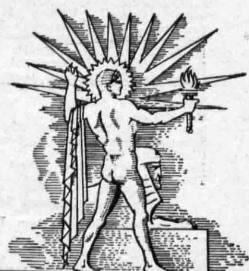


SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



FEBRUARY 27, 1932

"Like Pussy-Cats All in a Row"

See Page 139

SCIENCE NEWS LETTER

VOL. XXI

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Summary of Science

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DO YOU KNOW THAT

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A landslide at Tivoli revealed the first tomb of a Vestal virgin ever discovered, and an inscription told that the woman had served the goddess Vesta for 66 years.

A slow-motion timing machine which revolves only twice a day has been produced.

A small device which detects presence of the dangerous carbon monoxide gas has been developed as a safety aid for homes and garages.

In tropical countries covered with luxuriant vegetation the rainfall is seldom less than 60 inches a year.

The region of the Florida Everglades which may become a national park contains the greatest exhibit of herons, egrets, and ibises in the United States.

The nectar which bees gather from flowers contains sucrose, the same sugar that is in sugar beets and cane.

Until 10 years ago, no remains of old structures in India could be dated with certainty beyond the third century B.C.; now Indian prehistory goes back to 4300 B.C.

A cotton fabric for curing concrete has been tested in road construction and reported to be satisfactory.

Of the 66 different birds that feed upon the cotton-boll weevil, government scientists regard orioles and swallows as probably the most effective destroyers.

A new aid to police squads pursuing bandits and other escaping lawbreakers is a pistol that fires a splash of red dye on the back of the pursued car, thus marking it conspicuously.

The Norwegian whaling companies have not gone out on whaling expeditions this year, and as a result large numbers of people have been left unemployed.

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Science Service presents over the radio, an address

THE AGE AND SIZE OF PLANTS

By Dr. Charles J. Chamberlain, Professor of Botany at the University of Chicago

Friday, March 4, at 3.45 P. M., Eastern Standard Time
Over Stations of

The Columbia Broadcasting System

PSYCHOLOGY

Blind Have Special Ability To Sense Objects in Pathway

Faint Sounds Which Cannot Be Heard Normally Give Rise To Warning Sensation on Faces of Afflicted Persons

THE BLIND do have a special ability to sense obstacles in their pathway, but they do not have a "special sense" making use of an organ not available to persons with sight, Dr. Vladimir Dolansky, blind Russian psychologist, said in a report to the new American Braille Press journal, "And There Was Light."

Dr. Dolansky lost his sight and his right arm in an accident when he was a child of ten years. After he became blind, he began to observe a fact which astonished him—at the moment when he came close to an obstacle he was aware of the sensation of being lightly grazed across the face. Even then he began to experiment to find the cause of this helpful warning.

Sensation Irregular

"Very gently, on tiptoe, holding my breath, I would move towards an object," Dr. Dolansky said, "but the sensation was irregular and did not always occur when desired.

"However, I gradually noticed that these sensations never appeared when I knew where the obstacle was and, invariably, they always occurred when I was unexpectedly brought up against an object."

Later when he had grown up and was attached to the Institute of Experimental Psycho-Physiology at Paris, he started a long series of experiments to solve definitely this mystery. These experiments were continued in his own laboratory at Laski, near Warsaw.

To test suggested theories explaining the sensation as a reflection of air waves from the obstacle against the face or a change in temperature of the column of air between the object and the face, Dr. Dolansky placed cardboard masks, or ordinary "false faces," on the persons tested. Despite this protection, they still felt the odd brushing or grazing across the face.

Next he tried putting cotton in their ears. Then they felt nothing at all.

Dr. Dolansky concludes that some slight sound to which only the blind

person is acute, perhaps the echo of his footsteps against the obstacle, brings the warning to him.

But what then causes the mysterious sensation in the face?

Dr. Dolansky points out that the blind are constantly fearful of accidents. This fear increases when the warning sound is heard. And fear causes a certain reflex action in the skin.

"On the surface of the body, beside the fatty glands, and those of perspiration, hair follicles are placed obliquely. At their bases are attached contractile muscular fibres communicating with the nerves. Under the action of certain nervous currents occasioned by fear, the muscular fibres contract and the hair rises perpendicularly to the surface of the skin, which gives us the impression of tingling, of a cold touch on the cheeks, and in moments of terror, the feeling that the hair stands up on end.

METALLURGY

Iron Chunks Blown Up Like Puffed Grain in New Process

HUGE CHUNKS of iron ore are stuffed with steam and blown to pieces as if they were grains of wheat or rice being made into breakfast food, in a new metallurgical process which may become a widespread and money-saving method of treating ores, it was revealed at the meeting of the American Institute of Mining and Metallurgical Engineers.

R. S. Dean, chief engineer of the metallurgical division of the U. S. Bureau of Mines, and John Gross, metallurgist of the Bureau, who discovered the process, described it before the engineering society. Preliminary investigations have disclosed that their method requires little expense and labor and they believe that it may work something of a revolution in mining.



HOW THE BLIND "SEE"

Although blind and masked, this girl senses the approach of the disk by a faint brushing across her face.

"A cat attacked by a dog bristles in the same way, likewise a dog or a horse which has smelled a wolf."

Thus the rustling or grazing over the face is actually a result of the warning, not the cause of it.

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Zinc and iron ores have been successfully shattered. The pores and crevices of the ore are first impregnated with water, then the ore is heated under pressure until the water turns to steam. When the pressure is suddenly released, the lumps of ore tear apart under the force of the expanding steam just as small grains of wheat are blown into large fluffy particles.

The Bureau is planning experiments on a larger scale, it was said. Fuel expense for treating ore in this fashion has been estimated to be only five cents per ton of ore treated, when the cost of coal is two dollars per ton.

The process means the salvaging of materials formerly discarded, Mr. Dean said.

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INVENTION

New Electric Eye Functions With Single Piece of Metal

A NEW KIND of "electric eye" that converts light into useful electricity without the use of evacuated glass bulbs or tubes is about to come into practical use.

The functioning part of the new photoelectric cell is a single piece of coated metal and the claim is made by the manufacturer, the Weston Electrical Instrument Corporation, that it will have unlimited life, high sensitivity, no deterioration, no chemical or physical change, combined with low cost. An electric relay to actuate electrical machinery can be operated direct from the cell without other source of current.

The new light-sensitive device is believed to consist essentially of a thin layer of selenium on an iron-nickel alloy plate, covered by a film of metallic silver. The manufacturers have not made public the method of construction of the cell on account of their pending patent claims.

If the metallic photocell is constructed in this way, it is similar in principle to that developed by the Berlin scientist, Dr. Bruno Lange, last year. First reports of Dr. Lange's development were brought to this country exclusively by Science Service. Dr. Lange

first developed a metallic photoelectric cell using a layer of copper oxide on copper, and later he devised one using silver selenide.

It is expected that the new Weston cell will open the use of photoelectric cells to amateurs and experimenters. Due to its low cost it may come into use for controlling household devices by beams of light, in the same way that traffic lights are now switching in many installations by the older and more complex "electric eyes."

First hopes of exceptional performance raised by the German silver-selenium invention have been justified by the new Weston cell, which is credited by experts as being better than any previous cell. It gives 200 times as much current for a given amount of light, as the best caesium vacuum cell at present in use. Its sensitivity is about ten times that of the copper oxide cell. In direct sunlight, it gives a current of a two-hundredth of an ampere.

There is no immediate prospect that the device will be used for tapping the energy of sunlight for practical purposes but this is the most efficient converter of solar energy known to man.

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DENTISTRY

Claim for One Toothpaste Found to be Unwarranted

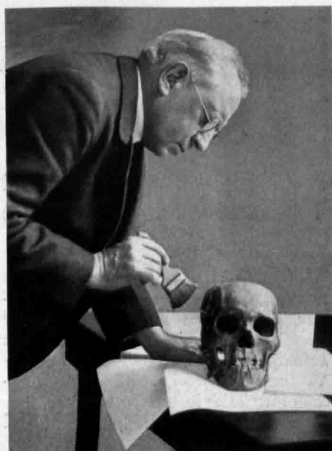
THE "three shades lighter in three days" claim of a certain toothpaste has been tested scientifically and found unwarranted, the South Bend Dental Society has just reported to the American Dental Association.

