GENERAL SCIENCE

National Youth Science Camp Has Convened

➤ TWO YOUNG SCIENTISTS from each of the 50 states have converged on Camp Pocahontas in Bartow, W.Va. for the Third Annual National Youth Science Camp. This camp, conceived during West Virginia's Centennial, is unique in that it draws together 100 of the top student scientists in the country to an all-expenses-paid three weeks of scientific enrichment.

Thirteen of these campers already know the rewards of scientific competition and achievement through their experiences at the National Science Fair-International, conducted by SCIENCE SERVICE, or the Science Talent Search for the Westinghouse Science Scholarships and Awards administered by Science Clubs of America.

These campers include: Christopher M. Roth of Brunswick, Ga., who was one of the top 40 winners from the entire nation in the Science Talent Search; Mark S. Radomski of Miami, Fla., and Robert C. Barton of Oklahoma City, Okla., who were members of the honors group in this competition; Charles Jernigan of Tallahassee, Fla., and Carl M. Abramson of Charlotte, N.C., who won honors in the Science Talent Search and have competed as finalists in the National Science Fair-International; and Dennis L. Schatz of Denver, Colo., Lawrence A. Stanley of Savannah, Ga., Michael P. Schafer of Lafayette, Ind., John C. Lidington of Red Hook, N.Y., John A. Ormand of Camp Lejeune, N.C., Michael Merrill of Jamestown, N. Dak., C. W. Gantt of Columbia, S.C., and Richard R. Jones of Ducktown, Tenn., who have all competed as finalists in the National Science Fair-International.

For these students, the National Youth Science Camp, which is sponsored by the State of West Virginia and West Virginia University, is another step in their high school scientific endeavors. A scientific foundation has been established; college is around the corner.

• Science News Letter, 88:40 July 17, 1965

METEOROLOGY

Seed Hurricanes to Study Intensity and Growth

➤ SPRINKLING HURRICANES and tropical clouds with silver iodide to change their intensity or growth if possible will be tried this year.

The cloud seeding tests are part of Project Stormfury, a joint U.S. Weather Bureau-U.S. Navy effort. If a hurricane's strength or growth pattern can be altered, it would have "enormous potential rewards for the nation," Dr. Robert M. White, Weather Bureau chief, said.

Hurricanes cause billions of dollars of damage, great human suffering and many deaths every year.

Aim of the 1965 tests, which will overcome "formidable obstacles," is to make a scientifically sound exploration of how hurricanes are born, grow and die. When these factors are known, not only can predictions be improved but the feasibility of changing the destructive storms will be known.

Cloud seeding experiments in 1963 suggested that tropical clouds "explode" when sprinkled with silver iodide. The explosion is first upward, then sideward.

The horizontal spread is believed by scientists to be the most significant for purposes of practical weather modification. The sideward explosion in the Caribbean clouds in 1963 released additional energy equal to that of one or two Hiroshima atomic bombs, which were equivalent to 20,000 tons of TNT.

One giant tropical cloud releases, in heat of condensation, as much energy as several Hiroshima bombs, and hurricanes cover hundreds of square miles with towering tropical clouds.

The 1965 tests are expected to confirm that meteorology no longer has to be a purely observational science. It can now be experimental, using the atmosphere as a laboratory.

Continuation of Project Stormfury, which was suspended in 1964 because of lack of necessary aircraft support, was announced by Dr. J. Herbert Hollomon, assistant secretary of commerce for science and technology, and Dr. Robert W. Morse, assistant secretary of the Navy for research and development.

Between July 28 and Oct. 1, seeding experiments will be carried out in the western Atlantic on active hurricanes and in the eastern Caribbean on tropical cumulus clouds. Testing for changes resulting from silver iodide thrown into hurricane rainbands will be tried for the first time in 1965.

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AERONAUTICS

Huge SST Engine Mockup Shown for First Time

➤ A LIFE-SIZE MOCKUP of a huge jet engine, 25 feet long and six feet across, represents the first final design proposal for a major piece of equipment in the U.S. supersonic transport (SST) program.

At the 26th Paris Air Show, General Electric Company, one of two competitors for the SST powerplant contract (the other is Pratt and Whitney), displayed the mockup for the first time.

The engine itself, called the GE4/J5, would produce about 50,000 pounds of thrust and could be ready for prototype flight testing in three years, said GE's SST project manager, E. E. Hood. Type certification by the FAA could be achieved by 1970, he said.

