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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

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A SCIENCE SERVICE PUBLICATION

GENERAL SCIENCE

Visa Problems of Scientists

Congressional committee learns that 100 foreign scientists, including three Nobel Prize winners, have had difficulties obtaining visas for short visits to the United States.

➤ AT LEAST seven international scientific organizations have not held meetings in the United States because present visa regulations are a "paper curtain" hampering entry of temporary visitors.

About 100 foreign scientists, including three Nobel Prize winners, have had trouble obtaining visas in the last few years, even after they were invited to come to the U. S., Dr. Victor F. Weisskopf, Massachusetts Institute of Technology physics professor, told the Senate Judiciary Subcommittee's hearings on immigration and naturalization.

Dr. Weisskopf is chairman of the Federation of American Scientists' committee on visa problems, Cambridge branch.

The trend toward holding an increasing number of international scientific meetings outside the U. S., Dr. Weisskopf said, greatly reduces the stimulation to research and to new ideas that such gatherings provide scientists. Younger scientists, who have not yet gained international reputation, need this stimulation the most, yet are less likely to be invited to foreign conferences, Dr. Weisskopf pointed out.

Arguments for the present, "very restrictive" visa policy are based on concern for security, Dr. Weisskopf said, which can be obtained in two ways: "by concealment and by achievement."

Since security by concealment, such as maintaining guarded laboratories, screening personnel for secret work and classifying information of military significance, already protects secrets adequately, Dr. Weisskopf sees no need for "further barriers at our shores."

Security by achievement is "directly dependent on rapid progress in scientific and technical fields" and is the "only real protection against a potential enemy who is also advancing" in science and technology. Achievements rest on rapid assimilation of new scientific ideas, in which personal contacts play an important role.

"The present visa procedure does far more harm to our security by preventing the flow of useful ideas from abroad than it helps to prevent espionage," Dr. Weisskopf said, and contradicts "our professed championship of an open world."

Dr. Weisskopf urged that new visa regulations should be "drafted to encourage, rather than discourage," visits by foreign scientists and other representatives of foreign cultural life.

The seven international groups that have not held meetings in the U. S. were listed as the International Congress of Psychology, the International Congress of Genetics, the International Botanical Congress, the International Astronomical Union, the International Union of Geodesy and Geophysics, the International Union of Crystallography and the International Union of Biochemistry.

Of the 100 cases of foreign scientists experiencing visa difficulties, Dr. Weisskopf said 66 never obtained a visa. Three Nobel Prize winners and 46 others were directly refused a visa and eight never received a reply from the consulates.

In nine cases, Dr. Weisskopf said it was impossible to establish whether visas were refused or applicants were still awaiting word.

Of the 34 cases where visas were granted "after serious delay," the waiting period was so long as to prevent the visit for 22 applicants.

The best-known case of direct refusal is that of the Nobel Prize winner in physics, Prof. P. A. M. Dirac (see SNL, June 5, p. 357).

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HOME ECONOMICS

Advice for Buying Warm Cloth Coat

➤ TIMELY ADVICE for Christmas shoppers who want a warm cloth coat but not a bulky one is given by Dr. Mary Ann Morris of the University of Minnesota's School of Home Economics in Minneapolis.

She tested 29 different layers of coating materials and linings to learn what combinations might give best protection from winter's cold.

For a superior, not-too-heavy coat, Dr. Morris recommends an outer fabric, such as a worsted, that allows little air to penetrate, combined with a lining or interlining fabric that is thick and contains a large number of minute dead air spaces within the fabric.

Her study showed that, under average conditions, "thick fabrics, or combinations of fabrics, that contain a large amount of air and, at the same time, have good resistance to the passage of air will be the warmest."

The amount of heat a fabric transmits, Dr. Morris points out, depends on its thickness and not on the thermal insulating ability of the fiber itself. Usually, she says in the *Journal of Home Economics* (Dec.), the less dense fabric has the greater thermal insulation, which depends primarily on the still air it contains.

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MEDICINE

Viruses Against Cancer

➤ VIRUSES, usually feared as causing polio and other diseases, may be the means of stopping an even more feared disease, cancer.

Hope for success in this attempt came in the biennial report of the Sloan-Kettering Institute for Cancer Research, New York.

Scientists there and at Memorial Hospital have started treating very sick patients with far advanced cancer with two viruses. One goes by the name of Egypt 101. The other is a new virus never before tried as an anti-cancer weapon. Its name is still a secret. In the near future several more viruses will be tried in human cancer patients.

Because the treatments have only just started, no results can be given. Those who have followed closely the efforts of cancer fighters may remember there was hope a few years ago of stopping cancer with viruses.

Efforts along this line were "stymied" for a time. One reason was that the scientist in charge of the work, Dr. Chester Southam, was called to duty in the armed services.

Meanwhile a big step in cancer fighting was taken. This was the finding of ways to grow human cancers outside the human body. The earlier virus-against-cancer work had been done on animal cancers.

Scientists now know that every kind of cell has its own particular chemical needs and susceptibility to injury. Mouse cells differ somewhat from rat cells, and both differ from human cells. More than that, liver cells of one species differ in chemical needs from intestinal cells of the same species.

As a result of such findings, scientists were able to grow the two potential anti-cancer viruses in human cancer cells instead of in animal cancer cells. This, they think, gives them a much better chance of making the viruses destroy the cancers in the bodies of human patients.

Viruses, it has long been known, can kill some kinds of cells while leaving others unharmed. Polio virus, for example, kills cells of the brain and spinal cord.

The viruses now being used have been worked with and changed so that their ability to destroy cancer cells, especially human ones, has been increased. At the same time, any ability they had to injure any normal cells has been decreased.

The crucial step now is to see whether these viruses that can kill human cancer cells outside the body can do the same in the patient's body.

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Clothed and working normally, *man* is most comfortable at about 68 degrees Fahrenheit.

GENERAL SCIENCE

Minerals Seen Short

Mineral resources will be worst shortage of future, Dr. Vannevar Bush warns in his final report as president of Carnegie Institution of Washington. Hints universe expansion slowing.

➤ THE GREATEST SHORTAGES in civilization's future will be in mineral resources, Dr. Vannevar Bush warns in his final annual report as president of the Carnegie Institution of Washington.

"We can see the end of the process of just digging metals out of the ground wherever we find a surface indication that they may be present," he reports.

Dr. Bush, war-time director of the U. S. research effort, retires Jan. 1 after 17 years as head of America's oldest far-flung research foundation.

He is being succeeded as president by Dr. Caryl P. Haskins.

Dr. Bush is more optimistic about supplying energy for the future. He looks to the capturing of solar energy.

Man is "headed for catastrophe unless he mends his ways and takes thought for the morrow," Dr. Bush states.

"This is quite apart from the immediate question whether he will use the split atom or a trained virus to turn civilization back and force it to begin again its slow upward climb, and apart from the question whether great wars can be avoided through a general understanding of their consequences."

Dr. Bush explains these momentous questions are immediate ones, and even if resolved, man would still be headed for trouble.

"The world's population is increasing at a rate which renders distress, famine and disintegration inevitable unless we learn to hold our numbers within reason," Dr. Bush points out.

"New methods of extending the food supply, powerful though they may be, can only postpone the crisis, and perhaps allow time for communication and education to produce the general understanding that is essential to a sound solution of the underlying problem.

"There is no doubt that we can go far in providing new means of sustenance for great masses of people. The cultivation of that enormous reservoir, the sea, can yield richly if we learn to control organisms and species; and our land is far from exhausted if we learn to use it well.

"The process production of foods is just beginning. An understanding of photosynthesis and the creation of its synthetic equivalent could unlock stores of vital materials beyond our present power to envisage.

"Our control and training of natural species and the creation of new species at will for explicit purposes, especially species of lower organisms, hold enormous possibilities. And all this depends on our progress in understanding life itself, which is the subject of fundamental biology."

We shall soon know enough photochemistry to make it possible to exploit the sun's energy, Dr. Bush predicts. He sees great ponds of chemicals gathering energy for us. Chemical engineers will convert the chemicals into convenient forms for use.

More geological knowledge on a firmer scientific basis will help in the search for metallic ores in the earth's crust. Eventually, he suggests, we may learn to train organisms to recover metals for us from the sea, as seems to have been done in times past.

Such applications are not the sole aims of science, in Dr. Bush's opinion.

"The scientist lives by faith quite as much as the man of deep religious convictions," Dr. Bush states. "He operates on faith because he can operate in no other way. His dependence on the principle of causality is an act of faith in a principle unproved and unprovable. Yet he builds on it all his reasoning in regard to nature."

The motivation most powerful in its influence, Dr. Bush suggests, is "the faith that man can learn to know and to understand and that it is good to exercise that power and to strive for the extension of our wisdom."

Universe Not Expanding?

➤ THE EXPANDING universe shows signs of slowing down at the very limits of space now visible.

This is contrary to what astronomers have previously thought. Heretofore they believed that, in every direction, the universe was flying apart at a rate increasing with distance. (See SNL, Jan. 1, p. 3.)