Under the direction of Harold T. Daley, former instructor in pharmacology and oral surgery at Northwestern University, South Bend dentists made the following test: The shades of teeth of 73 patients were measured against a standard dental shade guide. Each patient was then given some of the toothpaste and was instructed to brush his teeth according to the directions appear-

ing in the newspaper advertising for this toothpaste, headed "Three Shades Brighter in Three Days." On the third day the shade was again measured by the same guide. Of the 73 patients only one showed any change at all. That was very slight, but to give the advertisers the benefit of the doubt, was reported as one shade lighter.

For this reason and because of other unwarranted claims in the advertising, this toothpaste, although unobjectionable in composition, was not accepted for admittance to Accepted Dental Remedies of the American Dental Association.

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A RACIAL STANDARD

Dr. A. E. Jenks, head of the department of anthropology of the University of Minnesota, dusting the first skull which archaeologists found of the Mechta el Arbi man.

ANTHROPOLOGY

First Type Skull to Reach America Comes from Africa

MUSEUMS abroad have long had a monopoly on the famous "type" skulls showing what man's early ancestors were like, but now America has acquired its first scientific treasure of this sort.

The first type skull received in this country is that of a man who lived in north Africa 25,000 years ago. The skull has been placed on display at the University of Minnesota where it becomes part of a collection of prehistoric relics gathered in north Africa by Arthur Debruge, French-African prehistorian.

A type skull, scientists explain, is important as a standard showing what a race of ancient men was like physically. The first skull discovered revealing a new distinct race or type of ancient man is set apart to be the type skull. America's newly acquired type skull has been named the Mechta el Arbi skull.

The Mechta el Arbi men were a race of white men in north Africa, long since extinct. Their main diet was snails, judging from the mounds of snail shells found by University of Minnesota expeditions. In these shell heaps, some fifteen feet deep, the Mechta el Arbi people buried their dead.

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GEOGRAPHY

Aviator Studies Skyscraper Cities Hidden in Desert

Miniature New Yorks Shut Off From Outside World Unvisited by Foreigners but Possessing Automobiles

SECRET Arabian cities that look like small New Yorks, yet are shut off from all outside contacts by deserts and mountainous "emptylands," have been studied from the air by the Honorable R. A. Cochrane of the British aviation service.

Although practically unvisited by strangers, these cities are prosperous and highly organized. They have temples of six and seven stories, covering with their outbuildings areas of several acres.

There are rich walled gardens and villas with colonnades and verandas, such as are rarely seen in native Arabian architecture. But strangest of all, there are a few modern automobiles. These were imported in pieces on camels' backs from over the mountains, and reassembled in these secret cities. The inhabitants of the cities emigrate, learn, and return, but no strangers enter.

These cities are in the Hadhramaut, a valley 300 miles long, parallel to the southern coast of Arabia, and running into the sea 450 miles east of Aden, on an abandoned unprotected coast where monsoons rage. In Bible times Hadhramaut was part of the famed incense-bearing lands of the Sabaeans, the source of frankincense and myrrh, and an important point in the trade route to the Orient.

Treasures Found

Within an area of a few miles square, and without excavation, were recently found a Sabaean seal, an Assyrian bronze horse, and a beautifully modeled Greek Apollo. One of the valley's cities, Shibam, has proof of continuous occupation for 2,500 years. A Sabaean queen visited Solomon.

The cities lie in a "wadi," as Arabs call ravines that in the rainy season are watercourses. The rain is caught and used for irrigating the luxuriant villa gardens and rich date groves that cover the valley.

The tallest temples, of six and seven stories, are made of dried mud bricks. Though they are the color of the earth,

they are made visible from the air by shadows cast by windows and angles of the walls. The "skyscrapers" are castles of the rich.

The primitive self-government of Hadhramaut dates from ancient times. The population is sharply divided into four classes. First are the Saiyids. They claim pure descent from Husian, the son-in-law of the Prophet, and jealously resent marriage outside of their own caste. They have large numbers of slaves, the richest lands, do no physical work, and have political and religious power.

Second are the "tribesmen," inseparable from their rifles. Each tribe has a head, and each family a "father." They still have nomad instincts, but live largely in settled communities.

Third are the townsfolk, the unarmed merchants, farmers and workers who buy safety from the tribesmen by their taxes, which the latter divide with the Saiyids.

Lastly are the slaves, hard to get now. Male slaves used to come from eastern Africa, and Chinese girls are still imported when agents can escape authorities at ports of export.

The Hadhramaut is a small valley, and its sons therefore emigrate. One stream goes to Hyderabad nearby, another to Dar-es-Salaam and the East African coast, and a third to the Straits Settlements and the Dutch East Indies. Whole streets in Singapore and Penang are owned by rich Hadhramis, who go back in their old age to die in their beloved Hadhramaut.

Only four Europeans are believed to have been inside this strange valley, and these saw only a small part of it. The greater part has never been seen by any European eyes, except from the air in the recent expedition.

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ECOLOGICAL

Nature Changing Aspen For Desirable Hardwoods

WHILE MAN discusses how to convert artificially the aspen woods of the Great Lakes area into a more desirable type of forest, nature has already begun the conversion, and a generation hence will see it well advanced.

Forest surveys conducted by the Lake States Forest Experiment Station of the University of Minnesota reveal that most aspen stands contain large numbers of hardwoods and conifers. As these are much longer-lived trees than the aspen, they will, if not disturbed by fire, eventually replace it.

Seedling reproduction in aspen stands, the survey pointed out, is actually not aspen. On heavier soils, hardwood reproduction among aspens was found to exceed 50 per cent.

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NOT A MIRAGE

Aerial photograph of the prosperous Arabian city of Shibam, in a land that only four Europeans are known to have visited.

NUTRITION

Errors in Our Food Economy

"A Classic of Science"

The Researches Which Started American Diet Study Contain Helpful Hints for these Depression Times

METHODS AND RESULTS OF INVESTIGATIONS ON THE CHEMISTRY AND ECONOMY OF FOOD. By W. O. Atwater, U. S. Department of Agriculture, Office of Experiment Stations, Bulletin No. 21. Washington: Government Printing Office, 1893.

FORTUNATELY, enough information has already been gained to indicate in a general way what are the principal mistakes in the food economy of people in the United States, even though we are not yet certain as to all the details.

Scientific research, interpreting the observations of practical life, implies that several errors are common in the use of food:

First, many people purchase needlessly expensive kinds of food, doing this under the false impression that there is some peculiar virtue in the costlier materials, and that economy in our diet is somehow detrimental to our dignity or our welfare. And, unfortunately, those who are most extravagant in this respect are often the ones who can least afford it.

Secondly, the food which we eat does not always contain the proper proportions of the different kinds of nutritive ingredients. We consume relatively too much of the fuel ingredients of food, such as the fats of meat and butter, the starch which makes up the larger part of the nutritive material of flour and potatoes, and sugar and sweetmeats. Conversely, we have relatively too little of the protein of flesh-forming substances, like the lean of meat and fish and the gluten of wheat, which make muscle and sinew and which are the basis of blood, bone, and brain.

Thirdly, many people, not only the well-to-do, but those in moderate circumstances, use needless quantities of food. Part of the excess, however, is simply thrown away with the wastes of the table and the kitchen; so that the injury to health, great as it may be, is doubtless much less than if all were

eaten. Probably the worst sufferers from this evil are well-to-do people of sedentary occupations—brain workers as distinguished from hand workers.

Finally, we are guilty of serious errors in our cooking. We waste a great deal of fuel in the preparation of our food, and even then a great deal of the food is very badly cooked. A reform in these methods of cooking is one of the economic demands of our time.

