

## SCIENCE NEWS

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## RAINFALL IN CALIFORNIA

STUDY of weather conditions in interior Asia may help predict the rainfall in California several months in advance in the opinion of E. A. Beals, of Alameda, who has presented the results of his studies in a report to the American Meteorological Society.

"From a daily study of weather maps prepared under my supervision at Portland, San Francisco and Honolulu for a quarter of a century," says Mr. Beals, "I have come to the conclusion that the most hopeful solution of the problem of long range forecasting in California lies in getting more detailed information about the winter high-pressure center of action over Asia. Very little is known about this disturbance for the reason that the Chinese and Mongolians have not been interested in making weather observations along modern lines. The Russians have many meteorological stations in Siberia, but as our government does not recognize the Russian government, the recent data they have accumulated can not be officially procured by the United States Weather Bureau, though it can be obtained by private individuals by corresponding directly with the Russian weather observers.

"To California, the track the storm takes after leaving the Aleutian Islands on its way to the United States is vital. The full maturing of our crops can not take place without sufficient moisture, and much money and labor could be saved, or adequate preparations made, if the amount to be expected could be told with reasonable accuracy in advance. If the track the storms take from the Aleutian Islands is northern, we get no rain; if the storm enters the United States south of the mouth of the Columbia River, we do get rain; and the farther south the track the greater the amount. I am convinced that the route they will take depends largely on the behavior of the winter high-pressure center of action over Asia."

By the term "centers of action," says Mr. Beals, he refers to rather complicated weather phenomena. These are large areas on the earth's surface where the barometer remains relatively high or low for a long period of time. Eight such centers are known, of which four influence the Pacific weather. The principal one is the area which covers nearly all of Asia, except in the summer. Another is located over western North America, and for much of the time it reaches out over the Pacific. An important low-pressure area extends over the Aleutian Islands and, like the other two, disappears in the summer. At that time, says Mr. Beals, a large high-pressure area appears over more than half of the north Pacific Ocean.

## FISH OF THE WATERS OF YELLOWSTONE PARK

OCCASIONALLY fish are found in the waters of Yellowstone National Park which have come from the Pacific

Slope drainage area, and which have crossed the Continental Divide in the course of their migration.

At the time of the park's creation in 1872 its waters were barren of fish. This was due to the fact that the park is a volcanic plateau several thousand feet higher than the surrounding region, and every stream that flows out of it has one or more falls in its course that carry it down to the lower elevation.

Early explorers to the region, however, had noted that Yellowstone Lake, and the Yellowstone River, both above and below the falls, abounded in a species of trout. For long this could not be explained, since the fish, coming up the river, could not surmount the falls to reach the upper river or lake. Then it was discovered that the fish were practically the same as the cut-throat trout of the Pacific Slope. Careful investigation revealed the fact that at Two-Ocean Pass, south of the park, the headwaters of the Yellowstone mingle with those of the Snake River of the Pacific drainage in a grassy, alpine meadow, on which the water often stands deep enough in the spring, when the trout ascend their native streams to spawn, for the fish to cross from one side of the Continental Divide to the other. This explanation was later completely verified by Dr. David Starr Jordan, who observed the trout passing from Pacific to Atlantic Creek.

The excellent fishing now obtainable in Yellowstone Park is the result of artificial fish planting. The Federal Bureau of Fisheries maintains a hatchery on Yellowstone Lake, and last year 5,891,000 black-spotted trout from here were distributed throughout park waters.

## BLUE GLOW IN AN ELECTRIC LIGHT BULB

A MYSTERIOUS and as yet unexplained blue glow in a special light bulb is puzzling members of the department of physics at Johns Hopkins University. The effect was noticed by Dr. Joseph Kaplan while trying to get hydrogen in atomic, instead of molecular form. The apparatus consisted of a large glass bulb, in the bottom of which had been sealed the filament from a 300 watt tungsten lamp. Varying amounts of hydrogen, under low pressures, were allowed to enter the bulb.

In a report to *Nature*, Dr. Kaplan describes the effect as follows: "The filament was allowed to come to incandescence, the observer very carefully shielding his eyes from the direct light of the filament. On extinguishing the filament and opening the eyes, it was possible to see a weakly luminous ball of vapor, blue in color, rising from the filament and spreading out into an umbrella-shaped cloud at the top of the bulb. This glow persisted for about a second and then disappeared. The act of disappearance was a characteristic one, the glow appearing to collapse from the wall of the bulb to its center. The speed with which the glow shot up from the filament increased with increased pressures."

When the filament was burned steadily for about

thirty minutes the glow was no longer observed. Letting it stand for about ten minutes, however, restored the power. This leads Dr. Kaplan to suppose that the glow is caused by something given off from the filament, but that after the filament has been burned awhile, all the carriers of the glow are released. The light is so faint that it has not yet been possible to observe its spectrum, which might furnish a clue to its nature.