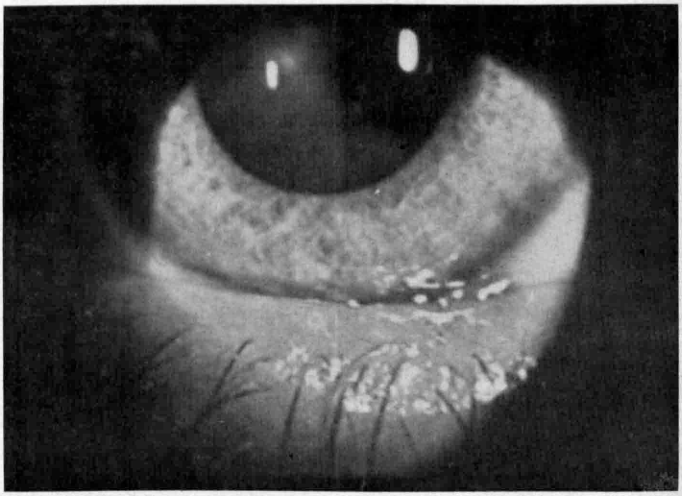
Now there is evidence this rate is slower at the very outer limits of space reached by the 200-inch Hale telescope, some two billion light years away. *See errata*

That the most distant galaxies yet seen are not receding as fast as closer galaxies is suggested in Carnegie's annual report.

Astronomers judge distances to far-away galaxies by observing the brightness of their light. The more remote these "island universes" are, the fainter they appear.

By combining measurements of the brightness of galaxies with observations on how much their light shifts toward the red end of the spectrum before reaching the earth, astronomers can test the apparent expansion of the universe.

Their evidence for a drop in the expansion rate at the edge of the visible universe is based on a survey of all available observa-



INSIDE THE EYE—Believed to be the first kinescope pictures made in the United States of the human eye's interior, this photograph is an enlargement from the 16 mm motion picture records taken during experiments at the National Institutes of Health. Television techniques were used in conjunction with standard optical equipment to photograph the eye and lower eyelid. Cameramen were from the Special Devices Center of the Office of Naval Research.

tions, including a 20-year research program recently completed at Mt. Wilson and Palomar Observatories.

The red-shift in light from more than 800 distant objects was obtained by Dr. N. U. Mayall of Lick Observatory, Mt. Hamilton, Calif., and Drs. M. L. Humason and Allan R. Sandage of Mt. Wilson and Palomar. Brightness measurements were made by Dr. Edison Pettit, also of Mt. Wilson and Palomar.

The astronomers caution that their results are preliminary. More observations are needed to confirm the slow-down, Dr. Ira S. Bowen, director of Mt. Wilson and Palomar Observatories, told SCIENCE SERVICE.

He pointed out that light from the very far distant galaxies is so faint they can be observed only during a few weeks in any year. More positive results based on these new measurements cannot be expected for at least a year, he said.

The apparent expansion of the universe may not be real. Some now-unknown law of nature might cause light to lose energy as it travels through space, thus making it redder.

Two-Cell Human Embryo

➤ THE SMALLEST and earliest human embryo, consisting of only two cells and aged no more than five days, has joined older, larger and more developed human embryos in the famous collection of the Carnegie Institution's department of embryology in Baltimore, directed by Dr. George W. Corner.

This very young two-celled embryo, with one of 12 cells, another of 58 cells and a fourth of 107 cells, closes the last gap in the collection. It now has human embryos from the earliest stage of development to the end of the embryonic period.

The very early embryos gave no surprises to scientists examining them, because they are much like the embryos of other animals at similar early stages of development. The fact that they are similar is termed "highly significant."

Explore Mayan Homes

➤ NEW KNOWLEDGE of the homes of the ancient Maya people who built elaborate and spectacular temples in what is now Yucatan, Mexico, was obtained by Carnegie scientists in a season's digging.

Family, or household, worship was an important part of the Maya culture, the archaeologists found. Simple homes had a niche or dais that served as an altar for family worship. The more elaborate homes of the wealthy had a separate room that served as family chapel.

Indications were found that ancestor worship was part of the family religion of the ancient Mayas.

Inside the altar of the family chapel of one very imposing residence was found a well-made pottery jar. A tripod bowl was carefully sealed in position as a lid. This carefully sealed jar was two-thirds filled with a very fine ash mixed with small fragments of bone, the first cremation in a sealed jar found at Mayapan.

In addition to the crematory jar, there was an ossuary under the dais-like steps before the altar. This held the "jumbled remains of five persons and a pair of copper tweezers."

Treasures buried with the dead, or "grave furniture," were scarce at Mayapan. Notable was the pair of copper tweezers and some copper rings. Also of interest was a complete pottery doll with articulated arms and legs.

A kitchen had been abandoned with most of its pottery equipment intact. The kitchen apparently served two houses, communicating with both by doorways and also by "pass-through windows" such as are built into the most modern kitchens.

The family that occupied one pretentious house were evidently fond of improving and rebuilding it. The building had been lengthened and broadened, rebuilt and added to, indicating that the home must have been lived in for several generations.

Houses were hastily abandoned and some burned when Mayapan was violently destroyed in the middle of the fifteenth century.

Hopes of the archaeologists that they would find caches of valuables in the fine houses were disappointed. When the people fled, they carried with them everything they could, even apparently small kitchen utensils.

A plundered tomb was found that had been refilled to the brim with ceremonial objects that the people could not carry away. Among them were several small sculptures, fragments from figure censers, heads of deities and pottery vessels. Apparently they preferred to break the household gods rather than have them fall into the hands of people of alien beliefs.

Among those taking part in the discoveries were: Drs. Karl Ruppert, A. L. Smith, Tatiana Proskouriakoff, Charles R. Temple, J. Eric S. Thompson and Donald E. Thompson.

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PSYCHIATRY

Mental Disease Hits More Men Than Women

➤ MENTAL DISEASE serious enough to put a person in a hospital hits more men than women.

In one year, 95,000 males were admitted to mental hospitals for the first time. In the same year, 76,000 females were admitted for the first time.

The figures are for 1951, most recent year for which statistics are available, statisticians for the Metropolitan Life Insurance Company in New York reported.

About half of all patients admitted to a mental hospital for the first time in that year were under 45, with only one-tenth under 25, and less than one percent under 15.

Progress in treatment of mental disorders is shown by a substantial increase in recovery rates, as reflected in the higher proportion of patients released from mental institutions.

In one hospital nearly three-fourths of the patients first admitted in 1946-1950 were released within three years. The corresponding proportion for similar patients first admitted in 1916-25 was little more than half.

These patients suffered from what were diagnosed as functional psychoses.

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ASTRONOMY

Electronic Photography

Development of ideal image converter, applying television principles to astronomical photography, would increase tenfold the light-gathering power of telescopes.

➤ TELEVISION PRINCIPLES applied to telescopes can make a 2,000-inch telescope of the 200-inch giant atop Mt. Palomar in California, the world's largest instrument.

This would let astronomers look three times farther into space than now possible.

It will happen only if the electronic device, called the "image converter," works perfectly. Development of such a device is the goal of astronomers and physicists working at several institutions in the United States and Europe.

Astronomers using any telescope equipped with the ideal image converter would be able to study stars only one-tenth as bright as the faintest they can now see with unaided photography.

Even if the electronic photography method does not work perfectly, gaining only part of the expected increase in sensitivity would be worth the "all-out effort" astronomers are making to develop image converters. (See SNL, Feb. 27, 1954, p. 134.)

One group of scientists, backed by Carnegie Corporation funds, is about ready to test some experimental tubes. Scientists cooperating to develop the tubes are Dr. John S. Hall of the U. S. Naval Observatory, Dr. William A. Baum of Mt. Wilson and Palomar Observatories, Dr. M. A. Tuve, director of Carnegie Institution's Department of Terrestrial Magnetism, and Dr. Ladislaus L. Marton of the National Bureau of Standards.

Cooperating with them in building the necessary parts for the image converter tubes are the Radio Corporation of America and Farnsworth Electronics, Ft. Wayne, Ind.

Dr. W. A. Hiltner of Yerkes Observatory, Williams Bay, Wis., is also reported ready to test an image converter he and Jay Burns, III, of the University of Chicago have constructed. ~~on a telescope~~

Just as a photographic plate gives a picture of a certain area of the sky, the image converter first gives, on a photoelectric surface, an electronic picture of a stellar view.

This photoelectric picture is then transferred by way of a television-like tube to a photographic plate. Stars too faint to be caught on a photographic plate are picked up because the light quanta are used more efficiently.

Key to the device, Dr. Hall said, is a thin film of aluminum foil that transmits electrons but stops atoms and molecules, which would otherwise quickly ruin the photocathode.

Further developments are aimed at producing a practical design for the image converter suitable for widespread routine use. Then if an image tube failed to operate properly, an astronomer could simply remove the bad tube and plug in a new one.

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GENERAL SCIENCE

Scientists Absolved From A-Bomb Blame

➤ SCIENTISTS could not have prevented the development of the atomic bomb.

As human beings, they have as much social consciousness as do businessmen, lawyers or even ministers, in the opinion of Dr. Gwilym E. Owen, professor of physics at Antioch College, Yellow Springs, Ohio, and to accuse them of creating a world-destroying monster is unjust.

In discussing the question of whether the world's scientists could have stopped development of the atomic bomb, Dr. Owen states in *Antioch Notes* (Nov.) that "there never was such a time."

