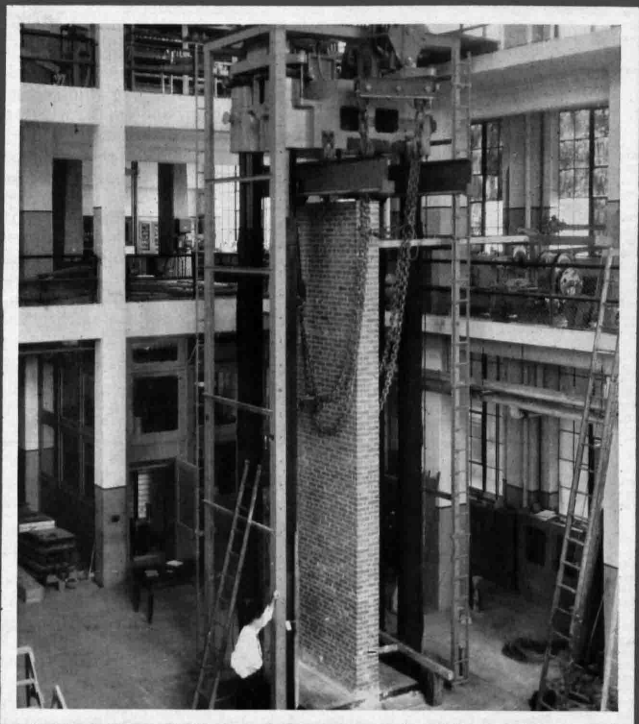
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



FEBRUARY 13, 1932

Strongest Jaws Crunch Brick and Steel

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A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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? DO YOU KNOW THAT ?

Government scientists are making feeding tests with livestock to see how artificially dried hay compares in nutritive value with hay dried naturally.

According to medical statistics from a large group of skilled workers, 30 per cent. of blacksmiths have impaired hearing.

The British Museum has acquired the discharge papers of a Roman soldier, dating from 122 A. D. and consisting of two small inscribed bronze plates hinged together.

Government tests show that ordinary record paper loses 27 to 75 per cent. of folding strength if directly exposed to sunlight for only 100 hours on each side.

British scientists have solved the mystery of why striped shirts tend to wear out faster than plain colored ones, the answer being that the dyed goods of the stripes becomes weakened by chlorine bleaching solutions.

Tests show the pecan nut to be a good source of Vitamin A.

In the days of the Roman Empire there were surgeons who specialized in operating on the eye for cataract.

Sugar maple is being studied with a view to increasing the sugar content of the sap.

The oldest preserved meteorite whose fall is recorded dates from 1492.

An attempt is being made to revive the industry of growing limes in Florida.

Frogs are not native to the Hawaiian Islands, but half a dozen kinds of toads and frogs, including big bullfrogs, have been introduced.

A new molding compound developed at the Mellon Institute of Industrial Research is said to take bright colors attractively and lends itself to rapid, low-cost mass fabrication.

Shanghai is one of the world's cities with more than a million population, the estimate being 1,540,000.

As early as the fourteenth century street vendors in Europe sold crude spectacles, both for adornment and as an aid to vision.

Waters of the Gulf Stream range in temperature from about 62 degrees Fahrenheit in winter to 88 in summer.

WITH THE SCIENCES THIS WEEK

METEOROLOGY

Persistent Highs in Southeast Account for Freakish Winter

Summary of Weather Reports Shows Whole Country Was Lifted off Map and Moved Several Hundred Miles South

WHY all this freak weather?

First, the driest year on record in the United States—1930. Then the hottest—1931.

And just recently high temperatures that split on the continental divide to bring states east of the Rockies their warmest winter weather and the Pacific coast unusual cold during December and January.

Finally a mass of high pressure atmosphere which, sweeping swiftly through the McKenzie river valley, brought upon the central and eastern parts of the country the winds of the Arctic before they had a chance to warm up. Thus came normal winter weather for the first time this season.

Such weather behavior is explained by scientists of the U. S. Weather Bureau in terms of the shifting areas of high and low pressure that move across the continent. Just what these air currents and pressure areas must account for has been summarized by J. B. Kincer, chief of the Division of Agricultural Meteorology of the Weather Bureau, from about 5,000 records taken in different parts of the country.

Mississippi Weather in St. Louis

Mr. Kincer's summary means that the whole country was lifted from the map and moved several hundred miles to the south. People in central Indiana enjoyed Tennessee weather; those living at Des Moines found out how much warmer it is at St. Louis, and people at St. Louis sweltered under temperatures of Meridian, Miss., 400 miles farther south. New Englanders lived in a Pennsylvania climate and Pennsylvanians experienced Virginia weather.

"As 1930 is distinguished in the climatological history of the United States for dryness," Mr. Kincer said, "so 1931 will stand out in the future as a year of abnormal warmth. The year was warmer than normal in practically all sections of the country. New Mexico is the only state that did not show an excess in temperature.

"The warmth was the greatest ever known at many places in the Middle Atlantic area, the lake region and from the middle Mississippi valley and central plains states northward. In the central northern area the average yearly excess ranged from five to six and one-half degrees Fahrenheit, making 1931 much the warmest year of record in that part of the country. For example, at Huron, S. D., and Moorhead, Minn., the accumulated excess of temperature for the year was some 900 degrees higher than that for the previous warmest year of record; and at Williston, N. D., it was more than 1,000 degrees higher than ever known before.

Warm for Two Years

"The outstanding warm months of 1931 were January and February, June and July, and September, October, November and December. In fact, warm weather has been persistent for two years, since 17 of the past 24 months have been abnormally warm. Prior to 1931, the warmest year in the United States was 1921."

