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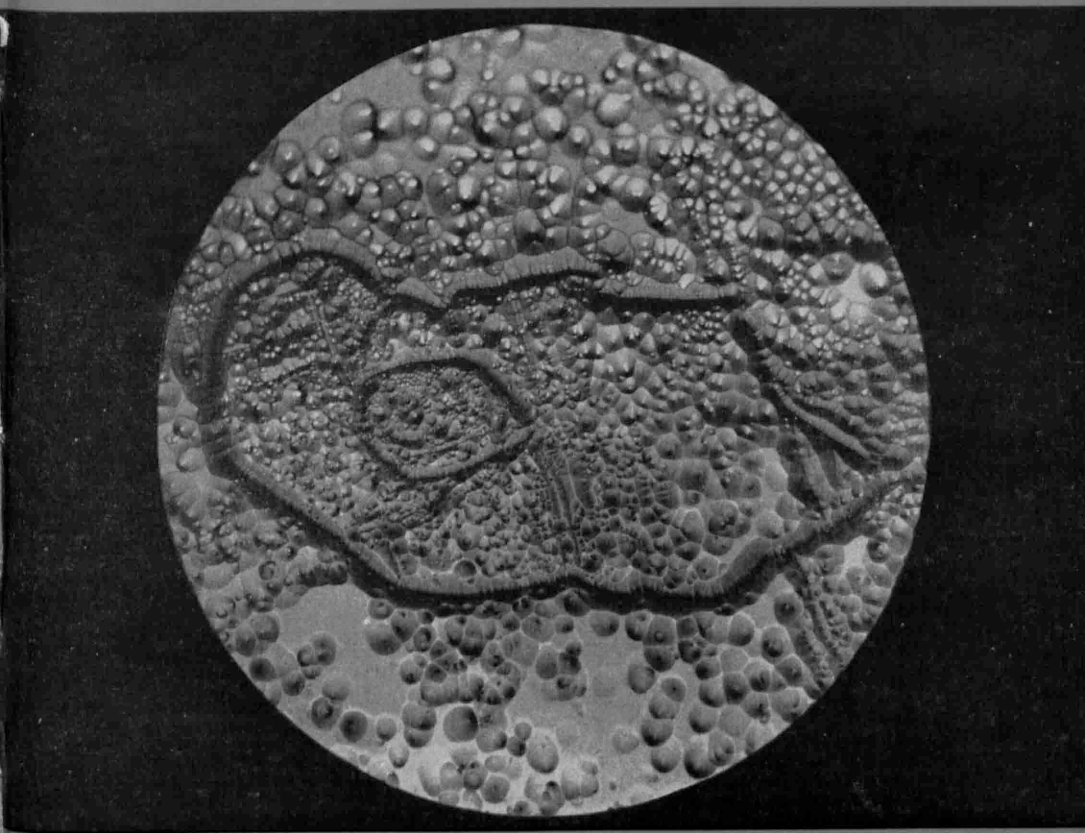
October 8, 1955

VOL. 68, NO. 15 PAGES 225-240

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Etched Germanium

See Page 233

A SCIENCE SERVICE PUBLICATION

Kodak reports to laboratories on:

what every high speed camera photographer should know . . . cementing glass with a fatty acid ester . . . 59 years of radiographic tricks

That new fast film

This picture is obsolete. No longer do fellows need mirrors and auxiliary incandescents to pour on the light when photographing lawn mower cutting action outdoors at 3,000 frames per second. Now they load their high speed cameras with *Cine-Kodak Tri-X C-P Reversal Film.* This is that new fast film that takes a Ph.D. to tell when it's underexposed—in a new version which permits showing the footage as a positive within an hour. (The boss hates to look at a negative.) When not cutting grass, the fellows can also now make their indoor high speed movies without sacrificing camera speed and/or depth of field to make the lighting easier.

The picture is one of the illustrations in a recent Machine Design *article, "High Speed Photography in Product Development," by W. G. Hyzer. This article is so clear and encouraging that a man who sends for a free reprint to Eastman Kodak Company, Graphic Reproduction Division, Rochester 4, N. Y., may wind up buying a* Kodak High Speed Camera.

A push from the Navy

We have made our decision to accord *Cellulose Caprate* official status as an Eastman Organic Chemical, albeit of only Practical Grade.

Certainly we had no thought of putting on a push for this casual effluent of basic research on cellulose chemistry; we can think of other things that would do our shareowners more good. The push, rather, came from the Navy, which had a hunch that one or the other fatty acid ester of cellulose might melt to a thin liquid below 250 F and still show little or no cold flow at 160 F. If so, and if a good many other if's could be satisfied, it might prove to be a better optical cement than polymerizing resins, which tend to go through a volume change as they set. We had the assortment of esters and the Navy chemists had the perseverance. After a while, the finger fell on *Cellulose Caprate,* painstakingly purified and properly plasticized.

It gives the Navy everything it wants in an optical cement for rugged service, except that the index of refraction can't seem to go any higher than 1.493 (which gives a little Fresnel reflection against glass) and it is not fungistatic (though vicious tropical fungi don't thrive nearly as well on it as they do on good old-fashioned Canada balsam).

As Eastman P7137 it needs to be put through a purification procedure, such as described in Naval Research Laboratory Report No. 4242. The report erroneously names a sister division of ours as suppliers of Cellulose Caprate *rather than Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company). And, we stock some 3500 other organic chemicals.*

The soft x-ray

Because so many professional opinions on periodontoses, pelves, porosities, and the like are reached from observations on our x-ray film, we find ourselves with the resources to do little things for our friends, who are legion.

For example, a bibliography on soft x-ray microscopy, microradiography, electron radiography, and geometric x-ray microscopy.* It lists every paper and article on those subjects known to us, except that unlike our bibliographies of vitamin E, this is not annotated. The arrangement is alphabetical by authors, whether they be of the industrial, medical, metallurgical, botanical, zoological, entomological, or fine arts persuasions or just plain physicists.

The earliest reference was published April 13, 1896, in *Comptes rendus hebdomadaires des séances de l'Académie des sciences* by F. Ranwez under the title, "Application de la photographie par les rayons Röntgen aux recherches analytiques des matières végétales." The most recent is dated August, 1955, and deals with electron radiography in the investigation of postage stamps. Among the 350-odd items that lie between these two, you will find "Ueber Weichstrahlaufnahmen mit der Gleichspannungsmaschine 'Trifas' der Elektrizitätsgesellschaft 'Sanitas' " (H. Chantraine, *Fortschritte auf dem Gebiete der Röntgenstrahlen vereinigt mit Röntgenpraxis, 38:* 534-541, September, 1928) and "**Микрорентгенография**" (С. В. **Гречишкин,** *Вестник рентгенологии и радиологии, 20:* 397-408, 1938).

Sending out free copies of the microradiography bibliography is easy for Eastman Kodak Company, X-ray Division, Rochester 4, N. Y. We'll go beyond that. If you'll give us the details of your problem, we'll do our best to answer questions about the use, handling, and behavior of sensitized materials in experimental radiographic work. But you wouldn't want us to do your research for you, would you?

*For the casual reader:

Soft x-rays are those of wavelength longer than about 0.25 Å. They are so easily absorbed that exceedingly thin or low-density materials, quite transparent to the ordinary x-rays of the healing arts, cast informative shadows. If the shadows are of microscopic details, if they are caught on very fine-grain film in close contact with the specimen, and if this film image is greatly enlarged in printing, that is *microradiography.* A switch in this technique is to use hard x-rays (wavelength shorter than 0.050 Å) that can knock electrons out of a sheet of lead and let differences in absorption of the electrons by the various parts of the specimen tell the story on film. This is *electron radiography.* Still another way of doing x-ray microscopy is to use a very tiny but intense x-ray source and keep it so close to the specimen that it casts greatly enlarged sharp x-ray shadows on the film, which can then be even further enlarged in projection printing. This is *geometric x-ray microscopy.*

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are . . . *serving laboratories everywhere*

Kodak
TRADE-MARK

CARDIOLOGY

Heart Victims Survive

The odds are two to one that victims of heart attack of the kind suffered by President Eisenhower will recover. Survival affected by age rather than sex.

➤ TWO out of three people who suffer a heart attack such as struck President Eisenhower are able to go back to moderate or complete activity, a recent survey of heart patients has shown.

Contrary to popular opinion that heart attacks usually mean early or sudden death, about three-fourths, or 77%, recover from a first attack.

Of those who survived the first two months, the average survival time was eight years, with 10% of the patients still alive at the end of 15 years.

Age rather than sex affects survival after a heart attack. The ones in the group surveyed who lived 10 years or longer were on the average some six years younger at the time of their first attack than those who died within two months.

When heart attacks come while the patient is resting or asleep they are more serious and have a less favorable outlook than those that come during or after exercise or emotional stress.

Coronary occlusion, which attacked the President, is the kind of heart trouble in which one of the arteries supplying the heart muscle with blood is blocked.

