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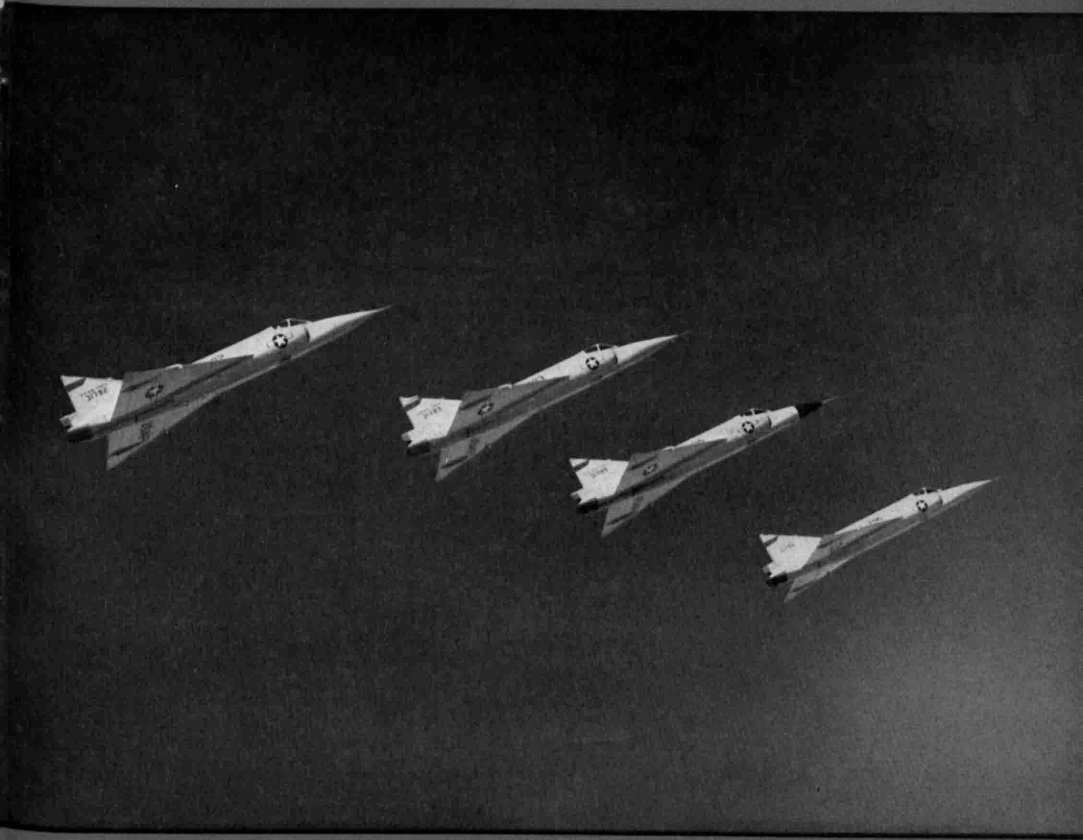
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Fighter Formation

See Page 181

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CYTOLOGY

Cells Resist Chemicals

Scientists find evidence that cancer cells may build up resistance to certain chemicals. Use of new experimental animal, the Chinese hamster, made the research possible.

➤ CANCER TISSUES, like DDT-resistant flies, may build up groups of cells that thrive in the presence of chemicals formerly able to hold them in check.

In treating patients and working with laboratory animals, for example, doctors have found that the chemical, aminopterin, is effective for a time, but only for a time. A switch to another chemical, perhaps six-mercaptopurine, may again control the cancer, but only for a period and not indefinitely.

In research at the Children's Cancer Research Foundation, Boston, Drs. George Yerganian and C. Livingston found that cancerous cells in a given tumor show a great range of difference in the structures which "carry" hereditary traits, the chromosomes.

Because of these constantly occurring hereditary changes, or mutations, there is a chance that new cancer strains may develop in tumors "immune" to regular chemotherapeutic treatment. This may lead to later flare-ups of "controlled" tumors, Dr. Yerganian said.

If these preliminary observations prove correct, he said, researchers will have to step up the search for more and better chemotherapeutics, just as insect fighters are now broadening their search for insecticides.

Dr. Yerganian gave a report of this research at the American Institute of Biological Sciences meeting in East Lansing, Mich.

Use of a new experimental animal made detailed study of hereditary structures in tumors possible, he said. The rats, mice and Golden hamsters usual in such experimental work have relatively large numbers of chromosomes in each cell and nucleus, making observation very difficult. The new laboratory animal, the Chinese hamster, has only 11 pairs of chromosomes. Each is clearly distinguishable from the other.

Using the drug colchicine makes the chromosomes even more easily observable, Dr. Yerganian said, and the scientists were able to watch abnormal cell division in tumor cells of the hamsters.

When the tumor cells divided, there were often different numbers of chromosomes in the daughter cells. There were several of one kind of chromosome present in the new cell, when normally there is only one of each, or there were none at all in others.

This great variation in hereditary structure means that new mutations are constantly appearing in hamster tumors, including the possibility of chemical-resistant strains.

Science News Letter, September 17, 1955

THE PLANET EARTH—From about 100 miles above the earth's surface, this composite photograph shows what you might see. About one and a quarter million square miles are visible in the picture, made up of 310 prints from a 16-mm film shot from an Aerobee rocket fired by the Naval Research Laboratory of Washington at White Sands Proving Grounds, Las Cruces, N. Mex., last year. The Navy believes it is the largest earth area ever photographed from one spot at one time.

BIOLOGY

Males Become Mothers But Have Sons Only

➤ SCIENTISTS have found a means to do away with the necessity for females of the species—females of a toad species, anyway.

Drs. Emil Witschi and C. Y. Chang of State University of Iowa told the American Institute of Biological Sciences meeting in East Lansing, Mich., that they were able to change male *Xenopus* toads into egg-laying females, and without the turncoats losing their male hereditary constitution.

To make this switch, the scientists place male embryos under the influence of a female hormone, estradiol. The male toads develop into behavioristic females.

All of the eggs of these sex-reversed toads fertilized by normal males will develop into males only, since the "mothers" retained their original male hereditary make-up.

When the need to replenish a new all-male generation comes, all the scientists have to do is add a little estradiol to the aquarium water to get a new crop of potential mother toads.

"Thus," said the scientists, "the true, genetic females can now be dispensed with."

One week's treatment with the sex hormone in aquarium water is enough to change a young male tadpole's future sex for life.

Science News Letter, September 17, 1955

CHEMISTRY

Rare Earths Successfully Separated as Free Ions

➤ THE FIRST successful separation of rare earth elements as free ions, or charged particles, rather than as complicated molecules is reported by Dr. M. Lederer of the Curie Laboratory's Institute of Radium in Paris.

Five of these rare earth elements appeared as separate small spots on paper when viewed under ultraviolet light. They have the tongue-twisting names of lanthanum, europium, yttrium, dysprosium and erbium.

Chromatographic methods were used to separate them, Dr. Lederer reports in *Nature* (Sept. 3). Chromatography is fundamentally as simple as blotting ink or sopping up spilled milk.

It is a process in which extracts separate into two or more bands, sometimes of different colors, as they seep out on absorbent paper.

The 15 rare earth elements all have chemical reactions so similar they are considered as one element in the periodic table. They have so far proved very difficult to separate for study. Some are formed in nuclear reactors as waste products from the burning of atomic fuel.

Dr. Lederer also reported that promethium produced at Britain's Atomic Energy Research Establishment at Harwell was separated from cesium and europium impurities it contained by the chromatographic method.

Science News Letter, September 17, 1955

NATURAL RESOURCES

Seals Are Big Business

➤ GOVERNMENT OFFICIALS are much more interested in sealskin coats than mink, contrary to the belief of some disgruntled taxpayers.

The United States Government is in the sealskin business, and last April sold 24,746 sealskins for over $2,000,000. Since 1910, the government has netted over $17,000,000 from sealskins from the Pribilof Islands of Alaska, more than twice the price paid Russia for the entire Alaskan territory.

The U. S. went into the sealskin business when over-hunting threatened the extinction of the great seal herd on the Pribilofs. From a low of 132,000 seals in 1910, when the Interior Department took over, the herd now numbers close to 1,500,000.

