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NEWS-LETTER TO BE PRINTED

We are happy to announce that beginning with the next issue, the SCIENCE NEWS-LETTER will be printed instead of mimeographed. Coincidentally with this change in the mode of publication, many new and interesting features will be introduced. Watch for them in the next issue. There will be no change in subscription price.

VACCINATION MAKES MONKEYS IMMUNE TO TUBERCULOSIS

Mankind's eventual safeguard against tuberculosis may have its origin in a monkey laboratory on the coast of Africa.

Prof. Albert Calmette whose tuberculosis experiments have attracted international attention, has been instrumental in establishing at Kindia in French Guinea a branch of the Pasteur Institute that is devoted exclusively to experimental work with monkeys. Since captive apes of the higher types nearest man, so necessary in medical experiments with the major diseases, succumb with fatal ease to the plagues of civilization, this laboratory has been fitted up for work with them under the best conditions of their natural environment.

Whole families of monkeys are bred and reared under hygienic conditions, in all other respects as much like their native haunts as possible. Medical experts administer vaccines and serums to protect them against pneumonia and the common diseases that are current among animals in Central Africa. Natives collect their customary foods for them from the jungle and scientists watch their intellectual development. In short no effort is spared to keep the ape colony well and happy.

The results have thus far been most gratifying and few animals have been lost from intercurrent infections. The experimental work with monkeys on tuberculosis, which could not be carried out successfully in Paris because the high prevalence of the disease in the metropolis constantly gave rise to accidental infection, has here gone on with great success. Dr. J. Wilbert on the staff of the Pasteur Institute at Kindia has found that not only are chimpanzees quite uninjured by Prof. Calmette's anti-tuberculosis vaccine but they fail to contract the disease when placed in isolation with other "patients" in its advanced stages.

The immunity conferred by the vaccine lasts over a year, according to Dr. Wilbert and can be renewed by fresh doses. The problem that naturally presents itself next is the perfection of a vaccine that will produce more permanent effects.

The Kindia monkeys will be used in experiments, says Prof. Calmette, to determine the cause and treatment of all the diseases against which man is not yet effectively armed. Kindia furnishes unrivaled facilities both for the psychologist to observe the family life of chimpanzees and for the physiologist to study the mechanism of their interior, he declares.

OLDEST KNOWN WRITING OF EARLY BABYLONIA FOUND

The evolution of the elaborate system of cuneiform writing of the ancient Babylonians may be traced from the crude pictured signs found on pottery recently unearthed at Kish.

The results of the excavations in Babylonia, being carried on under the joint auspices of Oxford University and the Field Museum of Chicago, may throw entirely new light on the history of the early stages of this ancient empire according to Prof. S. Langdon and Ernest Mackay, field director of the expedition, who reported on the work of this year's field season.

Systematic excavation was begun on a mound called Jemdet Nasr, a site from which had been obtained fragments of the early painted pottery which belongs to the earliest phases of culture in Sumeria and Elam. There also were found the inscribed tablets on which were recorded the earliest known traces of writing in signs just emerging from the hieroglyphic stage, which throw light on the evolution of writing from the pictographic stage to the later cuneiform writing with its use of wedge-shaped signs. It was found that remains in this mound all belonged to one age, about 4000 B.C. to 3500 B.C.

Remains of a building were uncovered and the excavators discovered, contrary to all expectations, that the bricks instead of being of the familiar plano-convex type, which is usually held to be the earliest type of brick in use in Babylonia, were rectangular in shape, well made, and measuring 8 by $3\frac{1}{2}$ by 3 inches. They are, however, quite different in size and shape from the later rectangular brick which superseded the plano-convex brick. The plano-convex brick is obviously inferior to the rectangular brick, and the two shapes were never in use at the same time. Mr. Mackay offers the conjecture that the plano-convex brick must have been introduced by a race of invaders who either rapidly overran the whole country, or at any rate were able to influence the style of building everywhere.

Is this a sign of a new race, which has not hitherto been detected, or can the new type of early brick be linked up with a culture with which we are already acquainted? It may throw light on the origin of the painted pottery of which archaeologists are seeking the origin and affinities. The people who inhabited this mound still used stone implements, though rarely. They were well acquainted with the use of copper. Fish hooks of this metal and hairpins and bodkins of bone for skin and leather work were found.

On another part of the site of Kish, no less than three large buildings have been brought to light and under at least one of them is another building, perhaps even more.

