program before attempting to reach the earth's mantle in the Mohole Project.

The first positive evidence was found that ice glaciers covered Antarctica some 300,000,000 years ago.

The oldest rock in the Western Hemisphere was dated at 3.2 billion years.

The earth vibrates for several weeks, moving up and down about .001 inch every 20 minutes, after an earthquake, it was reported.

A \$5 billion program of atmospheric research was proposed by the National Academy of Sciences-National Research Council, including rocket and satellite experiments.

The intensity of a twinkling star as seen through a telescope was shown to be an indication of wind speed in the upper atmosphere.

A network of stations that will simplify the search for fallen meteorites by photographing the night sky from seven Midwestern states was established.

A red aurora occurring closer to the equator than the usually observed northern lights and too dim to be seen by the naked eye was reported.

The U. S. Weather Bureau made public its experimental closed circuit television program known as "Vidmet," which shows the world's weather and weather satellite photographs, as well as more local forecast maps.

A network of 40 mobile and fixed stations was established across the country to detect and measure radioactive fallout from nuclear detonations.

Atmospheric waves sent out by the Russian explosion of a 50-megaton bomb passed around the earth at least five times.

Microseisms were reported caused by the constant squeezing of the earth, making it "hum" like a highly strained piece of steel.

A new national laboratory to probe basic weather processes, known as the National Center for Atmospheric Research, was established under the direction of a 14-university corporation.

A thorough exploration of the Indian Ocean by ships of many nations under a plan of international cooperation was launched.

Four years of seeding experiments with airborne silver iodide being thrown into clouds over Arizona resulted in the same amount of rainfall on both seeded and non-seeded days, statistically, it was reported.

For the first time since 1910, the entire country from coast to coast had a colder winter than normal.

More than 3,000 persons were killed when a massive avalanche thundered down Peru's high-

est mountain, 22,205-foot Mt. Huascaran, in January.

A high-speed, upper-level wind current in the mesosphere from 30 to 50 miles above the earth's surface was discovered from rocket soundings.

A group of scientists discovered that an ancient leg of the sea was cut off when part of Canada tilted upward some 10,000 years ago, trapping the sea water in a land-locked British Columbia lake.

Scientists have prepared four maps of the moon's surface, indicating desirable landing places for astronauts.

A new mineral, stishovite, was discovered, formed when a huge meteor struck the earth at what is now Meteor Crater, Arizona.

The "Triton," a new British drilling deck, was built to anchor in 600 feet of water and withstand 50-foot waves and 120-mile-an-hour winds.

A chain of submerged mountain peaks, believed to have been volcanoes, was discovered extending from the New England shore east and south to the island of Bermuda.

A research vessel explored an unknown 4,000-mile section of the Indian Ocean bottom, mapping the strata of sediment between the bottom of the sea and the crust of the earth.

An expedition left for North Central Argentina to search for a lost meteorite so large that Indians of the 18th century called it a "mountain of iron."

A new radioactive dating method applicable to million-year-old sediments was based on radioactive inequality in nature between uranium-234 and its parent U-238.

MEDICAL SCIENCES

Drug During Pregnancy Causes Deformed Babies

Thalidomide, a tranquilizer tested but not licensed in the United States, was found, when used by women in early pregnancy, to cause phocomelia, a malformation taking the form of seal-like limbs, among thousands of babies in West Germany with a smaller number in England and elsewhere.

New safeguards for drug research, manufacture and distribution were legalized through the Drug Amendments of 1962 to the Federal Food, Drug and Cosmetic Act.

German measles virus, isolated by several investigators, may lead to preventive vaccine.

Reconstruction of diseased artery parts after removal of obstructions restored blood supply to kidneys, brain and limbs, and saved many lives.

A change in genetic DNA (deoxyribonucleic acid) is involved in all cancer causes, it was reported, and methods were developed for isolating DNA from the cancer-inducing polyoma virus.

The first direct evidence was found that fats carried to the arteries, and not those manufactured by the arteries themselves, play a dominant role in hardening of the arteries in humans.