He reports that prior to 1939 there was not enough evidence to indicate atomic energy could be released in quantity for use, but Dr. Owen questions the practicality of stopping work for fear scientists might have found something that could be misused.

After 1940, he points out, unless every scientist in the world agreed to stop work on atomic energy, development could not have been stopped. For scientists in the United States only to have stopped would have been suicide, he explains.

By 1940 it was too late, Dr. Owen states. Scientists here, in Germany, Russia, England and France knew that the release of atomic energy was a possibility. They did not know, however, whether it could be used as an atomic bomb or to run ships and generators.

"At that stage," he says, "a scientist could no more refuse to work on atomic energy problems than a manufacturer could refuse to make materials which would be useful in carrying on the war or a drafted civilian could refuse to carry a gun."

Science is cumulative and international, Dr. Owen concludes, and security measures do little more than prevent one country from knowing what another country is doing. It does not, he indicates in describing Russia's atomic energy work, for example, halt the scientific progress being made in a country that is on a science information blacklist.

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SHOTGUN FOR ROCKETS—This honey-combed pod, mounted on each wing tip of the Northrop Scorpion F-89D all-weather interceptor, is a rocket launcher. The plane carries 104 air-to-air rockets that are fired electronically in shotgun fashion after the Scorpion's pilot has made radar contact with the target. The rockets are 2.75 inches.

MEDICINE

Anti-Arthritis Drugs Help in Leukemia

➤ MASSIVE DOSES of two new anti-arthritis drugs, prednisolone and prednisone, are proving "useful" in three phases of acute leukemia, Dr. Joseph M. Hill of the Wadley Research Institute and Blood Center, Dallas, Tex., reported at an American Geriatrics Society symposium in New York.

The new chemicals are not curing patients, but with two other chemicals, 6-mercaptopurine and azaserine, they have increased the more than one-year survival rate of all acute leukemia patients at the Dallas institution from 13% to 38%.

Rates for remissions, periods when the patient is better or apparently well temporarily, have improved from 41% to 86%, Dr. Hill reported.

The three phases of acute leukemia in which the two new anti-arthritis chemicals are useful are:

1. In the acutely ill where the patients quite evidently did not have time for other drugs to take effect.

2. In those patients in whom remissions appeared unduly delayed or not forthcoming after sufficiently lengthy courses of the other drugs, called antimetabolites.

3. In those cases in the last stages of the illness in whom all other treatments had stopped being effective.

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PUBLIC SAFETY

Limit Uranium Mining

Increasing production of uranium beyond point soon to be reached would mean exceeding rate at which earth's surface can dissipate the radioactive by-products.

➤ WORLD URANIUM PRODUCTION is about to reach the saturation point when all that can be used safely will be produced, in the opinion of Prof. George W. Bain of Amherst College's geology department.

The recent opening of the Pronto Mine in the Blind River District in Ontario, Canada, marks the effective end of uranium hunting, he suggested.

Within a year or two the Blind River area, in conjunction with existing producers, will be furnishing as much uranium annually as can be safely used in the entire world, Prof. Bain said. It has been estimated that the earth's surface can dissipate radioactive by-products from the fission of a maximum of 15,000 tons of uranium annually.

"Unless we discover a more efficient method of fission in using atomic power, 15,000 tons is the maximum that can be safely used," he said. "No greater improved or radically new method is now in sight."

The series of mines in the Blind River District, of which Pronto is the first, will produce enough uranium shortly to reach the safe limit, Prof. Bain estimated. Although the potential production figures are an official Atomic Energy Commission secret, they can be calculated.

The prospectus offering Blind River stock estimates that uranium metal yield from the area will be between two and three pounds of metal to each ton of ore. The size of the ore deposit is known.

It is in an old river bed, gravel averaging for most of its length, 40 feet deep, 10,000 feet wide and 22 miles long. The expected annual yield of the mines that are now being developed in the same area is also known.

Calculating the annual yield, the Blind River area mines, operating at existing planned mill capacity, can supply uranium for the next 400 years or the entire world requirement for 120 years.

Prof. Bain pointed out two factors resulting from this conclusion:

1. The world will have to find a way of policing uranium consumption. Many nations, including Australia and South Africa, which are uranium producers and are short of mechanical power, are very eager to use the power to be derived from uranium. These countries as well as the nations of Western Europe, Soviet Russia, the United States and Canada may try to use as much atomic power as they can.

Excessive fission will endanger human life, scientists feel. Prof. Bain's opinion is that the problem of fission control is one for the United Nations, probably the most important problem the UN has ever faced. Furthermore, the equatorial septum in the earth's atmospheric and oceanic circulation makes Northern and Southern Hemisphere problems quite independent of each other.

2. Economically feasible uranium prospecting is at an end. Prof. Bain, who has intimate first hand knowledge of most of the world's possible uranium sources, believes no one will be able to find a deposit to match the Blind River District.

Eventually, he thinks, no source will be able to compete with Blind River. The Canadian government's price of $12.60 per pound of metal will drop for all uranium deposits not blocked out by March 31 of next year, giving the Blind River area a tremendous financial advantage over potential future competitors.

The Pronto Mine, opened officially this fall, will produce about two tons of uranium metal a day or about 700 tons a year. It may be for the moment the biggest single producer in the world.

Next fall the nearby Algom mine is scheduled to start operating with a production of roughly 3,600 tons of metal a year. Another mine in the area will start production early in 1957.

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OCEANOGRAPHY

Ups and Downs of Fish Populations Under Study

➤ SUDDEN DISAPPEARANCES of once-numerous fish species or equally sudden reappearances have long made commercial fishing almost a hit or miss undertaking. Large fishery industries have been hard hit when basic species become rarities in one or two seasons.

Over-fishing is probably only a part, perhaps a minor part, of the cause.

Dr. O. E. Sette, director of the Ocean Research Laboratory, Stanford, Calif., established by the U.S. Fish and Wildlife Service, is setting out to look for the causes of fluctuating fish populations "on an ocean-wide basis." His laboratory will pay especial attention to the possible effects of changes of climate on fish numbers.

"If we can discover any connections between the presence of fish and the climate of surrounding air and water, we may be able to predict where to find fish," Dr. Sette said.

The Stanford program is part of a wide-scale project by the U.S. Fish and Wildlife Service, with the cooperation of several oceanographic institutions, to place commercial fisheries on a more scientific basis.

It has been said that, compared with the well-developed science of agriculture, the world's fisheries are "stone-age" at present.

The work of the Ocean Research Laboratory will be aided by more than a dozen oceanographic and fishery research vessels already in use by the U.S. and Canadian governments and various universities in the Eastern Pacific. Data on Western Pacific waters will come in from research there by the U. S., France, Australia and Japan.

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STATISTICS

U. S. Health Record

➤ HEALTH CONSCIOUS AMERICANS have rung up an "exceptionally good" health record for the year 1955 and are likely to do the same in 1956.

This is the opinion of Metropolitan Life Insurance Company statisticians in New York, based on health experience of the nation so far this year.

The death rate for the year, 9.2 per 1,000 of population in the United States, will be about equal to that for 1954, which was the lowest on record, the statisticians say. This marks the eighth successive year for which the death rate for the country has been below 10 per 1,000 population.

For the first time the death rate from tuberculosis will have been somewhat less than 10 per 100,000 of the population.

Mortality from influenza and pneumonia continued at a low level in 1955.

In 1955 there were about 29,000 cases of poliomyelitis in the country, compared with about 39,000 for the year before.

Among the communicable diseases of childhood, there was an appreciable reduction in the number of reported cases of measles. For scarlet fever there was little change from the year before, but there was a rise for whooping cough.

The number of reported cases from diphtheria, already at a relatively low level, continued to decline. The combined death rate from these conditions of childhood was under 1 per 100,000 population during the year.

There was little change in the death rate from cancer, which continues to account for about one-sixth of the total mortality, the statisticians noted. On the other hand, the death rate from the heart and kidney diseases showed a small rise, practically all of which occurred in mortality from coronary artery disease. There was practically no change in the death rate from diabetes.

The accident fatality rate during 1955 was practically as favorable as in 1954.

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YAM AS DRUG SOURCE—Tropical yams, such as the one being pruned here by horticulturist William Kennard, are being grown by the U. S. Department of Agriculture's Federal Experiment Station, Mayaguez, Puerto Rico. Further research on the Dioscorea, *a source of anti-arthritic cortisone and other drugs, may lead to a variety that can be cultivated in the tropical country.*

AERONAUTICS

Short-Lived Airplanes

➤ AIRCRAFT of the future may have to be designed to last for only a few hours, and then be scrapped, a research aeronautical engineer reports in *Ordnance* (Nov.-Dec.).

Outlining the problems created by the "thermal barrier," Dr. George Gerard, assistant director of research at New York University's college of engineering, pointed out that it "may no longer be possible to design a structure for decades of useful life, hours may be a more realistic measure of endurance."

Dr. Gerard foresees two problems that must be mastered before man's missiles can break through the earth's atmosphere at supersonic speed: heat and the softening of materials under increased stress, known as creep.

At five times the speed of sound at sea level (approximately 3,750 miles per hour), temperatures are sufficient to melt the best aluminum alloys known, he points out.

This, coupled with a weight penalty, due to weakening of materials brought on by aerodynamic heating, may limit sustained flight to the region below 800 degrees Fahrenheit, or three and one-half times the speed of sound. (Speed of sound is approximately 750 miles per hour at sea level).