A temple of Nebuchadnezzar has been found to have standing walls of unbaked brick 18 feet high and is probably the best preserved temple in Mesopotamia. Underneath was a building of the period of Hammurabi, the great law-giver (2100 B.C.). There are probably earlier buildings at a lower level.

Another remarkable building was a ziggurat, or tower, of exceptionally large proportions, dating possibly from the time of Sargon I (B.C. 2750), while another temple constructed of mud brick was found near that of Nebuchadnezzar. From the size and character of the brick it is assigned to the reign of Dungi (2250 B.C.)

DUAL ROLE FOR GOGGLES URGED BY SAFETY EXPERT

Goggles worn by automobile drivers or by workmen in hazardous industries should not merely protect the eyes but they should also correct defective vision. This step forward in safety measures was urged by Joshua E. Hannum, safety expert, who stated that the majority of workmen have sight defects of more or less severe degree.

When such workmen wear ordinary goggles, the eye protectors apparently serve to emphasize the defects, and the workmen blame the goggles for their discomfort, Mr. Hannum explained in a report to Industrial Psychology.

"Herein lies the answer to much of the objection to wearing goggles, the true reason for which is recognized neither by the safety man nor the worker," he stated. "Experience has demonstrated that where defective vision exists, objections to goggles are overcome when they are fitted with lenses which correct the eyes."

Eye hazards are so widespread that they are found to some extent in almost every type of industry, yet only a few companies are actively engaged in a well organized program for eye protection. The National Safety Council estimates that 250,000 eye injuries occur in the United States each year, and millions of dollars are spent in compensation claims as a result of accidents which might be prevented by adequate safety appliances.

Besides use of corrective lenses in safety goggles, Mr. Hannum advocated that such appliances should be fitted to the face of the individual workman so as to afford the greatest possible degree of comfort.

BREAD AND WATER DIET MAY VIOLATE VOLSTEAD LAW

Nebraska's liquor prisoners, who are languishing in jail with nothing to look forward to except a bread and water diet for the next 20 days, may be getting more alcohol than the law allows, and from the jail kitchen, too. At least, this is the logical conclusion to be drawn from the latest alcohol experiments, conducted by Prof. Nicholas Knight and Miss Violet Simpson, chemists at Cornell College, Iowa, and reported recently to the American Chemical Society.

These two chemists collected twelve samples of ordinary bread from bakeries and housewives' ovens, and after chemical analyses announced that the alcohol content in this prosaic food varied from .04 to 1.9 per cent., the latter quantity being well above the one-half of one per cent. limit set by the well-known prohibition statute.

The alcohol content of a loaf of bread varies with the kind of yeast used, the time it sets, and the temperature of baking. Because of this fact, the jail keeper at Tekamah, Nebraska, would have difficulty in ascertaining the legal status of any meal served to his bread and water prisoners during their 20 days on this ration.

Whether these prisoners are getting sufficient nourishment is a question which is attracting considerable attention. If the men are in reasonably good physical condition, they are in no danger from being restricted to such a diet, in the opinion of Joseph C. Murphy, of the U.S. Bureau of Chemistry. Mr. Murphy has been engaged in a series of experiments on rats, to test the effects of a diet of white flour as compared with a diet of whole wheat.

"An individual could live more than a month without food," said Mr. Murphy today. "So that there is no question of serious consequences following 20 days on bread and water. An individual who ate nothing but bread especially white bread, for a long period of time, say a year, would probably suffer from malnutrition."

Here again, a bread and water diet turns out to be more complicated than it looks, since there are many kinds and qualities of bread. R.M. Allen, of New York, director of the research laboratory of a large baking company, has reported that animals fed exclusively on bread and water have grown, thrived, and reproduced to the seventh generation. The bread used in this experiment was white bread, to which milk, lime salts, and an extract of the wheat germ were added.

GIANT AMPHIBIAN IS OVER 100 YEARS OLD

A giant salamander, said to be over 100 years old, was recently presented to the Prince Regent of Japan by the head priest at the Enyo temple at Asakura. The amphibian is over four feet long and has been living in a pond in the temple grounds for 130 years, it is reported.

Salamanders of this size flourished in large numbers in past geologic ages but are nearly extinct at the present time. While turtles have been known to live for a century and more, this is the first recorded instance of an amphibian attaining such longevity.