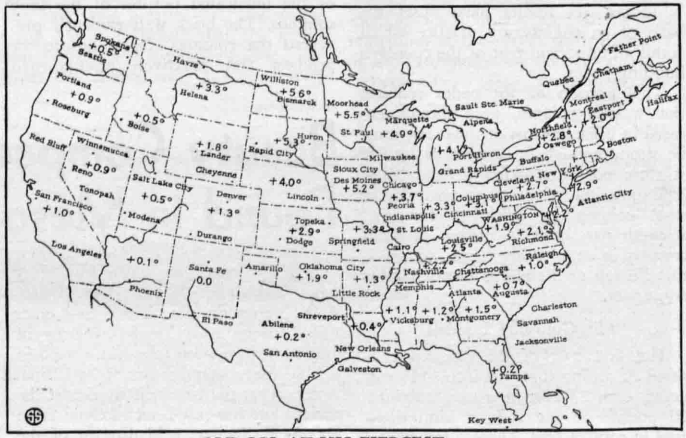
During the past year, records for the single hottest day were broken at six weather stations well scattered throughout the country. They are Ithaca, N. Y.; Minneapolis, Minn.; Pierre, S. D.; Salt Lake City, Utah; Reno, Nev.; Spokane, Wash., and San Jose, Calif.

With the beginning of winter the most freakish change began. The abnormal warmth in the eastern part of the country even increased while the far west entered winter with unusually cold weather. While snow heaped up in orange groves of California, fruit buds as far north as Michigan became dangerously swollen. Eastern cattle ate green grass in pastures that normally would have been barren and frozen, while stock on some western ranges hungered and died where the animals should have found plenty.

On-Coming Cold Blocked

The blame for most of the abnormal conditions can largely be placed upon hot air. Great masses of high pressure atmosphere have been hovering persistently over the Gulf of Mexico and adjoining southern waters, it appears from explanations given by Charles L. Mitchell, forecaster for the Weather Bureau. These masses of air have sent warm breezes up over the country and have blocked the coming of normal cold weather from the Arctic.

The country's chief supply of cold winter air comes from the Arctic as great high pressure masses by way of a natural groove in the earth, the McKenzie river valley, Mr. Mitchell said. Most



OLD SOL AT HIS FIERCEST

This map of the hottest year on the records of the U. S. Weather Bureau shows the average departure above normal for 1931 in different sections of the country. The year was normal in only one state, New Mexico; the average temperature for 1931 in all other states was above normal, the greatest departures above normal being in the north central states.

of them sweep over the central part of the United States and then curve back to the northeast to cover a portion of the Atlantic coast before going out to sea.

Ordinarily the "highs" bring their Arctic air so fast that it does not have time to warm before it reaches the United States and plunges its chief cities into winter temperatures. They come fastest and bring coldest weather when pulled by a low pressure area along the southeastern coast.

But during the past two years these lows have been scarce. A huge high pressure area has been hovering where the lows were often found; and this "high" forms a barricade in the path of other "highs" coming down from the north to bring cold weather. The oncoming cold air is dammed up and diverted over Canada. Or the "highs" make such slow progress that by the time they reach the central part of the United States their cold air has lost its Arctic tang.

Why "highs" have persisted over the South Atlantic area, Mr. Mitchell does not attempt to explain. This cannot be done until behavior of air currents that swirl around the earth from its surface to a height of several miles are observed and studied more fully.

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MOST LIGHT, LEAST POWER

The hot cathode sodium vapor lamp here demonstrated by Dr. Harvey C. Rentschler, director of the Westinghouse Lamp Company, gives six times as much light for the same current as the common 40-watt tungsten bulb. This brilliant yellow light, seventy per cent. efficient, was invented by Dr. M. Pirani, director of the Osram Lamp Company of Berlin. It owes its high efficiency to the fact that the radiation from the vaporized sodium is in that part of the spectrum to which the eye is most sensitive.

ENGINEERING

Tests Show Steel Columns Strengthened by Brick Wall

STEEL-FRAME buildings, from modest structures of just a few floors to the tallest skyscrapers may be built more economically with the use of less steel as the result of facts discovered by research at the U. S. Bureau of Standards.

This study, which was carried out in the Engineering and Mechanics section of the Bureau under the direction of Dr. A. H. Stang, consisted of tests in the world's largest testing machine of the strength of vertical steel columns of the kind used in the steel skeletons of buildings. Its results have upset the basis of an engineering practice which forms an important part of the country's building codes.

This portion of the codes requires that a steel column, even though encased in brick as most of them are, must be strong enough to support its load if it were not surrounded by the brick. The question of whether enclosing a steel column in brick increases its strength has been a matter of controversy in engineering circles, to which this Bureau of Standards research gives an answer.

"H" Columns Loaded

The first part of the research consisted of testing three six-inch "H" columns, each 23 feet long and weighing 20 pounds to the foot, a kind often used in construction. These columns carried loads of 23,900, 23,000 and 23,100 pounds per square inch before they failed by bending at mid-height.

Then each of six other columns of the same kind and size was built into the center of a brick wall, fourteen inches thick, about 22⅓ feet high and six feet wide. These columns were tested to loads of 40,000, 41,500, 40,700, 38,800, 42,100 and 41,100 pounds per square inch before they crumpled at the projecting end. These maximum stresses are practically equal to the yield point values for the steel and also to the compressive strengths of short H-sections of about the same length as that of the unencased portion of the long columns. The brick wall evidently prevented the columns from failure by bending and effectively strengthened them so that the unencased portion failed by yielding.

See Front Cover

Scientists at the Bureau of Standards think that this test, the first of its kind, may lead to a partial revision of building codes so that engineers may use smaller columns than are now required, provided they are properly surrounded by brick.

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ARCHAEOLOGY

Beauty Compact of 500 B. C. Found in Mesopotamian Tomb

A MAKE-UP SET, bronze mirror, bronze perfume bottle, and other toilet articles used by some beauty of 500 B. C. have been found in a tomb in the old Mesopotamian city of Tell Billa. A report on the latest discoveries at the ancient site has just been received from Dr. A. E. Speiser, field director of the expedition which is being conducted by the University of Pennsylvania Museum.

This make-up set is completely equipped for the use of kohl, a popular material for shadowing the eyes in early days of beauty culture.