Dr. Gerard explains there are several distinct possibilities for conquering the problems of sustained "thermal" flight. Chiefly they offer means of "skirting" the thermal barrier.

One solution in the foreseeable future will be the incorporation of nuclear power plants in aircraft to solve the fuel problem. This, he reports, may give scientists and engineers a steady-state temperature.

The research engineer listed several different views now held by scientists for beating the heat problem, such as using various types of systems to cool the aircraft; flying faster than twice the speed of sound for only a short time; using insulation to delay heating effects, or designing craft to carry loads at elevated temperatures.

Breaking through the thermal barrier, Dr. Gerard concludes, will not be a quick or easy accomplishment. The new design philosophy, which Dr. Gerard foresees as necessary for supersonic sustained flight, must account for the creep of metals at high temperatures.

Science News Letter, December 17, 1955

New rich banks of ocean *shrimp* have been discovered off Jamaica.

The Norwegian Geologic Survey has discovered a series of fairly rich *uranium* deposits some 60 miles west of Oslo.

PALEONTOLOGY

Find Fossil Remains of Kangaroo-Like Animal

➤ KUKUKUKU LAND, a wild part of the central highlands of New Guinea, has yielded some ancient fossilized bones of kangaroo-like animals that may shed light on how the continents were formed millions of years ago.

The ancestral kangaroo-like animals were about five feet tall and weighed nearly 200 pounds. Three apparently new species of the pouched animals, or marsupials, are among the fossils brought back by G. D. Woodard, a graduate student in paleontology at the University of California.

Mr. Woodard, working among gold miners in desolate and dangerous territory, dug the fossils from the gold-laden sands of a dry lake bed surrounded by high mountains and forests of "extinct" trees that border Kukukuku land.

The ancestral kangaroos roamed the New Guinea highlands about 10,000,000 years ago. The fossils are the oldest ever found in that area, and the oldest history of marsupials in the South Pacific area. Scientists believe pouched animals first came to the South Pacific about 80,000,000 years ago.

Mr. Woodard's finding is a step toward solving the mystery of how the ancestors of modern-day kangaroos and opossums arrived at the islands of the South Pacific in the first place.

Currently, paleontologists think marsupials first appeared on the earth about 125,000,000 years ago, in North America. Then the animals spread to other parts of the world, but there are too many missing links to prove how the spread was accomplished.

Knowledge of how the marsupials migrated would provide new information on the way continents and other large land masses formed.

Science News Letter, December 17, 1955

MEDICINE

Urges International Transfusion Equipment

➤ BLOOD TRANSFUSION equipment should be standardized promptly so as to permit international interchange.

This suggestion for internationalizing blood transfusions comes from Dr. Ross T. McIntire, former surgeon general of the Navy and now executive director of the International College of Surgeons in Chicago.

Blood and its derivatives will be the surgeon's greatest aids in an atomic or guided missile war, he said.

If the equipment used for transfusions is made the same in all parts of the world, replacements for all or parts of the equipment could be rushed to any bombed region needing it for giving transfusions to victims of the bombing.

Science News Letter, December 17, 1955

ORNITHOLOGY

Airmen Help Birds Over Airport Hazards

➤ AS MANY as 25,000 southward-migrating birds have perished in one night at an airfield as they flew into the bright, vertical beam of light used to determine the visibility ceiling.

The ceilometer beam presumably blinds the birds or blunts their sense of direction, so they crash into the ground at high speeds and are killed.

For some unknown reason, such bird losses occur only in the fall on southward flights, the U. S. Fish and Wildlife Service reports.

Next fall the birds may get a break, since filters have been developed for the ceilometers that retain visible light, beaming only ultraviolet light for ceiling measurement.

Two filters have already been installed on Weather Bureau ceilometers in Knoxville and Nashville, Tenn., with good results. The U. S. Air Force is expected to use the filters next fall.

The Weather Bureau has instructed its personnel at ceilometer stations to turn off unfiltered beams when birds are in flight if it is possible to do so without endangering air travel.

Science News Letter, December 17, 1955

PUBLIC SAFETY

Jump Behind Wall to Escape H-Bomb Burn

➤ JUMPING behind a wall will help protect you from burns from a fusion bomb, although it will not in case of an atomic bomb.

The reason is that fusion bombs give off radiant energy that will produce burns for up to about 15 seconds. Atomic bombs, or fission bombs, produce radiant energy burns chiefly within the first two-tenths of a second and no burn at all after the first five-tenths of a second, so there is not enough time to jump behind a shielding structure in the case of these bombs.

These differences were pointed out by Capt. Donald W. Miller of the Navy Medical Corps, chief of surgery at the U. S. Naval Hospital, Newport, R. I., at the meeting in Washington of the Association of Military Surgeons of the United States.

In treating badly burned patients, treatment of the burn surface is of secondary importance, Capt. Miller declared.

First thing that must be done, he stressed, is to give blood and fluid to combat shock. There is, he pointed out, a rapid shift in distribution of body fluid and salts when a considerable area of the body is burned.

Fluid quickly collects in the tissues under the burn and there is considerable loss of fluid that exudes from the burn surface. This fluid comes from other body tissues and from the blood. The blood gets more concentrated and there is less of it circulating through the body.

Fluid with salts in the same proportion as in normal body fluids must be given to replace that being lost.

Capt. Miller advises exposure treatment, that is leaving the burns uncovered after gentle cleansing, in preference to compression bandages. The exposure treatment saves time, expense, reduces infection and consequent need for skin grafting, and the patients are more comfortable after the first 24 hours.

Antibiotics in large doses and a diet high in calories, protein and vitamins are needed by burn patients. In the early stages, they must be watched for breathing difficulty and tubes put into the throat if necessary. Suction tubes into the stomach may also be needed to overcome the stomach dilatation when there are burns over 30% to 50% of the body area.

With this type of treatment, 93% of the burn casualties from the U.S.S. Bennington disaster survived 25% to 50% second and third degree burns and 79% survived 50% to 75% second and third degree burns.

Science News Letter, December 17, 1955

NUTRITION

Bakers May Soon Make Frozen Bread

➤ THE AMERICAN HOUSEWIFE may have to go to the frozen counter for a loaf of bread in the near future.

The U. S. Department of Agriculture reports in *Agricultural Research* (Dec.) that bakers are looking hopefully towards the commercial freezing of bread, a practice that promises to reduce staling, loss of unsold loaves and costly night baking.

They also hope that frozen bread sales might help to reverse the downward trend in wheat consumption. In 1900, the per capita consumption of flour was 225 pounds, while in 1954 it was only 124 pounds.

USDA experts have been probing into the technical side of bread freezing, to find out what it does and does not do to bread. They learned that the maximum storage temperature for top quality bread is 10 degrees Fahrenheit for periods of about a week, while zero degrees Fahrenheit is needed for extended storage. (See SNL, April 18, 1953, p. 243.)

Bread is best when frozen as rapidly as possible as soon as it leaves the oven, the USDA said. Quick defrosting is also preferable, although freezing time affects crumb firmness more than defrosting time does.

Frozen bread stored for more than a day should be wrapped in sturdy moisture-vapor-resistant material that is flexible at low temperature, and it should always be stored separate from strongly flavored foods.

Moisture distribution in frozen bread is essentially the same as in freshly baked bread, the USDA found, and will remain that way for four to seven weeks at zero degrees Fahrenheit.

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IN SCIEN

BOTANY

Chemical Yields Grapes Three Times Normal Size

➤ GRAPES two to three times their normal size and resistant to disease attack have been produced on a laboratory scale and may soon becme commercially important, the U. S. Department of Agriculture reveals in *Agricultural Research* (Dec.).

The chief tool used to create the larger grapes was a chemical colchicine, which doubles the normal number of a plant's hereditary units, or chromosomes.

With colchicine treatment, USDA scientists were able to get the small but disease resistant Loretto grape to produce berries up to three times as large and bunches two and a half times as large as the normal plant.

The number of chromosomes in the Loretto grape was changed from 38 to 76 by action of the colchicine.

Besides the Loretto grape, which is a variety of eastern bunch grape, two strains of muscadine grapes were developed with colchichine treatment that bear berries almost twice normal size. Their chromosome number was changed from 40 to 80.

The new Loretto grape offers a good chance for commercial development of a commercial bunch-type grape industry in the Deep South, where disease usually eliminates this kind of grape in about three years.

The Loretto grape grows well there already and is disease resistant, but its normal small size has made it unpopular.

The enlarged Loretto, though, should offer the South a bunch grape comparable to the northern varieties like the Concord, the USDA states.

Science News Letter, December 17, 1955

BACTERIOLOGY

"Instant" Media for Bacteria Developed

➤ "INSTANT" MEDIA for bacteria, somewhat related to "instant" cake mixes in the kitchen, have been developed by Dr. John Pickett, University of California at Los Angeles bacteriologist.

The instant media are in tablet form and are used in certain chemical tests for identifying various types of bacteria.

Bacteria frequently have subtle distinctions not apparent under the microscope, Dr. Pickett points out. The only way differences may be discerned in many cases is by chemical changes that bacteria bring about when placed in precisely defined solutions. These solutions are known as media or substrates.