Doctors also call this condition coronary thrombosis and myocardial infarction. The most frequent cause is atherosclerosis. This condition causes more than half of all deaths due to heart and blood vessel disease.

Normally the lining of all arteries is smooth, so the blood can flow easily and steadily to all parts of the body. But in atherosclerosis little spots filled with a fat-like substance called cholesterol form along the artery walls.

These spots roughen and narrow the channel, or bore, through which the blood must flow. If the flow of blood is slowed so much that a clot forms, the artery may be completely closed.

The pain of a heart attack comes because part of the heart muscle is deprived of blood and consequently of oxygen.

Complete rest, physical and mental, is essential in treatment of an acute heart attack. Morphine or other medicine is usually given to relieve pain. Oxygen is given in all moderate or severe cases. This helps relieve pain, trouble in breathing and slows the heart rate.

The period of complete rest after a heart attack is usually four to six weeks. After that, in uncomplicated attacks, the patient may be allowed to sit in a chair for increasing periods. But he continues to rest for three to four months in most cases.

Various medicines are given at various stages of the illness. These include aminophylline, atropine and digitalis. The diet at first is light, consisting of fruit juices, milk, ice cream, eggs, toast and custards and the like.

When one of the heart's arteries has become clogged, other blood vessels may in time take up the work of supplying blood to the affected area. In the normal heart there are many very small communications between arteries.

These may enlarge and take over the work of the blocked artery so that very little of the heart muscle tissue is deprived of nourishment. If the tissue is deprived of nourishment from the blood for long, it dies.

Red Blood Cell Test

➤ ONE of the tests President Eisenhower's physicians may use to help determine when he can be allowed to sit in a chair and later to start more activity is a blood test known to scientists as the erythrocyte sedimentation test.

This test shows how fast the red blood cells, or erythrocytes, fall to the bottom of a tube of blood. This rate is almost always high within the first three or four days after a heart attack, even when the symptoms are mild.

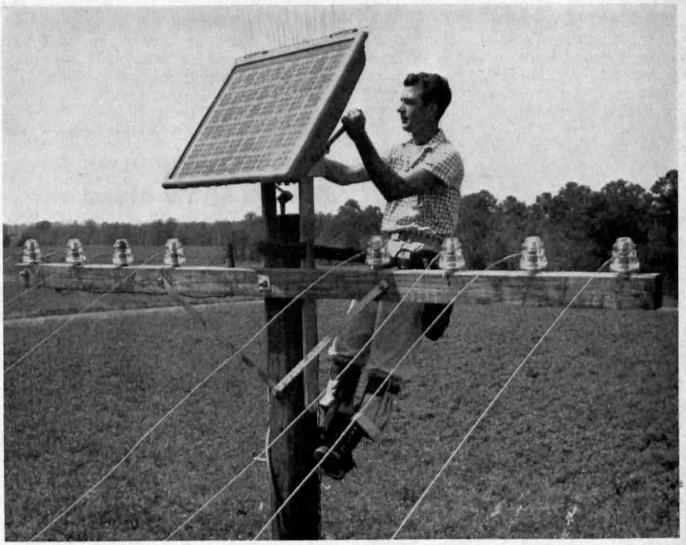
A return to normal, or to the rate before the attack if that is known, is considered a favorable sign. But if the rate continues high, doctors are cautious about letting the patient out of bed. A continued high rate, if there is no other cause, is a sign of continued death of heart muscle.

Embolism Is Complication

➤ AMONG the most common and dangerous complications of a heart attack are what doctors call thromboembolic episodes.

This means that the original thrombus, or clot, that stopped an artery supplying part of the heart muscle may extend, blocking important branches of the artery. Or a piece may break off and block another artery. In either case a larger area of the heart muscle would be damaged.

Little clots may break off and travel to the lungs, blocking a blood vessel in them. This condition is called pulmonary embolism, and it occurs fairly often in cases of myocardial infarction, or coronary thrombosis.



SOLAR BATTERY USED—For the first time, the sun has been used to furnish power directly to a telephone line. Use of solar power is part of experiments being conducted by Bell Telephone Laboratories near Americus, Ga., to develop better rural telephone service. B. W. Kennon, a Southern Bell Telephone Company cable repairman, is adjusting the device to pick up light. (See SNL, July 9, p. 19.)

Rupture of the heart accounts for about 10% of all deaths during the acute stage of a heart attack. It usually happens without warning between the fourth and fourteenth days after the beginning of the heart attack. It is particularly likely to come in patients who previously had high blood pressure.

In the first four weeks also there may come such complications as stopping of the heart, and irregular and rapid heart action.

Congestive heart failure is another complication doctors watch for. This condition gets its name because congestion of the veins is a prominent feature. The congestion may be in veins in internal organs and would then interfere with their functioning.

Although these complications may come, sometimes with little or no warning, the danger of them grows less as the days and weeks go by. Patients who survive the third week generally recover.

Science News Letter, October 8, 1955

ASTRONOMY

Find Bright Comet Splits into Two

➤ A SPLIT COMET, an astronomical event only observed about once a decade, has been spotted by Dr. Elizabeth Roemer, astronomer at the University of California.

The object is Comet Honda, discovered by a Japanese astronomer (see SNL, Aug. 13, p. 108).

Astronomers observing the comet reported it brightened on Sept. 3 and 4. Dr. Roemer detected the comet's splitting on photographs taken Sept. 20 with the 36-inch telescope at the University's Lick Observatory at Mt. Hamilton.

The comet appears almost like a fuzzy double star, with two nuclei. It is no longer visible to the naked eye, but can be seen through small telescopes in the constellation of Corona Borealis, the northern crown, in the western sky immediately after dark.

Comet Honda was about 100,000,000 miles from the earth on Sept. 20.

California astronomers will observe the comet as long as possible in an effort to compute the orbits of the two tails, which will reveal the point at which the split occurred. The fission may have taken place at the time of reported brightening.

Severe stresses within the comet, probably a result of the object's passing close to the sun or a planet such as Jupiter, caused the splitting.

Science News Letter, October 8, 1955

PHYSICS

Australian Atomic Tests

➤ TWO SERIES of atomic weapon tests by the British will be held in Australia next year.

The first will be in April at the Monte Bello Islands, off northwest Australia, and the second will be at the new Maralinga proving ground, north of the Trans-Australian railroad and 500 miles west of Woomera.

These will be the third and fourth series of atomic tests in Australia. The first was at Monte Bello islands on Oct. 3, 1952, and the second was at Emu Field on the Woomera rocket range, on Oct. 14, 1953.

Scientific director of the new series will be C. A. Adams, who was deputy director at the first tests at Monte Bello and the scientific superintendent for the Emu Field tests under Sir William Penney, Britain's top atomic scientist. The Maralinga tests will be under the scientific direction of Sir William.

Minister for Supply Howard Beale has announced that no test would exceed "a few tens of kilotons in yield and some would be smaller." A kiloton is equal to 1,000 tons of TNT.

He said there would be no danger to people or stock, and a safety committee of Australian scientists would make an independent estimate of the fallout patterns, before giving permission to fire.

Canberra reports state that the Maralinga tests will include guided missiles with atomic warheads.

The guided missile program at Woomera earlier this year reached the state where missile prototypes were undergoing final trials.

Observers point out that Mr. Beale's emphasis on the smallness of the explosions could mean they will try out the efficiency of new bomb detonating systems, or test a number of atomic weapons other than bombs.

Prof. M. L. Oliphant, atomic scientist of the Australian National University, said Mr. Beale's statement definitely ruled out any possibility the explosions would be of an H-bomb, but did not exclude the possibility that the atomic devices could be a trigger-mechanism for the H-bomb.

Prof. Oliphant said previous atomic explosions in Australia had been equivalent to about 20,000 or 30,000 tons of TNT. The term "a few tens of kilotons" suggested the new tests would be about the same size.

It is understood that United States observers will not attend the tests.

Science News Letter, October 8, 1955

MEDICINE

X-Rays Show Blood And Iron in Lung

➤ X-RAYS can show surgeons about to operate on the heart whether blood and iron deposits have seeped into the lungs before the operation, Dr. Edwin L. Lame of Presbyterian Hospital, Philadelphia, reported at the American Roentgen Ray Society meeting in Chicago.

The blood and iron deposit condition is called hemosiderosis. It is quite benign in itself, but shows there has been prolonged and severe heart valve disease resulting in the narrowing of an opening between two chambers of the heart. Surgeons are now able to correct the condition by an operation called mitral commissurotomy.

The iron and blood deposits, Dr. Lame said, need not prevent the operation. Although marked deposits occur in the more severely ill patients, the deposits themselves do not give any information at present about the outcome of the heart condition and the operation.

Science News Letter, October 8, 1955

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MEDICINE

Purple Color Test Detects Unusual Tumor

➤ A PURPLE COLOR in a simple test tells whether or not the patient has the unusual tumor called metastatic carcinoid, three National Heart Institute scientists reported in the *Journal of the American Medical Association* (Sept. 24).