The expedition has been digging in strata of different ages at the ruined site. A highly colored hematite figurine of a bull is a discovery of importance. A number of Assyrian tablets and a beautifully carved ivory plaque more than 4,000 years old are other discoveries. Scores of cylinder seals with heraldic markings of animals have been found.

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SEISMOLOGY

Santiago Earthquake Not Major Shock, Says Geologist

By DR. STEPHEN TABER,
Professor of Geology, University of South Carolina

Editor's Note: Dr. Taber was at Guantanamo Naval Station near Santiago during the recent earthquake and flew over the stricken city the morning of the quake. He is one of the leading authorities on earthquakes of the region and has just surveyed the damage caused by the earthquake.

THE earthquake that damaged Santiago was not one of major intensity and little loss of life or damage to property would have occurred had the buildings been better constructed.

Most of the badly damaged buildings were of rubble masonry with poor mortar. This same type of construction was the cause of much damage in Porto Rico at the time of the earthquake of 1928.

When I flew over the city on the morning of the quake all the prominent buildings were standing and there was very little debris on the streets.

A hasty examination of the city since shows many buildings cracked, some dangerously, but very few walls have been thrown down, except narrow partition walls.

No deaths have been reported from points out of Santiago. Some slight damage has been reported from Bayamo and other towns, but practically all the damage was confined to Santiago, where nine were killed and about three hundred injured.

Earthquakes are frequent along the south coast of the province of Oriente, especially in the vicinity of Santiago, which has suffered severely several times during its history of four centuries. The frequent occurrence of earthquakes in this belt is due to the fact that it is a region of young mountains that are still growing.

Huge Blocks Uplifted

Some of the mountain ridges that have been studied consist of huge blocks of the earth's crust that were uplifted along faults or fractures in the earth's crust and tilted toward the north. That structure is especially noticeable in the vicinity of Santiago where I have recently located several faults. One of these is located within the city and displaces the marl beds on which Santiago is built. Other faults run along the coast and the destructive sea waves which have accompanied certain previous earthquakes indicate that those shocks have been caused by diplacements along these faults.

A very deep trough in the ocean's bed, called Bartlett deep, lies between Cuba and Jamaica and on both sides of it earthquakes occur along the precipitous slopes that descend into it. It will require detailed work to locate the fault along which the recent earthquake originated and since the shock was not of very high intensity there may be no visible displacement at the surface.

The earthquake has been followed by many aftershocks. I counted twenty during the half hour following the initial disturbance which lasted over one minute. More aftershocks are to be expected but they will probably decrease gradually in frequency and intensity.

Occured at Night

The damage to property has been estimated at about five million dollars. The effect was greatest near the waterfront. It is fortunate that the earthquake occurred at night for had it come when the streets were thronged with people the loss of life would have been much greater.

While it is impossible to predict, it is unlikely that the damage will be greatly increased by any shocks occurring in the near future.

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SEISMOLOGY

Submarine May Determine Cause of Santiago Quake

THE U. S. SUBMARINE S-48 has sailed from Guantanamo Bay, Cuba, carrying an international scientific expedition studying the cause of changes in the earth's crust in the region of Cuba and the Caribbean, and one result of this research may be a better understanding of the cause of the earthquake that shook Santiago de Cuba.

Dr. F. A. Vening Meinesz, Dutch geologist and authority on the determination of gravity at sea, is aboard the submarine. Measurements of the pull of gravity and sonic soundings will be taken in the Bartlett deep, the trough of the ocean floor in which the earthquake is believed to have had its origin. Although the research program developed through the cooperation of the U. S. Navy, Princeton University and several other institutions was formulated weeks ago, it is given added interest by the occurrence of the Santiago quake just two days before the beginning of the expedition.

An announced purpose of the expedition is the study of the four-mile depression that forms Bartlett deep just south of Cuba in the hope of learning something of the origin and periodicity of the earthquakes of the region.

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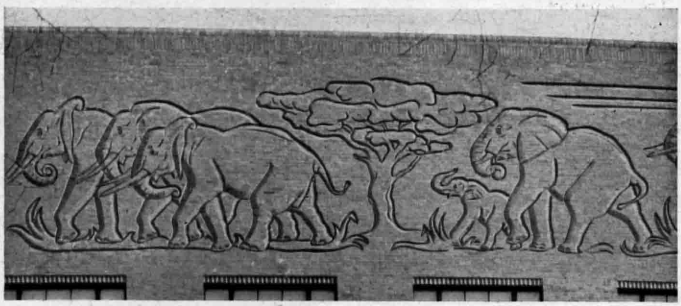

ELEPHANTS IN BRICK

Sculptures in an unusual medium, the face of an ordinary brick wall, greet the visitor to the new biological laboratories of Harvard University, which have just been opened for use. The buildings were put up first, and then their brick walls carved with spirited reliefs of plant and animal life, just as though they were stone. One of the most striking of the reliefs represents a troop of elephants.

BIOCHEMISTRY

New Method Measures Size Of Germs Totally Invisible

War on Disease Expected to Benefit from Development Which Combines Filtering and Centrifuging of Organisms

GERMS so small that they cannot be seen with the most powerful microscopes have nevertheless been measured and their size has been determined by a new method developed by Prof. H. Bechhold and Dr. M. Schlesinger of the Frankfort Institute for Colloid Research in Germany.

This new development is of particular importance because a number of disease germs, notably those of smallpox, measles, yellow fever, rabies or hydrophobia, and possibly influenza and the common cold are so small that they cannot be seen even with the most powerful microscopes. Because they are invisible and the classic methods of bacteriology are not applicable to them, many investigators have come to the conclusion that they do not exist at all, and that the maladies said to be caused by them are in reality chemical intoxications by some unknown poison.

It was found by the new method that the germ of smallpox is from 21 to 23 hundredths of a micron in diameter. One micron is one thousandth of a millimeter, which in turn is about one twenty-fifth of an inch. The germ of chickenpox is smaller, having a diameter of from 12 to 13 hundredths of a micron, which makes it only about half as large as the germ of smallpox.