Cheap vs. Dear Food

We can not judge of the nutritive value of food by the quantity. This fact is brought out clearly by the figures [amounts of nutrients furnished for 25 cents in food materials at prices in Eastern States]. There is as much nutriment in a pound of wheat flour as in $3\frac{1}{2}$ quarts of oysters, which weigh seven pounds. There is still less connection between nutritive value and price. In buying at ordinary market rates we get as much material to build up our bodies, repair their wastes, and give strength for work, in 5 cents' worth of flour or beans or codfish, as 50 cents or \$1 will pay for in tenderloin, salmon, or lobsters.

Round steak at 15 cents a pound is just as digestible and is fully as nutritious as tenderloin at 50. Mackerel has as high nutritive value as salmon, and costs from an eighth to half as much. Oysters are a delicacy. If one can afford them there is no reason for not having them, but 25 cents invested in a pint would bring only about an ounce of protein and 230 calories of energy. The same 25 cents spent for flour at \$6 a barrel, or 3 cents a pound, would pay for nine-tenths of a pound of protein and 13,700 calories of energy. When a day-laborer buys bread at $7\frac{1}{2}$ cents a pound the actually nutritive material costs him three times as much as it does his employer, who buys it in flour at \$6 a barrel.

Illustrations of the prejudice of people, especially those in moderate circumstances, against the less expensive kinds of foods are very common.

Mr. Lee Meriwether, who has given much attention to this special subject, cites a case in point, that of a coal laborer who boasted: "No one can say that I do not give my family the best of flour, the finest of sugar, the very best quality of meat." He paid \$156 a year for the nicest cuts of meat, which his wife had to cook before 6 in the morning or after half past 6 at night, because she worked all day in a factory. When excellent butter was selling at 25 cents a pound he paid 29 cents for an extra quality. He spent only \$108 a year for clothing for his family of 9, and only \$72 a year for rent in a close tenement house, where they slept in rooms without windows or closets. He indulged in this extravagance in diet when much less expensive food materials, such as regularly come upon the tables of men of wealth, would have been just as nutritious, just as wholesome, and in every way just as good, save in the gratification to pride and palate. He was committing an immense economic blunder. Like thousands of others, he did so in the belief that it was wise and economical.

The sad side of the story is that the poor are the ones who practice the worst economy in the purchase as well as the use of food. The Massachusetts Bureau of Labor, in collecting the dietaries above referred to, made numerous inquiries of tradesmen regarding the food of the poor in Boston, meaning by poor "those who earn just enough to keep themselves and families from want." The almost universal testimony was,

After a policy of strict isolation from the rest of the world, beginning about the year 1600

JAPAN

was brought back into the stream of world commerce, through a visit in 1853 of

Commodore Perry, U.S.N.

Perry's account of the people as he found them is

THE NEXT CLASSIC OF SCIENCE



W. O. ATWATER

—who studied the American dietary and measured the calories of energy which our food must supply. For these experiments he built a huge calorimeter in which a man lived for days at a time, sometimes merely eating and sleeping, sometimes pedaling a bicycle or doing other hard muscular work.

"They usually want the best and pay for it, and the most fastidious are those who can least afford it." The costliest kind of meat, finest flour, and very highest priced butter were demanded, and many scorned the less expensive meats and groceries such as well-to-do and sensible people were in the habit of buying.

I have taken occasion to verify these observations by personal inquiry in Boston markets. One intelligent meat man gave his experience with a poor seamstress, who insisted on buying tenderloin steak at 60 cents per pound. He tried to persuade her that other parts of the meat were just as nutritive, as they really are, but she would not believe him; and when he urged the wiser economy of using them she became angry at him for what she regarded as a reflection upon her dignity. "My wealthy customers," said he, "take our cheaper cuts, but I have got through trying to sell these economical meats to that woman and others of her class."

I am told that people in the poorer parts of New York City buy the highest priced groceries, and that the meat men say they can sell the coarser cuts of meat to the rich, but that people of moderate means refuse them. I hear the same thing in Washington and other cities.

The direct waste of food occurs in two ways, in eating more than is needed and in throwing away valuable material in the form of kitchen and table refuse. That which is thrown away does no

harm to health, and in so far as part of it may be fed to animals or otherwise utilized, it is not an absolute loss. That which we consume in excess of our need or nourishment is worse than wasted because of the injury it does to health. A few instances taken from the investigations mentioned above will help to illustrate the waste of food.

One of the dietaries examined by the Massachusetts Labor Bureau was that of a machinist in Boston who earned \$3.25 per day. In food purchased the dietary furnished 182 grams of protein and 5,640 calories of energy per man per day, at a cost of 47 cents. One-half the

meats, fish, lard, milk, butter, cheese, eggs, sugar, and molasses would have been represented by 57 grams of protein, 1,650 calories, and 19 cents. If these had been subtracted the record would have stood at 125 grams, 3,990 calories, and 28 cents. This family might have dispensed with one-half of all their meats, fish, eggs, dairy products, and sugar, saved 40 per cent. of the whole cost of their food, and still have had all the protein and much more energy than is called for by a standard which is supposed to be decidedly liberal. . . .

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PHYSIOLOGY

Deep-Sea Fish Produce Light Under Stimulation of Drug

FISH which shed light in the black depths of the ocean can, like their luminous brethren at the surface, be stimulated to exercise their peculiar powers through the action of adrenalin, a potent drug used by physicians to prolong human life.

This discovery, reported to the New York Zoological Society, was made by Dr. E. Newton Harvey, professor of physiology at Princeton University, during experiments with living deep-sea specimens furnished by William Beebe, noted naturalist. The fish, *Echiostoma ctenobarba*, measuring about one foot in length, was caught with dragnets at a depth of about a mile.

A small amount of adrenalin, Dr. Harvey states, was injected with a hypodermic needle near the tail, causing a yellowish glow to spread over the fish, not only at points where the light-producing cells were in evidence, but also at the forward and underside fins which had no marked organs of luminescence. Similar stimulation could not be obtained, Dr. Harvey found, by squeezing or twisting the fish, or injecting fluid without adrenalin. A pink organ in the cheek, which flashed with a bluish luminescence, was the only part of the fish to glow without the use of adrenalin.

The same "lighting" effect was achieved with second, third, and fourth injections of adrenalin; but the stimulant was unavailing upon fish which had been dead for some time. Dr. Harvey's experiment was a second ex-

ample of stimulation of luminous fish with adrenalin, a previous one having shown that surface dwelling forms are likewise affected.

Ability of organisms to produce light is due, Dr. Harvey points out, to the slow burning of a substance, luciferin, in the presence of an enzyme, or a substance which assists the chemical reaction without actually being part of the resulting product. The name of this enzyme is luciferase.

Dr. Harvey prepared solutions of these two substances from a crustacean, *Cypridina*, and a deep sea shrimp, *Systellaspis*. He discovered that the mixing of luciferin of one organism with its own enzyme would give plenty of light; if, however, he tried the solutions from the shrimp on those of the crustacean, he got no results.

Light will be produced, Dr. Harvey learned, when appropriate solutions from closely related animals are used. He called attention to an interesting experiment that can be carried out with two species of fire-flies, where the luminescence of each differs in color. The luciferin of one species, which gave off yellowish light, was mixed with the enzyme of the other species, whose light was reddish.

The result was not what the person familiar with water colors would expect. Instead of getting light from the mixture which had an intermediate orange color, Dr. Harvey got reddish light, showing that the enzyme is the real source of the luminescence.

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GEOLOGY

River Improved to Bring Radium to Civilization

EIGHT HUNDRED miles of waterway linking rich radium discoveries with civilization are being improved by the Hudson's Bay Company in order that valuable ores newly discovered in the Canadian Northwest Territories can be transported out of the wilderness, Hugh S. Spence, mining expert for the Canadian government, has reported to the American Institute of Mining and Metallurgical Engineers.

The radium ores are worth \$70,000 a ton at present prices and silver ores found in the same workings assay \$3,000 a ton.

