

PHYSICS

Mirrors Reflect Heat To Melt Platinum

A COPPER burning mirror which reflects to a focus the rays from an electric arc instead of from the sun has been perfected in Stockholm at the Metallographic Institute by Prof. C. A. F. Benedicks and Dr. J. Harden. Temperatures of over 3,600 degrees Fahrenheit have been obtained with its aid.

An electric arc between poles of carbon, carrying up to 100 amperes of current, is fixed at one focus of an elliptical mirror 17 inches in diameter, and the heat and light rays are concentrated at another point some distance away. A high temperature can thus be made at this second focus.

Rapid heating and freedom from admixture with foreign substances are advantages of this method of producing high temperatures. A piece of platinum, which requires a temperature of 3,250 degrees centigrade to melt it, was reduced to the molten condition in four and a half minutes. About 25 per cent. of the energy put into the arc is effective in producing the hot spot.

Mirrors have been used to produce high temperatures from the sun's rays throughout history. There is, however, a natural limit to the heating power of such a device, since a mirror of given size can only pick up a certain definite amount of the sun's rays.

Solar furnaces of this kind using parabolic reflectors have recently been perfected at Jena, Germany, by Prof. Rudolf Straubel of the Zeiss Optical Works and at the new astrophysical laboratory of the California Institute of Technology, Pasadena, California. Carbon, one of the most refractory of all substances, has been melted in these furnaces at a heat of 5,400 degrees Fahrenheit.

Science News Letter, July 4, 1931

CONSERVATION

10,000-Acre Redwood Forest Becomes California Park

TEN THOUSAND acres of the finest redwood forest land in existence, comprising the famous Bull Creek Flat country, has been added to the state park system of California, the Save-the-Redwoods League has announced.

This acquisition marks a high point in a long campaign by the League, backed by many private donors and by the official support of the state, to pre-

serve for future generations some of the best representative stands of the coast redwood, just as its botanical relative, the sequoia or big tree, has been saved, largely in the National Parks. Together with previously acquired park lands in the Humboldt State Redwood Park, the total area preserved in this region is approximately 16,000 acres. While there still remain redwood forest lands, particularly along the Redwood Highway, which it is hoped can ultimately be acquired.

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PHYSICS

Ultraviolet Much the Same In Antarctica as Here

ULTRAVIOLET light observed on the Antarctic continent by scientists of the Byrd expedition is very similar in nature to that observed in Washington. The photographs on which this conclusion is based were made at the bottom of the world by Malcolm P. Hanson, and the findings announced jointly by himself and Dr. E. O. Hulburt of the U. S. Naval Research Laboratory.

The rainbows formed by the light of both the sun and also of the moon during the long night of the Antarctic, were measured and found to contain practically the same range of colors. These spectra are of importance to science as indicating that the quantity of ozone in the upper atmosphere does not change with the seasons and is much the same in different parts of the world. The comparison spectra were made with similar equipment by the Naval Research Laboratory in Washington.

The short wave limit in the ultraviolet was found to be much the same in November and January in Little America as it was in December or January in Washington.

The penetration of the shortest light waves is prevented by the presence of small amounts of ozone, a form of oxygen, in the upper atmosphere. The amount of this gas is astonishingly small in view of its importance for protecting mankind from too severe sunburn. The thickness of the ozone layer that keeps back the shorter waves from penetrating the atmosphere would be only about one-eighth of an inch if brought down to the surface of the earth.

The moon spectra were taken in April and July by the expedition, both observations being made during the Antarctic winter night.

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IN SCIEN

ENTOMOLOGY

Magnifying Eye Would See Strange Things

See Front Cover

IF WE could only convert our eyes into magnifying glasses at will, we would see a lot of astonishing things that escape us now because they are too small. The little walking gargoyle shown on the front cover of the SCIENCE NEWS LETTER, for example.

It is a juvenile stage of a very common insect, which we ordinarily pass by as just another "bug." But here he is, magnified only sixteen times by Cornelia Clarke's camera, and he assumes an appearance more bizarre than the imagination of a Persian artist, more impossible than the figures in a medieval bestiary.

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VENTILATION

Homes Are Unlike Sahara Only in the Summer

THE average home in winter is drier than the Sahara Desert, according to experiments in relative humidity conducted by Edwin Fleischman, industrial heating engineer of Buffalo, N. Y. Few realize that during each of the winter months from fifteen to twenty gallons of water per room should be evaporated. July and August are the only months when water need not be evaporated indoors to provide adequate moisture, Mr. Fleischman said.

Customary provisions for increasing moisture, such as pans of water on stoves, do not give nearly enough evaporation, according to his experiments. Water should be boiled several hours daily in each room during the winter, if the air is not to be so dry that it will cause colds and increase coal bills by

During September a gallon of water per room should be evaporated, and the amount should increase to a peak in January, it was found. Should too much moisture be evaporated, water droplets will form on window panes.