The tumor originates in the small intestine and spreads to other abdominal organs, especially the liver. Its symptoms may mimic rheumatic heart disease, allergies, liver disease, dysentery and menopause, as well as other conditions.

The heart valve damage that accompanies the disease is of especial interest to the scientists because study of it may give information about other heart valve damage.

The test for detecting the tumor and helping to make a positive diagnosis depends on the fact that in this condition much greater than normal amounts of a body chemical, serotonin, are produced.

Serotonin is found in the brain, as well as in other body tissues and blood. It has an anti-shock effect and contracts smooth muscles. Because anti-serotonin chemicals cause symptoms like those of mental disease, a deficiency of serotonin in the brain has been suggested as a cause of mental illness.

Metastatic carcinoid patients who produce as much as 100 times the normal amount of serotonin daily therefore give scientists an unusual opportunity to study the production and fate of this chemical.

Probably many cases of this tumor exist but have not yet been diagnosed, the scientists state on the basis of their experience of seeing five cases within a few months.

The scientists who developed the test for the tumor are Drs. Albert Sjoerdsma, Herbert Weissbach and Sidney Udenfriend.

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SURGERY

"Sleepy Rabbit" Helps Ready Child for Surgery

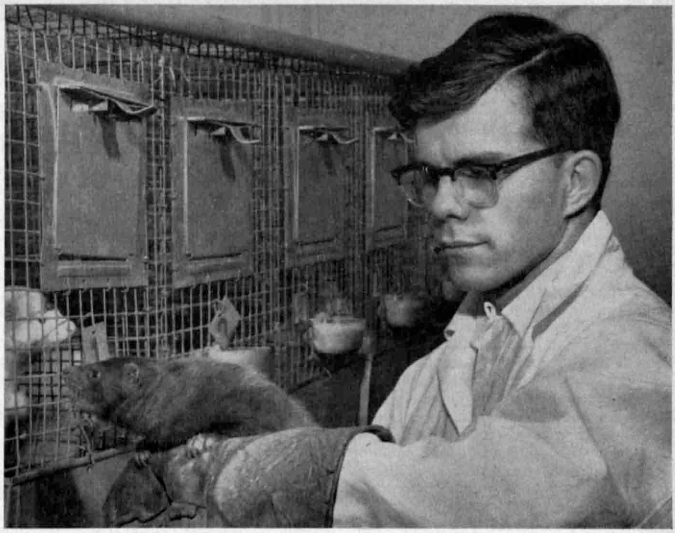
➤ "SLEEPY RABBIT" helps many youngsters take the anesthetic before an operation, Dr. Jack D. Stringham, anesthesiologist, and Dr. Thomas Ray Broadbent, plastic surgeon, of the University of Utah College of Medicine, Salt Lake City, told the American Society of Plastic and Reconstructive Surgery meeting in Atlantic City, N. J.

"Sleepy rabbit" is a toy through which the anesthetic agent flows. A nervous, jumpy child calms down while watching the rabbit get sleepy and soon the child himself falls quietly asleep.

The toy is among measures advised to avoid emotional upset and decrease anesthetic risk in operations on young children.

Important among these measures, the doctors said, is telling the child beforehand just what the procedures will be that lead up to the time of unconsciousness.

Science News Letter, October 8, 1955



GLUTTONOUS MINKS—Research at the University of Wisconsin has added new evidence to the old that minks are heavy eaters, consuming a third of their weight a day in meat or its equivalent. To protect him from the animals, William Leoschke needs the heavy gloves he is shown wearing.

GENERAL SCIENCE

National Science Fair

➤ ONE of the nation's youngest states is preparing to greet some of the nation's youngest scientists.

The program for the Seventh Annual National Science Fair to be held in Oklahoma City next May has been announced by Science Clubs of America.

Probably more than 200 boys and girls, representing over 100 areas throughout the United States, will vie for national honors at the annual event in Oklahoma City. When the teen-aged scientists display their award-winning scientific projects, Oklahoma City will be on scientific display.

The program will include visits by the fair finalists to:

The University of Oklahoma for demonstrations and displays concerning cosmic rays, radioisotope autographing, petroleum microbiology and other topics.

Tinker Air Force Base, where the world's longest engineering line for aircraft modification and maintenance is located.

The Oklahoma Medical Research Foundation, the first of its kind in the Southwest, to view scientific attacks on cancer, arthritis and heart diseases.

Armour & Company and Wilson & Company for the complete process of a packing industry from "hoof" to "table."

The Oklahoma City and West Edmond oil fields, where a man-made "earthquake" will be set off.

WKY-TV to see the country's first independent station to transmit color.

Oklahoma Historical Society Museum, rich in relics of Indian history and lore.

Southwestern Bell Telephone to view the latest in the communications field.

The National Science Fair is the culmination of hundreds of local science fairs held in the spring throughout the United States. Thousands of boys and girls are now working on experiments and exhibits for the fairs.

The national event is run by Science Clubs of America, administered by SCIENCE SERVICE, along with the local fair sponsors that include newspapers, radio and TV stations, colleges, medical, engineering and scientific societies, industries and local civic groups.

In addition to the 71 areas represented at the Nationnal Fair last year, at least eight new regional fairs will be held. These are: Topeka Regional Science Fair, Topeka, Kans.; Greater Baltimore Science Fair, Baltimore, Md.; Prince Georges Science Fair and Congress, Hyattsville, Md.; Montgomery County Science Fair, Rockville, Md.; Worcester Regional Science Fair, Worcester, Mass.; Montana Science Fair, Missoula, Mont.; Westchester Science Fair, White Plains, N. Y., and Arlington County Science Fair, Arlington, Va.

Science News Letter, October 8, 1955

TECHNOLOGY

Prepare Now for Winter

To save money on repair bills this winter and for more comfortable living, experts urge preparing houses now to minimize damage by winter weather.

➤NOW IS the time to prepare your house for the winter onslaught of snow, ice and cold, building experts in Washington advise.

Homes subjected to hurricanes and heavy rains should receive more attention than normal.

Here is the experts' advice to save the homeowner repair bills this winter and provide more comfortable living:

If you have a gas furnace, do not wait for the first cold spell to light the pilot. The spigot may be carboned or jammed and most likely the first few cold days will be spent without heat. Gas companies are flooded each year with pilot light service requests. Light it now and avoid service trouble.

If you have a forced warm air heating system, check the filters, dust out the vents, and oil the blower and motor, using just a few drops of oil to keep from over-lubricating.

Other types of heating systems should receive a thorough check after being idle during the summer months.

Insure against moisture damage, which the experts point out is becoming a major problem. Houses are being constructed tighter to keep in the heat. The moisture that builds up in a house is also kept in, and can damage woodwork and window frames, or blister ceilings.

Water found in attics during the winter is more often caused by this moisture condensation than by leaky roofs. To prevent moisture condensation, weather strip attic doors to keep moisture from downstairs out of the cold attics. Also be sure there is no leakage elsewhere into the attic. Easy-to-apply metal and plastic stripping is available.

Tight storm windows will help prevent moisture from soaking into window frames.

Another aid in keeping down moisture condensation is to cut down on the amount produced in the home. One of the worst moisture-makers, experts state, is the unventilated laundry drier. Water from washed clothes is converted into water vapor that saturates the house and condenses in cold areas.

Like an overcoat for humans during the cold months, an outside coat of paint helps keep houses warm and comfortable. If the outside of a house has not been painted for five years, it deserves a coat before the cold sets in. Two coats are recommended. As added protection, the paint will help both wood and masonry last longer under the beating of the elements.

Here are some painting do's and don'ts:

1. Do not paint after a heavy rain.
2. Do not paint early in the morning.
3. Let the sun dry the exterior.
4. Do not paint in a strong wind.
5. Fill in all cracks before painting.
6. Scrape and sandpaper rough spots.
7. Caulk joints and openings around doors and windows.

Other pointers for your pre-winter house check-up should include checking your chimney, emptying water pipes outside the house, and repairing steps and sidewalk.

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BIOPHYSICS

Lung Cancer Outlook Is Called Grim

➤ THE OUTLOOK for lung cancer patients is grim, even when one-million-volt X-ray treatment is given, three X-ray specialists from Memorial Center for Cancer and Allied Diseases, New York, reported at the American Roentgen Ray Society meeting in Chicago.

The specialists are Drs. James J. Nickson, Eugene E. Clifton and Henry Selby.

Of 115 patients treated with super-voltage X-rays, only one, with less extensive Stage II lung cancer, survived more than 18 months.

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PHYSIOLOGY

Serious Trouble Possible From Pain in the Neck

➤ SERIOUS TROUBLE later may result from one kind of pain in the neck, Dr. George Jacobson of Los Angeles warned at the American Roentgen Ray Society meeting in Chicago.

The pain in the neck he reported is one that comes from injury in which there is dislocation of the atlanto-axial joint at the very top of the neck. The dislocation is one that interferes with proper turning of the neck. The injury usually comes from an auto accident.