Airplanes have been used to carry prospectors and miners back and forth, but it will be more economical to carry the heavy ore by water. Twenty tons of ore were brought out last summer, but the difficulties were great.

Most of the improvements are being made on the Great Bear River, the outlet from Great Bear Lake on which are situated the new mines. The Great Bear River leads to the Mackenzie down which some seven thousand tons of freight are carried in the fur steamers each year. One ten-ton scow is the only means of transport at present on Great Bear Lake itself.

The radium deposits of pitchblende were discovered by Gilbert LaBine last year. Mr. Spence predicted that further rich ore discoveries will be made in the same region this coming summer.

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EMBRYOLOGY

Embryos Found in Ovaries Of Unmated Guinea Pigs

THE BEGINNINGS of embryo guinea pigs that never had a father have been found in the ovaries of unmated female animals by Prof. Leo Loeb of Washington University Medical School at St. Louis. Four such finds made during the past year will be described in *The Anatomical Record*.

These "parthenogenetic" embryonic structures have been found in virgin guinea pig ovaries several times in the past by Prof. Loeb, and the present observations confirm his earlier work. Although the production of fatherless young is a commonplace occurrence in many animals, of which the ordinary aphid or plant louse is perhaps the most widely distributed example, it has never

been observed among the higher vertebrates that bring forth their young alive, and even the abortive beginnings of such a process are regarded as extraordinary phenomena by biologists.

Prof. Loeb's brother, the late Dr. Jacques Loeb, many years ago startled the world by making the eggs of sea urchins and other lower animals develop without fertilization, stimulating them with chemicals, and the use of other methods, and Prof. Bataillon, a French embryologist, induced development of frog eggs by pricking them with needles. This set Prof. Loeb to wondering whether the supposedly impossible mammalian parthenogenesis was not possible after all, at least in part, and he started sectioning the ovaries of unmated young female guinea pigs and examining them with his microscope.

Science News Letter, February 27, 1932

PUBLIC HEALTH

First Year of Life Best For Smallpox Vaccination

CHILDREN should have their first smallpox vaccination before they reach their first birthdays, Dr. Charles Armstrong of the U. S. Public Health Service and the National Institute of Health advised students of medicine and public health at the fifth De LaMar lecture of this season at the Johns Hopkins School of Hygiene and Public Health.

This protects the child from deadly, disfiguring smallpox during the first year of his life when he would otherwise be susceptible to the disease. At this age children suffer less severe reactions after the vaccination than older children, Dr. Armstrong pointed out, and they are less likely to develop the complications which occasionally follow smallpox vaccinations in older children. Dr. Armstrong described the method of vaccination which his studies of the subject have shown to be best.

"Fixed dressings and shields should be avoided," he declared.

Cases of tetanus following vaccination were reduced from an average of thirty to nine or ten per year following a campaign, instituted by the U. S. Public Health Service in 1928, against the use of vaccination shields or dressings. In infant vaccinations it is important to keep the surroundings clean and the blister at the site of the vaccination firm, dry and unbroken, Dr. Armstrong emphasized. The arm is the preferred place for vaccinations, especially in patients who are up and about.

Science News Letter, February 27, 1932

IN SCIENCE

CHEMISTRY

Harmful Stuff in Tobacco Removed by Silica Gel

NICOTIN, together with harmful tarry stuffs and coloring matter, is taken out of tobacco smoke by tubes of silica gel inserted in pipestems and cigarette or cigar holders, states *Zeitschrift für angewandte Chemie*. The "smoke-sweetening" properties of silica gel were discovered by Prof. J. Traube. Silica gel is a common chemical, widely used as an adhesive and as an egg preservative. Smoke from bad cigars and cigarettes loses its "scratchy" quality when drawn through the gel, the report states. Even the rank tobacco grown in the German Palatinate is said to be rendered smokable by it.

Science News Letter, February 27, 1932

ETHNOLOGY

Scientist Not to Attend Head-Hunting Party

THE COMPANY of Mr. Matthew W. Stirling, chief of the Bureau of American Ethnology, is cordially requested by the Jivaro tribe at a head-hunting party in the jungle of Ecuador.

This polite invitation—well, perhaps not in these precise words, but in the South American Indian equivalent—has been received by Mr. Stirling, who is now exploring the home-land of the head-hunters.

Mr. Stirling sent regrets, he writes, in a letter received at the Bureau headquarters in Washington. He and his party are just off on a walking trip into the heart of the Jivaro region, and he has much scientific material to gather.

The Jivaro invitation is mentioned by Mr. Stirling merely as an indication that he has found the Jivaro friendly. The head-hunters may be dangerous characters to some people. But to the ethnologist they are "a mighty interesting, quite friendly and real primitive tribe."

The Jivaros are famous for their custom of preserving the dried heads of their enemies as gruesome trophies.

Science News Letter, February 27, 1932

CE FIELDS

PSYCHIATRY

School Record May be Clue To Incipient Psychosis

CAN the school teacher tell from a child's behavior whether or not he is beginning to develop mental disease? In about half the cases she might, in the other half she could not, Dr. Jacob Kasanin told members of the American Orthopsychiatric Association at its annual meeting in Baltimore.

The question was investigated by Dr. Kasanin and Louise Veo because some mental diseases are looked upon as a gradual evolution of special personalities. They wanted to know whether these personality changes could be detected in the schools. The schools must play a very important part in any efforts to prevent mental disease or to recognize it in its early stages, they consider. So they studied school histories of 54 cases of one type of mental disease, schizophrenia, and found that in half the cases the children had shown very striking characteristics. They were reported as having been very odd, peculiar and queer, or else extremely shy, retiring and withdrawn. The other half of the children had not been, on the whole, very different from the great majority of their schoolmates. In this group it would have been practically impossible to foresee any difficulty or mental disturbance, Dr. Kasanin said.

Science News Letter, February 27, 1932

ARCHAEOLOGY

Wine Eight Centuries Old No Longer Fit to Drink

WINE eight hundred years old is no longer fit to drink. It has lost its alcohol, it has lost its "bouquet"—the ethereal fruit essences that make it taste good and give each vintage its distinction. There is nothing left but a weak solution of a number of mineral salts in water.

This, in summary, is what Prof. Johannes Grüss of Berlin found when he analyzed the contents of an ancient, round-bellied glass bottle found by a Russian expedition in a twelfth-century

burial mound in the Caucasus region. Corked and sealed with a double seal, the bottle had preserved a considerable portion of its original contents, but had not been able to prevent the deterioration of the wine.

A microscopic examination of the dregs disclosed a considerable variety of vegetables and animal debris. There were of course many yeast cells, some fragments of the original grape seeds, remains of "vinegar eels," fungus threads and spores, etc. Most interesting of all was a curious alga, a low form of plant life, apparently absolutely identical with a similar species found in Baltic amber of an estimated 280,000-year antiquity.

Science News Letter, February 27, 1932

PLANT PHYSIOLOGY

Apple Aroma Prevents Sprouting of Potatoes

KEEP your potatoes in a well-closed bin with some ripe apples, if you want to prevent them from spoiling themselves by sprouting.

This appears to be the practical hint to be derived from a series of experiments reported in *Science* by Dr. O. H. Elmer of the Kansas Agricultural Experiment Station.

Dr. Elmer found, in a test preliminary to his main experiments, that potato tubers stored with apples in closed containers until June remained firmer and of better quality than did a similar lot of potatoes stored without apples for company.

Then he tried the effect of the volatile emanations from apples of several varieties on the eye-sprouts of a number of kinds of potatoes. Uniformly he found that potato sprouts within "smelling distance" of the apples failed to develop normally. Growth at the ends was stopped in every instance. Sometimes multiple sprouts appeared, which became abortive.

Just what this sprout-stopping volatile substance in apples may be is not yet known. Apparently only ripe apples have it, for green apples and rotten apples alike failed to stop potatoes from sprouting. It is not confined to the skin of the apple, for peeled apples seemed to be as potentially sprout-preventive as whole ones. One test with ripe Kieffer pears showed that this kinsfruit of the apple also has the same power. But fruits outside the apple family lack it: oranges and bananas were tried and failed to prevent sprouting.