### YELLOW FEVER

YELLOW fever, which has almost been stamped out in the Western Hemisphere, has flared up in the East. Reports of the cases and control work in French West Africa, which have just been received by the Academy of Medicine, show that the outbreak of this highly fatal plague in Senegal is widely scattered over an immense territory where sanitary measures are difficult to enforce.

The preventive vaccine and curative serum developed by Dr. Hideyo Noguchi, of the Rockefeller Institute for Medical Research, have been used with considerable success in keeping down the number of deaths. In so far as possible patients have been isolated, travelers inspected and war instigated on the deadly *stegomyia* mosquito that carries the disease.

The International Health Board of the Rockefeller Foundation has taken up quarters at Lagos, Nigeria, where the epidemic is supposed to have started and is making a thorough study of the problem. On account of the lack of transportation and other difficulties in the way of carrying out a scientific program of disease-control in a primitive tropical country, the work of this organization has been confined to the British colonies of Nigeria and the Gold Coast.

Epidemiologists stress the importance of suppressing yellow fever on the west coast of Africa before a trans-continental railway or other avenues of communication are opened up to carry the disease to the East. The *stegomyia* mosquito flourishes in the warmer countries of the Orient and once the mosquitoes of this genus become infected the havoc that a disease like yellow fever would wreak amid the unsanitary conditions of India and southern China would be appalling and should be prevented at all costs.

### TEST ONLY POULTRY FOR TUBERCULOSIS

THE application of the same principles of disease protection to the hen that have proved successful in treating human beings and the larger domestic animals was discussed by Dr. John R. Mohler, chief of the U. S. Bureau of Animal Industry, in a paper read before the Third International Poultry Congress.

The day when it was cheaper and more expedient to destroy a diseased bird or even a whole flock than to call in a veterinary is past. So important is the health of the hen that the extent of such major infectious diseases as tuberculosis among fowls has been mapped out throughout the United States through the cooperation of Federal inspectors and sanitary officials.

To check the inroads of avian tuberculosis which threatens not only poultry but the hog industry as well

because it is readily communicable to swine, Dr. Mohler suggested the feasibility of the tuberculin testing of fowls. In this way tubercular fowls would be eliminated from a flock in much the same way that infected cows are now tested and dropped from dairy herds. The method is being used to some extent at the present time and has no harmful effects on normal healthy birds.

Other dangerous infections that cause great losses to the industry will probably eventually be brought under control through the application of the immunization methods that are proving increasingly successful in human medicine.

So great is the demand of chicken raisers for information on poultry diseases that editions of the farmers' bulletin on this subject published by the Department of Agriculture have been issued at the rate of 16,000 copies a month for the last five years, the most popular government bulletin on animal disease.

Dr. Mohler stressed the mutual advantage to be gained from closer cooperation between countries engaged in poultry production to protect themselves from foreign contagion and emphasized the fact that the most effective disease control must be based on the vigilance of the owners themselves and their organizations.

### THE DIET IN ANEMIA

ANEMICS who have had to eat liver until they revolted at the word itself may obtain a little variety with apricots, peaches and prunes. Recent experiments at the University of Rochester Medical School by Drs. G. H. Whipple and F. S. Robschey-Robbins indicate that, although liver and kidney are by far the most potent food materials for the regeneration of the red blood corpuscles, certain other animal organs and several fruits are also effective, and hence can be used to vary the diet in anemia.

A long-debated question in medicine is whether iron must be in organic combination before it can be utilized by the body in regenerating the iron-containing hemoglobin, or whether a simple inorganic salt of iron, such as ferrous carbonate, will suffice. Apparently the form of iron and the quantity in which it occurs are not the deciding factors. Beef kidney contains three times as much iron as does beef liver, but the latter is far more effective in blood regeneration. Raspberries contain more iron than do apricots and peaches, but are inert in blood regeneration. There is certain evidence that some unknown substance is supplied by the effective foods, and that it enables the body to utilize the iron. This is comparable to the use by the body of vitamin D for calcium deposition in the bones.

Apricots, peaches and prunes are about as effective as bone marrow, pancreas and spleen, the Rochester investigators have found. The dried fruits are as effective as the fresh. Raisins, grapes and apples are in a lower class, but are about on a par with brain tissue. All these fruits are far superior to dairy products for this particular purpose.

It is thus apparent that, although liver is the most effective tissue so far found for hemoglobin formation

in anemia, the diet may include certain fruits, which are fairly effective and which will serve as a very welcome variation in the diet.

### EXCAVATIONS IN MEXICO CITY

To dig or not to dig, that is the problem worrying Mexican archeologists living in Mexico City, built on and out of ancient and mysterious ruins.

