RADIO

Radio Frequency Standards Now Available World-Wide

➤ NATIONAL Bureau of Standards radio broadcasts of continuous standard frequency and time signals on five, ten and 15 megacycles will be audible all over the world, it is expected, with a supplemental experimental station just opened on the island of Maui, Hawaii.

The new station operates under the call letters WWVH. It has been established specifically to determine if the basic technical broadcasts of the Bureau's station WWV at Beltsville, Md., can be extended to localities in the Pacific not reached by WWV.

Standard frequencies are necessary in radio and radar communications, electronics, acoustics, and other fields. Radio frequencies are inclined to "drift," but the Bureau's basic signals are accurate and any desired frequency may be precisely measured by reference to the standards broadcast. Standard frequencies, for example, enable radio stations to keep within their assigned frequency channels, and to avoid interference with each other.

The accuracy of each of the Bureau's transmitted frequencies and time intervals of one minute or longer is better than one part in 50,000,000. Basic component of all the broadcasts is a quartz crystal oscillator which vibrates at a frequency of 100,000 cycles per second.

One purpose of this Hawaii experimental program is to determine whether simultaneous operation of two standard frequency stations can be achieved without mutual interference or degradation, and without a complicated schedule of operation. For this reason, the Bureau desires reports by users of WWV who now experience interference from the new station. Other information desired is evidence of any beat frequency, and whether the operation of WWVH does or does not improve standard frequency reception at any given place.

Science News Letter, March 12, 1949

ECOLOGY

Life in 50 Caves Studied By High School Explorer

➤ CAVE exploration meant adventure and treasure-hunting to boys of the Tom Sawyer-Huckleberry Finn era, but to modern youth it has come to mean a scientific search for fascinating facts. This is well exemplified in the case of 17-year-old Thomas C. Barr, Jr., senior at Hillsboro High School in Nashville, Tenn. He has spent most of his holidays and other spare time for the past two years investigating the animals and plants of the dark worlds represented in some 50 caves in Tennessee, Kentucky and New York.

All told, he has found about 40 animal species in the caves. They range all the way from occasional transient lodgers, like opossums and racoons, to regular tenants like hibernating bats, and on to the blind fish, salamanders and insects of the perpetually dark inner caves.

Plant life in caves is far less abundant and varied than the animal life, Mr. Barr states. This is of course to be expected, considering the dependence of all freeliving higher plants on light. Green plants are found only in the twilight zone near the cave entrances. These include mainly such forms as tolerate or even prefer dim light, notably ferns and mosses. In the total dark the only plants are fungi, and even these are frequently not particularly thrifty.

Animals living in darkness evolve into lean, pallid, almost colorless forms, and are frequently blind or even wholly eyeless, Mr. Barr states; but they tend to compensate for their loss of sight by greater sensitiveness to other sensory stimuli.

Mr. Barr's cave studies helped win him a place among the 40 winners of the Eighth Annual Science Talent Search.

Science News Letter, March 12, 1949

ENTOMOLOGY

Mosquito Crosses Bred; May Also Happen in Nature

➤ HYBRID mosquitoes in nature are the disturbing possibility suggested by success in producing, under laboratory conditions, crosses between the dangerous species that carries yellow fever, *Aedes aegypti*, and a related species, *Aedes albopictus*. The experiments are reported in the journal, SCIENCE (Feb. 25), by Dr. Wilbur D. Downs of the International Health Division of the Rockefeller Foundation and Dr. Rollin H. Baker of the University of Kansas.

Science News Letter, March 12, 1949

PHYSIOLOGY

Applied Air Pressure Sets "Deep Sea" Diving Mark

➤ WHEN the work piles up and you feel the "pressure" is on, give heed to the feat of Navy Bo's'n Harold Weisbrod of Chicago.

He has just had more pressure on him than anyone in history who lived to tell about it. The literal pressure was turned on in a diving tank at the Naval Gun Factory in Washington.

Although he was only in 10 feet of water, Mr. Weisbrod set a new "deep sea" diving mark. It was done with compressed air on the surface of the water in a diving tank. The pressure put on him was the equivalent of a depth of 561 feet.

The pressure was approximately 265 pounds per square inch, or 18 times normal atmospheric pressure.