Science News Letter, February 27, 1932

ENGINEERING

Weather Vane of Little Concern in House Heating

THOUGH the wind reverse itself and blow from the opposite direction, your house will be no easier and no harder to heat, provided the temperature remains the same. For the speed at which heat is lost through building materials varies little as the direction of the air blowing against the material changes, it has been found at the University of Minnesota by Prof. F. B. Rowley and W. A. Eckley of the Experimental Engineering Laboratory.

Prof. Rowley and Mr. Eckley tested plate glass and pine wood in artificial winds as great as thirty miles per hour. It is thought that their results will apply to a variety of building materials. Sections of glass and wood held in the artificial wind were varied through angles of 15 degrees as the temperatures of their surface were taken. Heat was supplied by electric resistances.

Though heat is lost a little more rapidly to a head-on wind than to one blowing parallel to a surface, Prof. Rowley and Mr. Eckley said that for all practical purposes surface coefficients for air flow parallel to the surface might well be used without correction for any angle of the wind.

Science News Letter, February 27, 1932

NAVIGATION

Oil on Waves Averts Wreck of Merchant Ship

OIL CALMED troubled waters in a very practical way when waves from 50 to 60 feet high in the middle of the Pacific ocean threatened to bring disaster to the S.S. Elizabeth Kellogg on its recent voyage from Manila to San Pedro, Calif., the U. S. Navy Hydrographic Office has been informed.

The worst seas that Captain Kort, master of the vessel, has seen in his 25 years' experience as a captain rolled over the lower decks and finally carried away everything and dented the after steel deckhouse seven inches. All hands stood by only hoping that the ship would not be "scrambled to pieces before their eyes," Captain Kort said.

Then oil was pumped through sanitary drains on the water. After the oil spread, the combers lost their terrific force and rolled safely under the stern of the vessel instead of breaking over the decks.

Science News Letter, February 27, 1932

BACTERIOLOGY

Invisible Germs Made Visible

When Placed on New Type Medium, Elusive Bacteria Can Be Seen and thus Brought Within the Power of Medicine

By **FRANK THONE**

DEATH took a terrible beating when Louis Pasteur, in the middle of the last century, demonstrated the nature of bacteria and their relation to disease. Bacteria had always been the Old Scythian's best shock-troops, but once discovered they were subject to the primary maxim of modern warfare: "An enemy seen is an enemy destroyed." Invisibility had been their strength; visibility was their undoing. Pasteur's first great success in routing such foes as rabies and anthrax was followed up swiftly by attacks on the part of other generals—Koch, Metchnikoff, and a whole host of greater and lesser leaders of all nations. Wherever they saw germs they hit them. Some battles, like that against typhoid, ended in complete rout of the enemy, while others, like the drive against tuberculosis, have turned into the stubbornest kind of trench warfare. But in general, all the germs that classic bacteriology could locate with its spyglass, which is the microscope, have had an exceedingly tough time of it.

Yet there have remained a number of diseases that kept their cloak of invisibility and hence their malign power over humankind. Some of them, like arthritis and the common cold, are not killers; but they add much to the sum of human discomfort and often weaken their victims so that a more venomous fellow-germ can finish them off. Others, like infantile paralysis and European sleeping-sickness, are sufficiently deadly in themselves.

No amount of searching with the highest-powered microscope ever showed a bacteriologist one of these germs. The blood serum of a patient sick with one of these diseases filtered through the finest stone filter, taking out every trace of a visible particle of any kind, still possessed the power to create the disease anew. Because they could pass through these fine filters, men gave them the name, "filterable viruses." One of them, or one class of them, only lately discovered by the French-Canadian scientist d'Herelle, befriended man by killing bacteria, and so got the name "bacteriophage," which means "bacterium-devourer."

But bacteriophage was the only friend man had among these filterable invisible germs—if germs they were. They remained unseen, unknown, unconquered.

Now appeared an American scientist, Dr. Arthur I. Kendall of Northwestern University Medical School, who with a swift bold stroke of scientific genius unmasked these lurkers, made them visible under the microscope, laid them open to study and to possibly successful future attack.

Sensational Results

Like many stubborn problems in science, this business of the filterable viruses yielded big results, even sensational results, when it yielded at last. It gave way like a dam with the waters piled behind it, and things followed with a rush. In the very first announcement of his results, Dr. Kendall was able to tell his audience not only that he had forced invisible germs to become visible, but also that he had been able to reverse the process and induce visible germs to lose their visibility, that bacteriophage appears to be only the invisible or filterable form of the visible germs it attacks, and that many germs and viruses that have hitherto defied culturing outside living men or animals can now be grown in glass tubes in an incubator, thus vastly simplifying the war against them and of course making it much less expensive. Test-tubes and flasks are cheaper even than guinea pigs and monkeys.

Like many successful forward strides in science, Dr. Kendall's started from the solid ground of straight and simple thinking. Germs, he reasoned, must eat. In our bodies, they eat our living tissues. Those tissues are made very largely of protein—at least those tissues that the germs eat. Therefore it should be a good idea to give them proteins to eat in the tubes and flasks that we try to grow them in when we culture them in the laboratory.

This was something that had not been done before. All culture media at use in bacteriological work up until now have been very much like the naive

soups used in the classic experiments of Pasteur—and even generations before him by his groping forerunners Spallanzani and Leeuwenhoek and the rest. Early in the bacteriological game Koch had shown how to make these soups solid by mixing them with various kinds of animal and vegetable jellies, such as gelatin and agar. But soups they were and soups they remained.

These soupy media differ greatly from the protein tissues of human and animal bodies in the kind of nourishment they offered bacteria. They have next to no protein at all in them. They consist mostly of a grand mixture of the chemical fragments of proteins, lumped for convenience as "peptones."

There are some disease bacteria that can feed on these peptones and appear to be perfectly happy; for example, the staphylococci that cause common boils and carbuncles. Others, like the bacillus of tuberculosis and the germ of leprosy, lack this omnivorous appetite, and languish for the kind of food they had "back home." They either refuse altogether to grow outside of a living body, or must be coaxed by the addition of blood, chopped-up lung, or other witches'-cauldron ingredients.

Finally, there are many germs that have always stubbornly declined to grow at all outside the bodies of their living



UNMASKER OF THE INVISIBLE
Dr. Arthur I. Kendall in his laboratory



GOING OPPOSITE WAYS

Above: Staphylococci, found in common boils, produced from their corresponding bacteriophage by culturing on a conventional medium. Below: Typhoid bacilli in process of dissolution into their filterable phase, after culturing on Dr. Kendall's new medium.

prey; and to this class the filterable viruses adhered unanimously. It was this intractability, this absolute refusal to eat the standard bacteriological fare, that protected them from discovery, investigation and eventual conquest, quite as much as their invisibility. Until they could be induced to live on something besides living meat, they could not be grown in the bacteriologist's glassware, and hence could retain the protection of our ignorance of their identities and natures.

This was the formidable-looking riddle which Dr. Kendall solved with his extremely simple key: Don't give these creatures peptones; give them protein.

Protein Plentiful

Getting protein is a relatively simple matter. All animal tissue is full of it, and there is a lot of it in some vegetables, too. Dr. Kendall has had best success with protein from animal sources, and his best source is a part of the animal that is still an "unmentionable" in many circles, even in these candid post-Victorian days—intestine. He has used several kinds, even experimenting with pieces of the human digestive tract, for which the late-lamented owners had no further need. He found hog intestines better than rabbit, rabbit better than dog.

There is no mystery about the preparation. The material is washed thoroughly in water, then chopped up in a meat grinder. The ground-up tissue gets three long soakings in alcohol, to extract the water and to dissolve out all the non-protein substances that are al-

cohol-soluble. Finally, it is soaked in benzol to remove all fatty substances, thoroughly dried; then powdered and stored away in bottles. It will keep indefinitely.