HEADS BLAMED MORE THAN EYES IN AUTO ACCIDENTS

That bad eyesight has less to do with automobile smash ups than is commonly supposed is the opinion of Dr. Harold D. Judd of Detroit who has made a study of one hundred serious automobile accidents in Detroit recently. The investigation was made in cooperation with the city police department, and showed that there is all too little cooperation between heads and feet of drivers.

"After carefully studying the cases considered it is quite obvious that the poor vision that causes accidents in Detroit is frequently above the eyes," Dr. Judd reported. "A man with only 50 per cent. visual efficiency and a 100 per cent. mental mentality would make a more careful driver than the man with perfect eyes and half mentality. Observation has also shown that the man with the perfect eyes and full intelligence is liable to be more careless than the man who knows his eyesight is bad, but who is mentally normal."

In order to find out just how much vision did have to do with the one hundred bad accidents studied, Dr. Judd devised an ingenious method of testing both the eyes and the mental acuteness of the drivers at the same time. The subject was seated before a screen, and instructed to tell what he saw and what action he would take as soon as he was sure of what he saw. A lantern slide with the word "STOP" was illuminated and projected onto the screen. The image was too small to be seen at first but was gradually increased in size until the subject responded. The quickness of the response was the measure of his mental alertness as well as of the sharpness of his eyesight. The use of the slide was based on the theory, Dr. Judd said, that objects are really recognized by their form long before they reach the size at which they are actually distinguished.

A color test was also made. Red, orange, green, and blue, all of which are colors used on automatic semaphores for directing the traffic in Detroit, were thrown in turn on the screen, and the subject had to state what he would do if he saw the color, stop or proceed. The tests were made with great care and when the mentality of the subject was known to be below normal that was taken into consideration.

Out of the one hundred cases studied, there were only five which Dr. Judd found were unquestionably due to poor eyesight. There were also two doubtful cases which may have fallen into that class. In all of the hundred cases studied the accident was serious and in 83 of them death or injury had resulted.

PHYSIOLOGISTS TO MEET IN AMERICA IN 1929

America is to be the scene of the next International Physiological Congress in 1929. The invitation of the American Physiological Society was accepted by the recent Stockholm congress at which one-eighth of the members were Americans.

NEW FUNGUS PEST THREATENS BEAN CROP

American bean growers, already seriously handicapped by the Mexican bean beetle and several other serious pests, are due soon to have still another to combat, if events bear out indications from the southeast part of our country. This pest is already established there and is spreading rapidly.

The new trouble-maker is a fungus, to which scientists have given the rather long name, *Macrophoma phaseoli*, and which was not known to exist in this country before 1923. In that year it was discovered in South Carolina. During the next year it was not heard from but in 1925 it was again found during a wet spell in parts of South Carolina. At this time it threatened to become very serious in the infested regions but dry weather intervened and it nearly disappeared. However, there was little consolation in that circumstance, for the drouth was about as disastrous to the crop as the disease would have been. This year the disease has been found thus far in Georgia, Mississippi, and in two or three places in South Carolina.

The virulence of the disease and the wide distribution it has attained strongly indicate, according to plant pathologists, that it will quickly spread over the bean growing sections of the country and take a heavy toll in moist seasons. Whence it came to this country, or how, nobody knows. And nobody knows where, or how, or whether its present spread will be checked short of the boundaries of the continent.

The disease might appropriately be called "ashy stem blight", as this phrase describes its appearance. Affected plants are diseased from the ground well out into the branches. The plant dies and these parts assume the gray color characteristic of dead bean stems. In the meantime, however, the fungus, which has been growing within the tissues of the plant, produces a multitude of tiny fruiting bodies. These appear as minute black dots on the gray background; and the result is a characteristic ashen appearance quite different from that of any other bean disease.

DOCTORS WANT FULL BIRTH REGISTRATION

Complete national registration of births and deaths by 1930 is the goal for which the American Medical Association is striving to obtain the cooperation of state authorities throughout the country.

Seven states do not have adequate death registration laws and fifteen either have defective birth registration or the registration is less than 90 per cent. complete. The information furnished by complete records is essential for medical and sanitary progress, medical authorities declare, and its necessity is recognized by the leading countries of the world.

Eleven of the deficient birth registration states and four of those with inadequate death registration come within the group of Southern states. The problem therefore becomes largely a sectional one, according to the American Medical Association, with special emphasis on the South where many other difficulties of disease control peculiar to the region already enlist the concerted attention of medical leaders.