Immunization against the world scourge of malaria was found possible for a year by injections of the experimental drug, CI-501, possibly indicating a conquest of this disease.

Direct surgery to unclog human coronary arteries was foreseen using a technique, successful in dogs, that helps overcome the problem of shrinkage at the point where the artery is opened to remove a clot or fat deposit.

Survival of animals longer than 300 days following organ transplants from unrelated donors, with the usual immune reaction believed overcome by drug injections, was reported.

An unidentified cell substance that stops the growth of cancer cells without harming healthy tissue was discovered in laboratory tests.

Freezing the stomach for about an hour was found to promote healing of ulcers.

Attacks of delirium tremens were prevented and treated by injection of amino acids, essential blood elements, which are found to be at low levels among alcoholics subject to delirium tremens.

By injecting their own knee joints, two physicians showed that sodium urate crystals actually cause gouty arthritis.

Removal of the thymus gland during the first two days of life in mice resulted in acceptance of skin grafts in totally unrelated strains.

The drug Mer-29 (triparanol), given to reduce cholesterol in the blood, was withdrawn from the market because patients developed cataracts after taking it.

A new experimental drug called Methyl GAG caused remission of bone marrow cancer (acute myelocytic leukemia) in adult patients.

The Royal College of Physicians in London recommended that its Government take steps to curb the rising consumption of tobacco, especially of cigarettes, because of the relationship to lung cancer and other diseases.

Smaller babies were born more frequently to mothers who smoke than to nonsmokers, a survey of 23,000 expectant mothers and their babies showed.

Persons who have smoked one to three packs of cigarettes a day for eight years or more have significantly higher chances of chronic respiratory diseases than nonsmokers, a survey of residents in a New Hampshire town showed.

Death rate from coronary heart disease was found to be higher in cigarette smokers than in non-smokers and lower in former cigarette smokers than in men who continue to smoke cigarettes in a survey of 2,074 professional men.

A person can have at least 20 colds a season without having exactly the same infection, a study of 403 adults and children showed.

Cancer in hamsters was produced with human adenoviruses, types 12 and 18, viruses that cause respiratory disease with more severe symptoms than those of the common cold.

Stomach cancer was diagnosed by radioautography after passing a thin-walled rubber balloon coated with a latex-based photosensitive emulsion into the stomach of patients who had received a tracer dose of radioactive phosphorus (P-32).

A simple test for kidney and bladder cancer involving measurement of increase and activity of a zinc enzyme, lactic dehydrogenase (LDH), in the urine was reported.

Finding positive cancer smears in 77 females under the age of 20 pointed to the advisability of tests for all female patients old enough to have routine pelvic examinations.

A jet gun, firing a hog bristle that produced clotting in a brain aneurysm, was devised and used successfully in a patient at whose autopsy it was shown that the aneurysm was completely destroyed and that he died of other causes.

Surgery that "short-circuited" an area of the small intestine decreased fat absorption and enabled two obese women to lose more than 90 pounds after previously unsuccessful dieting.

A portable pump driven by pressure from a tank of compressed gas and suitable for emergency rescue operations was developed to take over the manual labor of massage to revive a stopped heart without surgery.

A drop was reported through the Pan American Health Organization in the number of cases of leprosy, yellow fever, tuberculosis, polio, malaria and yaws in Latin American countries.

Coxsackie B-5 virus was reported to cause hepatitis in an adult for the first time, affecting the patient's heart, kidneys, eyelids and nervous system, as well as the liver.

Closed-chest massage on stillborn babies with

good fetal heartbeat gave hope for their lives and was reported to be more successful than open-chest heart resuscitation.

Several stillborn babies were brought back to life in Sweden by immersion in water chilled to between 50 and 59 degrees Fahrenheit and then gradually heated to normal body temperature.

A new concept of ovulation was reported that puts the time of release of the egg cell from the ovary at the eighth or tenth day following the onset of menstruation instead of 14 days before the next menstrual period begins.

Total replacement of a living heart in several dogs that survived with the plastic, compressed-air-driven "organ" longer than a day was announced.