To diagnose the trouble by X-rays, the neck has to be moved and partially rotated before each picture is taken.

In cases so far reported, most of the patients have fully recovered.

In a few, however, the dislocation has persisted. Chronic degenerative changes may develop in these cases, Dr. Jacobson thinks. He advises careful and prolonged follow-up to determine the eventual outcome.

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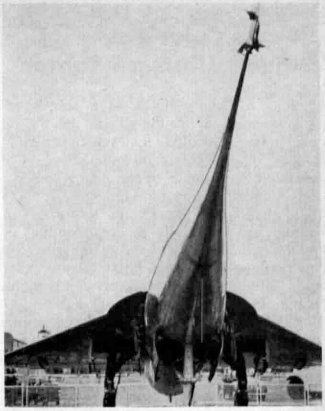

"DROOP-SNOOT" — Nose of the Fairey Delta 2, a single-seat delta-wing research aircraft, can be lowered, rather like a drawbridge, to give the pilot a good forward view for landing, take-off and taxiing. "Droop-Snoot" is the second British aircraft capable of supersonic speed in level flight. It is powered by a Rolls Royce Avon jet engine.

ZOOLOGY

Study Giant, Poisonous Colorado River Toad

➤ A NEW SUBJECT for writers of horror tales is the giant toad that can squirt deadly poison and devour small mammals.

The amphibian, known as the Colorado River toad, or *Bufo alvarius,* is native to the Colorado basin in Arizona and California.

It is being studied in a laboratory aquarium by James Vial and Joseph Hanson, University of California at Los Angeles zoologists, to learn more about its little-known habits. The Colorado River toad has a body up to six and three-fifth inches long, and is nearly a foot long when fully outstretched.

The animal has glands on the back of its head that are a prolific source of potent poison. With a little prodding, it can squirt its poison some distance.

The scientists are trying to determine whether the animal normally uses the poison defensively in a spray technique. It has been reported that the substance forms a poison gas when squirted. But experiments in a tiny gas chamber with a skunk, which is thought to be a natural predator of the toad, have failed to prove the toad's poison is effective as a spray.

Apparently, however, the toad merely releases the poison in an animal's mouth after it has been picked up, causing the animal to spit the toad out. The poison is deadly when ingested.

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SURGERY

First Civilian Skin Bank

Skin from deceased persons can be used successfully for grafts, allowing time for severely burned patients to grow their own skin. First civilian skin bank established.

➤ SUCCESSFUL USE of skin from recently dead bodies for grafting and establishment of the first skin bank in a civilian hospital were announced at American Society of Plastic and Reconstructive Surgery meeting in Atlantic City, N. J.

The news came in a report by Drs. James Barrett Brown, Minot P. Fryer and Thomas J. Zaydon of Washington University School of Medicine, St. Louis. They urge establishment of similar skin banks in hospitals elsewhere.

"We believe that there is no longer any need for live donors of skin for severely burned persons," they said. "A skin bank has been established which can meet most demands for skin at any time. Similar skin banks could be started in hospitals of any size or by the Armed Services."

In the event of civilian disaster or a national emergency, or with large military requirements, they pointed out, unlimited amounts of banked skin could be decisive in saving many lives.

Stored postmortem homografts, that is, skin taken from a recently deceased person and preserved, provided a temporary biological covering that was often life-saving to persons with extensive burns, they reported.

Although skin grafts from donors do not "take" permanently, they last from 10 to 30 days, until the patient is well enough to have raw areas of his body covered with his own skin.

In St. Louis, thin sheets of skin were removed from unexposed areas of the body, after permission was secured from the nearest relative. The grafts available from one postmortem donor equaled those from a large group of live donors without the personnel and expense of multiple operative procedures or the discomfort, wound care and time loss.

When stored at ordinary refrigerator temperatures, postmortem skin can be used as long as three weeks after removal. It can be stored for periods ranging up to six months, if other methods, some still in an experimental stage, are used.

These include freezing at temperatures as low as 79 degrees below zero, and freeze-drying, which allows the dried skin to be stored on a shelf at room temperature.

Because skin grafts from a donor do not last permanently, a search is now in progress to find a synthetic or other natural material that will give similar temporary covering for severely burned persons. Studies to discover a means by which grafts will survive permanently are also under way, but permanent "takes" have so far only succeeded between identical twins.

The possibility of growing skin cells in the laboratory by tissue culture methods is in a preliminary stage of research.

Science News Letter, October 8, 1955

ULTRA-LIGHT HELICOPTER— This plane is powered by compressed air supplied to pressure-jet units at tips of two-bladed rotor. Pilot and observer sit facing forward or aft with a 360 degrees field of vision. The helicopter can be transported on a three-ton truck.

AERONAUTICS

Trees, Fences Prove Small Plane Hazard

➤ TREES AND FENCES are as much a hazard for small airplanes as they often prove to be for small boys.

A study of small-plane accidents during August showed that ground objects are responsible for more accidents than any other type of mishap, the Civil Aeronautics Administration has reported.

"As usual," the agency announced, "most of the accidents could have been prevented if pilots had followed good operating practices. Experience offered no immunity to accidents; pilots with long experience contributed to some of the most easily avoidable incidents set forth in the accident reports."

Science News Letter, October 8, 1955

SURGERY

Use Tissue Sponge to Soak Up Dropsy Fluid

➤ WHEN DROPSY fluid accumulates in the abdomen, as in liver and kidney diseases, doctors may in future be able to provide sponges of body tissue to soak up the fluid.

This new treatment, successful in laboratory animals but not yet tried in humans, was reported by Drs. Charles Neumann, J. William Hinton and Nina Braunwald of New York University-Post Graduate Medical School, New York, at American Society of Plastic and Reconstructive Surgery meeting in Atlantic City, N. J.

The sponge is made of a few inches of small intestine. The inner surface of the intestine is normally absorbent. So the small piece is removed from the body, split open, thoroughly sterilized and the inner absorbent surface attached to the peritoneum which lines the abdomen.

Dogs treated by this method have remained well and free from dropsy for periods up to six months. Since about a quart of fluid accumulates weekly in the abdomens of dropsical dogs not given the sponge treatment, the doctors believe the piece of intestine is absorbing a quart of fluid each week in the treated dogs.

Humans with dropsy in the abdomen, called ascites, are treated now by tapping the abdomen to remove the fluid. In some cases as much as 10 to 15 quarts must be removed every two weeks. This treatment unfortunately deprives the body of life-supporting substances in the fluid.

Science News Letter, October 8, 1955

SURGERY

Horns in Girl's Neck From Embryo Gills

➤ THE CASE of a nine-year-old girl who had "horns" on both sides of her neck was reported by Dr. Verner V. Lindgren of the University of Oregon Medical School, Portland, at the American Society of Plastic and Reconstructive Surgery meeting in Atlantic City, N. J.

The horns are probably remnants of gills. During the early stages of pre-birth development, human babies have gills like a fish. Sometimes when these gills disappear, as the embryo baby develops, cysts develop where the gills were. When the cysts remain after the baby is born, they look like small horns.

The little girl reported on had such horns, each about a half inch long. Dr. Lindgren removed them.

Five generations of this child's family, Dr. Lindgren said, were born with similar horns. The youngster's mother had them, as did eight other family members, all of them female except two. The nine-year-old and one other member of her family had horns on both sides of the neck. In other cases, the condition appeared on one side only.

Science News Letter, October 8, 1955

DENTISTRY

New Theory Gives Acids Anti-Tooth Decay Role

➤ FERMENTATION ACIDS in the mouth may help prevent tooth decay instead of causing it.

This theory of tooth decay is announced by Dr. Albert Schatz, co-discoverer of streptomycin, and Dr. Joseph J. Martin, both of the National Agricultural College, Doylestown, Pa.

The theory hints that ammoniated dentifrices designed to check decay by neutralizing mouth acids may actually have the reverse effect of promoting decay.

The Schatz-Martin theory of tooth decay revives one developed by another scientist in 1906. According to both theories, it is not the acid-forming lactobacilli that cause tooth decay but another kind that attack the keratin of the teeth rather than the minerals in the enamel.

Failure of dental bacteriologists to find such bacteria caused the 1906 theory to be abandoned, but now Drs. Schatz and Martin have discovered bacteria which fit the theory.

Besides discovering such bacteria, the two scientists have modified the theory in the light of modern knowledge of chelating substances. These chemicals, used in water purification among other places, are compounds linked into a lattice that can trap other chemicals and hold them for a time.

The tooth decay process, they think, is a naturally occurring chelating process in which the chelating chemicals found in the body might help transport mineral matter ordinarily insoluble.

This process might go on along with the bacterial breakdown of keratin, resulting in tooth decay.

The lactobacilli might appear as a result of this process, and the acid they produce may check the destructive action of the newly discovered organisms.

The Schatz-Martin theory is presented in detail in the *New York State Dental Journal* (Oct.).