Science News Letter, December 17, 1955

E FIELDS

MEDICINE

Link Smoking With Lung Disease Besides Cancer

➤ CIGARETTE SMOKING was linked with a non-cancerous but relatively common lung disease, emphysema, in a report by Drs. Francis C. Lowell, William Franklin, Alan L. Michelson and Irving W. Schiller of Massachusetts Memorial Hospitals, Boston, at an American Medical Association meeting in Boston.

Emphysema was described as an unnatural swelling and rupture of the tiny air sacs in the lungs, usually due to excessive effort in breathing out. It causes a great deal of disability and may even be fatal.

The four doctors reported a study of more than 40 patients with chronic obstructive emphysema of the lungs. None had shown unusual lung symptoms before the age of 40. None had other diseases which could account for their symptoms. All had been heavy cigarette smokers.

"Interesting points for speculation," the doctors said, were the 10 cases of peptic ulcer and two of lung cancer found among the group.

Science News Letter, December 17, 1955

PSYCHOLOGY

Calls Touch of Neurosis Possible Business Asset

➤ A "TOUCH OF NEUROSIS" may be an asset to the business executive today.

Telling him to slow down may rob him of the drive on which his past, present and future security depends, Dr. Christopher Leggo of Menlo Park, Calif., told the Industrial Hygiene Foundation Meeting at the Mellon Institute, Pittsburgh.

In selecting executives for the younger generation to copy, Dr. Leggo advises choosing the "open happy Horatio Alger type of hero rather than the inward-driven compulsive for whom success demands such a price."

The tense, overwrought brain of executive or worker can, he said, be compared to an automobile battery that is overcharged. Dr. Leggo described five ways of draining the overcharge:

1. The disturbed person may find the acceptable language of his group for telling his superior to "go jump in the lake." The average person may find to his surprise that he can develop skill in this technique.

"It is the healthiest method of releasing aggression and corresponds to draining off the battery through the headlights," Dr. Leggo said.

2. Spending energy in a useful activity, such as an active hobby or activity in community affairs, may be compared to a useful short-circuit, such as a work lamp or electric shaver plugged into the circuit of an automobile.

3. Spending energy in aggressive, destructive behavior, such as going on alcoholic binges or gambling excessively, can be compared to the destructive short circuit that burns up the generator in the car.

4. "Getting it off one's chest" by talking about the emotional upset to anyone who will listen is comparable to bringing the charge in the battery to normal by short-circuiting the battery poles with a pair of pliers, with a resulting harmless spark in the air.

5. The automobile battery, if not drained by any of the methods mentioned, will suffer internal corrosion and damage from the overcharge, Dr. Leggo said. This he compared to the highly charged, tense person who does not release his emotions by any of the ways suggested, and who then is likely to get a stomach ulcer, high blood pressure or some other physical ailment.

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MEDICINE

Quieting Drug Aids Accident Treatment

➤ A QUIETING DRUG found useful in treating mental patients can help in treating painful injuries of accident victims.

The injuries can be treated in a doctor's office without need of sending the patient to a hospital, Dr. Charles E. Friedgood of the State University of New York College of Medicine at Brooklyn, N. Y., reported at the American Medical Association meeting in Boston.

The drug, chlorpromazine, creates "a detached, indifferent attitude toward pain," he reported, and reduces the tension and anxiety accident victims feel. Patients are better able to cooperate with the doctor. Nausea and vomiting are controlled.

It is particularly useful in working with panicky children who are difficult to manage, let alone treat.

In addition to these advantages, Dr. Friedgood found the drug controlled pain during emergency surgery.

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AERONAUTICS

Gas Turbines Power 40-Passenger 'Copter

See Front Cover

➤ THE WORLD'S largest turbine-powered transport helicopter, built by Piasecki Helicopter Corporation, Morton, Pa., can transport 40 people at a top speed of about 150 miles per hour.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the helicopter, with gas turbines harnessed to turn the rotors rather than to provide thrust.

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TECHNOLOGY

Fluomeric Lamp Consists Of Three Light Sources

➤ A LIGHT SOURCE combining the best features of incandescent, fluorescent and mercury vapor lamps has been developed by Duro-Test Corporation, North Bergen, N. J.

The new lamp it known as fluomeric, and comes in every size, shape, wattage and voltage. Its three light sources are combined in one screw-in bulb that fits any ordinary electric socket.

Described as being capable of burning for 12,000 hours, the lamp was invented by Michael Macksound.

Fluomeric lamps emit light in three ways, from incandescent filament, by quartz mercury vapor discharge and from fluorescent phosphors, yielding 25 lumens per watt. Color can be varied by changing the phosphor composition.

When a switch connected to a fluomeric lamp is flicked, the incandescent tungsten filament immediately emits its peak light, while the mercury vapor arc discharge tube starts building up to its greatest light intensity. The fluorescent phosphors are activated by ultraviolet rays from the arc tube.

The tungsten filaments are so connected in the lamp's circuit as to control the wattage and lamp functions, thus eliminating the need for external transformers usually required with vapor tube lights.

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GEOPHYSICS

U. S. Plans to Land Men at South Pole

➤ THE UNITED STATES Antarctic Expedition hopes to land men at the South Pole this Antarctic summer by plane or parachute. Comdr. Robin M. Hartmann, a member of the advance party of the American expedition, announced the plans in Wellington, New Zealand.

He said those landed would check the snow for possible use as a landing field for transport planes. Light planes taken south next March will reconnoiter the Pole first and, if possible, land to determine the snow conditions.

If the terrain appears too dangerous for planes, Comdr. Hartmann said, parachutists will be dropped to prepare a field for light aircraft. If for some unforseeable reason the men cannot be picked up again, he explained, they will be supplied from the air for their march to the Beardmore Glacier advance base.

"Dog teams will be dropped if necessary to get them out," Comdr. Hartmann stated.

He also reported that supply planes would lay depots by parachute if needed. When the South Pole base is established, 15 men will winter there in a specially prefabricated camp throughout the International Geophysical Year of 1957-58.

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ANTHROPOLOGY

Toys Forecast Future

The toys that will enchant the children on Christmas morning may date back to the childhood of thousands of years ago or may look to the future beyond the view of scientists.

By MARJORIE VAN DE WATER

➤ THE TOYS that are the fruit hanging on that wonderful tree, the Christmas tree, mirror life at it goes on around the children but they also reflect America's past and its future as well.

Little girls this Christmas will play with rag dolls not too different from those that charmed mother and grandma when they were little girls. There will also be dolls that can be given the latest style of permanent wave to hair that is the latest product of the chemical laboratory.

Little boys these days do not see their fathers go downtown dressed in a coonskin cap. Yet they will be delighted to find such a cap on Chirstmas morning so that they can relive America's past as the juvenile hero Davy Crockett.

Toymaker Sometimes Leads

Often, however, the toy-maker is far ahead of the most modern scientist. For some time now, little boys have been playing with toy "flying saucers" although, apart from the world of make-believe, flying saucers exist only on the designer's drawing board. The young space cadet's "disintegrator gun" today is an invention of the comic strip and science fiction. But who can foretell any better the fantastic weapons the future may bring?

It is not new for toys to employ scientific principles having no practical application in the adult workaday world. Some of the great developments of man's genius first were known in the form of toys.

The wheel is one such invention. The earliest known wheel in America was not used for transportation. Neither was it used to put the power of flowing water or the wind to man's use.

Long before the people of the New World ever saw a cart on wheels, a pottery wheel or a water wheel, their children were playing with little toy animals on wheels. Archaeologists have dug up such an appealing wheeled animal in what is now northern Vera Cruz.

Today's youngsters will get the same delight out of a modern plastic pull-toy that the ancient Mexican Indian baby did from his animal on wheels. They do not even look very different.

Under the tree this Christmas, there is almost sure to be a doll baby for the little girl of the family. Many years ago a prehistoric Indian mother laid in the grave of her little daughter a little clay doll in the image of an Indian baby strapped to a cradle board. An archaeologist found it buried in Tennessee just where the weeping mother had placed it—where the baby hands could touch the doll during her eternal sleep. Other strikingly similar baby Indian dolls have been unearthed in Mexico.

Children of a past generation talked on a telephone made of a waxed string stretched between two tin cans long before their parents had a real telephone in the house. Today's young adventurer, with a loud "Whoosh-sh-sh!" takes off in his space ship or rocket for the moon and does not worry because no scientist has yet found it possible.

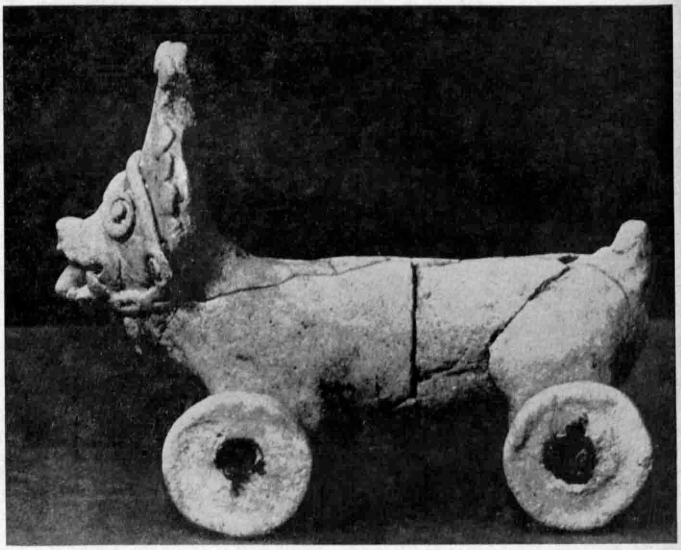
Despite the forward-looking tendencies of the space ship set, they are never willing to let go of the past. And it does not seem a bit incongruous to the young space ship commander that he should set out on his adventures armed with bow and arrow or even a sling shot.