Strokes were prevented and heart disease deaths reduced 50 per cent when male heart attack victims took small doses of female hormones, a 57-month study of 421 men showed.

Rheumatic fever patients who are without later symptoms may safely indulge in unrestricted physical activities, a study of 216 rheumatic fever patients for an average of 21 years showed.

"Radio nurses" in the form of tiny wireless radios the size of a lump of sugar were worn by patients to transmit data on temperature, pulse and respiration to a central office.

Space suits were used to help a number of stroke victims walk and work through pressure that restored necessary tone to the blood vessels.

Alpha-methyl DOPA, a derivative of one of the body's naturally occurring amino acids, was found useful in treating high blood pressure with few side effects.

Radioactive chromium-51 was used as a safe, quick and accurate tracer for locating the site of the placenta in pregnant women, thus assuring greater safety in childbirth.

Studies on snakebite showed that death is not caused by the venom itself but by disruption of the enzymatic balance that starts a

series of events causing nerve disorders, shortness of breath or heart failure.

Type III live oral poliovirus vaccine was licensed by the U.S. Public Health Service, but six months later PHS sounded a warning against its use by adults because of some possibly related cases of polio.

A new plastic suture for closing wounds, a polypropylene monofilament, was reported biologically inert in the presence of infection and a possible replacement for catgut.

Syphilis was back near the top of the list of reported cases of communicable diseases in the United States and abroad, with more than 20,000 cases in this country alone despite the availability of penicillin as a cure.

Crooked teeth occurred two and a half times more frequently among children drinking water without fluoride and the rate of decay was nearly four times greater, a study showed.

Total fast periods for 10 days, supervised in a hospital, with polyvitamins and weak beverages the only intake, resulted in loss of more than two pounds a day among 40 obese persons.

A new mental health program aimed at improving the treatment of the mentally ill throughout the United States was launched by the American Medical Association.

Curvature of the spine was reported straightened in a selected group of 34 patients through use of a turnbuckle jack permanently placed after an operation requiring the removal of seven ribs.

A new technique for treating Parkinsonism, or shaking palsy, using finely focused proton accelerator beams to destroy abnormal brain tissue, resulted in marked improvement in tremors.

Myelin, the fatty sheath of nerve fiber, regenerated after it was destroyed in test tube cultures of the blood of laboratory animals in which experimental "allergic" encephalomyelitis was produced.

The 1962 Nobel Prize in Medicine was shared by an American, Dr. James D. Watson, and two British scientists, Drs. Francis H. C. Crick and Maurice H. F. Wilkins, in honor of their discoveries concerning the molecular structure of nucleic acids and its significance for information transfer in living material.

Cysteine, an antiradiation drug, proved 80 per cent to 90 per cent effective in protecting monkeys exposed to 700 roentgens, and 50 per cent effective against exposures of 900 roentgens, although the lethal dose for monkeys is 500 roentgens.

Protection of swine from hog cholera by use of a vaccine prepared from a virus isolated from a cattle disease was 90 per cent successful in field tests.

Electrically induced sleep with electrical apparatus patterned on a Russian device was reported especially useful in preparing patients with painful muscular spasms for treatment.

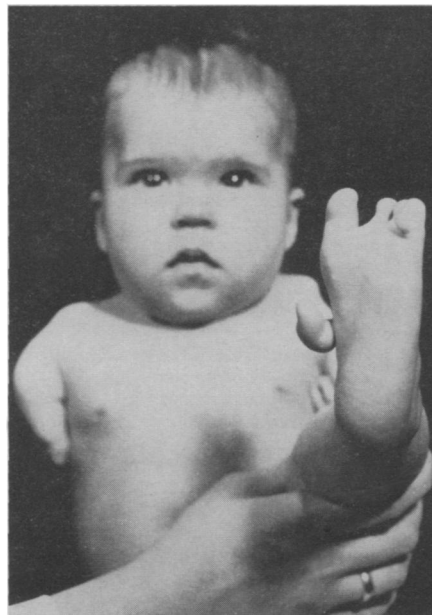
Yellow wax models of human heads and other parts that change color dramatically to red when exposed to radiation were used to help doctors determine the radiation dose patients should receive.