Science News Letter, October 8, 1955

TECHNOLOGY

Government in Only Insurance End of Atom

➤ TAKING GOVERNMENT out of all business except the insurance business on atomic reactors was advocated by Francis K. McCune, vice president and general manager of the atomic products division of General Electric Co., at the First U. S. Trade Fair of the Atomic Industry in Washington.

Atomic energy reactors for the European market will give U. S. industry a "shot in the arm," for the European market is "wide open right now," Mr. McCune said. "But it is imperative that information not be just declassifiable, but positively unclassified."

It is not reasonable, he believes, to sell Europeans a reactor, but keep secret the information needed to run it.

The people of Europe are not lacking in scientific understanding, Mr. McCune emphasized. What they lack, which United States industry can give them, is experience and experienced people.

As they learn the complex business of atomic power, they expect to apply their own abilities to further development of reactor technology. The time interval will allow U. S. industry to prepare itself to meet the "tremendous market coming up."

Insuring against the chance of a potentially devastating disaster is too great for one insurance company to underwrite, even though such a disaster is extremely unlikely. The General Electric Co. believes, therefore, this phase of the new business of atomic energy should be undertaken by the Government, in the same way that it undertook War Risk Insurance.

The Trade Fair of the Atomic Industry was held in connection with the Annual Forum on Commercial and International Developments in Atomic Energy. Many of the exhibits have been brought back from the international exhibit held at Geneva in August, to give Americans a chance to see the latest commercial developments in materials and instruments for atomic power.

Some of the material shown at the "little Geneva on the Potomac" may later be shown in other cities, especially in industrial parts of the United States.

Science News Letter, October 8, 1955

AERONAUTICS

Commercial Helicopters To Be "Strange Animals"

➤ HELICOPTERS may be used routinely in ten years to carry passengers to and from big city airports, but these helicopters will differ from battlefield helicopters or those that snatch people from flood waters.

They will not hover, and they will not take off and land "straight up and down." Neither will they fly sideways or back up.

Thomas M. Sullivan, head of aviation planning for the Port of New York Authority in New York, predicts that hovering and vertical take-offs and landings will be eliminated because of the economics and safety aspects of operating helicopters commercially.

Basing his predictions on an extensive study completed recently by the Port Authority, he said big city heliports of 1965 will measure 200 by 400 feet.

This landing area still is small when compared to the acreage required by conventional airplanes, but it suggests fewer rooftop heliports on downtown office buildings than supposed.

Commercial 'copters will use relatively flat approaches and take-off angles. This will make larger landing fields mandatory. The future heliport likely will be on the ground or on top of its own one- or two-story building.

Science News Letter, October 8, 1955

IN SCIEN

TECHNOLOGY

Moving Sidewalk Has Escalator Treads

➤ A MOVING SIDEWALK with cleated escalator treads has been developed by the Otis Elevator Company.

The ramp can be made as long as desired. It can climb mild inclines of about 14 degrees and travel at 180 feet a minute or over two miles an hour.

Designers foresee use of the moving platform, called "Trav-o-lator," for such congested areas as airports, subway stations, railroad and bus terminals, shopping centers and sports arenas. In the future, it might be used in tunnels under traffic intersections.

Two ramp models will be available. One, 32 inches wide that can accommodate an adult and a child side by side, will carry up to 7,500 passengers an hour. The 48-inch size will accommodate two adults side by side and will transport up to 12,000 persons an hour.

The company decided to use metal-treaded platforms after experimenting with other materials and designs. A. W. Paulson, chief engineer for Otis, said.

A prototype of the "Trav-o-lator" has been demonstrated publicly for the first time at the company's factory in Harrison, N.J.

Although high speeds are theoretically possible with the new ramp, velocity will be governed by the site and human safety requirements.

The system is described as safe and efficient. It may remove many present restrictions on spacing and location of buildings, shopping centers and airports, allowing architects of the future to create new designs.

Science News Letter, October 8, 1955

BIOCHEMISTRY

Mumps Virus Reproduces In 14 Hours on Eggs

➤ MUMPS VIRUS reproduces, making more mumps virus, in about 14 to 17 hours in the yolk sac of fertile eggs, Dr. H. L. Wolff of Leyden, The Netherlands, has discovered.

The gain in infectiousness after this period is about 30 times that of the initial amount of virus.

Heretofore, scientists have known little about the reproductive cycle of this virus, largely because it took so long for the virus to be absorbed by the cells of the yolk sac. The method Dr. Wolff worked out to overcome this difficulty is reported in *Nature* (Sept. 24).

Science News Letter, October 8, 1955

E FIELDS

ACOUSTICS

Engineers Setting Up Unique Sound Library

➤ A "LIBRARY OF NOISE" is being built by engineers at Fort Wayne, Ind., using a soundproof room 50 times quieter than the average suburban home in the dead of night.

The unique collection of recordings will be used to compare the scratches, screeches and squawks from machines in order to help analyze and reduce these noises.

Recordings of the slightest murmur of electrical transformers are part of the rare noise collection. The sounds are recorded on charts and graphs that reveal the entire spectrum of the noise.

A sneeze, for instance, is not a simple thing acoustically. Depending on who sneezes, the noise might contain peaks at several dozen frequencies, some of which are not audible to the human ear.

The sound laboratory, developed by General Electric Company, is constructed so that its walls are not parallel to any adjacent structure. This prevents outside noise from reflecting back and forth between the laboratory and other buildings, and also keeps extraneous noises outside the lab.

Inside the laboratory, the sound chamber, literally a room within a room, floats on steel springs and rubber shock absorbers to keep ground vibrations from entering.

Science News Letter, October 8, 1955

GEOPHYSICS

Interference Slated for Mobile Radio Stations

➤ MOBILE RADIO FACILITIES, such as police, fire department and forest conservation stations, are in for a mounting onslaught of radio interference in the next five years, the chief engineer of the Federal Communications Commission has reported.

The expected wave of interference, Edward W. Allen said, might also affect television reception, with TV sets picking up the ghostly images from stations more than 2,000 miles away.

Reason for the interference is the approaching peak in sunspot activity expected in 1957-58. High sunspot activity, Mr. Allen said, will make a layer of air in the upper atmosphere known as the F-2 layer reflect back to earth signals that would ordinarily beam into space.

A typical mobile station with a 60-mile range might reach only 24 or perhaps even 12 miles on bad days. Receivers beyond that distance would blare out only voices being broadcast thousands of miles away.

This interference would occur mostly during the daytime when the F-2 layer is exposed to the direct rays of the sun. It would be experienced most in the 30- to 50-megacycle range, just below the television frequencies.

On days of unusually severe sunspot activity, television also might be affected, primarily channels 2, 3 and 4.

The FCC has been preparing mobile operators for the onslaught of interference by allotting safer frequencies to the more important mobile operations.

As for television, Mr. Allen said, watching a low numbered channel regularly during the day for the next few years might yield glimpses of far-off, perhaps foreign, broadcasts for a total of only a few hours. Commercial AM and FM stations will not be affected.

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BIOCHEMISTRY

"Weak, Tired Feeling" Due to Potassium Lack?

➤ A MARKED LOSS of body potassium causes that "weak, tired feeling" after an illness, Dr. Joseph Ross of the University of California at Los Angeles Medical Center and Dr. Belton Burrows of the Boston University School of Medicine suggest.

Using trace atoms of radioactive potassium, the doctors found a marked decrease of potassium in bodies of patients with chronic illness.

Potassium is a substance important in muscle contraction and strength, the researchers point out. A shortage might account for the weakness and tendency to tire easily that generally follow an illness.

Minute amounts of radioactive potassium were administered to patients in "atomic cocktails." The total potassium content of the body was indicated by how much the radioactive atoms were diluted with normal body potassium.

Such measurements enable doctors to recognize potassium deficiency in patients, and indicate the amounts of potassium that should be administered to make up the deficit and improve the patient's condition.

Science News Letter, October 8, 1955

BIOLOGY

Hybrid Bees Yield More Honey

➤ HYBRID VIGOR seems to work as well for honeybees as it does for corn, two geneticists told the American Institute of Biological Sciences meeting in East Lansing, Mich.

Honey production of hybrid bees ranged 17% to 29% higher than that of their parents, while egg laying increased more than 35% above their parents' rate, reported Dr. Gladstone H. Cale Jr., of Hamilton, Ill., and John W. Gowen of Iowa State College. The hybrid strain exceeded average performance of standard honeybee stocks by 16% for egg laying and 23% honey yield, they said.

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PHYSICS

Germanium Etched by Ultrasonic Vibrations

See Front Cover

➤ A PHOTOMICROGRAPH of the surface of a germanium crystal etched by treatment with ultrasonic vibrations during growth is shown on the cover of this week's SCIENCE NEWS LETTER.

Certain types of imperfections in crystalline structure are known as dislocations. Scientists at the Research Department of Bell Telephone Laboratories are studying them in the hope that, by properly controlling the imperfections, it may be possible to create structural materials many times stronger than those in use today.