Hunting activities for the 1955 season, from June 22 to the end of July, netted 65,638 fur-seal skins, the U. S. Fish and Wildlife Service reports.

Only male, bachelor seals about three years old are taken in the yearly hunt. Older bulls keep harems of up to 40 females. They also chase away unattached males. This practice allows the hunters to take surplus seals without upsetting the breeding balance.

The Fish and Wildlife Service hires native Aleuts to hunt the young males in the "hauling grounds" of the islands, a sort of bachelors' quarters distinct from the old bulls' well-guarded rookeries. The seals, having a very thin skull, are humanely dispatched by a blow on the head with hardwood poles.

Of the annual Pribilof seal harvest, 20% goes to the Canadian government, under the terms of the international agreement by which the U. S. controls the sealing operations.

Only one U. S. company can process the skins into the soft, luxurious fur for coats and wraps, the Fouke Fur Company of St. Louis.

Until 1913, the Government had to send all its sealskins to England for processing. At that time, only a small group of English workmen could do the job.

The U. S., determined to process its own skins in this country, persuaded a few of the skilled Englishmen to come to this country to set up a sealskin processing industry here. This was the origin of the present St. Louis group.

The process of preparing the skins is said to require more than 125 manipulations or treatments, and each skin is handled individually. The company is paid $32.50 for each $100 skin sold.

The present day Aleut hunters on the Pribilofs are descendants of Aleuts brought to the islands for hunting by the Russians when that country owned Alaska.

Today, sealing is the only economic activity of importance on these fog-shrouded islands in the heart of the Bering Sea.

Science News Letter, September 17, 1955

WILDLIFE

Hunters Can Import Kills

➤ UNITED STATES CITIZENS hunting in Canada or Mexico can bring or ship their kills of migratory game birds back home, as long as they comply with a few clear-cut requirements.

Here are some pointers on the law for hunters both north and south of the border, promulgated by the U. S. Fish and Wildlife Service.

1. Migratory game birds coming in from Canada, if dressed, must have the head, head plumage and feet attached. Shipments from Canada must be accompanied by tags or permits, if Provincial or Dominion laws require them.

2. Birds brought out of Mexico are treated just the opposite of Canadian birds. They must be dressed, drawn and have head and feet removed before shipping. An export permit, or permission by a Mexican game official, is required to take the birds out.

3. Shipments made not later than five days after the close of the Mexican or Canadian hunting season may continue in transit for at least five more days to permit delivery at the destination.

4. Packages must be marked with names and addresses of both sender and receiver, and an accurate statement of the number and kinds of birds included.

5. During any one calendar week, 10 ducks, five geese (except Ross's Goose), six brant, 25 coots, eight woodcock, eight jacksnipe, six bandtailed pigeons, 15 doves (with no more than 10 mourning doves included), and 20 rails and gallinules per person can be sent into this country.

6. Federal regulations do not permit the importation or possession of birds contrary to laws of the individual states.

Science News Letter, September 17, 1955

GEOGRAPHY

New Zealanders Explored Ross Sea

➤ CENTURIES BEFORE Columbus, New Zealand navigators were exploring the Ross Sea that washes New Zealand's Antarctic dependencies today, claim the Maori people, descendants of a race that populated the Pacific from New Zealand to the Hawaiian Islands and made long sea voyages.

The Maoris point to their legends as evidence. These verbal records speak of ice mountains growing out of frozen cliffs and seas, strange marine monsters and a land plunged in perpetual darkness.

They claim that Antarctica's discoverer was the great Polynesian navigator, Hui te Rangiora.

In a big outrigger canoe, Hui is said to have sailed from his home in Rarotonga in the Cook Islands, 2,650 miles from Sydney, into the "frozen sea of Pia" where "mountains grew out of the ocean, their peaks piercing the sky."

Science News Letter, September 17, 1955

Ground alfalfa is used as a *protein* supplement, especially in the feeding of swine and poultry.

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PUBLIC SAFETY

"Dream Safety Car"

Passenger automobiles are being designed to incorporate safety devices to cut down injuries from highway accidents. Safety belts are introduced in new models.

➤ SAFETY EXPERTS at Cornell University are designing a "dream safety car" that will incorporate science's latest injury-preventing features.

It will have a steering lever instead of a steering wheel. The device will be much like the control stick used on some airplanes. Dashboards will be well padded and all protruding surfaces on the instrument panel will be removed or moved to where they will not be an injury hazard.

Edward R. Dye, head of the industrial division of the Cornell Aeronautics Laboratory, told SCIENCE SERVICE the car is now on the drafting board.

Although the model is expected to include seat belts, it would be designed for crash safety without them. Small features will receive attention. Moving the ignition key away from the knee area, for example, could save many a mangled joint, he said at the National Safety Forum sponsored by the Ford Motor Company in Detroit.

Dr. Herbert J. Stack, director of the center for safety education of New York University, said his group plans to urge that all driver training vehicles be equipped with safety belts.

In the United States, 8,500 high schools and 300 colleges provide courses in driver training, he pointed out, and they trained about a million drivers last year.

The psychological problem of getting people to accept the safety belt, said Dr. A. R. Lauer, director of the Driving Laboratory of Iowa State College, would be a big one. People might get used to driving without them in the city where speeds are slow, then would neglect them on the highways.

Mr. Donald S. Buck, safety director for the Army, said he would not drive without a safety belt. He explained that, in case of a crash, it holds back the lower part of the body, thus reducing the momentum of the upper part. Much of the dangerous force from a crash would be sustained by the strong waist structure of the body.

The belts also prevent passengers from being thrown from the car.

In 1956, Ford cars can be bought with a five-part safety package. It includes a steering wheel that gives way under crash impact, latches that prevent doors from flying open, a cushioned instrument panel, seat belts and a safety rear-view mirror.

The safety features were worked up by Ford engineers after extensive crash tests to find out how to prevent cracked heads, smashed-in chests, broken limbs and deaths. The researchers sent new cars with dummy passengers and instruments speeding into each other and into barricades during the demonstrations.

Experts at Cornell University have found that the new safety design features could lessen or prevent half the injuries on the road today. They blamed the steering wheel, the instrument panel, the mirror and opening doors for almost half of today's traffic injuries.

Features of the five-phase safety design are:

1. A steering wheel with a deep-center. It slowly gives way under impact of the driver, absorbing energy and distributing it over the driver's chest area. This feature alone could cushion almost 40% of the injuries on the road.

2. The new safety door latches give added protection against persons being thrown from the car. Research has shown that the chances of escaping injury in a crash are twice as great if you remain inside the car.

3. Seat belts will be structurally anchored to the vehicle with a steel plate. They will be available for both front and back seats.

4. Padding five times more shock absorbent than sponge will be available to cushion the instrument panel and sun visors. The instrument panel accounts for 38% of the injuries to right front and center seat passengers.

5. New safety rear-view mirrors have an especially prepared backing to prevent glass from falling out when shattered. About four percent of the injuries to front seat passengers are received from the mirror.

Science News Letter, September 17, 1955

Packaged Passengers

➤ GETTING AWAY with holiday murder on the nation's highways might be a bit tougher next year, despite the driver.

Safety devices shown at the forum promise to lessen the carnage that claimed so many lives in traffic accidents.

The Ford Motor Company is literally packaging the passenger and sending him along the roads padded, protected and marked fragile, handle with care.

AERONAUTICS

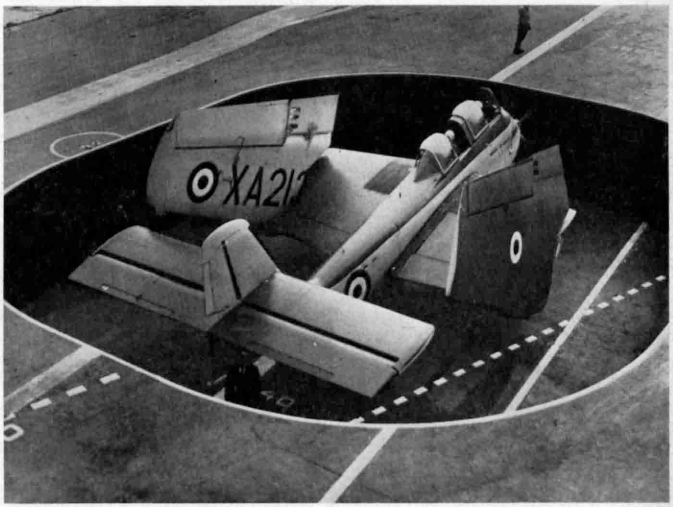
Supersonic Fighters in First Formation Flight

See Front Cover

➤ SUPERSONIC Air Force fighters recently made their first formation flights over southern California, as shown on the cover of this week's SCIENCE NEWS LETTER.