Waiting for X-ray plate processing was eliminated by electronic techniques, allowing surgeons to set broken bones in one-fourth the usual time.

A new treatment for the incurable wasting disease called muscular dystrophy was devised using a digitalis preparation with a synthetic steroid compound.

Sufferers from recurring kidney stones were helped by an improved solvent formerly used to clean calcium salts from the pipes of beer and dairy equipment.

The isolation of a central portion of the weak antibiotic, cephalosporin C, gave a drug which acts against infections resistant to penicillin.



D. W. Lenz

THALIDOMIDE BABY—*The finlike arm and abnormal foot of this baby are typical of deformities affecting thousands of German infants whose mothers took the drug thalidomide in the early months of pregnancy.*

A simple chemical test using a drop of blood helped to diagnose jaundice before it is visible in patients.

PATENTS

Year's Patents Include Print Translator for Blind

Numbers following items are U. S. patent numbers. Printed copies of patents can be obtained from the U. S. Patent Office at 25 cents each. Order by number, do not send stamps, and address orders to the Commissioner of Patents, Washington 25, D. C.

Notable and interesting inventions patented during the past year include:

A reading machine that translates print into sound signals blind persons can understand. Patent 3,007,259.

A device for transporting cargo using one or more underwater barges. Patent 3,018,748.

A 16-wheeled vehicle that enables wheel chair occupants to surmount stairs and curbs. Patent 3,049,364.

A method of making diamonds by growing them on other diamonds. Patent 3,030,188.

An airway to blow air into a person's lungs, for use in artificial respiration. Patent 3,013,554.

A man-made chemical that attracts male gypsy moths by duplicating the natural attractant of female gypsy moths. Patent 3,018,219.

An atomic reactor for powering aircraft. Patent 3,009,866.

A process for producing high-protein stock feed from low-grade citrus fruit. Patent 3,002,838.

An anti-skid sanding device, designed for installation in automobile trunk compartments. Patent 2,999,711.

A mining device that detects the difference between coal and rock. Patent 3,015,477.

A disposable ash tray that can be carried flat in the pocket. Patent 3,017,063.

A "flying saucer" type of aircraft, with an improved jet method of propulsion and control. Patent 3,022,963.

A tiny device used in computers, called a persistatron, operating at very low temperatures. Patent 3,043,512.

A tiny microphone-loudspeaker combination, so small it can be hidden under a shirt collar. Patent 3,029,307.

A bottle specifically designed for christening boats or airplanes, with a pre-weakened portion between the neck and the bottom. Patent 3,031,095.

A method by which crew members can escape from a sunken submarine using a buoyant sphere carried aboard. Patent 3,045,622.

An improved method of cooling the nose cone and outer surfaces of a missile entering the earth's atmosphere by feeding to the forward surface a material that is vaporized by atmospheric friction and then flows toward the rear. Patent 3,050,000.

A system for changing speech into the digital language that giant electronic "brains" can understand. Patents 3,037,076 and 3,037,077.

Chemical coatings that make clothing resistant to nerve gases for at least 20 minutes. Patents 3,054,695 and 3,054,696.

A method of dating objects 100,000 or more years old by measuring the thickness of the surface layer of obsidian, or volcanic glass. Patent 3,010,208.

An electric locomotive that runs on pulverized coal. Patent 3,021,797.

A method for building a supersonic airplane with wings that change position for flying at slow speeds. Patent 3,053,484.

An alarm system for shopping carts, to prevent shoplifting or to remind customers they

have forgotten their personal belongings. Patent 3,051,936.

A cheat-proof teaching machine. Patent 3,056,215.

A new class of plastic products, made by the polymerization of cyclic esters. Patents 3,021,309 through 3,021,317.

The fusion reactor known as the Stellarator. Patent 3,016,341.

PSYCHIATRY AND PSYCHOLOGY

Fourth of Mental Patients Seek Own Hospital Care

Increase in the free fatty acids in the bloodstream was associated for the first time with emotional stress such as depression, fear and anger.