Of particular interest at present is the effect that such imperfections in crystals have on the electrical properties of semiconductors, Dr. F. L. Vogel Jr., a metallurgist, reports.

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BOTANY

European Trees Lack Fall Colors of U. S.

➤ AMERICAN TOURISTS visiting Europe in the fall should not expect the brilliant fall colors they are accustomed to see in the United States.

Prof. John Curtis, University of Wisconsin botanist, said the bright reds and yellows of autumn leaves are caused by shorter days and cool, but not cold, nights, followed by a period of warmer "Indian summer" weather. Jack Frost does not have anything to do with it.

"In fact," Prof. Curtis said, "a severe early frost can actually decrease the amount of red coloring which would normally form in many leaves."

Europe's trees do not show the gay colors of many North American varieties in mid-autumn because they do not have "Indian summer" weather, Prof. Curtis explained.

Shorter days, combined with cooler weather, cause leaf cells to separate from the cells of the branches, preventing food products manufactured in the leaves from going back into the trunk.

A period of warm fall weather after this separation occurs permits photosynthesis to continue. The sugar that is produced accumulates and is turned into a red pigment called anthocyanin.

The onset of autumn is more gradual in Europe than in the U. S., and the leaf cell separation does not happen as early there.

When the separation finally occurs, there are seldom enough warm days left for photosynthesis to continue.

Brilliant fall coloring in the United States is not restricted to our leaves, Prof. Curtis adds. North American prairie grasses often turn red, yellow and even blue, but Europe's grasses stay green.

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BIOLOGY

Monkey Business

U. S. laboratories need 10,000 rhesus monkeys a month for polio vaccine production and medical research. Flown in from India, they are given a medical check-up before use.

By HORACE LOFTIN

➤ MONKEYS by the barrelful are not so much fun when you have to pull each one separately out of the barrel to give them a complete physical examination.

Although their monkeys do not come in barrels, the First Army Area Medical Laboratory in New York does have this problem with cages full of rhesus monkeys, flown to this country from India for experimental use by the School of Aviation Medicine at Randolph Air Force Base, Texas.

When scientists at Army Medical Laboratory took on the job of giving physicals to the monkey immigrants, they met with a host of new problems no docile draftees had ever presented.

First, how do you get a single monkey out of a cage full of the lively creatures without hurting him, or the handler, or scaring him so much that the medical tests are thrown out of kilter?

After you catch him, how do you hold the squirming animal long enough to check him thoroughly?

And then, how do you perform a medical check-up on a monkey?

Strong Man Is Solution

One good, quick way to solve the first problem was found: send a brave handler into the cage to grasp the monkey by the back or loins, then quickly pin his arms behind him. However, a shortage of handlers with the will and talent for this kind of monkey business limits its practicality.

The scientists tried sending the handler in the cage with a butterfly net, then various combinations of squeeze boxes, nets and strong-arm techniques.

Finally they hit upon forcing the monkey into a cage lined with netting or burlap. Once he is in the smaller cage, the netting is pulled together, trapping the monkey.

To hold the monkey for examination, putting him into constricting boxes, strapping him to a board and using anesthesia were considered. Eventually, the scientists decided the best way to hold a monkey is with two strong hands, one pinning his arms behind his back, the other clamped tight around his legs.

When this method is used, the monkey can be turned in any position desired for examination.

Pulse rate, heart examination, tuberculosis test, parasite determinations and temperature readings are included in the physical.

The average pulse rate of 297 rhesus monkeys examined was 188, ranging between 90 and 280. (Normal pulse rate for human males is 70 to 72, and 78 to 82 for females.)

The rate varied directly with the amount of exercise just taken by the animals.

The monkeys' temperatures were surprisingly high, from 101.0 to 106.5 degrees Fahrenheit, compared to 98.6 degrees Fahrenheit for man. At first, this high monkey temperature was thought to indicate disease, but later was credited to their violent exercising and general excitement.

After the monkeys calm down to life in captivity, the average temperature is just above 101 degrees.

Only one of the 297 monkeys tested had external parasites—a solitary flea. A very small percentage showed presence of harmful internal parasites.

The biggest problem met was to test for tuberculosis, an important monkey disease. The scientists tried using a "shocking dose" of tuberculin, which was supposed to make tubercular animals seriously ill, or even kill advanced cases, without affecting healthy monkeys. None of the 297 monkeys showed any ill effects from the tuberculin on the first test.

However, five of the tested animals died later in their Texas home. Four of these had had positive tuberculin tests a month after the first tests. X-rays showed lung changes in these animals, but the scientists could never pinpoint the presence of tuberculosis in the monkeys.

Because of the unsatisfactory results in tuberculosis testing, the Veterinary Corps of the U. S. Air Force has set up a new routine for imported monkeys.

It includes a 30-day quarantine in individual crates, a 48-hour period with light diet and no human interference, and a physical check-up that includes chest X-rays, examination for parasites, weekly weight recording, and a tuberculin test to be read in 72 hours.

Monkeys reacting to the tuberculin test or showing positive chest plates will be destroyed immediately. Suspicious reactors will be isolated and retested at 30-day intervals until they give positive or negative reactions on three successive tests.

A PATIENT PATIENT—Wearing the same resigned look as many a human in his position, this rhesus monkey submits to a complete physical check-up. Dr. Roy Kinard is shown here looking over one of the National Institutes of Health's pampered inmates. They are examined for everything from fleas to tuberculosis in the program for humane care.

Problems Are Multiplied

Multiply the scientists' perplexities several thousand times and you will have an idea of the extent of the "monkey problem" in the country today. An estimated 10,000 rhesus monkeys are being shipped from India every month to supply the needs of polio vaccine manufacturers and medical research laboratories throughout the United States.

Each one of the animals must be considered a possible carrier of disease, until quarantine and physical examinations show that he apparently is in good health, and will not infect other monkeys or human handlers with disease.

First check on the animals comes in the country of their origin, since U. S. regulations forbid the entry of monkeys not accompanied by a health certificate stating they have been examined by medical or veterinary doctors. The first check is probably limited to looking for obviously sick monkeys.

At the port of entry, quarantine officers of the U. S. Public Health Service take over, again giving the animals a gross check-up. Any monkeys arriving without the health certificate are held in quarantine until their freedom from disease is established.

It is when the monkeys are distributed to the research laboratories and vaccine producers that rigorous examinations start.

The routine examination on rhesus monkeys at the National Institutes for Health in Bethesda, Md., follows quite closely the Air Force's testing routine. All incoming monkeys there are put into isolation quarantine for not less than 30 days.

During this time, three tuberculin tests are given, one when they arrive, one after two weeks and one four weeks later. No monkey is "cleared" until all three tests show negative. Even then, chest X-rays are taken on monkeys showing suspicious signs such as coughing or high temperatures.

An NIH scientist said the majority of monkeys received at their laboratories are "certainly not well animals as they come here."

Although they may not have infectious diseases that would endanger the monkey colony, their general health is often low, following the abrupt change from the jungles of India to U. S. laboratories. They are often riddled with both internal and external parasites, ranging from fleas to the one-celled villain that causes amebic dysentery.

It is absolutely necessary that all monkeys imported to this country for medical and research purposes undergo a rigid quarantine period and physical inspection, the scientist said.

He noted his impression that rhesus monkeys from the northern part of India seem much healthier than those from the south.

His explanation was, "Unfortunately for the monkeys, they are just too exposed to human beings in the south of India."

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GENERAL SCIENCE

"Runaway" Reactor Was Named Borax

➤ THE NUCLEAR REACTOR intentionally allowed to "run away" in order that scientists might study the resulting explosion was named Borax 1, not Supo as was reported in SNL, Aug 20, p. 115.

The blow-up which occurred at Arco, Idaho, in July 1954, was described at the International Conference on Peaceful Uses of Atomic Energy in Geneva in a paper by Dr. J. R. Dietrich of Argonne National Laboratory, Lemont, Ill.

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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.

ADVANCES IN CANCER RESEARCH: Vol. III—Jesse P. Greenstein and Alexander Haddow, Eds.—*Academic*, 369 p., illus., $8.50. Articles covering recent research in this field.

AMATEUR ASTRONOMER'S HANDBOOK—J. B. Sidgwick—*Macmillan*, 580 p., illus., $12.50. A reference book dealing with the theoretical and instrumental background of observation.

ANIMAL MASQUERADE—Ivah Green—*Coward-McCann*, 64 p., illus., $2.50. Telling, for children, how certain animals can disguise themselves for protection from man and other animals.

THE BIOLOGY OF THE SPIRIT—Edmund W. Sinnott—*Viking Press*, 180 p., $3.50. A leading scientist at Yale suggests that the human spirit has its origin in protoplasm, the substance generally regarded as the physical basis of life.

CANCER CELLS—E. V. Cowdry—*Saunders*, 677 p., illus., $16.00. "Cancer is a fascinating problem both from the biological and medical points of view," states the author. "It focusses attention on cells both normal and malignant, for neither can be appreciated without knowledge of the other."