ZOO DEVELOPS ANIMAL BUSINESS

A zoo, collected for scientific and human interest, has become a big business. The San Diego Zoological Society, which started in 1922 to collect animals, has developed an international business in export and import of animals.

The most important trade animal they have is the sea-lion. This year to-date 57 sea lions have been shipped, twenty of which went to Europe. Six more will be shipped to Japan during September. The sales of these and the other animals this year have been from the zoo's own product, while other deals are handled by the zoo as agents. Offspring of the recently acquired sea-elephants from Guadalupe Island are in demand by all the zoos in the world and Dr. H. S. Wegeforth, president of the society, is in receipt of many letters requesting specific information from municipal parks and scientists.

One pair of breeding lions, 10 years old, have furnished 44 offspring to the zoo, 42 of which have been sold, with two cubs remaining. Many of the seals, snakes, lions and other felines are sold to Carl Hagenback, of Berlin, regular customer. The entire stock of animals in the San Diego Zoo at the present time is worth \$80,000. As breeding progresses only a restricted few are retained for local study and exhibition purposes.

The bar-less grotto, or "cage" invented by the Hagenbacks of Germany, is put to good use owing to the mild climate. Eventually all of the cat and canine specimens will be so housed.

More bear grottoes, dens for wolves, coyotes, racoons, badgers; small cages for the rodents, small quadrupeds, and cages for birds, are being installed. A huge hippopotamus "compound" will be erected soon. The sales of the animals are expected to return a good profit.

Another division of the San Diego zoo industry is the making of anti-rattlesnake-bite serum. Recently Harvard University designated the zoo reptile department as one of the units of the institute, as exclusive manufacturers of antivenom in the United States. The poison is extracted from the fang-sack of the rattlers, of which the zoo has a fine stock, and the serum distributed from it. This serum is to be packed in portable cases and sold at little more than cost to hikers and out-door workers for first aid reserve.

The zoo offers prizes for the delivery of rattlesnakes to the reptile house to be used for study. Construction of a new zoological hospital and research building is now underway which will be open to the scientists of the world.

NORTHERN CHANNEL RESEMBLES LAYER CAKE

A strange, three layer arrangement of water has been revealed by recent hydrographic investigation of the Faroe-Shetland Channel, north of Scotland. The layers are so distributed that a swimmer in the channel could take his choice of swimming in Atlantic Ocean water at the surface or diving into the Norwegian Sea which flows at the bottom, while between top and bottom he could enjoy a mixture of the two kinds of water with a dash of Icelandic Arctic Current added to the blend.

The observations of the channel were reported to the International Council for the Exploration of the Sea.

AUTOS CAUSE DECREASE IN HOUSE FLY MENACE

The motor car is causing the extinction of the common house fly, it is declared by Dr. Charles V. Chapin, superintendent of health of the city of Providence, Rhode Island.

"Each year, as the automobiles have increased in number," Dr. Chapin explained in support of his statement, "the flies have diminished and of late years the decrease has been quite noticeable. The reason lies in the fact that the auto has done away with the demand for horses.

"This being so, there are fewer stables to-day than ever before. Naturally, this has resulted in a decrease of manure piles, which have been the principal breeding place of flies.

"Contrary to popular fancy in many cases, flies do not breed in garbage. Manure is the principal source of their propagation."

Dr. Chapin's explanation is supported by a census of Providence stores where it has been found that fly paper is no longer an article for which there is any demand.

PSYCHOLOGIST SAYS PATRIOTISM A RESULT OF ENVIRONMENT

Patriotism is the product of education and environment. It is not an innate or inborn sentiment, Dr. J.C. Maxwell Garnett, secretary of the League of Nations Union, told a recent gathering of British psychologists.

Sharp geographical boundaries, distinctive language and ways of living, a glorious tradition, a noble literature and common ideals, are among the influential factors of our surroundings that help build up a strong feeling of patriotism, according to Dr. Garnett.

"No one of these things is essential, however," he continued. "The Swiss have at least two races and three languages. A few years in the United States and a common purpose to put 'America first' often suffices to make Finns or Slavs or Latins into patriotic Americans with a nationality resembling Anglo-Scotch.

"It is good for the human race that its most important divisions should be psychological — into nations with their different patriotisms — rather than racial, or political; provided that the variety is within, and subordinate to a unity, a spiritual commonwealth of nations."