One-fourth of all new patients entering a mental hospital do so at their own request in the United States, while nearly three-fourths of mental hospital admissions in England are voluntary.

Learning ability of mice can be lowered or increased to an unusual degree by regulating the amount of the hormone serotonin in the brain.

That mothering is frequently the last function to be impaired by mental illness was shown in a study of outpatients returned to their homes with the aid of drug treatment.

The dreamer watches his own dreams by actually moving his eyes in sleep, psychologists reported.

Patients with schizophrenia, the most common form of mental disease, were found to have a high incidence of unusual fingerprints, including lines that make almost complete circles or rise to a peak.

Placebos, inert substances sometimes given for the relief of pain, relieved suffering in 55 per cent to 60 per cent of patients with a variety of arthritic diseases.

Watching a motion picture of a knife-fight scene made volunteers in an experiment more aggressive and willing to inflict pain than were those in a group viewing an educational film.

Several cities have planned cozy, cottage-styled homes to replace old drab buildings for housing mental patients because purely functional buildings fail through their monotony.

A research program to get data on delinquency paid off by curbing the delinquency rate, a three-year follow-up showed after the close of the project in which juveniles talked to a tape recorder about their lives.

High school freshmen as well as gifted adults are able to think creatively, test scores for several hundred boys and girls showed.

An individual is capable of executing several different mental processes simultaneously, as shown in an experiment revealing that it takes no longer to search for several letters than for one.

The rising or setting moon looks larger than when overhead because such earthly objects as trees, houses and hills make the moon on the horizon seem farther away than when overhead, two psychologists found.

Imprinting by strange objects, known previously as a matter of choice, can be forced upon baby chicks, it was found.

Persons who are highly sensitive to bitter tastes were also observed to have more food dislikes.

A monkey with a split brain could see two different objects simultaneously while a normal animal could not make the distinction.

A group of technicians who were taught basic electricity from teaching machines, or programmed books, did significantly better on tests than a similar group who were taught the same material by the instructor-lecture method.

SPACE AND AERONAUTICS

Russians Launch Two Spacemen At Same Time

Soviet Cosmonauts Andrian Nikolayev and Pavel Popovich, launched into earth orbit respectively Aug. 11 and 12, landed six minutes apart Aug. 15 about 1,500 miles southeast of Moscow; the twin cosmonauts maneuvered as close as 3.1 miles to each other during the flights.

Weightlessness no longer appears to be a barrier to round-trip manned lunar flights from earth as a result of the two successful Soviet manned orbital flights in August.

No appreciable radiation exposure was evidenced by readings of dosimeters worn by Astronaut Walter M. Schirra, the first U.S. astronaut to wear such instruments during his six-orbit space flight.

Heat during reentry was the most severe stress experience of Astronaut John H. Glenn during his space ride in February.

The Soviet interplanetary probe, Mars-1, was launched from a rocket in a parking orbit around earth on Nov. 1, and is expected to pass close to Mars next June.

The United States successfully launched Mariner II on a course passing close to Venus; its broadcasts established a record for long-distance communication.

The Mariner II probe to Venus verified previous earth-based estimates of the density of cosmic radiation and the strength of magnetic fields to be encountered in interplanetary travel.

Telstar, the nation's first private enterprise communications satellite, was launched and successfully relayed television, telephone calls and data across the Atlantic Ocean.

Telstar, the communications satellite, measured the electrons and protons encountered in space in the natural and man-made radiation belts.

The successful launches of Tiros V and Tiros VI, designed to watch hurricanes and storms, demonstrated not only the reliability of the three-stage combination liquid-solid fuel Delta rocket but also the operational reliability of this system of surveying the world's weather.

Plans to track a satellite for the first time by means of a laser's concentrated beam of light were announced.

Orbiting Solar Observatory, or OSO-I, was placed in a near-circular earth orbit to conduct 13 experiments, including measurement of electromagnetic radiation and dust particles in space.