The bacteriophage, which preys on the germs just as they prey on animals and humans, is very much smaller than these two germs, however. Its diameter measures between 12 and 20 millimicrons. Since a millimicron is one thousandth of a micron, this shows that the bacteriophage is about one-tenth of the size of the tiny chickenpox germ, for instance. Its very small size seems to prove that it is no organism but a special stuff, in the opinion of the men who have measured it.

Prof. Bechhold and Dr. Schlesinger succeeded in determining the size of these tiny organisms by a simple method of combined filtering and centrifuging. Prof. Bechhold devised ultrafiltration methods and consequently was able to procure filters with very small pores, having a diameter of 1/250 millimeter. The centrifuge used made 10,000 revolutions per minute. Prof. Bechhold found a general formula by which may be calculated the correlation between decrease of concentration and size of the particles of a semifluid substance centrifuged at high speed. From this formula and the known diameter of the filter pores, the investigators determined the size of the germs. Inoculation into animals proved that the material measured was capable of producing the disease in question.

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ZOOLOGY

American King Snake Conquers Amazon Rattler

YANKEE aggressiveness was too much for tropical venom in a strange snake-fight staged on one of the islands of the Amazon delta, between a non-poisonous American king-snake and an Amazon rattler. The king-snake is the pet of Emerson Smith, photographer of the Brooklyn Museum's Brazil Expedition. He took the animal with him for the express purpose of picking a fight with a Brazilian rattlesnake, so that he might make a motion picture of the battle.

Although the Amazon serpent has a reputation for aggressiveness, and is even said to attack unprovoked and without warning, the appearance of a strange creature of its own kind that was not afraid of it seemed to throw it into a panic, and it tried to run away. The American king-snake took after it, seized it, with lightning swiftness threw coil after coil around it, bent it into a hairpin loop and slowly strangled it. Then the king-snake calmly swallowed the body of its victim, head first.

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ENGINEERING

Oil-Filled Cable to Be Used Beneath River

THE HIGHEST voltage transmission line to carry electricity under water will soon be laid beneath the Columbia river and Oregon Slough to bring power to Portland, Ore.

Three cables rated at 115,000 volts will be buried six feet under the river bottom. The distance to be covered under the Columbia is 3,700 feet and under the slough 1,515 feet.

In this installation, oil-filled cable will be used for the first time to make a submarine crossing. Each of the three parallel cables will weigh nearly fifty tons and their total length will be more than three miles.

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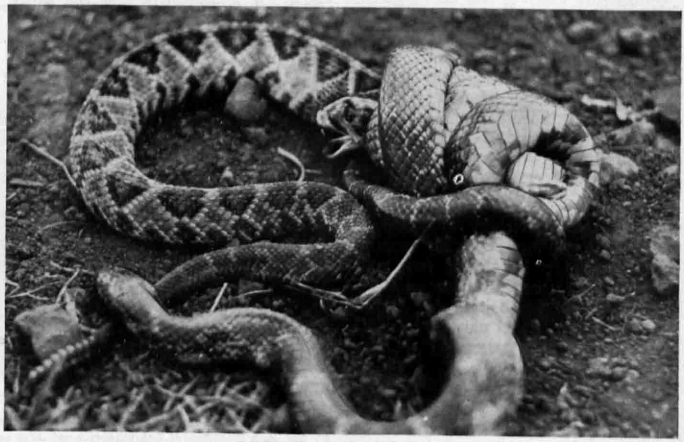

THE STRANGLEHOLD

Yankee King-Snake holds the Amazon Rattler in an unescapable grip and slowly squeezes the life out of him.

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MEDICINE

Treatment of Brain Malady With Malaria is Successful

SIGNAL success in treating a hitherto fatal disease of the brain has been achieved at St. Elizabeth's Hospital, government institution at Washington for the treatment of nervous and mental diseases, Dr. William A. White, superintendent of the hospital for 28 years, has announced.

The earliest patients treated by the new method have remained alive for over five years now, a sufficient time so that physicians feel certain of the success of the treatment. The disease, general paresis, is being arrested or cured in nine out of ten cases brought to the hospital, whereas a few years ago no one recovered from it and more than half the patients brought to the hospital died within a year.

Fever Kills Spirochetes

The change is due to the discovery by a Viennese physician, Wagner von Jauregg, that paresis patients recovered from their brain disease after they had suffered an attack of malaria. Dr. White was first to use this treatment of paresis in America. That was in 1922.

Success of the treatment depends on the fact that the spirochetes which cause paresis cannot live at a temperature over 104 degrees Fahrenheit. Malaria produces such a high fever in the body of the patient, and when he has recovered from the malaria, the spirochetes in his body have generally died and his brain disease is arrested or cured. If the germs have seriously damaged the brain the patient will not recover his former mental competence.

Before the introduction of the malaria cure at St. Elizabeth's Hospital, 127 out of 214 consecutive paresis patients, or nearly two-thirds, died within a year. At the end of three years only 26 of the group were alive, Dr. White's records show, while at the end of five years only five of the original 214 were alive. There were no cures. In contrast, Dr. White gave the figures following the introduction of the new cure. Of 192 paresis patients only 18, or less than one-tenth, died within one year, while 174, all that survived the first year, are still alive five and more years after the treatment. Forty of these have recovered sufficiently to be discharged from the hospital, while others are at various stages of recovery or permanent improvement.

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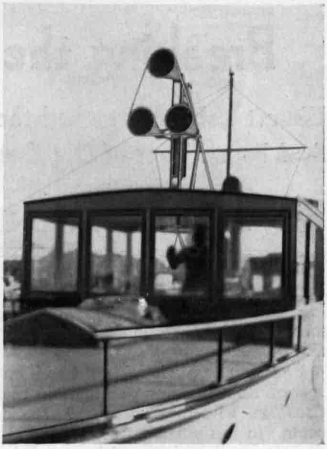
ENGINEERING

Echoes from Danger Points Guide Boat Through Fog

ECHOES from unseen boats, docks and buoys in Long Island Sound have enabled Chester W. Rice, an engineer of the General Electric Company, to navigate a seventeen-ton motorboat safely through thick fog.