Equipped with the latest electronic gear, the interceptors, now being delivered to the Air Force, can zoom into the stratosphere.

Science News Letter, September 17, 1955



FOLDED WINGS FIGHTER—The Short Seamew, Britain's latest anti-submarine aircraft, recently carried out successful deck trials on the aircraft carrier, H.M.S. Bulwark. With its wings folded, the short plane is shown being lowered into the carrier's hangar. It can take off from merchant ships, and costs only two-thirds as much as comparable aircraft.

MARINE BIOLOGY

Coelacanth's Death Cause

Expert on "fossil fish" suggests that pace of modern life may have been too much for the specimen, which died 20 hours after capture.

➤ PREHISTORIC ANIMALS do not have the nerves to take the modern pace of life.

The only live specimen of Africa's famous "living fossil" fish, the coelacanth, to be studied by scientists died 20 hours after it was captured.

At first scientists believed the fish, member of a family long thought extinct for some 50,000,000 years, had died from the change of pressure between his deep-sea home and his pen at the ocean level, combined with too much heat and too much light.

Dr. J. L. B. Smith, coelacanth expert from Rhodes University, Grahamstown, South Africa, suggests shattered nerves might have had something to do with its demise. (See SNL, March 14, 1953, p. 169.)

The coelacanth was captured near Matsumudu, Madagascar, on Africa's East Coast. The fish was kept the night of his capture in a partly submerged open boat.

"We are told," Dr. Smith reports, "that 'throughout the night, which the delighted population of Matsumudu passed in singing and dancing to celebrate the capture, the coelacanth was watched over with admirable care.'

"Only those who have experienced such a night such as is indicated here can have any idea of the noise and lights," he says. "The coelacanth at Matsumudu must have passed the night in a state of high nervous tension."

Dr. Smith, in *Nature* (Sept. 3), also questions the effects of pressure change and temperature as possible causes of the coelacanth's death.

The scientists, pointing out that a coelacanth caught earlier in a net lived for three hours out of water on the deck of a trawler, states he thought the fact that the captive fish was taken by hook and line led to his death.

Large fish taken after a struggle on a line rarely live long after, and certainly not in aquaria. Fish taken by harpooning, even when extensively gashed, show a greater survival rate than those taken on hooks, Dr. Smith says.

Coelacanths caught by net or trap and kept in a closed vessel will almost certainly have a greater chance of survival, even at normal pressure, he concludes.

The French scientist, Prof. James Millot, who observed the first captive coelacanth, decided that its death was caused by acute decompression resulting from the change in pressure from ocean bottom to surface, combined with the higher temperature and light intensity at the surface.

In hopes of another coelacanth find near Madagascar, Prof. Millot has made arrangements for a cage that will be kept at a depth of 150 meters, which will be hauled up only rarely for brief studies of the "living fossil."

Science News Letter, September 17, 1955

ICHTHYOLOGY

Ocean Fish in Lakes

➤ SHARKS AND SAWFISHES often leave their deep ocean homes to see how the other half of the finny world—the freshwater fishes—lives.

According to Dr. Albert W. C. T. Herre of the University of Washington School of Fisheries, Seattle, many species of sharks and rays, including sawfishes, enter fresh water freely and travel long distances.

One man-eater, the Ganges shark, *Carcharias gangeticus,* long has been known to attack bathers in India's Ganges and Hugli Rivers. In the Philippines, this same shark appears in all rivers of any size and in all fresh water lakes having a good-sized outlet to the sea, Dr. Herre reports.

Sharks and sawfishes are present in Lake Sentani, Dutch New Guinea, some 500 feet above sea level.

Sawfishes are abundant along with the Ganges shark in Philippine rivers and have been reported in the Amazon, in the Zambezi below the great falls and in the large rivers of Borneo and Sumatra, he says.

A six-foot ground shark was once captured 2,300 miles from the ocean, in the Peruvian headwaters of the Amazon (see SNL, Feb. 14, 1953, p. 108). Lake Nicaragua, a ~~land-locked~~ fresh water lake, contains sharks that have adapted themselves to living their whole life in fresh water.

The sharks and sawfishes Dr. Herre mentions do not breed in fresh water, but must return to the ocean to reproduce. Otherwise ecological conditions in tropical rivers and lakes are favorable to their existence, and there is an abundance of easily taken food, he reports.

The inland forest people of Mindanao, seeing sharks and sawfishes in their rivers, often believe the sharks are females and the sawfishes are males of the same species, Dr. Herre says. This belief does not seem to be held by coast fishermen who are familiar with the great fishes.

It is not surprising, Dr. Herre states, to find sharks and sawfishes in tropic rivers. An astonishing variety of marine fishes migrate up rivers and into lakes, many stopping only when they meet waterfalls or other physical barriers.

Eels, gobies and mullets may ascend in this way to 5,000 feet elevation, Dr. Herre reports in *Science* (Sept. 2).

Science News Letter, September 17, 1955

PSYCHOLOGY

Old People Fight Death Worry Through Religion

➤ ELDERLY PEOPLE turn to religion to overcome anxiety about death, Herman Feifel of the Veterans Administration Mental Hygiene Clinic, Los Angeles, reported to the American Psychological Association meeting in San Francisco.

He studied the psychological attitudes toward death of 40 World War I veterans whose average age was 67 years.

About 40% viewed death as "the end of everything". Most wanted to die suddenly with little suffering, in bed, and they did not care whether it came in the morning, evening or the middle of the night.

Over half thought people feared death least in childhood and the 70's. They said that in childhood "you don't understand what it is," and "in old age you have less to live for" and "you are resigned to it."

Science News Letter, September 17, 1955

PSYCHOLOGY

Delinquents Take Crime Seriously

➤ DELINQUENTS see the seriousness of crime in the same way as non-delinquents and teachers, contrary to some opinions, Shepard A. Insel of Stanford University, Calif., reported at the American Psychological Association meeting in San Francisco.

His findings refute the idea that there is an "outlaw law," but that the trouble is it does not follow the law of the land.

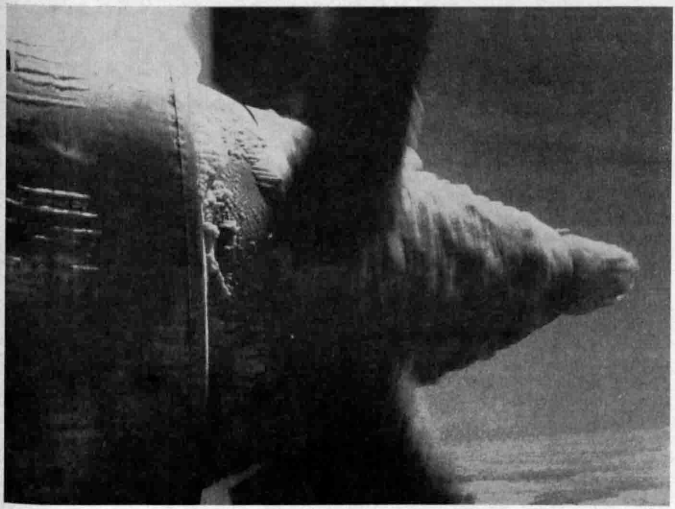
Mr. Insel studied 32 adolescent boys legally defined as delinquents, another 32 boys who were non-delinquents and a third group of 30 male teachers from the same high school as the two groups of boys.

Each person in the three groups was asked to look over and express agreement or disagreement with 70 statements about specific crimes. They were asked to rate these statements according to whether they regarded them as serious or not, and to say just how serious they seemed to them.

"In general," reported, "the results of this study do not show delinquents to be different from others in their perception of anti-social behavior."

Science News Letter, September 17, 1955

Using radioactive phosphorus as a research tool, soil scientists have successfully developed a method to measure available *phosphate* in any soil very accurately.