Transit, to develop an all-weather navigation system, and TRAAC, to test a gravity system for attitude control and to measure radiation, were orbited simultaneously.

The first international satellite, containing six British-designed experiments investigating the ionosphere, was launched on April 26.

A pygmy satellite with a highly eccentric orbit was launched to study the artificial as well as the natural radiation belts.

To learn what the ionosphere is like from space, the Canadian-built "Alouette" satellite was placed in orbit by the U.S., with U.S., British and Canadian scientists cooperating to analyze the data.

Superconductors, which operate only at temperatures near absolute zero (459.7 degrees below zero Fahrenheit), were reported to provide possible radiation protection in space.

Anna, a blinking satellite of the Army, Navy, National Aeronautics and Space Administration and Air Force, was launched to help measure more accurately distances between continents.

Two OSCARs (Orbital Satellite Carrying Amateur Radio), built by a group of California radio "hams," were carried aloft piggyback by Air Force satellites.

The Ranger III lunar probe, which failed to impact, showed that the intensity of gamma rays in interplanetary space is probably ten times as high as previously thought.

The U.S. sent Ranger IV into impact with the moon but no scientific data was obtained; two other Rangers were in solar orbit.

Several more satellites in both the Explorer and Discoverer series were successfully launched.

The rocket that launched Cosmonaut Titov and other Soviet spacemen into orbit was announced as having three stages.

The Russians launched a series of 11 Cosmos satellites, to investigate the upper layers of the atmosphere and cosmic space.

Three Saturn C-1 rockets were successfully flight-tested as part of a program leading to manned circumlunar exploration.

The first U.S. liquid hydrogen rocket, designed for use in the Centaur program of a soft landing on the moon, passed its preliminary flight-rating test.

A space propellant, oxygen difluoride, was developed that will make smaller and lighter spaceships and will make moon landings safer.

An electrolytic cell, capable of producing oxygen when weightless in space, was developed.

A convertible aluminum mirror to catch the sun's rays to power vehicles in space was developed.

The X-15 aircraft was flown to a world altitude record of 314,750 feet on July 17, for which the pilot, Maj. Robert M. White, was awarded an astronaut's wings.

On June 27, Joseph A. Walker flew the X-15 to a new world's speed record of 4,104 miles per hour.

Instruments for using the high-flying X-15 as a space platform for studying the stars from above most of the earth's atmosphere were developed.

Astronaut Donald K. Slayton was barred from space because of a "heart flutter" occurring during exposure to stresses of simulated space flight.

Pieces believed to be part of the disintegrated Russian satellite, Sputnik IV, were found in northeastern Wisconsin with the help of Moon-watch teams; parts of the rocket that launched Astronaut John H. Glenn Jr. into space in February were recovered in South Africa.

The "Glenn effect," particles observed during flight by Astronaut John H. Glenn Jr., which looked like luminous fireflies, were found to originate from the capsule.

A U.S. B-52H bomber set a world record for non-stop, non-refueling distance in a closed circuit of 11,400 miles at an average speed of 510 miles per hour in 22 hours, 38 minutes, 41.8 seconds.

The National Aeronautics and Space Administration announced the selection of nine new space pilot trainees.

Eight test pilots were chosen by the Air Force for training at Edwards Air Force Base, Calif., for such military aerospace projects as the X-15, Dyna Soar and other follow-up space projects.

A small instrument using radioactive broth was developed for landing on Mars in 1964 to help solve the question of whether or not life forms exist on Mars.

Full-scale tests were conducted for stopping jet airplanes in emergencies by hooking the plane onto a cable that operates water pistons.

GENERAL

U.S. and Russia Study Joint Space Weather Plan

The United States and Russia made a start of cooperating in space research by officially designating representatives who mapped out a

report on the worldwide benefits obtainable from weather satellites.

An Office of Science and Technology was established as part of the President's Executive Office, headed by the President's Science Adviser.

At the Department of State a new office of International Science Affairs was established.

A Presidential memorandum setting standards of conduct for scientific consultants was issued to insure scientists' compliance with the conflict of interest statutes.