Mr. Rice uses a device called the sonic locator, an outgrowth of the sonic altimeter which he developed as an aid to fog-flying. A megaphone directs a shrill whistle of a frequency of 3000 cycles per second ahead of the boat. Objects in the path of the sound reflect a portion back to receiving instruments on the boat where it is observed by a navigator with a stopwatch.

Measurement of the time elapsing between the sounding of the whistle and the receiving of the echo makes possible a close determination of the distance to objects ahead of the boat, Mr. Rice says. The Fishers Island boat, a 563-ton vessel, was heard head-on, broadside and from the rear in from two and one half to four seconds, corresponding to distances of from 1,350 to 2,160 feet, and a rowboat containing three occupants was detected at more than 800 feet, it is stated.



SONIC LOCATOR

This device by whistling and catching the echo, enables a boat to avoid unseen objects in its path

A high frequency whistle is essential to the apparatus because the scattered sound energy reflected by small objects is 10,000 times greater when the sound source is a 3000-cycle whistle than when the sound comes from an ordinary whistle of 300 cycles.

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PARASITOLOGY

Parasites Killed by Feeding On Blood of Human Beings

THE BRAG in the old cowboy song, that "Rattlesnakes came out and bit me, and then crawled away and died," has been made good at least on smaller vermin, to-wit: the "cooties" that infest certain monkeys. Lice of two species, from two species of monkey, showed no more wit than to feed on the blood of a human being when Dr. Henry E. Ewing of the Bureau of Entomology, U. S. Department of Agriculture, offered them the chance; but they died shortly after ingesting their ill-chosen meal. Vermin from a dog met a similar fate, he has reported to the American Society of Parasitologists.

Nevertheless, insects of the same troublesome order have been able to transfer themselves from an original host to an animal of the remotest zoological kinship. Dr. Ewing cited a case from Australia, where the kangaroo louse has made itself at home on dogs.

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It has been reported that 2,000 experiments were made in bringing cellophane to its present stage.

GEOLOGY

Breaking the World's Radium Monopoly

Gilbert LaBine Attacked the Far North Singlehanded And Found Tons of Ore Containing the Rare Element

By D. LINDSAY WATSON

RADIUM! This cry of discovery is being echoed in geological and mining circles these days, recalling the thrills of gold rushes in the Yukon and California.

For an inky black mineral has been spotted from a rushing airplane in the Canadian wilderness near the Arctic ocean. In this pitchblende ore lies hidden more radium than now is at work in the world, treating cancer, unravelling the inner structure of atoms and peering into steel to discover hidden flaws.

More precious and more useful than gold is radium, wonder element discovered by the Curies. It is worth $1,500,000 an ounce; gold is worth ~~$27.56~~ $18.84 an avoirdupois ounce.

The new discovery of radium ore in Canada promises to break the radium monopoly of the Belgian Congo, just as the development of the African deposits broke the American monopoly after the war.

This result was hardly anticipated by the lone prospector who set out in 1929 for the vast cold, barren wastes around the Great Bear Lake, 800 miles from the nearest railroad.

High hopes of mineral treasures in this remote wilderness were entertained by a number of adventurous spirits. Airplanes, radios and other paraphernalia of modern science were employed in this geological treasure hunt.

Two companies, the Dominion Explorers Limited and the Northern Aerial Minerals Exploration Company, undeterred by the armchair experts who scoffed at the idea of profitably bringing minerals from the back of beyond, have been courageously scouring this country since 1929. They have been rewarded by the finding of rich and substantial deposits of copper ore, good enough to repay the long haul back to civilization.

Gilbert LaBine, Canadian mining engineer, fascinated too by this enigmatic frontier, decided to adventure on his own. In the summer of 1929 he flew to Great Bear Lake in the Northwest Territories with Leigh Brintnell, chief of the Western Canada Airways.

Flying over the eastern shore of the lake, they observed, in the region of Hunter Bay and Echo Bay, that the ground was broken up by a great red slash of "gozzan," a rusty stain 200 feet wide caused by iron ore. They landed and soon found alongside a large vein of quartz. This quartz vein was about 400 to 500 feet wide and, when further investigated, proved to be eighty miles long. Parallel with it were found copper, cobalt and silver ores.

Boulders of Copper

Along the shore at Hunter Bay on Great Bear Lake, were lying immense boulders, some of them as much as sixty tons in weight. They were practically pure copper ore.

This looked hopeful, LaBine staked claims and with his companion turned south wondering if, perhaps, the quartz contained some gold.

The other companies were operating by airplane only a few miles away. Unwilling to let a possible fortune slip out of his hands, LaBine did not wait for the thaw before returning. At the height of the next winter, in February, with nature in her unkindest mood, he returned to Great Bear Lake by plane.

Landing, and pushing ahead on snow shoes, he prospected most of the eastern shore of the lake. There was no gold, as far as he could see; but after four months he found on a promontory, near where the huge quartz vein ran into the lake, a dull, black, lusterless rock that aroused his curiosity. He thought perhaps it might be pitchblende, the precious ore in which Pierre and Marie Curie first discovered radium. He called the spot "LaBine Point."

Two months later he was joined by his brother Charles, who with Leo Seaberg and Shirley E. Cragg, an American engineer from Cincinnati, had made the long trip down the Peace, Athabasca, Slave and MacKenzie rivers by canoe. With their help an exhaustive search of the region was carried out.