Previous depth record was 550 feet, also simulated in a tank. British Navy divers still hold the actual deep diving record which is 536 feet, made in a Scottish lake.

Science News Letter, March 12, 1949

IN SCIEN

CHEMISTRY

Wool-Like Fiber Made From Cottonseed Protein

➤ THE cotton plant asserts anew its claim to first honors in clothing mankind. A synthetic wool-like fiber has been added to ages-old cotton cloth and more recent silky synthetics of the rayon family made from acid-treated cotton linters.

The new fiber is made from cottonseed protein, obtained by alkaline extraction after the last of the oil has been removed with solvents. First efforts in this direction were unsuccessful because chemical cross-linkages made its molecules too "lumpy" for good spinning. In the new process, on which U. S. patent 2,462,933 has been granted to a group of four Department of Agriculture scientists, the first alkaline extraction product is modified with acid, resulting in a solution which extrudes and spins well.

Participating in the work, which was done at the Southern Regional Research Laboratory in New Orleans, were J. C. Arthur, Jr., M. L. Karon, A. F. Pomes and A. M. Altschul. Rights in their patent are assigned royalty-free to the government.

Science News Letter, March 12, 1949

ENGINEERING

New Car Air Filter Uses Casein and Wool Fiber

➤ SURPLUS milk is helping automobile engines. The help comes in a new air filter which uses spun fiber made from casein, a protein of milk. The filters have a chemically treated air-cleaning element, four parts casein fiber and one part wool.

This casein filament-wool fiber mixture has unusual resiliency or "bounce" and seems particularly suitable for bed mattresses and upholstered furniture. The casein fiber is already used in paint and other brushes. The type employed is the result of work at the U. S. Department of Agriculture laboratory at Philadelphia, where an improved method of making the fiber was developed.

Automobile carburetor filters using the filament, made by a firm that produces standard filter equipment, will be ready for the general market in the near future. They are intended to supersede oil-bath air cleaners now used on many cars. The filter is built in a cartridge designed for easy and inexpensive replacement. When the element becomes clogged with dirt the cartridge is discarded and a clean one inserted. The filter fiber is dustless and odorless, and may be colored as desired.

Science News Letter, March 12, 1949

SCIENCE FIELDS

MEDICINE

New Sulfa Drug Proves Effective for Ear Disease

➤ NEXT time Junior gets "running ears," the doctor may treat him with Sulfamylon instead of some other sulfa drug or penicillin.

This latest sulfa drug is termed "more effective" than "any other agent now available" for running ears, or chronic otitis media, and also another ear trouble, otitis externa, in a report by Dr. J. W. McLaurin, Baton Rouge, La., to the LARYNGOSCOPE. Dr. McLaurin used the drug in 141 of these ear infections.

Equally enthusiastic reports on the use of the new sulfa drug in other conditions have been made by Dr. Edward L. Howes of Columbia University and Dr. Samuel L. Fox of the University of Maryland to Dr. J. B. Rice of Winthrop-Stearns, New York, who make the drug. Existence of the drug was discovered when captured German soldiers in World War II were found carrying it in powder form for sprinkling on wounds. It will soon be generally available to physicians.

Advantage of the drug emphasized by Dr. Rice is that germs do not become resistant to it.

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ARCHAEOLOGY

Life in Old Southwest Modeled by Girl Student

➤ LIFE as it was lived many centuries ago in what is now the American Southwest is portrayed vividly in a diorama of a group of Indians of the long-extinct Basket-Maker Culture, modeled by Vorsila L. Bohrer of Prospect Heights, 18, senior at Arlington Heights Township High School in Arlington Heights, Ill. This diorama, which shows the beginnings of settled village life among the Indians, was exhibited at the Science Talent Institute in Washington. Miss Bohrer was one of 40 winners of the Eighth Annual Science Talent Search.

Miss Bohrer spent two summers in the Southwest, concentrating on Indian archaeology, and especially on the level known as Basket-Maker III. She absorbed all the information she could obtain in museums, from lectures and in consultation with professional archaeologists, before beginning work on her models.

In the group which she has completed, several Indians are shown working on the construction of an earthen house. One woman is shown bringing up earth in a pannier or carrying-basket, while another kneads more earth to the proper consistency in a mixing-trough and a man plasters it on the stick-and-brush framework of the unfinished dwelling. The Indians wear very little in the way of clothing, but their ornaments of shell and other materials are modeled carefully after originals found in Basket-Maker sites.