To use, it is simply soaked up in salt water of the same saltiness as normal blood, or in a similar physiological solution. After sterilization under steam pressure, it is ready to use.

Dr. Kendall's first experiment with this new food for germs was with a series of blood samples taken from influenza patients in three different Chicago hospitals. Drops of the blood fluid injected into rabbits has given the animals undoubted symptoms of the "flu"; the blood was certainly "loaded." Blood fluid, both from the original patients and from the sniffing rabbits, was planted in flasks of the new culture medium, and the flasks put in a warm incubator.

After a few days Dr. Kendall looked at his flasks again. The medium was decidedly cloudier than it had been at first. Evidently there was something going on in there, though the most powerful lens on the microscope could not show even the smallest living organism.

But he injected a little of this clouded medium into some more rabbits—and the rabbits got the "flu!"

For the first time in medical history, the invisible virus of this troublesome disease had consented to grow outside a living patient.

Then samples from the culture flasks were planted in flat dishes containing, in agar, a mixture of his protein food and one of the old-fashioned peptones—that is, a mixture of food they liked and of food they had hitherto consistently refused. After a few days in the incubator, little colonies of living objects appeared. Under the microscope they showed as exceedingly tiny round organisms, almost always in pairs—the kind of a thing that the scientists call a "diplococcus."

The invisible had become visible: here, under man's eye at last, was the germ of influenza!

Returned to the flask containing nothing but protein food, these germs disappeared into invisibility again. Brought back once more to a mixed diet containing the hated peptones, they once more emerged into microscopic visibility.

Having induced one invisible germ to come out and become visible, Dr. Kendall tried his hand with others. He also took germs that have hitherto been known only in their visible form, on old-fashioned culture media, and grew them in his new high-protein culture.

Every one of them turned from visibility to invisibility. He filtered the invisible-form germs through porcelain filters, took the fluid that came through and planted it on old-fashioned germ foods again. Colonies of germs appeared out of the invisible. He could repeat this process as often as he liked, in either direction, getting visible germs out of invisible virus filtrates, and making visible forms change back again by planting them in his new high-protein food.

Jekyll-Hyde Life

The following germs he lists as having been "put through their paces": infantile paralysis, streptococcus, scarlet fever, typhoid, one form of paratyphoid, the staphylococcus that causes boils, and the crooked germ that the late Dr. Hideyo Noguchi found in yellow fever patients, as well as the little diplococcus. Dr. Kendall himself found in his influenza cultures. He concludes that possibly all bacteria lead this Dr. Jekyll and Mr. Hyde existence.

Not content with dragging filterable forms out of their ambush of invisibility and subjecting them to the merciless light of the microscope, Dr. Kendall has also pursued them into their hitherto unpenetrated lair. In collaboration with Dr. Royal Raymond Rife of San Diego, who has constructed a super-microscope with ten times greater magnifying power than that of the best instruments in common use, he has demonstrated moving, apparently living, elliptical bodies in the filterable phase of typhoid germs.

It should not be inferred that Dr. Kendall was the first to learn that bacteria can have an invisible, filterable phase. There were pioneers in this field; very notably Dr. Philip Hadley of the University of Michigan. In December, 1930, Dr. Hadley reported to the Society of American Bacteriologists that he and his associates had been able to make the germs of cholera, typhoid, dysentery and diphtheria, as well as other ordinary bacteria, take on a filterable state of existence, which he called the G type culture. This form differs markedly in form, growth, chemical nature and serum reactions from the ordinary types of the germ, he reported then.

But the credit of Dr. Kendall is not at all diminished by the work of Dr. Hadley. Dr. Kendall's real triumph lies in his having perfected a means for performing, with relative ease, the difficult feat of changing invisible to visible and back again; in having found a rational food for bacteria that will coax even the fussiest among them out of the human

body and into a culture flask, where the trained eye and keen mind of the bacteriologist can pry into their secrets and plot for their downfall.

A sensational by-product of this research is an insight into the use of the bacteriophage, the mysterious filter-passing something that kills as germs kill us. By planting filtered "phage" on old-type culture media, Dr. Kendall obtained good growths of the germs they destroy. Bacteriophage therefore seems to be nothing but the invisible form of the germ it seems to delight in wiping out. Dr. Kendall could produce phage from germs by planting the germs in his new medium.

The behavior of ordinary visible germs, those of typhoid for example,

in changing from visible to invisible is peculiar. They begin to lose sharpness of outline, growing fuzzy and dim under the microscope. At last nothing but tiny granules remain, which will pass through the fine filters and grow back (or perhaps reassemble themselves like a scattered platoon of soldiers) into visible germs again. Other granules, too large to pass through the filter, appear none too anxious to assume full-fledged germ forms, but under proper encouragement will do so.

For further experiments Dr. Kendall has a new refinement of his medium, made of highly purified, crystalline proteins. This will replace the one he has used in his pioneer researches.

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PUBLIC HEALTH

Depression Has Not Yet Affected Health of Nation

"DEPRESSION and unemployment have not yet affected the public health," officers of the Metropolitan Life Insurance Co. of New York declared after surveying the figures showing the health of their industrial policyholders for the year 1931. The year just ended was remarkably healthy, in spite of the depression, unemployment and an influenza epidemic. In fact, it came very close to being the healthiest year on record.

"There is no justification, however, for the thesis that hard times and good health go hand in hand," their report warns. "It is important that every vital public health activity be continued in order that the public be protected against the ill effects that usually follow from long periods of unemployment."

Six diseases, tuberculosis, diphtheria, whooping cough, pneumonia, diarrheal complaints and conditions associated with childbirth, recorded lower death rates than ever before in 1931. Railroad accidents and accidental burns also set new low records.

The reduction in the tuberculosis death rate during the year is considered the biggest single public health achievement for 1931, because this disease is the very last from which could be expected a decrease in death rate under the prevailing economic conditions. The actual death rate was 76.7 per 100,000.

The gloomy side of the picture is

seen in the new high death rates reported for cancer, diseases of the heart, diabetes and automobile accidents. The increase in cancer deaths was considerably higher than expected, even though a small increase from year to year is now considered usual for this disease.

No accurate figures are available for automobile fatalities but it is estimated that not less than 34,000 people lost their lives in motor vehicle accidents in the United States during 1931.

"There are few, if any, life conservation problems which today are of greater importance," the report declares.

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ARCHAEOLOGY-AVIATION

First Aircraft Lands At Chichen Itza Ruins

A PERFECT LANDING with an autogiro has been made by Capt. Lewis Yancey on the plaza front of the ruined Temple of the Warriors at Chichen Itza, Yucatan, says a report received by the Carnegie Institution of Washington. Capt. Yancey flew from Merida.

This is the first time in history that an aircraft has landed at the famous Mayan city of Chichen Itza. It is believed that success with the autogiro opens up new possibilities for reaching ruins in the tropical forests. Two years ago, Col. and Mrs. Charles A. Lind-

bergh, accompanied by Dr. A. V. Kidder, head of the Carnegie Institution's archaeologists, flew over Chichen Itza and took air photographs of the city, but ground conditions were not suitable for landing.

Dr. Sylvanus G. Morley, who reported the safe arrival of Capt. Yancey at Chichen Itza, said that the autogiro was greeted enthusiastically by staff members of the Carnegie Institution who are now assembled at Chichen Itza to confer on archaeological research in the Mayan country.

Science News Letter, February 27, 1932

METALLURGY

Powerful Magnet Attracts Non-Magnetic Substances

A MAGNET so powerful that it will attract substances commonly considered non-magnetic and so separate valuable from worthless minerals was described before the American Institute of Mining and Metallurgical Engineers at its meeting in New York.

Under the force of modern electromagnets more than twenty times as powerful as an ordinary permanent magnet, slate has been taken from coal in the reclamation of vast heaps of mine scrap, it was said, and even common sand of the seashore has been divided into piles of like grains valuable in industry.