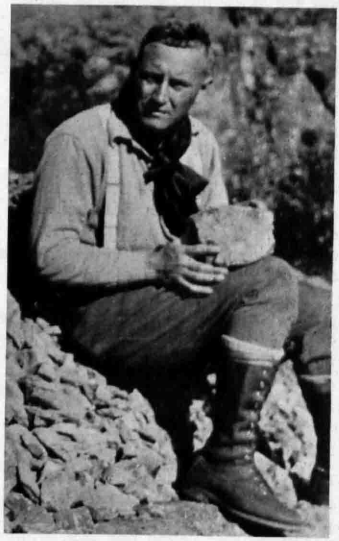
The Canadian Northwest Territories, through which they passed, 3,700,000 square miles in expanse, the only real frontier on the American continent, is a vast country of immense distances, mighty rivers and huge lakes. The Great Bear Lake itself is about the size of Lake Ontario, 12,000 square miles in area. Only 12,000 people, whites, half-breeds, Indians and Eskimos, occupy this whole region.

Along the course of the rivers there are settlements every 50 to 150 miles; stations of the Hudson Bay Company and the Royal Canadian Mounted Police, chief agents of civilization here, together with Indian camps, missions of the Catholic Church and cabins of lone trappers.

Within reach of this help all seems comfortable. But for those who travel just a short distance from the Mackenzie waterway, starvation, freezing, or madness are waiting.

Horrible things may happen in these lonely places of the north, not the least of dangers being the sleigh dogs. They are part wolf, and if one accidentally falls, the wolf in them occasionally masters them and they attack. On their journey LaBine and Cragg heard of a child being eaten by the dogs, and of a colonel of the Mounted Police who, returning from a duty tour, found that his wife had been torn to pieces by his dogs.

At another point they were met by a



THE TREASURE IS HIS

Gilbert LaBine, Canadian Mining Engineer, sitting on a pile of the radium-bearing pitchblende ore.

strange-looking man with white hair hanging down his back. He had been away on a trapping expedition but was unable to remember where he had been or what he had seen. How he had lived in the winter when the temperature runs from 50 to 70 degrees below zero, was a mystery.

Rapidly, however, planes and radios are encroaching on the wilderness. Everybody flies now in the Northwest. But this too has its perils. When Cragg's party arrived at Hunter Bay on the Great Bear Lake they found the wreck of James Vance's plane. Misjudging the distance to the water, he had crashed and drowned.

With the help of planes both LaBine and Cragg were able to make several trips back and forth from Edmonton to the site of their find in thirteen hours, whereas the canoe trip took all of six weeks from start to finish.

When they got back to civilization in Canada they took some pieces of the black ore to the laboratories. The mineralogists told them that it was a very high grade of pitchblende, containing from 30 to 80 per cent. uranium oxide. Some of the Colorado ores containing only two to four per cent. of uranium oxide have been profitably worked.

Radium too was present in the pitchblende to the extent of 100 to 200 miligrams to the ton. This was as much as the best of Belgian ores, which still rule the world market. At least seven thousand dollars' worth of radium, they were told, was present in every ton of the ore. Fortunately the deposits are concentrated and easily accessible to the surface, which is not true even in the Congo.

Further flights were made in February and July until the lay-out of the lake shore was thoroughly understood. After the first discovery further explorations were rewarded by the discovery of a second pitchblende vein.

Mr. Cragg believes, however, that a "radium rush" to Echo Bay is not likely to be profitable. The discoverers have fully protected their deposits by claiming all ground within striking range of their veins for long distances.

But the radium find was not all. The silver ore found alongside of the pitchblende has turned out to be of very high grade, containing a relatively high per cent. of metal, in itself a good strike.

Twenty tons of the pitchblende ore have already been shipped down the Mackenzie river to Edmonton in the fur steamer of the Hudson Bay Company. Forty more tons are now ready for shipping the 1,000 miles back to civilization.

MORE PRECIOUS THAN GOLD

Workmen sacking radium ore, worth $7,000 a ton, for shipment back to civilization.

The two great railway systems of Canada are believed to be ready to build into these remote regions when outstanding ore bodies are found. Even with the $1.30 per pound charged for air freight back to Edmonton it would almost be profitable to ship the ore by airplane.

It is beginning to look as if these two men had done a bigger thing for the world (and for their new company, Eldorado Gold Mines, Limited) than many more-advertised expeditions into the polar regions.

The world can do with an addition to its meager store of radium. After all, there is less than a pound and a half all told. About half of this total (9 ounces to be exact) has been mined and purified in the United States.

Martyr to Radium

This country owes the development of its radium resources particularly to one man, Dr. Richard B. Moore, who was a martyr to his work. Dr. Moore and his fellow professor at the University of Missouri, Prof. Hermann Schlund, were the first in this country to take an interest in the work of the Curies on the remarkable properties of radium.

In 1912 Prof. Moore made a speech at the opening of the Chemists' Club in New York City. He warned his fellow chemists, that the United States was letting the radium industry slip out of its hands into foreign control.

Aroused by Dr. Moore's remarks, the U. S. Bureau of Mines sent him out to Colorado to investigate. Three times as much radium, he found, was being made from the carnotite ores of Colorado and Utah as from all other sources of radium in the world. Europe was buying and shipping abroad these American ores, manufacturing the radium, keeping the bulk of it and selling small amounts back to those Americans that could afford $70,000 for one gram of radium bromide.

A rare-minerals laboratory under the charge of Dr. Moore was established at Denver, to work out the best method of coaxing the radium from the ores. At the same time a Radium Institute based on foreign models, was set up under the direction of such men as Dr. Howard A. Kelly of Baltimore, and Dr. James Douglas, who, losing his daughter by cancer, had decided to found the great cancer hospital in New York, the Memorial Hospital. The Bureau of Mines cooperated by supplying experts in geology and chemistry.

These efforts to give the world and the United States a readier supply of radium were completely successful. Shortly after 1913, when the work was begun, the Denver radium plant was producing the bulk of the world's supply.

By the irony of fate, however, this same year witnessed the discovery at Katanga, in the Belgian Congo, of a much richer and more extensive pitchblende deposit. This contained enough radium so that it was profitable to ship it to Europe for extraction.