Two other women are shown preparing food, with a man at work in a corn-patch behind them, and a naked baby crawling towards its mother. A turkey stretches its neck inquisitively over the corn-basket—perhaps watching for a chance to snatch a grain.

In the background, partly hidden behind a cactus thicket, stands a hunter with spear and spear-thrower. In Basket-Maker times, the Indians had not yet invented the bow, but used a noched stick, called an atlatl by archaeologists, to give their throwing-spears longer range and higher velocity. Within spear-throw sits a jackrabbit, a food animal whose fur was also much used in making blankets.

Miss Bohrer's ambition is to become a full-fledged archaeologist, and to have a part in the further development of our knowledge of prehistoric man in the Southwest.

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AERONAUTICS

New Jet Fighter Plane Has Rocket-Assist Engines

➤ A PEPPED-UP version of the Republic Thunderjet, now completing taxi tests in Farmingdale, L. I., is designed as the U. S. Air Force's newest, and perhaps speediest, jet fighter. Rocket power will assist the jet engines for rapid take-offs, climbs and spurts in emergencies.

This plane is what the Air Force calls a high-altitude interceptor fighter to be used as a local defense weapon capable of combatting enemy bombers and such missiles as come within its range and capabilities. It is in the 600-mile-per-hour class. It has the general conformation of the Thunderjet, with its air scoop centered on its nose, but differs in several important respects.

A notable feature is its swept-back wings and swept-back tail, adopted to give less drag in the air and thus promote speed. Its thin wings appear to have greater vertical width at the wing tips than at their junction with the fuselage. The wingspan is 30 feet, and the length of the plane is 45 feet. The craft is powered with a turbojet engine, but the type is not revealed. Its rocket engines are for assists, not for primary power.

This new plane will make its first flight tests at Muroc Field, Calif., at the Air Force flight test base. Its present designation is the XF-91, the "X" to be removed when it has proven its worth. A distinguishing feature is its landing gear, with tandem-wheels well centered under each wing, and a third wheel well forward under the nose of the fuselage.

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PLANT PHYSIOLOGY

Fluorine in Drinking Water Found Harmless to Plants

➤ IF fluorine is being added to the water supply in your town to protect children's teeth against decay, you need not fear to use it in sprinkling your garden or watering your potted plants. Experiments carefully carried out by John D. Kaufman, 16, a high school senior in Grinnell, Ia., have demonstrated that in the concentrations used for decay-preventing purposes, fluorine will not harm young plants.

Mr. Kaufman used soilless gardening methods in making his tests. He planted three bean seeds each in 12 pots filled with the artificial soil known as vermiculite, and watered them with solutions containing chemically active fluorine in eight different dilutions, ranging from one to 1,000 parts per million. Three pots received dilute solutions of common salt (sodium chloride) instead of fluorine, and one pot, used as a control, received distilled water only. It was found that in a concentration between 100 and 500 parts of fluorine per million of water, sprouting was inhibited. This concentration, however, is far above the level commonly used in city water.

In a second experiment, the effects of fluorine on growth rather than on sprouting were investigated. This time the beans were allowed to sprout and grow to a height of two inches before they received water containing any fluorine. The plants were also given the necessary fertilizer elements in solution.

After five weeks, all the plants were still alive. Only those receiving tthe highest concentration of fluorine, 1,000 parts per million of water, were stunted. Since this concentration is hundreds of times higher than that used in drinking water anywhere, Mr. Kaufman states that "we may conclude that the use of fluorides in drinking water to check tooth decay could have no harmful effect upon the sprouting or the growth of plants."

Mr. Kaufman was one of 40 winners of the Eighth Annual Science Talent Search.

Science News Letter, March 12, 1949

PUBLIC HEALTH

WHO Is Awarded Medal For Fight Against Cholera

➤ A MEDAL has been awarded to the World Health Organization of the United Nations for its first big job of international cooperation against disease.

The medal was awarded to WHO by the Egyptian Government for the international action which stopped a cholera epidemic in that country in 1947. Presentation of the medal on behalf of the Egyptian Government was made in Geneva, Switz., to WHO by WHO's executive board chairman, Sir Aly Tewfikshousha, Pasha.

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