When he tires of outer space, he will enjoy playing with dominoes, just as did his great-great-grandparents as much as seven generations ago. Or, if he is older, he may enjoy the game of checkers, a pastime among the Egyptians at least as long ago as 1600 B.C. Older boys will be delighted to find a game of chess under the tree, although the origin of chess is lost in antiquity long before the first Christmas.

Little sister, when she tires of her toy television set or an iron that "really heats up" or the toy electric stove that can burn little fingers, will reach for her set of jacks or a bag of marbles, ancient toys both.

She may find a sewing set under the tree complete with the most modern nylon sewing thread. But an archaeologist exploring the living site of some of the earliest of Americans in Alaska found a tiny thimble that a fond father carved out of ivory for his little daughter to sew with long before the birth of the Christ Child. That little Eskimo girl had her sewing kit.

As with the children's Christmas toys, so the adult symbols of Christmas are a mingling of the very old and the very new. The Christmas tree itself can be traced back until its history is lost. The pagans, as much as 5,000 years before the birth of



FIRST WHEELS—Before the wheel, one of man's greatest inventions, was ever put to adult use in America, the toy-maker used it on little children's toys, animals on wheels. That the little wheeled animal was a toy is confirmed by the fact that archaeologists found it in the ancient grave of a child.

Christ, decorated evergreen trees, hung boughs of holly and mistletoe, and burned logs to celebrate the first day of winter, which they called Yuletide.

If you have a "Star of Bethlehem" placed on the highest tip of your tree, you will be following a long tradition as you will if you have a manger scene with Christ Child, wise men, lambs, cattle, Virgin and Saint Joseph beneath the tree. But chances are you will have tiny electric lights instead of candles on the boughs and ornaments of unbreakable plastic instead of fragile glass.

In selecting toys for the youngsters, remember that they love the old as well as the new. And simple toys that give free play to active imaginations are sometimes much more fun than modern realistic inventions.

The elaborate electric train with intricate switches, bridges, tunnels and freight yards are sometimes selected by a fond father because his own heart is delighted with it. But the boy, if he is young, might get more pleasure from a "choo-choo" that he can run by winding it up, or even a simple wooden train or block that he can push along and "play like" it is a train. It does not have to have an electric whistle, the boy can provide the proper sound effects.

Little children get endless delight from fitting things together, putting the tops on boxes, pushing clothes pins into a jar and then dumping them out again.

Noisemakers are always fun, but a couple of saucepan lids from the kitchen enchant a baby as well as any cymbals.

The three-year-old, it has been pointed out, is beginning to be interested in other children and social play is important. At this age he loves to build with blocks or sand and will work with another child in building a fort or a castle.

At this age, too, he loves simple stories about other children and common domestic animals or pets.

The four-year-old enjoys dramatic play. At this age the child will love a truck, fire engine, filling station, toy store or other "prop" with which he can act out any situation that appeals to his fancy. Little girls will delight in dress-up clothes and costumes, dolls and doll clothes, doll houses and furniture, and equipment with which she can "keep house."

Older children may want gifts with which they can imitate adult activity — baseball uniforms, bats and balls, toy lawnmowers, vacuum cleaners and brooms.

One authority urges a well balanced diet of toys and play equipment to help the child to all round development. The diet has four main courses:

1. Active physical play. Heavy push and pull toys such as wagons, tractors and the old-fashioned animal on wheels. Then, too, he needs balls, and sports equipment, swings, climbing bars, etc.

2. Manipulative, constructive, creative play. Blocks, construction toys, sewing and painting equipment, and hobby kits are typical aids to this.

3. Initiative, imaginative, dramatic play. Anything that will set the stage for the constant make-believe of a child's mind will help in this department.

4. Social play. Games in which several children can take part as dart games, jump ropes and croquet, and such quiet games as checkers, parchesi and dominoes will help the child to learn to play with others.

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REFLECTS THE PAST. The gay little modern plastic animal on wheels that may be found on Christmas morning by some good boy or girl bears a striking resemblance to the little wheeled animal that was the plaything of an early American Indian child, shown in the photograph on the opposite page.

FORESTRY

Valuable New Acid Found in Pine Rosin

➤ SOUTHERN PINES have yielded another valuable commercial chemical, with the isolation of palustric acid from pine gum rosin by a team of chemists at the U. S. Department of Agriculture's Naval Stores Station, Olustee, Fla.

Information concerning this new acid has already proved valuable in preparation of paper sizing, the USDA reports in *Agricultural Research* (Dec.). Chemists believe they have discovered at least three other new rosin acids, but these have not been identified yet.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ASTM STANDARDS ON PAPER AND PAPER PRODUCTS AND SHIPPING CONTAINERS (WITH RELATED INFORMATION): Methods of Testing, Specifications, Definitions—ASTM Committee D-6 and ASTM Committee D-10—*American Society for Testing Materials,* 389 p.. illus., paper, $3.75.

ALL ABOUT THE ATOM—Ira M. Freeman—*Random House,* 146 p., illus., $1.95. Explaining for young people the atom and atomic energy.

ANALYTIC GEOMETRY AND CALCULUS—Thurman S. Peterson—*Harper,* 456 p., $5.50. An introductory course for those who have already had some algebra and trigonometry.

ARCHAEOLOGICAL RECONNAISSANCE IN CENTRAL GUATEMALA—A. Ledyard Smith—*Carnegie Institution of Washington,* 87 p., 140 plates, paper, $3.85, cloth $4.35. Reporting an investigation of both valley and hilltop sites dating from Late pre-Classic times up to the Spanish conquest, a period of some 1,300 years.

BIBLIOGRAPHY AND INDEX OF GEOLOGY EXCLUSIVE OF NORTH AMERICA—Volume 19—Marie Siegrist, Mary C. Grier and others—*Geological Society of America,* 689 p., $7.50. Includes references to books, monographs and papers published during 1954 and material published earlier but not cited in previous volumes.

CRYSTAL OSCILLATORS — Alexander Schure, Ed. — *Rider,* 64 p., illus., paper, $1.25. Comprehensive treatment of a topic seldom given extended treatment in textbooks.

DISTRIBUTION AND ECOLOGY OF THE MARINE INVERTEBRATES OF POINT BARROW, ALASKA — G. E. MacGinitie — *Smithsonian,* Miscellaneous Collections, Volume 128, Number 9, 201 p., illus., paper, $2.25. Work reported here was carried out through the facilities of the Arctic Research Laboratory, maintained by the Office of Naval Research, under contract with the Institute of Cooperative Research.

THE EUPHAUSIACEA (CRUSTACEA) OF THE NORTH PACIFIC—Brian P. Boden, Martin W. Johnson and Edward Brinton—*University of California Press,* 113 p., illus., paper, $1.50. Among the sea creatures that feed on this group of plankton are the herring, sardine and the huge whalebone whale.

FIBROUS PROTEINS AND THEIR BIOLOGICAL SIGNIFICANCE — R. Brown and others — *Academic,* Symposia of the Society for Experimental Biology, Number IX, 371 p., illus., $8.00. Papers read at a symposium held at Leeds in 1954.

THE FIRST BOOK OF SEA SHELLS — Betty Cavanna — *Franklin Watts,* 39 p., illus., $1.95. To supply the child who likes to collect sea shells with some information about them.

THE FLOOD AND NOAH'S ARK—Andre Parrot, translated from the French by Edwin Hudson—*Philosophical Library,* Studies in Biblical Archaeology No. 1, 76 p., illus., $2.75. Showing how archaeological studies help us to understand the Bible.

MARRIAGE, AUTHORITY, AND FINAL CAUSES: A Study of Unilateral Cross-Cousin Marriage—George C. Homans and David M. Schneider—*Free Press,* 64 p., $2.00. A study of customs, taboos and their causes in various primitive societies.

METALLURGY — Alvin S. Cohan — *Bellman,* Vocational and Professional Monographs, 20 p., paper, $1.00. Useful to those selecting a future vocation.

THE MOON: A Complete Description of the Surface of the Moon, Containing the 300-Inch Wilkins Lunar Map—H. Percy Wilkins and Patrick Moore — *Macmillian,* 388 p., illus., $12.00. Absence of atmosphere on the moon makes surface details visible in vivid distinctness and makes the moon a fascinating subject for study.

NEW MEDICINES FOR THE MIND: Their Meaning and Promise—Gilbert Cant—*Public Affairs Committee,* Public Affairs Pamphlet No. 228, 26 p., illus., paper, 25 cents. The tranquilizing drugs now offer new hope for the mentally ill.

SOIL AND SOIL-AGGREGATE STABILIZATION: A Symposium—Hans F. Winterkorn, Chairman—*Highway Research Board,* Bulletin 108, 175 p., illus., paper, $3.00. Papers describing our present knowledge of soil stabilization both by control of grain size and characteristics of the soil itself, and by adding organic or inorganic compounds to keep it stable.