Not indeed until 1922 did the Belgian radium appear on the market but when it did, it drove all other competitors out of the field. For this reason the American workings have been discontinued (some think unwisely) and the Belgian manufacturers have enjoyed a world monopoly since then.

ANTHROPOLOGY

Sinanthropus, Ancient Man Of China, Knew Use of Fire

SINANTHROPUS, or "Peking Man," knew the use of fire. Specimens of apparently charred animal bones have been recovered from the limestone deposits at Choukoutien, the locality about forty miles southwest of Peiping where the Sinanthropus remains were found. The physical appearance of these specimens made it fairly evident that they had been subject to the action of fire, but the origin of the fire was not known. It remained a question whether the bones had been burned within the Choukoutien caves while the latter were occupied by Sinanthropus or whether they were burned in a surface fire from natural causes and had subsequently been washed into the deposit.

Several of the charred bones were sent to Paris for comparison with similar specimens which have been found in abundance in many of the prehistoric sites in Europe, and Dr. Gaubert, of the Laboratory of Mineralogy of the Paris Museum, subjected some of these fragments to chemical analysis. These results of his experiments, taken in conjunction with an analysis of soil samples from the Choukoutien caves, have made it plain that Sinanthropus carried the fire into his subterranean dwelling.

Handiwork of Peking Man

Last spring W. C. Pei, the young Chinese geologist who found the famous Sinanthropus skull in 1929, collected from the Choukoutien deposits more than 2,000 quartz artifacts. These correspond to the pre-Chellean type of implement found in Europe, but in technique they resembled the Mousterian culture, in that they were made from quartz flakes rather than from cores. As these implements were found in association with Sinanthropus remains, consisting of a skull fragment and two additional jaw specimens, besides numerous animal fossils, it is considered certain that they represent the handiwork of the Peking Man.

Discussing the Choukoutien culture in a paper before the Chinese Geological Society, Abbé Henri Breuil, Director of Research in the Institute of Human Paleontology in Paris, who recently visited Peiping, pointed out that Sinanthropus must have made a considerable use of fire, as superimposed layers of charcoal debris extending to a depth of seven yards were found, while many stones were seen to be black with soot. It was evident that he used the stone implements for fashioning weapons from animal bones. Deer antlers with sharpened points might have been used as daggers, while the frontal portion of a deer skull looked as though it might have been used as a drinking vessel.

Among the artifacts Abbé Breuil was able to identify side scrapers, points, piercers and borers, all testifying to "a very systematic industry." Larger fragments resembled choppers or anvils. The quartz from which the implements had been made was a very imperfect material, Abbé Breuil pointed out, but Sinanthropus seemed to have done about as well with it as anyone could be expected to do. At any rate it was clear that Sinanthropus was already man and that he was able to organize his life so as to select intelligently the elements useful for burning, for cutting and for working. Probably he was able to work wood as well as bone, but this is difficult to prove. Unquestionably, too, he was a successful hunter of animals.

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MEDICINE

Tiny Apparatus Devised to Regulate Radium Treatment

A TINY apparatus hardly larger than a pea, so that it can be introduced into most cavities of the human body, has been devised by Dr. Louis Mallet, head of the laboratory of the anti-cancer center of Tenon Hospital, Paris, to help physicians measure the amount of radiation that reaches various organs and parts of the body during radium treatment. The apparatus was described in a report made to the French Academy of Sciences.

When ordinary medicines are used in treating disease, the full dose can be introduced directly into the veins or stomach, for instance, but with radium it is difficult to know whether the full dosage of rays actually reaches the organ to be treated or whether some of the rays are deflected to other parts of the body. For this reason a device like Dr. Mallet's would be very useful.

His apparatus is called an ionization chamber. It consists of a small metal knob the size of a pin head within a slightly larger metal enclosure. The air between the two does not conduct electricity under ordinary conditions, but becomes conducting under the influence of radium. These tiny chambers are first screwed onto an apparatus which charges them to about 160 volts. Then they are introduced into any part of the body, such as the throat, which is being exposed to radium. After a given time the ionizing chambers are taken out and their loss of voltage measured. This gives a measure of the intensity of radiation to which the chambers have been exposed in the body, and consequently to the amount of radiation to which that part of the body has been exposed.

Dr. Mallet is already known for his invention of a similar device which is used in many hospitals for measuring indirectly the strength of radiation employed in cancer treatment. The advantage of the new method is that one or more of the ionizing chambers can be introduced directly into the body, and that they can be sent out to be used by physicians and afterwards returned to a central laboratory for measurement.

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ORNITHOLOGY

Nature Ramblings

By FRANK THONE

Snowy Owl

"While nightly cries the staring owl,
"Towhit—, to—who, a merry note. . ."

THEREIN Shakespeare surely showed himself a true child of the country, for no man bred of the cities could by any stretch of imagination or suppression of ancestral instinct call the note of the owl a merry one. The shivering call of the screech-owl, or the loud whoop of the winter-visiting great snowy, coming without warning out of the night, are alike able to raise gooseflesh all along one's back.

Though mankind seems to share the prejudice of small birds against all owls, and is ready to chuck stones or bullets at them on sight, there is something about the snowy owl that compels a measure of respect in spite of our prejudices. He is a big fellow, and in this unfair world size counts in the favor of its possessor. But add thereto the downy whiteness of his feathers, and his air of slow dignity on his perch, and the snowy owl really does establish a claim for our consideration. And if we let reason rather than prejudice sway us, and reflect on the numbers of our enemies, the mice and rats, that he slays, we should be all the more willing to do him honor.

The snowy owl is not a permanent resident in our latitudes, as a usual rule. His home is in the high north, in lands where there are no cities and very few men. Labrador, the Hudson Bay region, the vast northwestern tundras, the arctic islands, lands of long winter, cold and silence, these are the favorite haunts of the snowy. He comes south as an occasional migrant in winter, or perhaps blown down the path of storms. Ships coming down out of northern waters sometimes pick up the great birds at sea, bewildered and thankful for a rescue and a chance to rest on the rigging.