THE CASE HISTORY OF SIGMUND FREUD: A Psycho-Biography—Maurice Natenberg—*Regent House*, 245 p., $3.95. The author uses Freud's own technique of psychoanalysis to determine that many elements of Freud's theories could be traced to his background.

THE CONSTRUCTION OF LABORATORY APPARATUS FOR SCHOOLS: Workshop Designs with Specifications and Instructions, Series II Secondary—Prepared by H. Struers Chemiske Laboratorium—*UNESCO (Columbia University Press)*, portfolio, illus., $8.00. Intended primarily for the use of manufacturers, but suitable also for the workshops of vocational schools. Written in French and English.

DISCOVERING BURIED WORLDS—André Parrot—*Philosophical Library*, 128 p., illus., $3.75. A survey of the great work done by archaeologists over the last century, which has thrown so much light on the history and culture of civilizations in the Near East.

EVEREST: From the First Attempt to the Final Victory—Micheline Morin—*Day*, 205 p., illus., $3.50. An account of the ten expeditions, which attempted, over 32 years, to conquer the highest mountain in the world, ending with the achievement of the British expedition in 1953.

EXPERIMENTS IN THE PRINCIPLES OF SPACE TRAVEL—Franklyn M. Branley—*Crowell*, 119 p., illus., $2.00. To enable the reader to differentiate between science and fiction. Discussing certain laws of science that are the basis for rocket research and space travel.

THE FABULOUS PHONOGRAPH: From Tin Foil to High Fidelity— Roland Gelatt—*Lippincott*, 320 p., illus., $4.95. Science, business and aesthetics are inseparably mingled in the historical progression from Edison's raucous tinfoil apparatus to the high-fidelity reproducers and recordings of today.

THE GOLDEN BOOK OF ASTRONOMY: A Child's Introduction to the Wonders of Space—Rose Wyler and Gerald Ames—*Simon and Schuster*, 97 p., illus., $3.95. The subject is well presented in this book that covers many aspects of elementary astronomy of interest to those who wonder about the universe around us.

INDUSTRIAL AND MANUFACTURING CHEMISTRY: Part I, Organic—Geoffrey Martin, revised by Edward I. Cooke and others—*Philosophical Library*, 7th ed., 752 p., illus., $17.50; together with the two vols. of Part II, $50.00. Describing the applications of organic chemistry to manufacturing.

INDUSTRIAL AND MANUFACTURING CHEMISTRY: Part II, Inorganic, 2 vols.—Geoffrey Martin, revised by Wilfrid Francis and others—*Philosophical Library*, 6th ed., Vol. I, 600 p., Vol. II, 491 p., illus., $17.50 per vol.; together with Part I, $50.00. The work has been brought up-to-date in this edition without altering its essential character.

AN INTRODUCTION TO HUMAN ANATOMY—Clyde Marshall, revised by Edgar L. Lazier—*Saunders*, 4th ed., 420 p., illus., $4.50. A textbook written from the standpoint of an anatomist, containing, in addition to the facts of anatomy, brief accounts of the functional activities of different organs.

KINSHIPS OF ANIMALS AND MAN: A Textbook of Animal Biology—Ann H. Morgan—*McGraw-Hill*, 839 p., illus., $6.75. Living things are not only composed of like substances but all living matter is put together in the same unique way. Kinships based on these similarities form the theme of this book.

MAN'S EMERGING MIND: Man's Progress Through Time—Trees, Ice, Flood, Atoms and the Universe—N. J. Berrill—*Dodd, Mead*, 308 p., $4.00. The evolution of man and his mind through the ages.

MY HOBBY IS COLLECTING ROCKS AND MINERALS—David E. Jensen—*Hart*, 122 p., illus., $2.95. A practical guide to the many aspects of rock and mineral collecting.

OLD AKKADIAN INSCRIPTIONS IN CHICAGO NATURAL HISTORY MUSEUM: Texts of Legal and Business Interest—Ignace J. Gelb—*Chicago Natural History Museum*, Fieldiana, Anthropology, Vol. 44, No. 2, 178 p., illus., paper, $5.00. These cuneiform tables lay buried in the museum for 11 years before their value was ascertained.

THE PLANTS WE EAT—Millicent E. Selsam—*Morrow*, 123 p., illus., $2.50. The interesting

Continued on p. 239

GENERAL SCIENCE

UNESCO Plan Cuts Instrument Damage

➤ FRAGILE SCIENTIFIC INSTRUMENTS can now travel across international borders and avoid custom inspection that may damage them irreparably.

UNESCO, the United Nations Educational, Scientific and Cultural Organization, has arranged with 22 nations a plan of having instruments inspected in designated laboratories in various countries, so as to avoid damage by inspection at custom points.

Special red and black labels warn custom authorities that the package is to be forwarded unopened. These labels also inform the custom inspectors where the instruments will be used.

The United States is not yet a member of the network of participating nations.

Science News Letter, October 8, 1955

BIOCHEMISTRY

Bicarbonate Ions May Block Mineral Uptake

➤ BICARBONATE IONS may sometimes block the uptake of vital minerals into plants, studies by James Goss of the department of botany at the University of California at Los Angeles suggest. By tagging such minerals as phosphorus and calcium with radioactivity, Mr. Goss has been able to follow their uptake in plants under various conditions.

He found that bicarbonate ions, abundant in much of the arid West's soil, actually inhibit the uptake of phosphorus and calcium. These minerals are essential to the plant growth, although their exact roles are not known.

It is possible that inhibited phosphorus and calcium uptake limits total plant growth, Mr. Goss said. It may also be that the inhibition is related to chlorosis, or lack of green coloring, a common condition in arid regions.

Science News Letter, October 8, 1955

BIOCHEMISTRY

Computer Helps Find Vitamin B-12 Structure

➤ SWAC, the giant electronic "brain" at the University of California at Los Angeles, played an important role in establishing the precise three-dimensional chemical structure of vitamin B-12.

Dr. Dorothy Hodgkin and her group at Oxford did the painstaking X-ray crystallographic work. Dr. Kenneth Trueblood, assisted by R. A. Sparks, F. H. Kruse and R. J. Prosen, processed the huge mass of data on the Institute for Numerical Analysis' SWAC at U.C.L.A. Sir Alexander Todd of Cambridge contributed preliminary chemical studies.

Almost a dozen man-years of work went into this piecing together of one of nature's most elaborate chemical jigsaw puzzles. More than a year was needed just to write instructions for the computer's calculations.

All facets of B-12's molecular geometry were established, including precise angles of the vast network of chemical bonds.

Heart of the huge molecule is a single cobalt atom. Around it are arranged cyanide groups, pyrrole rings and other complex chemical groups.

B-12 is the largest and most complex molecule to be defined in complete detail.

The complete picture of the B-12 molecule should shed new light on blood-building processes, of which the vitamin is an essential part. The extensive and successful use of SWAC in processing the vast amount of data may prove a boon to biochemists, who have shunned many structural problems of the giant molecules because of the overwhelming computations involved.

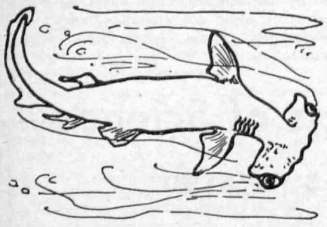
Lightning-fast calculations by SWAC made it possible to probe and eliminate many mathematical blind alleys, in which scientists using conventional mathematical techniques would have been bogged down.

Science News Letter, October 8, 1955

ICHTHYOLOGY

NATURE RAMBLINGS

by Horace Loftin



Hammer-Head Sharks

➤ AMONG the streamlined races of sharks, the hammer-head, *Sphyrna zygoena*, stands out like a knot on a billiard ball.

His body is sleek enough to fit the pattern for these predatory fishes; but that "hammer," which may reach three feet across from tip to tip, places him in a position all his own.

Of what use is the hammer to the hammer-head shark? This question has puzzled experts for generations and there is still no good answer.

The eyes are placed far apart on each tip, but this does not seem to give him an advantage in sight. It has been suggested that the hammer gives the shark greater speed in turning and maneuverability, but this has never been proved experimentally.

In any case, in spite of or because of the unique hammer, the hammer-head shark is a very successful species. It is found from the Mediterranean to Cape Cod, from California to Hawaii and Japan. It may grow to a length of 15 feet or more and weigh 1,500 pounds.

The hammer-head is a voracious feeder and, among other choice items, seems to enjoy eating the dangerous sting ray that it equipped with a sharp, barbed "stinger" at the base of its tail. A 12½ foot hammer-head harpooned as it chased a sting ray over sand-flats on the North Carolina coast was found to have 50 "stingers" imbedded in its body. Most of them had been driven into the shark's mouth and throat.

Hammer-heads have picked up an evil reputation as dangerous to man. But the case against them—besides their formidable appearance—rests mainly upon finding the remains of a man, including parts of his clothing, in a shark taken in 1805!