SOLID STATE PHYSICS: Volume 1, Advances in Research and Applications—Frederick Seitz and David Turnbull, Eds.—*Academic,* 469 p., illus., $10.00. Because physicists in this field are specializing in ever narrower interests, this series makes available in one place recent knowledge in the whole field.

A SOLOMON ISLAND SOCIETY: Kinship and Leadership Among the Siuai of Bougainville—Douglas L. Oliver—*Harvard University Press,* 534 p., illus., $10.00. An anthropological study of a people, once fierce and relentless war leaders, and now almost wiped out by World War II.

SPONTANEOUS IGNITION OF LIQUID FUELS—B. P. Mullins — For the *Advisory Group for Aeronautical Research and Development, NATO, Butterworths (Interscience),* 117 p., illus., $2.75. In addition to general theoretical considerations, spontaneous ignition temperatures are given for 433 substances arranged in alphabetical order.

STRATIGRAPHIC GEOLOGY—Maurice Gignoux, translated from the 4th French ed. by Gwendolyn G. Woodford—*Freeman,* 682 p., illus., $9.50. In the translation of this textbook, geographical names are anglicized and other foreign terms are retained where there is no English equivalent.

STRENGTHENING MANAGEMENT FOR THE NEW TECHNOLOGY: Organization, Automation, Management Development — Charles B. Thornton and others — *American Management Association,* General Management Series Number 178, 64 p., illus., paper, $1.75. Discussing three phases of the new technology.

TEACHING SALARIES THEN AND NOW: A 50-Year Comparison With Other Occupations and Industries — Beardsley Ruml and Sidney G. Tickton—*Fund for the Advancement of Education,* Bulletin No. 1, 93 p., paper, free upon request direct to publisher, 655 Madison Ave., New York 21, N. Y. The teaching profession, the report states, has suffered on a comparative basis over the years, particularly in its top salaries.

THE TOWER OF BABEL—Andre Parrot, translated from the French by Edwin Hudson — *Philosophical Library,* Studies in Biblical Archaeology No. 2, 75 p., illus., $2.75. Comparing the archaeological evidence with that from the Bible and other sources.

UNGRADED AGGREGATES IN BITUMINOUS MIXES —Ladis H. Csanyi and Hon-Pong Fung—*Highway Research Board,* Bulletin 109, 49 p., illus., paper, 90 cents. Of interest especially to highway engineers.

VECTOR ANALYSIS—Homer E. Newell, Jr.—*McGraw-Hill,* 216 p., $5.50. Intended to develop the algebra and calculus of vectors in the way in which the physicist and engineer will want to use them.

Science News Letter, December 17, 1955

TECHNOLOGY

Radio-Like Thermostat Broadcasts Heat Needs

➤ WIRELESS THERMOSTAT that automatically controls a heating system by radio signals has operated experimentally in Minneapolis.

The radio-like device was described by John E. Haines, vice-president of Minneapolis Honeywell Regulator Company, as the "control of the future, designed for homes in which electronics would perform duties ranging from opening and closing garage doors to cooking complete meals."

The revolutionary electronic system includes a conventional heating thermostat into which is built a tiny loop antenna and a crystal-controlled radio transmitter. The thermostat is set at the desired temperature in routine fashion.

If the temeperature drops below the setting, the thermostat automatically ."broadcasts" a signal to a small radio receiver. The receiver converts the sound impulse into energy and operates a valve on hot water and steam radiators, or it opens and closes dampers.

The wireless thermostat is completely portable and the home owner or apartment tenant could place it at his elbow and adjust temperatures according to the weather reports heard over the radio or seen on television.

Mr. Haines reported that the company did not have any immediate plans to produce this new control system. One of the practical problems still to be solved is the lack of long-lived batteries to provide power for the thermostat.

Science News Letter, December 17, 1955

ENTOMOLOGY

Hibernating Boll Weevils Threaten 1956 Trouble

➤ U.S. COTTON FARMERS may face a major battle with insect pests next year, a survey of boll weevils wintering over in two important cotton states indicates.

An average of 13,443 hibernating weevils per acre was found in 200 samples taken in Madison Parish, La., the U.S. Department of Agriculture reports, more than five times the average number recorded during the last 19 years.

In eight other parishes in the USDA survey, an average of 3,742 live weevils per acre was discovered. Boll weevils averaged almost twice as many this year as in the same areas last winter.

Hibernating weevils are present in record numbers in South Carolina, the USDA survey reveals. Samples taken in Florence County showed an average of 11,398 per acre, with a high of 35,332 per acre on one farm. This is almost five times as many as last year.

Six other counties in the survey gave weevil samples averaging 8,260 per acre, compared with only 1,499 per acre in 1954.

Next spring, the USDA will make a recheck of the survey areas to determine how well the weevils survive the rigors of winter.

Many or most may succumb to the cold, but a mild winter may leave them relatively unharmed. If that happens, then cotton farmers in the areas can look out for a real insect invasion.

Although the pink bollworm evidently did not extend its range beyond the quarantine area this year, checks on their numbers in gin trash revealed a build-up in several localities already infested. In 31 eastern Oklahoma counties, 27 showed increases in the cotton-destroying pink bollworm over 1954.

Checks in El Paso County, Texas, revealed 188 pink bollworms per sample, compared with 11.5 for 1954, the USDA reported.

Science News Letter, December 17, 1955

NUTRITION

New Storage Method Means Richer Butter

➤ A RICHER BUTTER that is easier to spread is the by-product of a new method for storing butter, developed by Dutch buttermakers.

To please customers who were complaining about cold-storage butter, Dutch dairies experimented with storing frozen cream, rather than the butter. When a sale is made, the frozen cream is thawed and churned into butter.

The butter not only tastes like fresh butter, but has a higher vitamin A content and is easier to spread, the Dutch report.

The U. S. Department of Agriculture states that American buttermakers are interested in the Dutch butter storage process.

Science News Letter, December 17, 1955

STATISTICS

American Wives Young, Have Children, Work

➤ THE AMERICAN WIFE is relatively young. She is younger than her husband. She lives with her husband in a household of their own. She has young children. She worked before the first baby came and she goes back to work after the children grow up.

This is the portrait of the American wife drawn by statisticians of the Metropolitan Life Insurance Company, New York.

For those who like figures: almost two-fifths of American wives are under age 35 and another one-fourth are in the age group 35-44. There are also 2,700,000 married women at ages 65 and over, nine-tenths of them having been married a quarter century or more.

Only about six out of every 100 American wives live apart from their husbands. In most of these cases the reason is not marital discord. Many husbands are away from home in civilian employment and about 446,000 are in the Armed Forces.

"The married population has risen to a record high, the birth rate is at the highest level in a generation, and more wives than ever before are actively participating in the economic life of the country," the statisticians report.

Married women in the population numbered almost 40,000,000 in 1954 and by 1960 there may be 42,500,000 American wives.

Science News Letter, December 17, 1955

BOTANY

NATURE RAMBLINGS

by Horace Loftin

Christmas Trees

➤ MANY TRADITIONS of our European-American Christmas have their roots deep in the pre-Christmas past of north Europe. The use of trees in this festival can be traced in shadowy outline to a time when Thor and Woden were the gods worshipped by the northern barbarians.

Just when and where trees were first used in Christmas celebrations is not known, but trees were a vital part of nearly all the pagan Northland's celebrations.

The Maypole, vital in the welcoming of spring, was originally a tree and was decorated much like the Christmas tree. Trees were always found in the rude northman's hut at New Year's, to drive away evil and bring good luck.

The early Church frowned on the pagan introduction of trees into the Christmas celebration, but the joyful feeling of the common people at this greatest anniversary of their new religion prevailed. As late as 1740, however, a German pastor described the Christmas tree as a non-Christian innovation.

Tradition says that Christmas trees were first used in America by German soldiers hired by England to fight against the rebellious colonists in the Revolutionary War.

In modern-day America, well over 30,000,000 Christmas trees are grown commercially each year, not to mention the thousands taken from the woods by individuals. Spruces, firs, Douglas fir, pines, red cedars and arbor vitae are the favorite American Christmas trees.

Old Saint Nick has a touch of the pagan in his family tree, too. The North god, Woden or Odin, dressed in flapping hat and a fluttering mantle, and traveling constantly on a white horse to bestow gifts and punishments where they are called for, is seen reflected in the European idea of St. Nicholas.

For on the continent, St. Nick wears a flapping hat, a fluttering mantle, and is mounted on his faithful white horse, just as the ancient Woden.

Science News Letter, December 17, 1955

ENTOMOLOGY

Increase Insecticide's Kills

➤ FARM INSECT PESTS may be dealt a staggering blow with the recent discovery of the structure of a chemical that increases pyrethrum's insect-killing power 31 times.

Dr. Morton Beroza, research chemist with the U. S. Department of Agriculture, has worked out the chemical structure of sesamolin, an oil from sesame seed that acts as a powerful booster to the insecticide, pyrethrum, the USDA has announced.

Although increasing the insecticide's effectiveness as a killer, sesamolin does not affect pyrethrum's low toxicity to humans and warm-blooded animals.

At present, sesamolin is not produced commercially.