PROPELLER DE-ICING TEST—Using a small television camera mounted in the port engine nacelle to record results, de-icing tests on the engine of the new British Bristol Britannia giant turboprop airliner were finished in one-tenth the usual time. Technicians were able to see, on a 14-inch screen inside the plane, that the engine was virtually immune from ice effects, shown after ice had been allowed to form for half an hour.

PUBLIC SAFETY

Pause For Better Driving

➤ ON LONG MOTOR TRIPS, stop driving every one and one-half hours. Take 15 minutes to rest and, perhaps, have a cup of tea.

You may be a more efficient driver as a result, although your reaction time, for some unknown reason, may not improve.

This seems to be the tentative conclusion of experiments in one phase of the Thomas J. Lipton, Inc., project on reducing driving fatigue reported by Drs. Virtus W. Suhr and A. R. Lauer of Iowa State College of Agriculture and Mechanic Arts, Ames, Ia., at the American Psychological Association meeting in San Francisco.

The tests were made on men and women matched as nearly as possible with respect to age and driving experience. They were divided into two groups of 19 men and nine women and 16 men and nine women.

Each person sat in a "dummy" car and used full-size automobile controls to drive a miniature car around a traveling roadway. The device, called a Drivometer, was in an air-conditioned booth with temperature kept at 70 degrees Fahrenheit and relative humidity about 57%.

An electric train emerging from a tunnel, traffic lights and printed instructions appearing just above the roadway gave each driver situations such as might be met on the highway.

One group of men and women drove in the Drivometer for three hours without stopping. The other group drove for one and one-half hours, stopped 15 minutes for rest and and tea, and then drove the second one and one-half hours. This group had also been served tea just before the start of the driving period.

Before and after the drive, each person was given tests for steadiness, choice reaction time, coordination, blood pressure and pulse, breathing rate and skin resistance.

Contrary to previous findings and to what was expected, the group that drove without pause showed up better in the choice reaction time test than the group that paused for tea. This was a test for speed and accuracy in putting on the brake for a red light, but not for a green or an amber one. The scientists could find no explanation for this.

Otherwise they tentatively conclude that the general effect of the tea and the rest pause combined seems to be a quieting one that may be reflected in a tendency to work a little harder, sustained alertness and greater efficiency at the task presented.

Science News Letter, September 17, 1955

The *rhinoceros beetle* is not only one of the largest insects, but is also becoming a serious economic threat in the Central and South Pacific, where it attacks coconut palm, sugar cane and pineapple.

TECHNOLOGY

Tiny Device Measures Sweat Under Clothing

➤ THE NAVY has a tiny device to help cope with the problem of perspiration in the Arctic.

No larger than a pencil, the instrument measures the moisture that may collect between the skin and the fabrics of cold-weather clothing.

"It is easy to keep a man warm with adequate clothing. The problem today is to keep him properly ventilated," a Navy expert said.

The instrument will be used to test special purpose suits under a wide range of weather conditions. The instrument is as accurate as the more bulky commercial humidity meters that measure five feet long and three feet in diameter.

The ceramic device was developed by the American Instrument Company, Silver Spring, Md., under a contract with the U. S. Navy's Bureau of Supplies and Accounts.

Science News Letter, September 17, 1955

BACTERIOLOGY

TB Germs Tool to Study Bleeding, Artery Clots

➤ THE TUBERCULOSIS GERM has been elevated from the role of death-dealer to that of a new tool to fight dangerous bleeding and the clots that sometimes plug arteries in the heart, lungs and other parts of the body.

This role for the tuberculosis germ, or bacillus, was announced by Drs. Alfred L. Copley and Trajan Balea of the International Children's Center and Research Laboratories, National Blood Transfusion Center, Paris, France, at the American Physiological Society meeting at Tufts College, Medford, Mass.

The TB germ will not be used directly to stop bleeding or to dissolve blood clots, but for fighting these killing conditions as a tool for studies of them.

This is foreseen from discoveries that also promise to lead to better understanding of tuberculosis.

The body's primary reaction against blood stream invasion of TB germs is not, as generally held, a mobilization of the body's scavenger cells, the phagocytes, Drs. Copley and Balea said.

Instead, the primary reaction is the formation of plugs in arteries and veins. The plugs, or thromboemboli as they are known technically, are made up of blood platelets stuck together with the TB germs. Subsequently, the walls of small blood vessels called capillaries suffer changes.

"These hitherto unknown findings," the scientists reported, "offer new guides toward better understanding of the tuberculous disease and establish the tubercle bacillus as a new tool for studies on hemorrhage and thromboembolism."

Science News Letter, September 17, 1955

PHARMACOLOGY

Pecking Pigeons Show Differences in Drugs

➤ PECKING PIGEONS are showing scientists differences in action of two drugs widely used because of their soothing or quieting effects.

One drug is the familiar sleeping medicine, phenobarbital. The other is the new synthetic tranquilizing medicine, chlorpromazine.

Chlorpromazine slows the pecking pigeons at a consistent pace. Phenobarbital also slows the pigeons, but at an erratic, uneven pace, Dr. Peter B. Dews of Harvard Medical School, Boston, reported at the American Society for Pharmacology and Experimental Therapeutics meeting in Iowa City, Iowa.

The pecking pigeons, he explained, were working at set tasks.

"The work consisted of pecking at a piece of translucent plastic. The pigeons had to peck at a different rate according to whether a red or blue light was on behind the plastic. They were rewarded with food for pecking.

"The tasks were arranged so that under normal conditions the pigeons started to peck as soon as the red light came on, but paused before starting to peck when the blue light was on.

"Under the influence of chlorpromazine," he reported, "the pigeon generally continued to perform correctly according to whether the red or blue light was on. However, the pauses when the blue light came on became much longer and the pecking was slower when it did start, as though the pigeon had become apathetic towards the task. The pigeon looked quite normal at this time.

"Another drug, phenobarbital, on the other hand, tended to cause a loss of pausing when the blue light came on, and although the average rate of pecking was reduced, it tended to be much more irregular and uneven than after chlorpromazine."

Science News Letter, September 17, 1955

PSYCHOLOGY

Devise Mood Meter to Chart Feelings Daily

➤ A MOOD METER for measuring a person's degree of happiness or unhappiness at a given moment and for charting the course of emotional changes, as the course of fever is charted, was presented by Dr. Hornell Hart of Duke University, Durham, N. C., at the Society for the Study of Social Problems meeting in Washington.

With the mood meter Dr. Hart reported success with a method of self-hypnosis, or autoconditioning, for changing one's own attitudes.

Autoconditioning results included the following cases:

1. The girl who autohypnotized herself to stop wanting to smoke cigarettes, when the best she had been able to do by "will power" was to cut down the number she smoked.

2. The middle-aged, married man who suffered such "plunges" into depression that he threatened suicide and who had a domineering wife who made him "blindly angry." By autoconditioning he first cured himself of his depression and then made his wife's unjust or harsh acts a signal to bring to his mind all the loving, kind, "thrilling" things she had done for him, so that the next time she "jumped him," he took her in his arms, kissed her and told her what a wonderful girl she was. The unhappy marriage took a turn for the better with the wife also autoconditioning herself to be less domineering.

The mood meter consists of a list of 30 words ranging from ecstatic through triumphant, pleased and determined to frustrated, discouraged, desperate and miserable.

Each word describing a feeling has a plus or minus number. Ecstatic is plus 15. Miserable is minus 15.

In using the mood meter, you check all the happy and all the unhappy words for your feelings at the moment. Your mood is scored from the sum of or the difference between the highest plus number and the lowest minus number.

You might, for example, feel alert, scoring plus three, and anxious, scoring minus two. Your mood score would then be plus one. Scoring should be done over a period of time.

Science News Letter, September 17, 1955

PHARMACOLOGY

New Drug Rouses Mental Patients

➤ MORE THAN 100 mentally sick women have benefited from treatment with a new stimulating drug, Dr. John T. Ferguson of Traverse City State Hospital, Md., reported at the American Society of Pharmacology and Experimental Therapeutics meeting in Iowa City, Iowa.

The drug is trade named Ritalin by its manufacturer, Ciba Pharmaceutical Products Inc. of Summit, N. J. It is known to chemists as methylphenidylacetate.