President Kennedy and Premier Khrushchev exchanged proposals aimed at a program of space cooperation.

At the United Nations, a 110-nation committee voted to set up a system of worldwide monitoring of radioactive fallout at the earliest possible date.

A group headed by the U.S. Ambassador to the International Atomic Energy Agency urged continued support by the U.S. of IAEA and Atoms-for-Peace.

Congress authorized, after long debate, estab-

lishment of a broadly based, privately owned corporation to be formed specifically to handle communications satellites.

The suit against the Government brought by the manufacturer of battery additive AD-X2 was dismissed "with prejudice" by the U.S. Court of Claims, ending nearly a decade of controversy.

Fallout from nuclear test explosions in the atmosphere became a matter of concern in certain areas—Utah and Minnesota—so that countermeasures were taken by the two states.

Controversy on the pressing problems raised by widespread use of insecticides was heightened by publication of "Silent Spring."

Science Clubs of America and 4-H clubs initiated a cooperative program whereby scientific projects are eligible for recognition by both groups.

Sweden, Mexico, Peru, Chile and Colombia joined the growing list of nations with science fair programs aimed at increasing student interest and activity in all fields of science.

• Science News Letter, 82:398 December 22, 1962

INVENTION

Patents of the Week

A spaceman's belt for maneuvering under zero gravity conditions, consisting of tube bundles containing a gas propellant under pressure, has won a patent.

➤ A BELT for the spaceman of the future to use in moving around when the attraction of gravity is near zero won a patent.

The device uses a gas propellant under high pressure that is stored in tube bundles around the user's waist. These tubes are so connected to the control mechanism that thrust is exerted in the desired direction by moving the controls in that direction.

The belt has been successfully tested in some 80 flights under zero gravity conditions in an Air Force Convair, inventor Wendell F. Moore of Youngstown, N. Y., said. This model used nitrogen for the propellant instead of the hot rocket fuel planned for space maneuvering.

Mr. Moore received patent 3,066,887, rights to which he assigned to Bell Aerospace Corporation, which also holds the patent on the highly successful one-gravity rocket belt by which soldiers can maneuver as high as 360 feet above the ground in controlled flight. Average altitude on distance flights with this personal rocket, which is carried on the back, has been three to four feet.

Mr. Moore, a rocket propulsion engineer, said the most recent rocket belt had also been tested underwater and maneuverability accomplished successfully.

Gyro Control System

A method for controlling unmanned aircraft, particularly gliders, was awarded patent 3,066,895 more than 17 years after the patent application, the long delay being due to the need for keeping the device secret.

Jacob Rabinow of Rabinow Engineering Company, Inc., Rockville, Md., and Harold K. Skramstad were awarded the long-delayed patent, rights to which they as-

signed to the Government through the Secretary of the Navy. Two gyroscopes are used to regulate the movement of the aircraft's control surfaces so that motion is stable.

One gyroscope keeps the glider horizontal while the other maintains stability around the up-and-down axis. The two are so mounted as to also prevent rolling.

Radioactivity Test Sampler

A paper tape holder that can be used to test for radioactively exposed materials or the presence of bacteria won patent 3,066,342. Walter B. Jackson and George W. Johanson of Waltham, Mass., and Lester F. Lowe of Ashland, Mass., assigned rights to the Government through the Secretary of the Air Force.

The Atomic Energy Act requires that smear tests for contamination of the surroundings be taken wherever radioactive materials are used. Instruments for doing this must protect the user from radioactivity, yet be easy to use.

Other Patents:

A new way to light your way to bed—tiny flashlights attached to the toes of your bedroom slippers. The light goes on when a foot is placed in the slipper and off when the foot is removed, according to patent 3,067,322, awarded to Errett O. Sala of Avon Lake, Ohio.

A method for making color reproductions of radar information, in order that objects may be more easily identified by their color, granted patent 3,067,415. Lloyd C. Downes assigned patent rights to Hoffman Electronics Corporation of Los Angeles, California.

• Science News Letter, 82:404 December 22, 1962