Dr. Beroza's discovery lays the groundwork for developing a satisfactory commercial process to extract the booster chemical from sesame seed and for possible development of synthetic sesamolin-type chemicals, the USDA said.

New strains of the sesame plant with seeds more suitable for mechanical harvesting than present types have been developed and are being cultivated. Some 12,000 to 15,000 acres were planted this year, mostly in Texas and other southern states, and the USDA expects increases.

Pyrethrum insecticides contain insect-killing compounds called pyrethrins, obtained from the dried flowers of the pyrethrum plant. Most pyrethrum is imported from East Africa.

A different kind of commercial chemical booster is already in use with pyrethrum, chemicals that contain a methylenedioxyphenyl molecular grouping in their structure. These boosters, or synergists, are incorporated in some 50,000,000 pounds of pyrethrin-containing insecticides sold in the U. S. each year.

Some of these commercial boosters, when mixed with pyrethrum in a ratio of five to one, make the insecticide about 12 times more effective against flies than pyrethrum alone. However, the USDA has found that sesamolin added to pyrethrum in equal parts is 31 times more effective.

Science News Letter, December 17, 1955

Pheasants were introduced into the eastern states of the U. S. as early as 1790.

Laboratory tests have shown that *compacted soils* inhibit the emergence of seedlings by reducing the amount of oxygen available to germinating seedlings or by increasing the strength of the soil crust.

BIOCHEMISTRY

Light on Kidney Disease

➤ THE APPLE-GREEN GLOW of a fluorescent dye is showing up a kidney disorder as an allergic disease.

The kidney ailment is glomerulonephritis, or Bright's disease. Its allergic nature has long been suspected. Further evidence for this, obtained with the aid of the apple-green dye, was reported by Drs. Robert C. Mellors and Louis G. Ortega of Sloan-Kettering Institute for Cancer Research, New York, at the American Medical Association meeting in Boston.

The doctors hope now to find a compound that will be useful in the cure and prevention of the kidney disorder, especially in children.

The apple-green fluorescent dye was mixed with blood serum from rabbits. Previously, the rabbits had been injected with human blood gamma globulins. This was to make the rabbits produce antibodies. The dye-containing serum was then injected into the kidney tissue from patients who had died of Bright's disease.

Under a fluorescent microscope, the kidney tissue gave a characteristic apple-green glow in the diseased areas. This showed the antibodies in the rabbit serum had combined with gamma globulin in the diseased part of the kidney, as the scientists had suspected it would.

From this, they formed the following theory of the chain of events in Bright's disease:

An agent, either bacteria, virus or some chemical, enters the blood stream and settles into an area of the kidney. There it stimulates antibody production. After a week or so the antibodies combine with their antigens (the bacteria, virus or chemical) and, together with another substance called complement, set up an irritating activity which inflames the kidney.

The antigen-antibody pair in Bright's disease evidently requires complement to unite. If this proves true, further research may show the nature of the complement. Then by giving the patient some compound known to prevent complement formation, doctors might be able to stop the antibody and antigen from combining and setting up the irritation and resulting disease.

Science News Letter, December 17, 1955

PUBLIC HEALTH

Effects of Nuclear Tests

➤ THERE ARE RISKS to life and property involved in continuing to test atomic weapons in the United States, but these risks must be balanced against what is ultimately best for the peoples of the free world.

This is reported by Dr. Gordon M. Dunning, a health physicist with the Atomic Energy Commission, in *Scientific Monthly* (Dec.), journal of the American Association for the Advancement of Science.

One risk, Dr. Dunning describes, is a possible increase in the number of genetic mutations in the American population. Some scientists, he states, have calculated that about 80,000 mutations may be present among the population living 100 years from now owing to radiation exposure from all nuclear tests to date.

If this figure is correct, Dr. Dunning explains, then by the same calculations about 120,000,000 additional mutations may be produced by natural causes by 2055, assuming no increase in the population over this year's census.

"It is generally held," he states, "that an increase in mutation rate is undesirable."

Other risks brought on by further testing within the United States such as internal exposure from radioactivity have had very little if any adverse effect on life or property up to the present, Dr. Dunning reports.

No one, for example, has been injured by heat radiation outside the Nevada test site. Dr. Dunning also reports that the United States is now enlarging the warning areas both here and at the Pacific proving ground to prevent danger from fallout in further tests.

Science News Letter, December 17, 1955

PSYCHIATRY

Overwork Not Cause Of Emotional Illness

➤ STRESS OF WORK or "overwork" cannot be blamed for emotional illness, Dr. Jackson A. Smith of the University of Nebraska College of Medicine, Omaha, said at the meeting of the American Medical Association in Boston.

Of 91 patients whose illnesses were thought to be due to overwork, only seven had emotional problems directly related to the stress of their work. These seven were all employees of a railroad that changed from steam to diesel power. They had great trouble developing confidence in their ability to operate the new equipment.

Although everyone else thought them quite competent, they became indecisive, apprehensive and fearful.

Factors precipitating the emotional illness in the other 84 patients included: unwise supervision, a severe illness in a fellow worker, a pre-existing tension state and physical injury.

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Questions

ANTHROPOLOGY—How do toys reflect the past and forecast the future? p. 394.

□ □ □

ASTRONOMY—What is an image converter? p. 389.

□ □ □

GENERAL SCIENCE—Why are scientists absolved from A-bomb blame? p. 389.

□ □ □

PSYCHOLOGY—How can a touch of neurosis be a business asset? p. 393.

□ □ □

STATISTICS—What was U. S. health record in 1955? p. 390.

□ □ □

PHOTOGRAPHS—Cover, Piasecki Helicopter Corporation; p. 387, U. S. Navy; p. 389, Northrop Aircraft, Inc.; p. 391, Hamilton-Wright; p. 395, Eastman Chemical Products, Inc.; p. 400, Bakelite Company.

MEDICINE

Tell Doctors to Stop Smoking as Example

➤ DOCTORS were told to stop smoking themselves as an example for their patients and friends by Drs. Richard H. Overholt and James A. Bougas, chest physicians of Boston, at the meeting of the American Medical Association in Boston.

The two implicated cigarette smoking as a causal factor in lung cancer and said prevention would have been better than treatment in the cases they studied.

Cured lung cancer patients are a constantly expanding group, they said. The only successful treatment they found is surgical operation.

The best alert for possible presence of lung cancer, they said, is an abnormal lung shadow on X-ray pictures.

Science News Letter, December 17, 1955

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 809. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

PLAYGROUND MAP permits youngsters to walk from Boston to San Francisco. A map of the U.S. scaled one foot to 100 miles can be permanently laid out on a backyard or playground blacktop. The geography kit includes paint, supplies and a learn-by-doing booklet.

Science News Letter, December 17, 1955

PLAY TENT is designed to resemble the log cabin Davy Crockett lived in. It holds four or five young "Crocketts." The walls are tan canvas two and one-half feet high and the roof is waterproof canvas. The tent has 16 square feet of floor space and comes with poles, ropes and stakes.

Science News Letter, December 17, 1955

REMOTE CONTROL CRANE for junior construction men operates from a box held in one hand. A touch of one button causes the bucket to load, raise, unload and lower. A second button makes the toy crane go forward or backward. Powered by two flashlight batteries, the crane and truck are made of plastic.

Science News Letter, December 17, 1955

WORLD GLOBE is made of plastic and inflated by either hand pump or lung power to a full 18-inch diameter, as shown in the photograph. Colored and containing the latest geographical information, the world globe can be attached to a wrought iron stand. If dropped, it will not shatter, split, dent or lose its shape.

Science News Letter, December 17, 1955

JUNIOR-SIZED TELESCOPE, patterned after the world's largest professional units, has a special optical system that makes the craters on the moon visible. The telescope is 18 inches long and has a three-inch tube and a highly polished reflecting mirror. A twin lens eyepiece is set at top for easy observation.

Science News Letter, December 17, 1955

COLORING TOY lets children create their own world of color, drawing, shapes and play. Containing 16 crayons, clips, and eight colored cards with 49 different shapes to punch out, the young imaginator can make jumping jacks or fairy tale scenes.

Science News Letter, December 17, 1955

PULL TOY for children is an ingenious cow designed like two milk bottles. With hollow feet that are wheels, she jingles and wiggles as she is pulled along. The plastic cow carries a daisy in her cheek and has a plumed tail.

Science News Letter, December 17, 1955

COWBOY KITCHEN permits junior cooking with chuck wagon equipment. Set includes cans of real food, a campfire style pot, a set of campers' eating equipment, two neckerchiefs, a ladle, stirring spoon and a 16-page cook book of Western dishes.

Science News Letter, December 17, 1955

Do You Know

Fall-planted *strawberries* send out fruit-producing runners sooner in the spring and in greater numbers than do spring-set plants.

The United States Government is stockpiling industrial *diamonds* in case the foreign supply should be cut off in time of war.

Ponderosa and Jeffrey *pine* are likely to survive forest fire damage if more than 50% of the buds at the twig tips remain alive.

The nation's total commercial *forest* area has increased from 461,044,000 acres in 1944 to 484,430,000 acres at present, excluding Alaska.

There are nearly 30 different retail cuts of fresh and smoked *pork*.

The electrical organs of the *torpedo ray* comprise one-sixth the total weight of the fish.