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CE FIELDS

ARCHAEOLOGY

Shoes of Saxon Children Unearthed in London

A LITTLE old leather shoe worn by a child of the Saxons about the tenth century A. D. has been acquired by the Royal Ontario Museum, Toronto, and is regarded as a very special treasure.

Prof. C. T. Curelly, director of the Museum, who has brought the shoe from London, stated that three of these shoes were unearthed recently during excavations in London. They are the first pieces of Saxon footgear ever discovered in England.

The design of the shoe is different from anything known in shoe structure, Prof. Curelly declared. Holding the little flattened leather object carefully in his hand, he pointed out that "the sole carries up from the back in a wedge to a point, where the two sides meet." The shoe would have been only an inch and a half high on the foot. The sole is fastened by thin leather loops, about three of them to an inch.

A hole in the toe indicates that the child wore the shoe out before it was lost or discarded. The moccasin-like shoe afforded no protection against wet ground, Prof. Curelly pointed out, but the Saxon child would have worn no stockings, and when his feet got wet they doubtless dried quickly.

Science News Letter, July 4, 1931

ZOOLOGY

Bears "Given the Works" To Save Fish Eggs

BEARS CAUGHT robbing the traps at the Yellowstone fish hatchery recently were "given the works," but not to a fatal degree.

It happened this way, according to Park Naturalist Alfred H. Povah. The traps, placed at the most advantageous spots in a number of creeks, were supposed to catch quantities of fish ready to spawn, and thus supply plenty of eggs for restocking purposes. Plenty of fish were seen in the creeks on their

way to these spawning grounds, but the traps remained empty. The fish culturists, acting as piscatorial detectives, solved the mystery. Through a few scattered eggs lying along the bottom of the creek just below the trap, they deduced the fact that bears were robbing the traps, and decided to administer an unforgettable lesson.

These traps were inclosed in a fence of wire screening about three feet high. Inside this and about one inch away from it, the hatchery men strung a single strand of heavy copper wire. This was connected with two large storage batteries, hidden in a nearby box, in such a way that when the wire screening was pushed against the copper wire an electric contact was made. The fact that the bear depredator had to stand in water to reach the trap assured a "ground" for the electric current through the animal. This current, while not strong enough to injure the bears, gave them a positive deterrent against fish forays.

Within a week after the shocking apparatus was installed the trap was full of fish—and there will be plenty of eggs for restocking the lakes and streams.

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PHYSICS

X-Rays Made Without Using X-Ray Tube

X-RAYS have been produced by a new method which does not require the use of the usual X-ray tube, by M. G. Reboul of the Physics Laboratory, Montpellier, France. The X-rays are produced when electric currents are driven through solids of high electrical resistance with the help of high electrical pressures.

In materials that conduct the electric current badly, like the magnesia, alum and yellow oxide of mercury used in these experiments, most of the voltage used is taken up in driving the current across one end of the specimen. At this point where the large fall of voltage occurs, X-rays of low penetration are produced.

In order not to interfere with the emission of the radiation, the electrode at which this large fall of voltage occurs is given a grid form. The material used is in the form of rods, about three and a half inches long and an inch in diameter, surrounded by ebonite, and an arrangement is provided for pressing the electrodes against the ends of the rod by means of an ebonite screw.

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ORNITHOLOGY

Male Pheasants' Valor Outruns Discretion

FEMALE pheasants have more sense than the males, or at least believe in safety first, according to Oscar Johnson, head of the Conservation Department of South Dakota.

During a storm, Mr. Johnson reported to the American Game Association, the hen pheasant will seek shelter at once and tuck her head under her wing. Her mate, however, evidently has never learned that at times discretion is the better part of valor. Instead, he tilts at the storm, head in the air. As a result of this defiance of the elements, Mr. Johnson stated that hundreds of cock pheasants died during the past winter of frozen, ice-clogged mouths.

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ARCHAEOLOGY

Unearth "Modernist" Art Five Thousand Years Old

FIVE THOUSAND years ago artists in Mesopotamia were turning out expressionist art, and doubtless the public of those days said that art was getting entirely too modern and peculiar.

Specimens of this ancient expressionistic art have just been received by the University of Pennsylvania Museum from its expedition which has been excavating at Tepe Gawra in Mesopotamia. The expedition worked in conjunction with the American Schools of Oriental Research and Dropsie College. A cylinder seal bearing the picture of a goat is pronounced decidedly expressionistic in style, as is also a stamped seal portraying an ibex.

An exquisitely painted clay chalice shows a more conservative art style. The pottery was made in an early age of civilization, when a comparative state of leisure existed, according to Dr. Ephraim A. Speiser, who served as field director of the expedition at Tepe Gawra. When the people acquired knowledge of using metal, they found that the new conveniences and labor aids speeded up their mode of living, and the painted clay dishes and ornaments gave place to articles of a more utilitarian nature.

More than 300 objects from the excavations have been sent to Philadelphia, the majority of them dating from the early Bronze Age. A copper frying pan with handle complete is a rare exhibit. A mold for casting bronze objects is also of unusual interest.

Science News Letter, July 4, 1931