Dr. Ferguson gave it to 127 women patients between the ages of 20 and 73. They had spent an average of 16 years in various institutions and hospitals because of the severe mental sickness, schizophrenia. After treatment with Ritalin, Dr. Ferguson reported that 101 of the patients showed generally improved behavior, increased control over physical activities, and "an awakening to reality."

Of the 101 improved patients, 79 needed no further treatment after results first became evident.

Scientists do not yet understand exactly how Ritalin produces these rapid changes in mentally ill patients, but it is believed to be the result of over-all chemical and physiological activity stimulated by the new drug.

Science News Letter, September 17, 1955

IN SCIEN

TECHNOLOGY

Can Set Up Radar Base in Three Hours

➤ LATEST DEVELOPMENT in the nation's air warning system is an emergency radar station that can be flown to a remote danger spot and set up in less than three hours. This is made possible by a new plastic and aluminum prefabricated shelter.

Fourteen men using only ladders and wrenches can assemble the fully equipped radar shelter and an auxiliary maintenance hut.

Shaped like quonset huts, the structures were developed by Luria-Cournand, Inc., Havre de Grace, Md., for the Air Force. Plastic panels cover the aluminum arch framework. Walls and floor act as insulators. The metal arches, and roof and floor panels are interchangeable.

Science News Letter, September 17, 1955

AERONAUTICS

Apple-Shape Noise Field Surrounds Jet Bomber

➤ A FLYING JET BOMBER is surrounded by a field of annoying noises shaped like an apple with the stem pulled out.

So two engineers found in a study of jet noise annoyance.

Complaints by residents near military airports have long been a problem and two noise-rating systems are commonly used. The first plots the noise in terms of symbols related to the community attitude. The categories range from no annoyance through mild complaints, threats of legal action and actual vigorous legal proceedings.

The second system rates the noise level in relation to its interference with normal conversation.

Using the latter, the apple-shaped surface was found to approximate the actual noise-annoyance field. In mathematical terms, the "apple" is called a three-dimensional isosilic imaginary surface. The hole around the "stem" of the apple is caused by the lower sound level behind the flying plane. A B-47 six-jet medium bomber was taken as the test criterion.

The noise-annoyance area on the ground below the bomber could be determined roughly by slicing the apple at the ground plane.

Noise from a B-47 would cause little interference with outdoor activities if the plane maintained an altitude of approximately 10,000 feet, Murray Kamrass of the Cornell Aeronautical Laboratory and Karl D. Swartzel, consultant in aeronautical engineering and instrumentation, reported to the Society of Automotive Engineers.

Science News Letter, September 17, 1955

E FIELDS

HERPETOLOGY

Black Cobra Oldest Living Snake in U. S.

➤ A BLACK COBRA from Africa holds title as the oldest living snake in United States zoos, reports Dr. C. B. Perkins of the San Diego Zoo in his yearly old-age snake census.

The deadly poisonous cobra, *Naja melanoleuca,* housed at the San Diego Zoo, is now 26 years and 10 months old. If he holds out for 14 more months, he will tie with a 17-foot anaconda from the Washington Zoo for the all-time old age championship.

The Washington Zoo's big snake was 28 years old when it died, which is thought to be the record age for captive snakes in this country.

The cobra still has a short way to go before he rates second place in the race. This record is held by a rainbow boa, *Epicrates cenchria,* at the Bronz Zoo, which lived 27 years and four months.

Second oldest living snake in captivity in the U. S. now is a large gopher snake, *Drymarchon corais,* from America's West, with 22 years and eleven months. A dangerous spitting cobra, *Naja nigricollis,* housed at the Brookfield Zoo, takes third place with 20 years and 9 months.

According to Dr. Perkins' census, reported in *Copeia* (Aug.), the oldest captive rattlesnake is a western diamond rattler, *Crotalus atrox,* at the San Diego Zoo, now 19 years and 2 months old.

Science News Letter, September 17, 1955

RADIO ASTRONOMY

Moon's Atmosphere Only A Trillionth of Earth's

➤ THE MOON'S ATMOSPHERE is less than a trillionth as dense as the earth's is at sea level, Drs. B. Elsmore and G. R. Whitfield of Cavendish Laboratory, Cambridge, report.

This new figure, a thousand times lower than the previous upper limit, results from measurements of how the moon affects radio waves sent out by a stellar broadcasting source know as IC 443, discovered only last year by radio astronomers. (See SNL, Jan. 30, 1954, p. 66.)

Last April 26, the moon came between the earth and this strong radio source in the constellation of Gemini, the twins. A photograph of this region of the sky, taken in red light with the 48-inch Schmidt telescope at Mt. Palomar, shows that IC 443 consists of thin wisp-like filaments with arch-like shapes.

Drs. Elsmore and Whitfield recorded a sharp rise in intensity of the radio waves from it at wavelength of 3.7 meters and at 7.9 meters as the moon uncovered one particularly bright filament.

This, they state in *Nature* (Sept. 3), supports the theory that the radio waves from IC 443 come from regions of strong hydrogen alpha emission.

If the bright filament caused the increased intensity of radio waves they recorded, the relative times of the uncovering and enhanced radio reception can be used to calculate density of the lunar atmosphere.

Radio waves of 3.7 meters measure about 12 feet from one wave to the next. Wavelength for frequencies in the middle of the standard broadcast band is about 1,000 feet.

Previous upper limits of the moon's atmosphere, known to be exceedingly thin, have been based on the fact that there is no distortion of light from the sun or the stars when the moon comes between the earth and these visible sources.

Science News Letter, September 17, 1955

PUBLIC SAFETY

Doctors Alerted on Skin Diving Hazards

➤ SKIN DIVING is becoming so popular that doctors need urgently "to be brought up-to-date" on the hazards of this sport, Dr. William T. Burns of Long Beach, Calif., report in the *Journal of the American Medical Association* (Sept. 3).

As many as 1,000,000 persons may have done skin diving in the United States in 1954. Conservative estimates place the number at 250,000 to 500,000.

With the increase in the sport of skin diving, diving accidents and deaths are becoming more common. In California, there has been an average of one death from this cause per month from January, 1953, through April, 1955, Dr. Burns reports.

The hazards of this sport are: caisson disease, commonly known as "the bends"; air embolism, or air bubbles in a vein; oxygen poisoning; carbon monoxide poisoning, and nervousness leading to panic.

The fat person should not skin dive. Fat tends to hold nitrogen which can lead to "the bends." Fat people are usually out of condition, also making them more prone to exhaustion, one of the most common hazards of diving.

"Perfect health is mandatory" for a skin diver, Dr. Burns states. The ideal diver is slender, young, calm and has good eyesight.

Head colds are another source of danger since underwater pressure may force the infection into ears, lungs or sinuses.

Dr. Burns gave these safety rules:

A diver should have perfect health and should follow a routine of clean living habits, adequate rest and plain simple diet.

A diver should learn diving procedure from competent instructors, know how to swim, be at home in the water, and always dive with another person.

Dr. Burns is medical consultant to the Sparling School of Deep Sea Diving, Wilmington, Calif.

Science News Letter, September 17, 1955

SOCIOLOGY

Wives Score on "Rate Your Mate" Test

➤ WIVES who do well on a marriage adjustment test score high on a "rate your mate" test. But the same is not true for men, and University of Southern California sociologists do not know why.

The sociologists, Drs. Harvey J. Locke and Georges Sabagh and Miss Mary Margaret Thomas of Los Angeles City College, Calif., reported their findings at the American Sociological Society meeting in Washington.

On the rate your mate, or empathy, test, husbands and wives were asked, for example, if the other had a sense of humor, enjoyed watching TV, was affectionate, easy to get along with, enjoyed music or sports, made friends and decisions easily.

On marital adjustment tests, men and women were asked such questions as "Have you ever wished you had not married?" and "If you had your life to live over again would you marry the same person, a different person, or not marry at all?"

The marriage has a high degree of family unity, the sociologists decided, if the husband kisses the wife several times a day, talks over problems with her, if problems are solved by mutual give and take, and if the couple engages in outside activities together.

Science News Letter, September 17, 1955

TECHNOLOGY

Your Boy May Camp In Glass Fiber

➤ A BOY going to camp a few summers from now may bunk in a "cabin" of glass fiber, concrete and aluminum. Or perhaps he may sleep in a "tent" of steel tubing, nylon fabric and Orlon net.