Boosters for a beautiful modern Mexico City want officials to cover up the ugly hole in the heart of the town a few blocks from the Cathedral plaza where ancient Tenoxtitlan, the prehistoric Aztec capital, was recently exposed.

Scientists, however, are anxious to learn as much as possible about the vanished City of the Montezumas, and would like to be allowed to burrow under most of the old buildings in downtown Mexico, even the National Palace and the cathedral.

The most recently discovered ruins in Mexico City are near the cathedral. Dr. Manuel Gamio, former director of archeology of the Mexican Department of Education, believes them to be part of the temple of worship for the two chief gods of the Aztecs, Huitzilopochtli, the god of war, and Tlaloc, the god of rain.

The temple of Huitzilopochtli and Tlaloc was part of a larger group of temples known as the Great Teocalli, which was the center of Aztec worship in Mexico. In ancient times it covered many blocks in the vicinity of the present day National Palace and cathedral. The palace of Montezuma was within the Great Teocalli and occupied the place where the National Palace now stands.

When the Spanish conquest was complete, the Spaniards razed the various temples to the ground and used the stones to build Christian churches. Many old Colonial buildings stand over valuable archeological sites, and stone carvings of serpents and other Aztec symbols have been used as decoration in old houses.

The recently discovered ruins are the remains of a great truncated pyramid on the top of which were Aztec idols to which human sacrifices were offered. The floor of the ruins is over twenty feet below the surface of the street.

During the excavations many objects were found which were recognized from the description of the conquistadores and other historians as belonging to the temple of the Aztec god of war and rain. There are craniums and cones carved from stone which decorated the temple of the Huitzilopochtli and turrets in the form of curved sea shells which crowned the walls of Tlaloc, god of rain.

A serpent at the bottom of a stairway corresponds to that represented in ancient Aztec illustrations on paper of maguery, and many blocks of marble pavement described in the tales of the conquistadores remain. Small representations of the Aztec crossbow were found, and these are probably symbolic tributes to the War God.

### ITEMS

CONTINUED wet weather has given an appreciable setback to the *Chinch* bug in the East-Central states and in the eastern half of Kansas according to reports reaching

the U. S. Bureau of Entomology. Areas in Illinois that were heavily infested last year are more nearly free from this pest than for a number of years. Wet springs do not help man fight the cutworm, however. Reports of serious injury have been received from Louisiana, Mississippi, Arkansas, Missouri, Iowa, Kansas, Nebraska, Minnesota, Indiana and North Carolina. The already afflicted Mississippi delta regions, from which the water has recently receded, are suffering now from cutworms. Some fields of cotton and corn have been replanted twice, and even three times in a few cases.

BURNING 8,900,000,000,000 tons of coal, 8,900 times as much as the world produces in a year, will release about as much energy as contained in the sunlight captured annually through the production of plant foods. Of this huge total, the human race uses less than two tenths of a per cent., according to an estimate by Dr. John M. Arthur, of the Boyce Thompson Institute for Plant Research. Daily each one of the 1,750,000,000 human beings on the earth consumes about 2,000 calories of food. Even meat comes indirectly from plants. The human race is therefore dependent on photosynthesis, the process by which the plant uses sunlight to form food. The total consumption of food during a year by man amounts to about 1,200,000,000,000,000 calories. All the other animal life, vertebrate or invertebrate, large or microscopic, on the globe are estimated to consume about six times this amount.

WHAT is described as the largest specimen of petroglyphs, or Indian rock carvings in Canada, has been reported to the Archeological Office of the Canadian National Museum at Ottawa. This carving is said to be 250 feet long and located near Yale, B. C. It is carved on a vertical face of reddish rock, sheltered by an overhanging ledge. It is about half a mile south of the eastern end of the Alexander Bridge on the Caribou Highway, and near the Canadian National Railway. A trout fishing trail from which it can probably be seen runs up in its direction. Previously, the largest known rock carving was located on the west side of a seventy foot canyon about one mile south of Mackenzie Highway, in the "Norway of Canada" near Bella Coola, B. C.

If the 250 foot carving is verified, efforts will probably be made to have the region set aside as a national monument.

A HOOK-UP between radio and the movies for scientific purposes has been perfected in Germany, which will permit eminent scientific authorities to lecture to many audiences at the same time, and to illustrate their addresses with motion pictures, no matter how widely separated the various auditoriums may be. The arrangement is relatively simple in principle. In each auditorium the films which are to illustrate the lecture are run on an ordinary projector, geared to a motor which is synchronized with all the other motors in the series, so that each point in all the films is thrown on the screens at exactly the same instant. The lecturer watches one of the projections, or a private projection in his own study, and times his remarks to fit the scenes or processes being illustrated.