The hammer-heads give birth to live young, and specimens have been taken which were found to contain as many as 37 well-developed embryos.

In some areas, these sharks are hunted for their skin, which makes a durable and handsome leather. The Japanese consider the hammer-head to be a tasty addition to the menu.

Science News Letter, October 8, 1955

MEDICINE

A.M.A. Runs New Tests On Decaffeinated Coffee

➤ MAKERS OF decaffeinated coffee who claim 97% or more of the caffeine has been removed from their products are correct, the American Medical Association announced on the basis of new tests it made, which are reported in the *Journal of the American Medical Association* (Sept. 24).

In its July 23 issue, the A.M.A. had said its tests showed such claims "must be viewed with skepticism."

The announcement states that the method used in the earlier tests leads to wrong values for caffeine in decaffeinated coffees.

The tests now reported show that the average cup of regular or instant decaffeinated coffee contains about one-fortieth the amount of caffeine in a cup of regular ground or instant coffee.

Regular instant coffees, the tests also show, contain about the same amount of caffeine as regular ground coffees, instead of only half as much, as reported from the earlier tests.

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Questions

ACOUSTICS—What are the uses to which the sound library may be put? p. 233.

□ □ □

CARDIOLOGY — What conditions affect the chances of recovery from a heart attack? p. 227.

□ □ □

DENTISTRY—What new theory of tooth decay may change our ideas of tooth care? p. 232.

□ □ □

MEDICINE—How is color used in detecting certain tumors? p. 229.

□ □ □

SURGERY—What are the advantages of a "skin bank"? p. 231.

□ □ □

TECHNOLOGY — What should the careful householder do to get his house ready for winter? p. 230.

□ □ □

Photographs: Cover, E. E. Thomas; p. 227, Bell Telephone Laboratories; p. 229, University of Wisconsin; pp. 230 and 231, British Information Services; p. 234, Fremont Davis; p. 240, Bakelite Company.

MEDICINE

Impaired Function Seen Favoring Kidney Graft

➤ SOMETHING about impaired kidney functioning seems to favor the success of grafts of new kidneys for old, Drs. Joseph E. Murray, Benjamin Miller and Stanley Lang of Harvard Medical School and Peter Bent Brigham Hospital, Boston, reported at the American Society of Plastic and Reconstructive Surgery meeting in Atlantic City.

The normal rejection reaction of the body to foreign tissue may be so changed when kidney function is damaged that the grafted kidney can survive longer in its new home, the scientists suggested on the basis of their studies.

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GEOPHYSICS

Satellite for Storm Patrol

➤ HURRICANES could easily be spotted from an earth satellite zooming around the world some 200 miles above the surface.

The satellite could be unmanned—a television camera could beam the scene to weathermen below.

Getting such a bird's eye view of the earth's weather would be of "extreme value," Dr. Harry Wexler, the U. S. Weather Bureau's director of meteorological research, told SCIENCE SERVICE.

It would be impossible to keep track of the violent tropical disturbances from one man-made moonlet for more than two or three hours out of 24, he said.

"Two or three satellites, however, might be timed to take fixes on the giant storm's position every three or four hours, depending on their altitudes and direction of circling," Dr. Wexler pointed out.

Another method of spotting and tracking hurricanes, Dr. Wexler said, would be to send up a large number of rockets over the area. These would go almost as high as the satellite. Although rockets remain aloft only a very short time, a few seconds are sufficient to get the required pictures of the earth's weather over a limited area.

Storms whose presence is only suspected by earthbound meteorologists, Dr. Wexler pointed out, can be "definitely identified and located" from rockets.

This was the case in the storm of Oct. 5-6, 1954, that produced severe flooding over Del Rio, Tex., which was photographed by a Naval Research Laboratory rocket on Oct. 5. Not until much later did Dr. L. F. Hubert, also of the Weather Bureau, and Dr. Otto Berg of the Naval Research Laboratory, discover the early spotting of the incipient cloudburst on a rocket-taken photograph.

The scientists report on their rocket portrait of a tropical storm in *Monthly Weather Review* (June).

If the rocket had been equipped to televise such information back to meteorologists, Dr. Wexler said, the storm could have been spotted immediately.

From an earth-circling satellite, a hurricane would appear as a tiny pinwheel of clouds, Dr. Wexler said. Other cloud formations could also be seen. (See SNL, May 15, 1954, p. 306.)

From later studies of clouds' positions and of the path taken by the hurricane, weathermen might soon learn how to predict where hurricanes are headed while they are still in their formative stages, as well as after they were mature.

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Books of the Week

Continued from p. 236

story, as told for children, of the development of our common food plants, their history and their changing uses.

PRINCIPLES OF MASS AND FLOW PRODUCTION—Frank G. Woollard—*Philosophical Library*, 195 p., illus., $7.50. For those who are seeking economical means for increasing production and for students of engineering economics.

RADIOCARBON DATING—Willard F. Libby—*University of Chicago Press*, 2nd ed., 175 p., illus., $4.50. Improvements in the measurement technique developed since the first edition appeared in 1951 are described, and hundreds of additional dates measured in author's laboratory are included.

SCHOOL HEALTH SOURCEBOOK—Compiled by Oliver E. Byrd—*Stanford University Press*, 373 p., $7.50. Intended to give the reader a comprehensive view of the school health program as represented in the professional literature during the last ten years.

SCIENCE AND SOCIAL ACTION: Josiah Mason Lectures Delivered at the University of Birmingham—W. J. H. Sprott—*Free Press*, 164 p., $3.50. Raising theoretical questions of importance to the social scientist.

THE SECOND MIRACLE—Peter Greave—*Holt*, 254 p., $3.00. The story of the author's triumph over leprosy.

YOUR FEET AND THEIR CARE—William A. Rossi with Introduction by Joseph Lelyveld—*Emerson*, 212 p., illus., $3.00. Devoted to foot health, and covering practical aspects of care and hygiene of the feet.

ZOO PETS—William Bridges—*Morrow*, 94 p., illus., $2.50. Telling, for children, about some of the animals that have become "pets" of the animal keepers in the Bronx Zoo.

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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 799. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

BATHTUB SHOWER ENCLOSURE is made of non-shattering sliding door panels of plastic. Using only a screwdriver and kitchen knife, the housewife can assemble the double doors to enclose any five-foot recessed tub. With track above and another on the tub edge, the lightweight doors are inserted.

Science News Letter, October 8, 1955

KEY KEEPER is an automatic key dispenser that eliminates fumbling. Push a runner along the top of the pack and the key pops out, pull and the key is snugly in its place. It is available in red, green or brown with chromium trim.

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FIREARMS LUBRICANT is a gun oil that will give indoor protection against rust for six months and protects against rain, salt water spray and humidity in the field. It will permit normal functioning at temperatures as low as 25 degrees below zero Fahrenheit. It comes in both spray can and standard spout can.

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JET PLANE, shown in the photograph, can be assembled by youngsters and slingshot through the air. A foot and one-half long, weighing only three ounces, the toy fighter is made by the do-it-yourself lad from plastic parts contained in the model plane kit. Launched by rubber bands, the toy plane flies high and wide.

Science News Letter, October 8, 1955

HAT-BAND SAVER is a spray that makes leather bands inside a man's hat impervious to perspiration. A few light coats of the clear, acrylic plastic keep the acid perspiration from penetrating to the outside band.

Science News Letter, October 8, 1955

DOUBLE-PLAY TAPE for magnetic recording now makes it possible for users to capture an entire opera or sports event. Up to four hours can be recorded without a reel change at 1⅞ speed, and eight hours dual track. The double time is made possible by the use of .5 mil of new film that is tear resistant and cannot dry out.

Science News Letter, October 8, 1955

STAINLESS STEEL WIRE has a built-in mirror-like finish that eliminates finishing for many end-products. Requiring neither plating nor coating, the wire can be used for safety pins, picnic grilles and forks, and toys. It can be drawn from .030 to .090 of an inch and has a maximum tensile strength of 250,000 pounds per square inch.

Science News Letter, October 8, 1955

CUTTING NEEDLE for clipping articles from newspapers and magazines is housed in a push-button, pen-like device. It can be easily and safely carried in the pocket.

Science News Letter, October 8, 1955

Do You Know?

A new wingtip device that measures the temperature of the outside air warns a *glider* pilot when the cool air currents that carry the craft aloft stop.

Every person requires a different amount of the essential *amino acids* in protein foods to strike a proper body balance between nitrogen intake and output.

Seed analysts urge homeowners to make certain the *lawn* seeding mixture they use is made up of fine-textured, persistent grasses if they want a permanent lawn.

Human *hair* grows at an angle of less than 90 degrees from the skin, a vestige of the days when it was a thick, overlapping mat sheltering the skin of primitive man.

One quart of *milk* will provide all the essential amino acids required daily in the average man's diet to reach and maintain protein nitrogen balance.