General Electric has already tested some of the GE4/J5 design features on another GE engine, the YJ93.

Although final designs will not be announced for some time, GE, and Pratt and Whitney are already working jointly with both Boeing and Lockheed to decide on the most efficient shape and design for the engine.

Unlike the two airframe designs, which are vastly different, the powerplants in the design competition are largely similar.

Pratt and Whitney will not have a prototype mockup at the Air Show.

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IN SCIEN

ICHTHYOLOGY

Bullhead Weakened By Traces of Detergents

➤ THE YELLOW BULLHEAD, source of pleasure for many a fisherman, is damaged and cannot eat, swim or function well in rivers polluted with even small amounts of household detergents.

The taste buds of the usually hardy bullhead become damaged by detergents in a concentration of 0.5 parts per million in water, considerably lower than that at which serious damage had been previously detected, reported John E. Bardach, Masaru Fujiya and Arthur Holl, school of natural resources, University of Michigan, Ann Arbor.

When the taste buds which are required in feeding are damaged, the fish become weakened and are more susceptible to disease, researchers reported in Science, 148: 1605, 1965.

Many major rivers now have detergent levels between 0.1 and 0.2 parts per million, but some rivers, such as the Illinois River below Chicago, and many smaller streams in highly populated areas are polluted above 0.5 ppm.

The soap industry of the U.S. has been making efforts to produce "soft" detergents, which are more readily broken apart by bacteria in the sewage water than are the "hard" detergents. By the end of this year all household detergents manufactured in the U.S. will be "soft," and this should assure detergent concentrations well below 0.5 ppm in most waters, the researchers reported.

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SEISMOLOGY

Sensitive Seismograph Aids Yellowstone Study

➤ EIGHTY EARTHQUAKES were recorded in one day in western Yellowstone National Park near Old Faithful Geyser, but hardly anyone knew it except a few scientists.

The quakes, too slight to be felt by humans in the area, were part of more than 500 tiny tremors recorded in a two-month span by a new highly sensitive seismic recording network. The network, established jointly by the Geological Survey and the National Park Service at Yellowstone, is aimed at efforts to better understand the forces that shape the earth's crust in the Yellowstone region.

The 80 quakes originated in approximately the same place as the disastrous Hebgen quake of Aug. 17, 1959, reported Dr. Jerry P. Eaton, Geological Survey geophysicist. He emphasized, however, that this seismic activity does not mean that there will be future strong quakes in that area.

• Science News Letter, 88:40 July 17, 1965

CE FIELDS

ENGINEERING

Lubricants Help Start Cracks in Metals

➤ NEW FACTS about the way in which some lubricants help to start fatigue cracks in metal or increase the rate at which they spread have been revealed by two research workers in a report to the Institution of Mechanical Engineers in London.

Dr. H. Naylor and G. D. Galvin of the Shell Thornton Research Center did most of their work on a three percent nickel steel. Their aim was to find the chemical rather than the mechanical effects of oil on metal in rolling contact.

Tests were made with castor oil, synthetic materials, mineral oils and mixtures of water, ethylene and glycol, comparing the performance of each with medicinal white oil.

Two main effects were found. Some oils affected the process of crack initiation, but all changed the rate at which a crack grows.

The rate at which a crack increased to fracture size in a steel specimen was found to be about six times greater in a silicone lubricant than in medicinal white oil.

Either the chemical reaction between the oil or the oxide layer on the surface of the metal is believed to be the cause of the breakdown.

• Science News Letter, 88:41 July 17, 1965

TECHNOLOGY

New High-Speed Drill Melts, Penetrates Rocks

➤ A RADICALLY NEW high-speed drill that penetrates rocks by melting them has been constructed and successfully tested by researchers of the Los Alamos Scientific Laboratory, N. Mex.

The drill is especially designed to penetrate layers of hard basaltic rock, difficult to drill using conventional methods. The new technique was announced by the U.S. Department of Commerce through the Clearinghouse for Federal Scientific and Technical Information.

According to the Los Alamos developers, the new drill glides through hard basaltic rock at a rate of 50 feet per day. This compares very favorably with the two to four feet per day often encountered with conventional drills in the harder rock formations.

A host of potential applications exists for the drill in mining and excavating for oil and minerals, in quarrying and in tunneling.

In the drill tested, researchers used molybdenum as the red-hot drill bit to melt the rock. It is heated to about 1700 degrees C., well above the melting point of steel and most basaltic rocks. The researchers applied the heat electrically at the rate of 15 volts and 150 amperes from a small commercial welding transformer. A tungsten plate heater at the base of the drill heats to incandescence and transmits the heat to the molybdenum drill bit.