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ANIMAL PATHOLOGY

Lead Shot Kills Ducks Even Though Hunters Fire and Miss

FROM Bear Lake, in southern Minnesota, comes the astonishing news that although hunters shoot and miss, they kill ducks just the same. Four hundred ducks died at the lake during the past season from shot which did not hit them. To explain this paradox, Dr. T. B. Magath, of the Mayo Clinic, made an investigation. He said lead poisoning was responsible.

Ducks swarmed to Bear Lake early in December. After a week or ten days many were neither able to rise from the water nor to walk on land. They soon died. Several of the dead birds, which a mystified game warden picked up on the shore, were X-rayed. Dr. Magath found the lead pellets grouped closely in the center of the body. Then he examined some sick ducks. In each case the wings drooped, the nerves of the feet were apparently injured and the birds suffered from anemia and diarrhea. The symptoms were similar to those of lead poisoning in man.

Dr. Magath investigated Bear Lake, where duck hunting has been going on for the past quarter of a century. He took samples of ooze from the bottom, where the water was not frozen, and discovered bird shot present in them. He estimated that in the last ten years fifty tons of shot have been poured into the lake by hunters, and that where the most shooting has been done the shot probably lie almost in layers.

The ducks that frequent Bear Lake feed in the shallows, scooping up the ooze in search of mollusks. And the shot contained in the ooze goes into the birds' gizzards to be absorbed.

But the fact that birds die from eating shot is not the only thing that alarms sportsmen and nature lovers. Lead poisoning, Dr. L. J. Cole of the University of Wisconsin has pointed out, reduces the fertility of the male domestic fowl and probably has the same effect on the male wild duck. As yet, no practical method has been suggested for protecting ducks from the shot that misses them.

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• First Glances at New Books

Geology

THE PRINCIPLES AND PRACTICE OF GEOPHYSICAL PROSPECTING — Edited by A. B. B. Edge and T. H. Laby—*Cambridge University Press,* 372 p., $5. Seeking hidden treasure of oil and ore by means of gravity balances and artificial earthquakes has become standard procedure now among economic geologists and mining engineers. This report of the Imperial Geophysical Experimental Survey gives a history of its development and an outline of its modern practice in Australia and Tasmania.

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Ethnology

HOPI GIRL—Dama Margaret Smith—*Stanford Univ. Press,* 273 p., $2.50. "Indians," declares the author, "are human beings, even as you and I, and not biological specimens on the ends of hatpins to be examined under a microscope." To bring home this realization to the reader, Mrs. Smith tells her story of the Hopi girl and her associates, their hopes and disappointments, their small dreams and heartaches, "just as though they lived in some small New England village."

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Zoology-Oceanography

CORAL REEFS AND ATOLLS—J. Stanley Gardiner — *Macmillan,* 181 p., $4.25. The palm-fringed islands of the South Seas have been fascinations for the traveller ever since the days of Sindbad; their reasons for existence have been debated with increasing interest from Darwin onward. The present volume gives us the benefit of the more recent work and observations in this field.

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Sociology

THE MEXICAN IMMIGRANT, HIS LIFE STORY—Dr. Manuel Gamio—*University of Chicago Press,* 288 p., $3. The volume contains seventy-six short life stories of Mexican immigrants into the United States. They give an important insight into the character of the typical Mexican who has come in hordes across the Rio Grande in years recently past. They also throw light on racial and economic problems arising therefrom. The documents were grouped according to the phase of the immigrant problem they most elucidate, by Dr. Robert Redfield of the Department of Anthropology of the University of Chicago, also author of the introduction. It is a supplementary volume to Dr. Gamio's *Mexican Immigration Into the United States.* It was human material gathered during that previous investigation, which was deemed worthy of separate publication and of value in the understanding of race problems in America.

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History

THE BLACK DEATH AND MEN OF LEARNING—Anna Montgomery Campbell—*Columbia University Press,* 190 p., $3. Previous discussions of the epidemics of plague which raged through the middle ages have been chiefly medical and epidemiological. This author discusses its influence on one broad class of the population, the learned or educated class, which includes physicians, mathematicians, physicists, astrologers, astronomers, statesmen, lawyers, clerics and university teachers and students.

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Hygiene

THE CARE AND FEEDING OF ADULTS, WITH DOUBTS ABOUT CHILDREN—Logan Clendening — *Knopf,* 317 p., $2.50. This new book on health pokes fun in a perfectly delightful manner at most other popular books on health, particularly those dealing with birth control, sex, diet, social reform, psychology, and child-rearing. Unfortunately, the "tender-minded" who most need Dr. Clendening's sane, sound advice will probably neither understand nor heed it, but the "tough-minded" will get enough hearty laughs to chase the depression blues quite far.

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Psychology

THE SECRET OF CONCENTRATION—T. S. Knowlson—*Harper,* 235 p., $2.50. The author tells you that you can concentrate and thus increase the power of your mind. Just say to yourself on retiring and before rising "I can concentrate." But there is a catch to it—you must believe the statement! And then you must practice. If you are a mind-wanderer of long habit, you should be content with fifteen minutes at a time, but later this can be stretched to a half hour.

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Plant Physiology

EXPERIMENTAL PLANT PHYSIOLOGY—George James Pierce—*Holt,* 166 p., $1.50. Much more condensed and compact than most of the texts in its field, this new book by one of the best known of American plant physiologists seeks to outline a series of experiments which will demonstrate the fundamental principles of plant function without taxing too heavily the beginning student's manipulative skill, yet without fubbing him off with "lamp chimneys and tomato cans."

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Vocational Guidance

GUIDANCE FOR CAREERS—VETERINARY MEDICINE—Walter J. Greenleaf—*Government Printing Office,* 9 p., 5 c. This appears as one of Dr. Greenleaf's series of career leaflets, published by the Office of Education. The leaflets explain what the occupations are, what preliminary and professional education is required, student budgets, etc., and include lists of selected references at the end.

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