Small Force Required

The magnet does not lift particles vertically from their fellow particles, it is explained in the report describing the new process which was prepared by S. G. Frantz, of Princeton, and G. W. Jarman, Jr., of New York. But the lines of magnetic force are exerted against a falling stream of particles to force those of the greatest magnetic susceptibility beyond a vertical partition.

Thus only a small force is required to divert from their vertical fall substances that respond only very slightly to magnetism. So powerful are the magnets now used that they separate materials having a magnetic susceptibility only one one-hundred-millionth that of iron, the engineers stated.

"Use of the process is of interest to the ceramic industry for the removal of faintly iron stained particles from sands and clays which go into the manufacture of glass and sanitary ware," they said. "It is also of interest to all producers of non-metallic materials such as bauxite, coal, fluorspar, kyanite, barite, the rare earths and other substances."

Science News Letter, February 27, 1932

NUTRITION

All Vitamins Contained In Ordinary "Square Meal"

**Rounded Diet of Meat, Potatoes, Vegetables, Salad,
Milk, Bread and Butter Provide Sufficiency of Them**

WHEN YOU are planning your cold weather menus, don't worry too much about the vitamins. As a matter of fact, physicians are cautioning that these food factors have become the victims of over-popularity and are in a fair way to lose out as a result of overzealous press-agenting.

Advertised Vitamins

The value of a food does not depend on its vitamin content alone. Likewise, while some foods are richer sources of specific vitamins than other foods, even the most plebeian articles of food may have their share of these vital factors. The average rounded diet of meat, potatoes, vegetables and salad, bread or cereal and butter and milk provides all the vitamins, both in variety and in amount, that the normal person needs.

Vitamins are found in many foods besides the well-advertised sources. Vitamin C, for instance, which is the scurvy-preventive, occurs in tomatoes, apples, carrots, potatoes and cabbage, as well as in the citrus fruits, oranges,

lemons, grapefruit and limes. Incidentally, a group of British scientists have just reported that the peel of the apple has more than six times as much vitamin C as the flesh around the core, so scrub your apple well and eat it skin and all if you want to get the full value of its vitamins.

Growth-promoting vitamin A, which also prevents eye disease, is found in liver, butter, egg yolk, cheese, spinach, leaves of plants and cod liver oil.

B is known as the anti-neuritic vitamin; it prevents beri-beri. The richest source of vitamin B is the germ of wheat, rice, etc. It is also found in tomatoes, peas and other vegetables.

Most famous, possibly, of all the vitamins is D, the rickets-preventing one. Cod liver oil and the new viosterol, which is irradiated ergosterol, are potent sources of D. The value of sunshine for preventing or curing rickets lies in the fact that the ultraviolet rays of the sun activate the ergosterol of the skin; for vitamin D is ergosterol which has been activated by ultraviolet radiation.

Vitamin E is less well-known. This

vitamin prevents sterility in rats. Its effect on man has not yet been determined. It is found in wheat germ and in lettuce.

Vitamin G is also known as P-P, the pellagra-preventive factor, and was originally thought to be part of vitamin B. Its richest sources are lean meat, milk, eggs, and yeast, though this vitamin is found in small amounts in some other foods.

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METALLURGY

Better Spark Plugs Sought On Lonely Mountain Peak

THE SEARCH for better spark-plug cores that began in 1917 at the U. S. Bureau of Standards in Washington finally ended on a lonely mountain peak in Southern California, F. H. Riddle, of Detroit, told the American Institute of Mining and Metallurgical Engineers at its annual meeting in New York. On this peak in the Inyo Range, Mr. Riddle stated, was discovered the rare mineral andalusite, which has since been used to manufacture more than 350,000,000 spark-plug cores.

Andalusite has the same chemical composition as sillimanite, the material developed synthetically at the Bureau of Standards. Sillimanite gives a mechanical strength two to four times as great as that of normal porcelain, with improved heat-shock resistance. It is too expensive a product to be used commercially, however, and for this reason other material was sought.

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<p>VITAMIN A</p>  <p>Prevents Eye Diseases</p>	<p>VITAMIN B</p>  <p>Prevents Beri-Beri</p>	<p>VITAMIN C</p>  <p>Prevents Sourvy</p>	<p>VITAMIN D</p>  <p>Prevents Rickets</p>	<p>VITAMIN E</p>  <p>Prevents Sterility</p>	<p>VITAMIN G</p>  <p>Prevents Pellagra</p>
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GEOLOGY

Rocks in Utah Canyon Yield Seaweeds of Primeval Date

ABOUT 500,000,000 years ago there grew in what is now Logan Canyon, Utah, masses of vegetation so abundant as to rival the most luxuriant growths of seaweed anywhere along our coasts today. Dr. G. R. Mansfield of the U. S. Geological Survey observed on a field exploration trip last summer with Prof. Reed W. Bailey of Utah State Agricultural College.

Prof. Bailey, the discoverer, guided Dr. Mansfield to this place where evidences of plant life in early geologic time were preserved in unusual profusion. On the west side of the main canyon just below the mouth of the Right Fork two great blocks of sandstone each weighing several tons had slid down hill from a ledge above and lay by the side of the road. They had turned bottom up in the process and displayed a mat of vegetation of the type usually called fucoids.

Moulded in Sand

"Few, if any, traces of the original plant substance now remain," Dr. Mansfield explained, "but the sand sifted into the tangle of vegetation as it lay on the sea bottom formed molds which were filled by later supplies of similar sand. Then the whole mass was buried beneath beds of sand and limy muds. As time went on these in turn gradually solidified into sandstones and limestones, which have since by changes in the earth's crust been raised above the sea and subjected to stream erosion and weathering."

Marine vegetation was undoubtedly one of the very first types of life to inhabit the earth. Indirect evidence of its presence in early times has been found in flakes or accumulations of graphite obtained here and there among crystalline rocks (schists) that were formed before the beginning of the Cambrian period, the time when the first of the great series of fossil-bearing rocks was laid down.

The rocks of the Cambrian and later successive early geologic ages contain abundant remains of animal life, but they do not so frequently preserve remains of plant life. Yet the very abundance of animal life implies equally or more abundant plant life, for plant life

forms the basic food supply of the animal kingdom. Here and there under favorable conditions evidences of plant life are preserved in these earlier rocks, but such evidences usually consist of imprints or fillings of imprints, that is, of molds or casts rather than of remains of the actual plants themselves.

Science News Letter, February 27, 1932

ZOOLOGY

Concentration to Save Rare European Bison

WISENT, the almost extinct native bison of the Old World, may yet escape the fate that looms over them, as did their cousins the bison, or "buffalo" of the American West. A project already under way aims at concentrating all available breeding animals on the Continent in one place, instead of keeping them widely scattered in zoological gardens and on private estates.

The place selected for the concentration and breeding of the pure-blood wisent remaining on the Continent is the Vialowsiska forest in Poland, once a hunting preserve of the Czars. Before the World War there was a good-sized herd of them in this region, but invasions, revolutions and the extreme need of the population resulted in their total disappearance. A similar fate has over-

taken an even larger herd that once lived far to the south, in the Caucasus.

A second concentration of wisent already exists on the estate of the Duke of Bedford, in England. Here are twenty wisent; though some of them are not pure-bred, being mixed with American bison blood. This herd is to be left in England.

There are only 61 pure-blooded wisent left alive, of which only thirteen are cows of breeding age. The concentration in the Polish forest will make the majority of these available for most efficient handling, and will also insure for themselves and their calves a wholly natural and congenial environment.

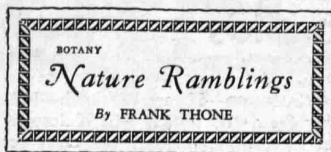
Since there is a large surplus of bulls, the work of producing a hybrid race by crossing with American bison cows will probably be carried on more widely than it has been. At present the most active center for this hybrid breeding is at Springe, Germany. This place was visited recently by Dr. Theodore Ahrens, an American zoologist long resident in Berlin. He reported to Science Service that a nucleus herd of one pure-blood wisent bull, two pure-blood American bison cows and two hybrid cows is kept there, and that several half- and three-quarter-blood wisent calves have already been born. The intention is to dispose of all hybrid bull calves, and to have all the offspring of the hybrid heifers sired by pure-blood wisent bulls. It is hoped that this will in time result in a hybrid stock with very little bison blood in it, closely resembling the pure-blood wisent. It is expected, however, to keep the hybrid animals from the Springe herd very strictly segregated from the pure-blood stock in the Polish forest.