Contact with the molybdenum drill bit melts basaltic rocks to lava, which is then ejected by being blown up the central core of the drilling apparatus by streams of gas. Molybdenum is ideal for the drill bit because it exhibits excellent strength and resistance to corrosion at the high temperatures needed for rock melting, but tungsten is also a candidate since it has even greater strength and corrosion resistance at such temperatures.

• Science News Letter, 88:41 July 17, 1965

PUBLIC HEALTH

Excessive Nitrate Making Water Unsafe

➤ TOO MUCH NITRATE in many rural water supplies is making the water unsafe for both human and animal consumption.

A number of infant deaths have already been attributed to excessive nitrate in drinking water and formulas, reported Donald E. Crane, Nalco Chemical Company, Chicago. Cows whose diet regularly includes excessive nitrate in feed or water may produce milk that is harmful to infants, he said. In addition, nitrate poisoning is believed to have been the cause of some cattle deaths.

Too much nitrate in the water is often the cause of nitrate cyanosis, a condition where the ability of the blood to absorb oxygen is reduced.

The excessive nitrate "is caused at least in part by the increased use of nitrogen fertilizers," Mr. Crane said. "Although there is some demand for processes and equipment which can remove nitrates from these water supplies, the demand is so small that only limited research effort is being made for improved nitrate removal techniques."

Speaking at the annual meeting of the American Society of Agricultural Engineers in Athens, Ga., Mr. Crane described ion exchange methods of treating water to remove nitrate and dissolved solids.

• Science News Letter, 88:41 July 17, 1965

TECHNOLOGY

New Electron Beam Gun Allows Change of Focus

➤ AN ELECTRON beam gun that allows change of focus during operation has recently been patented.

Electron beam heating is used for welding, etching, annealing, refining and melting through bombarding material with a focused beam of electrons to produce intense local heat at the target point, which may be microscopic. It offers the advantages of freedom from contamination, pinpoint location and high power densities because it is carried out in a vacuum.

The patent on the gun and technique for changing focus was issued to National Research Corporation, Newton, Mass., a subsidiary of the Norton Company.

• Science News Letter, 88:41 July 17, 1965

SPACE

Sending Probe to Sample Halley's Comet Proposed

➤ SENDING a space probe to sample Halley's Comet when it returns to the earth's vicinity in 1986 was proposed by Dr. P. Swings of the University of Liege, Belgium.

The probe might even land on the comet's nucleus, he suggested.

Studies made from a rocket flung millions of miles through space to investigate Halley's Comet or another of these wandering objects would give valuable clues to the origin of the sun and its system of planets.

Dr. Swings also proposed at a Royal Astronomical Society meeting in London, England, the launching of an artificial comet composed of known material. How this man-made mixture reacts in space could be observed both from the ground and an accompanying satellite.

The information thus gleaned would help determine the chemical composition of real comets. Dr. Swings further proposed observations of distant comets and the dimming of a star's light or radio waves when the stellar object passes behind the comet's tail.

• Science News Letter, 88:41 July 17, 1965

PUBLIC HEALTH

AMA Hits Free Care For Merchant Seamen

➤ TWELVE GENERAL hospitals furnishing free medical care to American-flag merchant seaman would be closed if an American Medical Association committee report has any influence.

The AMA Committee on Federal Medical Services says the merchant seaman can no longer be considered automatically needy because of his employment since the seafaring unions has "negotiated significant wage raises since World War II." Yet these unions object to stopping the program, operated under the U.S. Public Health Service's division of hospitals and medical care of the Bureau of Medical Services, the committee pointed out.

The condensed report, published in the Journal of the American Medical Association 192:1102, 1965, said seamen sailing under the American flag do not belong with such legitimately financed groups as veterans disabled in the service of their country.

The report pointed out that modern prepayment and health insurance mechanisms make possible nationwide or even international medical protection for seamen. The Public Health Service's division of hospitals and medical care also provides outpatient service in 25 clinics in the U.S. and Puerto Rico, which the report says is a "vastly less effective means of outpatient care than free-choice insurance."

Care of merchant seamen is a duty PHS can assign to physicians who volunteer for a two-year tour of duty to fulfill their military service requirement, the report suggested, but questioned whether this is an appropriate way for physicians to meet their obligations.

• Science News Letter, 88:41 July 17, 1965