These structures, developed by the Illinois Institute of Technology in Chicago, of modern materials, but are designed to retain the primitive characteristics of camp living. Actual use by the local Young Men's Christian Association will test their stability and practicality.

The permanent structure, with room for eight campers and a counselor, features a roof panel of glass fiber. The panel lets in sunlight, but deflects much of the sun's heat. The rest of the roof is of corrugated aluminum.

Three plywood doors open out at either end of the cabin. Insects are kept out by glass fiber screens.

Like the permanent cabin, the tent is made of materials that require little repair. It is covered with neoprene-coated nylon that resists rot and abrasion better than canvas and is much lighter.

The white nylon fabric around the base of the tent is translucent, permitting light to enter. Orlon net screening at the open ends keeps insects out. The tent resembles covered wagon of pioneer days.

Science News Letter, September 17, 1955

ENGINEERING

Jet Engine in Your Car?

The gas turbine engine, the powerful "pinwheel jet" that packs more horsepower per pound, is now being tested in cars by the major automobile manufacturers.

By EDWARD HOUSMAN

➤ THE JET AGE is coming for the motorist. His dream car of the future very likely may have a new type of motor with no pistons to give trouble, no cylinder valves to jam and no water system to overheat.

The revolutionary engine, a gas turbine, is simple and rugged compared to today's piston engines. And it is not as fussy about its fuel diet. A gas turbine will burn almost any liquid fuel, including kerosene and cheap diesel oil.

The inherent simplicity of the new motor, which operates on the pinwheel principle, reaches down to the transmission. There will be none of the clutch and shift jerks felt by riders even in cars with modern automatic transmissions, but a smooth, continuous acceleration with a fan-to-fan linkage that should be trouble free.

Gas turbine engines already have an impressive record as an aircraft power plant. In their turboprop form, gas turbines power the Vickers' Viscount, a four-engine passenger liner just put into service in the United States. The engine shows its muscles in the Navy's "Pogo Stick" fighter that generates enough propeller power to take off vertically from a nose-upward position.

The gas turbine packs more power per pound of engine than the piston motor—three times as much in General Motors' experimental sports-race car, the Firebird.

Exhaust-less Jet

Though it has no fiery exhaust tail, the gas turbine is a real jet engine. Hot gases generated in the combustion chamber are harnessed by a turbine instead of being shot out the rear as in turbojet planes.

The major automobile manufacturers have test models on the road today, but there are problems in designing a satisfactory version of the engine for mass produced cars, trucks and buses. Once on the production line, however, these motors should cut the purchase cost and operating expense of a car. The engines have far fewer parts than today's motors, and only one of the parts requires workmanship to close tolerances. That is also the only real moving part, the turbine, an efficient fan that converts the jet blasts to turning motion, much like a pinwheel in the breeze.

The motor is easy to take apart and put together. It takes about day for the job, a near impossibility with the complicated auto engines of today. And it is rugged.

An experimental Navy gas turbine engine, about the size of an auto motor, but one-third less in weight, was run continuously for more than 1,300 hours before its first failure. This is equivalent to 52,000 miles of trouble-free service at 40 miles-per-hour on a car.

The failure was a minor one. One of the turbine blades broke. The engine could be quickly repaired and, probably, run for another 1,300 hours before another failure. The engine went through a tough test schedule, too, being speeded up, slowed down, stopped and started on a regular schedule to simulate actual use.

Gas turbine engines also have no electrical system to mention. One spark plug is used, but only to start the engine. Once the fire is ignited in the combustion chamber, burning continues spontaneously during operation. This would reduce bothersome repairs and adjustments of distributors, batteries, generator and voltage regulators necessary in today's cars.

Another major repair item on today's auto is the transmission.

The purpose of the transmission is to connect and disconnect the wheels and the spinning shaft of the motor. This makes starting, stopping and changing gears possible. In the Navy's gas turbine, two fans, or rotors, stand face to face but are not mechanically connected. When the fan connected to the engine spins, the flow of hot gases from it makes the second fan turn.

Steps in Power Conversion

Here are the fundamental steps by which the gas turbine converts fuel and air to power:

1. Air, taken in from the grillwork at the front of the car, is compressed.

2. This high-pressure air rushes into the engine's single combustion chamber where it mixes with fuel and burns with a very hot flame. This expands the volume of the gas.

3. The hot, compressed air from the combustion chamber then rushes through the blades of a turbine, which like the windmill or the water wheel changes the flowing motion to spin.

Today's cars get their power from a much more complicated and critically machined motor that works by harnessing individual

"JET" CAR—A Chrysler Corporation engineer checks under the hood of the firm's experimental "Turbine Special," a 1955 chassis powered by a gas turbine engine. The car is undergoing tests as are gas turbine models designed by other auto manufacturers.

explosions in its six or eight cylinders. The heat caused by these cylinder explosions is removed by circulating water.

Parts of the gas turbine engine, get red hot, but water cooling is not necessary. The hot parts will be designed to withstand the heat with ordinary air cooling. An aluminum shield over the hottest parts of the engine is enough to prevent the heat from damaging the car body.

Auto manufacturers, after tests of the gas turbine on vehicles, say that it is not necessarily the engine of the future despite its performance record. There are still bugs that have to be ironed out. General Motors is running two vehicles, a bus and a race car with experimental engines. Chrysler Corporation has a conventional-looking experimental gas turbine model on the road, the "Turbine Special." Ford Motor Company is testing and improving the new motor part by part.

One disadvantage of the gas turbine is that there is no braking force from the engine when the driver takes his foot off the accelerator.

At high speeds, especially, the motor's role in breaking is important, even more important than the brakes themselves. Brakes alone could not stop the car in time in many cases.

Engineers believe the braking problem will be solved. It may, however, entail a large bill for maintaining a more powerful and complicated braking system than we find in today's cars. The GM Firebird gains extra braking force with adjustable fins on the body, and exterior wheel brakes. The GM Bus, the Turbocruiser, gets extra retarding force on steep downgrades by reversing its engine.

Another difficulty with the engines is that the auto industry is not tooled to produce them. The initial expense, some say, would be prohibitive. New materials, such as the high temperature steels for the combustion chambers and the turbine blades would have to be stockpiled at great expense.

There may also be objections from the oil industry, which has huge investments in production of high octane gasoline, too rich a diet for the new engines.

Cars Still in Future

These factors indicate that although successful experimental engines are now available, it may be five or ten years before gas turbine cars will be coming off the production line.

General Motors insists its Firebird is only experimental and that there are no plans to put it into production.

The Navy, on the other hand, is quite optimistic about gas turbines for certain applications.

A. C. Skortz, head of the gas turbine branch of the U. S. Naval Engineering Experiment Station, Annapolis, Md., who has been testing the Navy's small gas turbines, pointed out that these small turbines are vibration free.

The noise generated by the gas turbine is a high pitched whine, but it is a high-frequency noise and is fairly easy to muffle.

Gas turbines have come a long way in the Navy in the past 11 years, back to the time when about the only operating one was the Experimental Allis-Chalmers engine that filled a huge warehouse-type building at the experiment station.

Tiny Gas Turbines

That engine is now being taken apart and scrapped and, in a corner of the same building, the new tiny gas turbines are being tested and improved. These latter were designed and built by Boeing Aircraft Company for the Navy.

Gas turbine engines at their present stage of development drink fuel faster than piston engines, but it is cheap diesel fuel. Potentially, the gas turbine could use even cheaper fuel and the efficiency per mile per gallon could be stepped up.

Mr. Skortz sid he is now trying to run the motors on a very cheap. low grade, black, sticky oil called "Bunker C." The motors have run on it, but there are big problems involved in long term operation with such crude fuel. The experiment shows how variable the gas turbine's diet can be. Diesel oil seems to be the standard fuel.

Gas turbines are used by the Navy for auxiliary power aboard large ships.

Science News Letter, September 17, 1955

PSYCHOLOGY

Women Can Equal Men in Learning Gun Assembly

➤ WOMEN may not know as much about mechanics as men but, in the Navy, female recruits could learn as well as men how to assemble the breech block of a 40mm anti-aircraft gun.

Tests showing this were reported by Roger B. Allison Jr. of the Educational Testing Service, Princeton, N. J., at the American Psychological Association meeting in San Francisco. The tests were made under the sponsorship of the Office of Naval Research.