Science News Letter, February 27, 1932

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ARCHAEOLOGY

Hieroglyphs of Unknown Race Found Near Mexican Tomb

By ALFONSO CASO

Discoverer of the Monte Alban Treasure Tomb



Pussy-Willow

See Front Cover

FLORISTS' shops have long been offering big, beautiful and expensive wands of pussy-willows. But now the willow trees and bushes out of doors are putting forth their own offerings; smaller catkins, perhaps, but with the authentic tang of the wild about them. Harmless, charming, furry wild kittens, beloved of children everywhere!

Pussy-willows have a serious work in the world, however. They are the flower clusters of the willow, and it is their business to attend to the exchange of pollen. After fertilization is thus brought about, the seeds of the willows are launched on little cottony parachutes, much like those of cottonwood, but less woolly and hence less troublesome.

Unlike most trees, willows and their relatives are bisexual, that is, male and female flowers are borne on separate individuals. The necessity for transferring pollen for some distance, plus the fact that wind has to be depended on in the absence of any reliable insects at this time of year, accounts for the enormous numbers of flower clusters on every tree—for each catkin consists of from twenty to a hundred separate, primitive flowers.

It is easy to steal a march on the florists, if you have as much as a square yard of earth, or even of ashes. Just let one of your rods of decorative catkins sprout roots, as it surely will if you keep it in water long enough. Then plant it and forget about it. In a couple of years you will have a thrifty willow bush that will bear you a crop of gray velvet fairy kittens every spring.

(Front cover photo by Cornelia Clarke)
Science News Letter, February 27, 1932

A MYSTERIOUS race, neither Mixtec nor Zapotec, may have appeared in the evidence uncovered in our excavations at Monte Alban.

As we excavated the walls of the great North Terrace of Monte Alban, we found a number of human figures carved upon stone slabs that seem to be dancing men. These stones are simply used as building materials, and come from some older structure.

Some of the personages depicted there are accompanied by hieroglyphs that are neither Zapotec nor Mixtec. What unknown people carved these dancers in stone?

Were these earliest inhabitants of Monte Alban related to the Mayas, or to the races of the central Mexican highlands? Did their civilization come before the golden age of the Toltecs at Teotihuacan, near Mexico City in the north, or were they contemporaneous with the Mayas in their greatest epoch in the early centuries of the Christian era in Southern Mexico and Central America? These are some of the stirring questions that have arisen as a result of the excavations upon this North Terrace in Monte Alban.

I hope to be able to explore this platform further the coming season, when the rains have stopped, by the 15th of October, 1932. If funds are available we shall make stratigraphic explorations.

There are many tombs yet to be examined, similar to those in which the treasure of gold and precious stones was recently found. This work must be carefully done, and we will need more technical assistance than we had in the season just finished.

Science News Letter, February 27, 1932

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• First Glances at New Books

Genetics

HUMAN HEREDITY—Erwin Bauer, Eugen Fischer, Fritz Lenz—Translated by Eden and Cedar Paul—*Macmillan*, 734 p., \$8. This English translation is from the third edition of the book, which has been revised and brought up-to-date. In the first section, Dr. Bauer outlines the general theory of heredity. In the next section Dr. Fischer points out racial differences in man. Dr. Lenz, in the last part of the book, discusses heredity in disease and in mental endowment. While the first part of the book, because of the technical terms, may be difficult for the average reader, he will find much of interest in it as well as in the latter sections.

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General Science

YEAR BOOK NO. 30, 1931—*Carnegie Institution of Washington*, 488 p. Much more than merely an administrative annual report of a great scientific institution, this Year Book gives an installment of the running story of a large section of American scientific research. Here are epitomized the many investigations of Carnegie Institution scientists that range from the most distant nebulae to the innermost depths of the cell.

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Child Study

GROWTH IN PRIVATE SCHOOL CHILDREN—Horace Gray and J. G. Ayres—*University of Chicago Press*, 282 p., \$3.50. This monograph of the Behavior Research Fund contains a great mass of statistical data intended to help students of child behavior.

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Medicine

CONQUERING ARTHRITIS—H. M. Morgulis—*Macmillan*, 192 p., \$2. The patient suffering from arthritis—popularly called rheumatism—and his family always turn eagerly to anything dealing with the disease in the hope of finding a "cure" for it at last. This book should help them, although it does not give any remedies or methods to be tried at home. Instead it tells in simple, direct fashion what is known about the disease—its history, the different types of arthritis, the different causes, and the various methods of treatment which have been successful. The patient is warned not to let despair drive him to the charlatan or quack, but to take hope

and to have faith in his physician, even though the "cure" takes a long time. Dr. Morgulis advises arthritics to follow the example of patience and persistent optimism set by the many tuberculous patients who have successfully conquered their affliction after years of effort. Reading his book should be a good first step in that direction, since it will give these patients a clear idea, perhaps for the first time, of the nature of their disease and of how they can best cooperate with the physician in fighting it.

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Physics

RECENT ADVANCES IN PHYSICS (NON-ATOMIC)—F. H. Newman—*Blakiston*, 378 p., \$4. The series of books of which this is one should be useful to graduate students of the different subjects treated, in helping them to get abreast of some of the main recent developments in their science. As the author points out, some 4,000 original papers in physics are published annually. Therefore one is compelled to select what one shall pay attention to. Chapter headings are: Wave-like character of matter, statistical mechanics, general properties of matter, acoustics, low temperatures, electromagnetic radiations, magnetism, electricity. The book should also be of use to professional workers in physics who wish to study up on newer work of these fields without going to the labor of reading many original papers, and as a reference text to supplement older classical ones.

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Physiology

IDEAL MARRIAGE, ITS PHYSIOLOGY AND TECHNIQUE—Th. H. Van de Velde—Translated from the German by Stella Browne—*Covici, Friede*, 323 p., \$7.50. The sale of this work, because of its scientific character, is restricted to physicians, lawyers, ministers, educators and social workers, the publishers state. It is the author's intention to give these professional groups information which will enable them to advise their patients or clients quite specifically how to achieve happiness in marriage.

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Philosophy

KAMONGO—Homer W. Smith—*Viking Press*, 166 p., \$2. The philosophy of mechanistic biology, vigorously set forth in the form of a long conversation between a scientist and a clergyman during a hot night on the deck of a Red Sea steamer. The parable of the lung-fish, with which the talk begins, is presumably taken directly from the author's own experience; Prof. Smith did go to Africa to get living specimens of *Protopterus*, and performed physiological experiments on them. The book would really be a bit better if the author would let the clergyman hit back a little harder; he's a bit too much of a punching-bag as it is. There is an ironic twist (whether intended or not) in the name he gives his proponent of the mechanistic doctrine: Joel, which being Englished means, "The Lord is God."

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Public Health

THE MENACE OF NARCOTIC DRUGS—E. George Payne—*Prentice-Hall*, 294 p., \$1.50. This discussion of narcotics and education is prepared by the department of education of the International Narcotic Education Association. The book is designed for teachers, and presents specific information on this important subject which they can teach their pupils. There is also advice as to when and how to give this instruction.

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Archaeology

ARCHAEOLOGY OF SANTA MARTA, COLOMBIA, THE TAIRONA CULTURE, Part I—J. Alden Mason—*Field Museum*, 130 p., 64 pl., \$1.75. Colombia was one of the centers of high culture in prehistoric America. But archaeologists know much less about the Colombian Indians than about the tribes of high culture in Mexico and Peru. Dr. Mason's expedition, described in this report, is the first to make an archaeological search for remains of the long-extinct Tairona culture of this region. The report tells of the expedition's experiences in the field and describes the sites investigated.

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