HUGE MACHINE WILL CRUSH MOUNTAINS OF ORE

A new gyratory iron ore crusher has been completed which can handle 2,000 tons of stone in an hour and crush the rock to nine-inch size. It is one of the largest crushers ever built and its entire weight is over half a million pounds. Ten freight cars will be required to transport it from the Pennsylvania factory where it was built to the Michigan ore fields where it will be used. A motor of 350 horse power drives the huge machine.

The amount of iron ore it will be able to crush will depend on the character of the ore and the size to which it is desired to reduce it. When the ring size of the opening that determines the size of the broken pieces is reduced to six inches the machine crushes only 1,200 tons of rock in an hour.

DISCOVERY OF CHEMICAL ELEMENTS DISPUTED

Search for two missing chemical elements, reported discovered in Germany, may have to be continued. For from Russia comes word that a careful check-up on the elements, rhenium and masurium, fails to substantiate recent investigations.

In June 1925, Prof. Walter Noddack of the University of Berlin, assisted by Ida Tacke and Otto Berg, reported that he found the characteristic X-ray spectra of the missing elements, numbered 75 and 43 in the periodic tables, in platinum ores from the Ural Mountains.

Dr. O. Zvjaginstsev of the Platinum Institute of the Russian Academy of Sciences has repeated the experiments of Prof. Noddack using rare metals from the same source and has failed to find the element No. 75 at all and considers the presence of the still rarer element No. 43 "extremely unlikely."

"The platinum was treated chemically and the X-ray spectrum photographs of the final products were carefully measured." Dr. Zvjaginstsev announced through the Scientific journal, Nature, "No. 75 would have been easily detected if it were present in the native platinum in quantities pointed out by Prof. Noddack, or even 10 or 100 times less than that. As a matter of fact, the spectrum photographs obtained prove with certainty the absence of the element in native platinum in a quantity exceeding .0003 per cent."

The discovery of this element, which is a close relative of the well-known metal, manganese, has also been claimed by Dr. J. Heyrovsky and Dr. Doleyssek both of Prague, who reported that they had found it associated with manganese.

BLOODLESS TEST SHOWS CONDITION OF BLOOD

The patient who comes into a doctor's office, suffering from one of those diseases that turn the skin yellowish, or bluish, or dull bronze, may soon have a color analyzer turned on him so that the light reflected from his fingers can be analyzed. To the specialist, the amount of red, green, and violet found in the skin will indicate certain abnormal physical and chemical conditions in the patient's blood.

This bloodless way of finding out what is going on in the blood stream is being worked out at the Mayo Clinic at Rochester, Minn., and the first report of the method has just been announced by Dr. Charles Sheard.

The eye is a poor instrument for analyzing color, says Dr. Sheard. The eye can estimate the color in the skin itself. But there is also the color contributed by the blood, which is reflected by tiny capillaries in the skin surface. The only scientific method of finding out the role played by pigment and blood in the color of the skin is to use a color analyzing instrument, he believes.

An accurate method of determining the color ingredients of the skin is expected to be of value in indicating the condition of the blood in cases of anemia, jaundice with its yellow tinged skin, Addison's disease in which the skin takes on a peculiar bronzed look, and in various diseases in which the skin turns bluish for lack of oxygen in the blood.

YELLOWSTONE STEAM CAVE SHELTERS EASTERN FERN

Striking evidence that the minute spores of ferns are borne hundreds of miles across plains and mountain ranges by the wind has been found in a hot spring cave at Yellowstone National Park by a noted European botanist.

Dr. Karel Domin, of Charles University, Prague, Czechoslovakia, in company with Dr. H. S. Conard, of Grinnell College, discovered a maiden hair fern, fifteen feet below the level of the ground in the cave, which is warmed by adjacent hot springs. This fern is common to the northeastern United States, but west of the great plains region it has been found previously only in the Bad Lands of South Dakota and certain portions of Utah.

The European botanist, a delegate to the recent international botanical congress at Ithaca, N. Y., has long been a proponent of the theory that fern spores may drift for great distances in the air. While walking with Dr. Conard, he glanced into a deep fissure known as McCartney's cave. It was formed years ago by a hot spring cave-in and is now dry, running to great depths under-ground.

The scientists spied the maiden hair fern growing in comparative gloom, where moisture and heat from the underlying hot springs could reach it. The maiden hair fern, *Adiantum pedatum*, is unknown to the dry country of the West.