Four groups of naval recruits, men and women, were shown a motion picture on assembling a 40mm antiaircraft gun breech block. The recruits were then tested on what they knew about it and on putting one together.

In the knowledge test, females did as well as males, and they were only slightly behind males in the actual assembly test.

The conclusion was that "under controlled learning conditions female recruits were able to learn a mechanical-motor skill despite obvious background differences."

Science News Letter, September 17, 1955

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.

THE BEAST THAT WALKS LIKE MAN: The Story of the Grizzly Bear—Harold McCracken—*Hanover House*, 319 p., illus., $4.50. Giving legendary lore and historic melodrama, as well as facts, about this great American beast.

BIRDS OF NEW ZEALAND—Alfred M. Bailey—*Denver Museum of Natural History*, Museum Pictorial No. 11, 116 p., illus., paper, $1.60. Briefly introducing New Zealand as a country, and presenting photographs and descriptions of the interesting birds to be found there.

ENERGY AND SOCIETY: The Relation Between Energy, Social Change, and Economic Development — Fred Cottrell — *McGraw-Hill*, 330 p., $6.00. Tracing the development of civilzation through the history of fuel sources, with the thesis that the amounts and types of energy employed condition man's way of life materially, and set predictable limits on what he can do and how society will be organized.

FIX-IT-YOURSELF AUTO REPAIR MANUAL—Popular Mechanics—*Popular Mechanics Press*, 160 p., illus., $2.50. Explaining with diagrams and photographs how you can repair and maintain your car.

FLEAS: How to Control Them—U. S. Dept. of Agriculture—*Govt. Printing Office*, 8 p., illus., paper, 5 cents. Giving the different varieties of fleas and telling how to control them with insecticides.

GLOSSARY OF SELECTED GEOLOGIC TERMS: With Special Reference to Their Use in Engineering—Wm. Lee Stokes and David J. Varnes—*Colorado Scientific Society*, Proceedings, Vol. 16, 165 p., cloth $3.50, paper, $2.75. Providing civil engineers and specialists in related fields with a technical glossary of terms used by geologists.

MR. GOULD'S TROPICAL BIRDS—Eva Manning, Ed.—*Crown*, 16 p., 24 plates, $7.50. Containing plates selected from John Gould's folios, together with descriptions of the birds taken from his original text. The plates have been beautifully reproduced.

GRAY SQUIRREL — Mary Adrian — *Holiday House*, 46 p., illus., $2.00. Telling for children the life story of one of our most well known native mammals.

GROWING PLANTS UNDER ARTIFICIAL LIGHT—Peggie Schulz—*Barrows*, 146 p., illus., $3.50. Recent developments have made electric light practical for home gardeners and commercial growers, states the foreword of this book, which gives information on the indoor culture of various plants under artificial light alone, as well as under artificial and natural light combined.

HOW TO CHOOSE THAT CAREER: Civilian and Military—S. Norman Feingold—*Bellman*, 52 p., illus., paper, $1.00. A guide for parents, teachers and students.

HYDROCORTISONE, ITS NEWER ANALOGS AND ALDOSTERONE AS THERAPEUTIC AGENTS—Joseph W. Jailer, Ed.—*New York Academy of Sciences*, Annals, Vol. 61, Art. 2, 356 p., illus., paper, $4.50.

JOURNAL OF ELECTRONICS: Volume 1, Number 1—J. Thomson and N. F. Mott, Eds.—*Taylor & Francis (Academic)*, 102 p., illus., paper, Volume 1, 6 parts, $15.40, single copies $2.80. An English publication devoted to electron sciences, defined as "a field which extends from fundamental research to the scientific aspects of the construction of devices—the domain of the electron in theory and practice."

THE LIFE IN THE SEA—Ralph Buchsbaum—*Oregon State System of Higher Education*, Condon Lectures, 101 p., illus., paper, $1.50. An introduction to the study of the myriad life of the sea and its ecology.

THE MIRACLE OF LIGHT AND POWER: How Electricity, Gas and Steam Are Produced for Home and Industry—Captain Burr W. Leyson—*Dutton*, 186 p., illus., $3.50. Describing the problems involved in serving a community, and especially a great city, with uninterrupted electric power and gas.

A NEW RECORDING MICROBALANCE—Axel H. Peterson—*Mellon Institute*, 4 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Describing a method by which any standard laboratory analytical balance can be converted into a recording microbalance with a sensitivity gain of 10,000, permitting comparative measurements of 0.1 to 0.01 microgram.

OBEDIENCE TRAINING FOR YOUR DOG—Cecil Wimhurst—*Dover*, 70 p., illus., paper, 65 cents. Written, according to the introduction, for "every dog owner who is attempting to train his dog, and especially to those whose dogs are attempting to train them."

PLASTICS FOR CORROSION-RESISTANT APPLICATIONS—Raymond B. Seymour and Robert H. Steiner—*Reinhold*, 423 p., illus., $7.50. Development and application of plastics and resins for corrosion resistance introduced a complete new line of tools for the engineer to use in dealing with corrosion.

POLIO AND THE SALK VACCINE—Roland H. Berg—*Public Affairs Committee*, Public Affairs Pamphlet No. 150A, 28 p., illus., paper, 25 cents. "Despite minor shortcomings and some still unanswered problems, the Salk polio vaccine represents a safe, practical method for controlling paralytic polio," is the conclusion of this pamphlet, written by the medical editor of a leading magazine.

PROCEEDINGS: CONFERENCE ON EXPERIMENTAL HEPATOMAS — J. Walter Wilson, Ed. — *Govt. Printing Office*, 233 p., illus., paper, $2.25. Many laboratories in the field of cancer research are devoting a substantial part of their efforts to the study of the experimental hepatoma, or liver tumor, particularly in rodents. Proceedings of a conference held in October, 1954.

THE SCIENCE BOOK OF THE HUMAN BODY—Edith E. Sproul—*Watts*, 232 p., illus., $4.95. To help the layman gain new understanding of the delicate intricacies of the human body and its functioning as a whole.

STUTTERING IN CHILDREN AND ADULTS: Thirty Years of Research at the University of Iowa—Wendell Johnson, Ed., assisted by Ralph R. Leutenegger—*University of Minnesota Press*, 472 p., $5.00. Addressed primarily to professional workers and students, this book contains previously unpublished papers from the University of Iowa's stuttering research program.

THREE TICKETS TO ADVENTURE—Gerald M. Durrell—*Viking*, 203 p., illus., $3.75. A story of adventure in British Guiana, where the author went in search of animals for British zoos.

Science News Letter, September 17, 1955

ANIMAL NUTRITION

Corn Cobs as Diet for Sheep

See errata

➤ SHEEP can be fattened on corn cobs if you pamper their bacteria with fine foods, tests by the U. S. Department of Agriculture's research service indicate.

Sheep, as cattle and goats do, have an "extra stomach," the rumen, where rough feed is pre-digested with the help of bacteria. Normally there are not enough bacteria in the rumen to unlock the large amounts of nutrients hidden in tough materials like corn cobs.

When high-energy concentrate feed is added to a diet of pelleted corn cobs, the bacteria thrive and multiply, increasing in numbers until they digest the roughage.

The USDA scientists found that up to 75% of the main nutrients in roughage could be used by sheep when high-energy foods were added in equal weight.

While they are not as efficiently digested as corn cobs, pellets from low-quality hay and sugar cane wastes could also be used as sheep feed when bacteria are pampered.

Science News Letter, September 17, 1955

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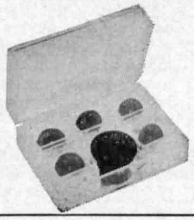

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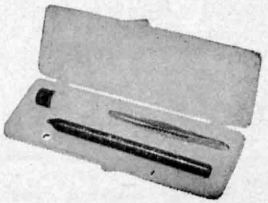

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BIOCHEMISTRY

Unstable Chemicals in Cigarette-Cancer Link

➤ IN SOLVING the problem of whether cigarette smoke causes lung cancer, scientists must consider unstable, "easily excited" chemical compounds of "limited lifetime," Drs. Hermann Druckrey and Dietrich Schmahl point out in reporting experiments at Sloan-Kettering Institute for Cancer Research in New York in *Science* (Sept. 2).

Dr. Schmahl is from the Chirurgischen Universitaetsklinik at Freiburg, Germany.

Fluorescence of solutions of tobacco smoke in benzene or petroleum ether shows, they found, that both stable and unstable compounds exist in the smoke. Unstable compounds account for 90% of the smoke's fluorescence under ultraviolet light.

These unstable compounds may or may not be cancer-causing. Their chemical nature is not known. Because they are unstable, they may break down before the smoke from cigarettes is condensed and they may not all get into the tobacco tars.

Cancer-causing power of smoke condensates and of tobacco tars may, it therefore appears, not give the true picture of the cancer-causing power, or lack of it, in cigarette smoke.

Science News Letter, September 17, 1955

BIOLOGY

Rabbit Chases Snake In Switch of Roles

➤ IF THINGS like this happen in Missouri often, no wonder it is the "show me" state.

Albert Adams, who superintends the Drury wildlife refuge near Mincy, Mo., was sitting on his porch when he heard a commotion in the bushes nearby. Looking over the rail, he saw a six-foot, sleek blacksnake slithering across the yard as fast as it could squirm. Hot in pursuit of the black villain was—a cottontail rabbit.

The rabbit chased the snake out of sight.

What gave a lowly rabbit the courage of a lioness? Mr. Adams discovered a nest of bunnies in the bushes where the fuss had started.

Science News Letter, September 17, 1955

MAMMOLOGY

NATURE RAMBLINGS by Horace Loftin

Mole Meets Atom

➤ UP TO NOW, the mole has been able to keep his secrets pretty much to himself.

Hidden in his labyrinth of burrows beneath the soil, he has defied the curiosity of scientists who would like to know such things as how far and how much he moves in a day, how long are his tunnels, where he rests and what he considers to be his own private territory.

Only when he was imprudent enough to tunnel near the surface, plowing up a "mole hill," did he offer a clue to his wanderings. About the only thing the inquisitive scientists could do was to dig him up and watch him in a cage, obviously not a very successful way to study the natural habits of the animal.

Now the atomic age has caught up with the mole, robbing him of his cloak of secrecy.

Scientists in England have thought up a simple means of tracking the mole all through his daily business, and without him being the least disturbed or aware of the intrusion, by using a radioactive tag and Geiger counter to follow him underground.

First they catch the mole, digging him up as he moves through a mole hill. The mole is tagged with a fine wire containing radioactive cobalt—not radioactive enough to hurt the animal, but strong enough to cause the counter to click when near it.

One problem they met at first seemed to have the scientists stumped. They did not know where to put the wire. His strong fore legs were too large, and his short, stumpy legs were too small.

Happily, they discovered that his tail was smaller at the base than on the end, and a wire ring put there would stay. So the wire went around the mole's tail.

The mole gets over his fright and indignation about a day after his release. He then starts his normal round of activities, unaware that all the time he is giving away long-guarded secrets of the mole tribe as his wanderings leave a tell-tale track of clicks in a Geiger counter.

Science News Letter, September 17, 1955

SOCIOLOGY

Foreign Travel Makes Executive More American

➤ FOREIGN TRAVEL makes the American businessman more American. He becomes less a Bostonian, New Yorker, Californian or Texan. And much-traveled businessmen are more likely to become Republicans than untraveled ones.

These conclusions from a study were reported by Ithiel de Sola Pool, Suzanne Keller and Raymond A. Bauer of Massachusetts Institute of Technology at American Sociological Society meeting in Washington.

The men they studied were heads of American corporations having 100 or more employees. They had made five or more trips abroad, at least one having been in the past five years.

The effect of traveling was broadening in that it led the traveling businessman to give up narrow identification with a particular region or segment of the United States.

Travel did not cause much acceptance of foreign ideas, but did lead to greater attention to foreign events and greater consideration of them in weighing policy.

On foreign trade matters, the attitude of the untraveled was dictated by self-interest of the firm. The traveled businessman, regardless of self-interest, was more likely to take the dominant business view.

Science News Letter, September 17, 1955

PSYCHOLOGY

Movies' Effect Depends On Mood of Audience

➤ WHETHER VIOLENCE in movies and TV programs arouses anger and aggressive reactions in children depends on whether the children are already angry and in a fighting mood when they see the picture.

This is the conclusion from a study of movies' effects on 10- and 11-year-old children. The study was reported by Eleanor E. Maccoby, Harry Levin and Bruce M. Selya of Harvard University, Cambridge, Mass., at the American Psychological Association meeting in San Francisco.

The children were all sixth graders. They were shown a chapter from a serial movie of the spy thriller type, but one group had previously been made angry and resentful. This was done through spelling bees in which one team was consistently given easy words, while the other team was consistently given hard words at about the ninth, instead of sixth, grade level.

The members of the team getting all hard words protested that the spelling bee was unfair. When asked, a week later, what they remembered of the movie, the victims of the unfair spelling test remembered more violent, aggressive scenes than the children who had easy words in the test.

Science News Letter, September 17, 1955

Questions

ENGINEERING—What are advantages of jet engines for passenger cars? p. 186.

□□□

HERPETOLOGY—What is the oldest living snake in the United States? p. 185.

□□□

MARINE BIOLOGY—Where are coelacanths being sought by scientists? p. 182.

□□□

PUBLIC SAFETY—What features are being incorporated in a "dream safety car"? p. 181.

□□□

WILDLIFE—How much money has the United States netted in fur seals since 1910? p. 180.

□□□

Photographs: Cover, Convair; p. 179, U. S. Navy; pp. 181 and 183, British Information Services; p. 186, Chrysler Corporation; p. 192, Jack Corbett.

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 796. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

UNIQUE WALL SWITCH is designed to be seen, but not heard. You can find it quickly in a dark room because it glows. It is quiet because the switch is not an up-and-down flip mechanism, but a dial you twist from left to right for light.

Science News Letter, September 17, 1955

PLASTIC PORTFOLIO is a thin, lightweight carrier of office or school papers. About 11-by-15 inches in size, the portfolio has a toothless plastic zipper. It is available at stationery and department stores in charcoal gray, brown, blue and black.

Science News Letter, September 17, 1955

LIQUID SHOE DRESSING that the manufacturer claims will not rub off contains lanolin and silicon, and is applied directly from the bottle through a sponge-rubber tip. Pastel pink and baby blue are among the eleven colors available.

Science News Letter, September 17, 1955

AMBER LENSES convert auto headlights into foglights quickly and simply. The durable lenses, made of acetate sheeting, slip on and off auto headlights easily. When there is no fog, the lenses can be stored in a compact glove compartment container.

Science News Letter, September 17, 1955

SECOND BASE, shown being slid into by the Cleveland Indians' George Strickland in the photograph, is covered with vinyl plastic instead of conventional canvas. The plastic-covered bags can be washed to keep them white and easy to see.

Science News Letter, September 17, 1955

CHORD PIANO, using especially written music, has a series of colored lights over the keys. When the beginning student plays the right hand melody note, the proper left hand chord is indicated by the lights. The indicators may be removed when the student no longer needs them.

Science News Letter, September 17, 1955

"WEATHER-PROOF" LETTERS for boat names and other outdoor signs will not corrode or rust. They are lightweight and easy to attach with nails or screws, without drilling. The letters' colors are a part of their plastic material and cannot chip or peel off.

Science News Letter, September 17, 1955

HOBBYIST'S TRANSISTOR is a low-priced unit that amateur radio enthusiasts can use to build vest-pocket radios and other small gear. The transistor is the size of a pencil eraser, is all metal and warranted for one year.

Science News Letter, September 17, 1955

Do You Know?

There is a definite possibility that *oceans*, almost virgin territory to scientific investigation, will eventually provide most of the food and energy for the world.

More than five percent of the general population suffers from some form of *allergy*

The favorite food of two tough-looking *lizards* brought from the Sahara Desert is flowers.

In the United States, 5,467,000 colonies of *bees* produced 217,414,000 pounds of commercial honey in 1954.

The direction of initial movement on a seismogram is a clue to the mechanism producing an *earthquake*.

An improved flame-resistant treatment for *cotton* fabric, much superior to previous treatments, has been developed by the U. S. Department of Agriculture.

Research studies are under way to determine to what degree *health* is affected by breathing air pollutants over many years.

A demonstration apparatus that enables men to practice operating a *nuclear reactor* without going near an atomic energy installation has been developed.