

PHYSICS

Lovely Feather Colors Due Mainly to Reflection

THE RAINBOW colors of a pheasant's feathers are rainbow colors in fact, to a very considerable extent. That is, the hues are largely due to reflection from transparent substances in the feather, just as the rainbow is due to reflected light from transparent raindrops.

How pheasant feathers borrow their hues from the sun was discussed before the meeting of the National Academy of Sciences at New Haven, Conn., by Dr. Stanley C. Ball of the Peabody Museum, Yale University. He found that the iridescence of the feathers he studied was determined partly by the shape and position of the feather barbs, partly by the position of the light source, and partly by the position of the observer himself.

This does not mean that feathers have no colors of their own. There are plenty of pigment bodies in parts of the feathers, supplying a sort of ground-color; but the real "show" of a beautiful bird's plumage is mostly a matter of reflected light.

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MEDICINE

Price of Cruiser Asked For Cancer Research

"ONE CRUISER for cancer would insure the banishment of this plague."

This dramatic statement was made at the meeting of the American Chemical Society at Washington by Dr. Ellice McDonald of the Cancer Research Laboratories, Graduate School of Medicine, University of Pennsylvania.

Dr. McDonald expressed great hopefulness over the possibility of the ultimate discovery of a cure for cancer, but said that time and money are needed for this work.

Criticizing the demands of the Navy League for huge sums of money for cruisers, he pointed out that the price of one cruiser would finance the work of the cancer research institutes of the country for 100 years.

Cancer is taking a toll of 130,000 deaths a year, he said. About three-quarters of a million people in the United States suffer from cancer at the present time. The mortality from cancer has increased by more than half in twenty-

five years, and if the same rate continues, the number of women dying from cancer 60 years from now will be 192 per 100,000 instead of 117 per 100,000 as at present.

Dr. McDonald described the work in his laboratories where chemists, physicists, biologists and other scientists are united in the fight against cancer. These investigators have found that blood of persons suffering from cancer is more alkaline and contains more sugar than normal blood. They believe this blood sugar is different from normal blood sugar and that it is of the active or gamma type of sugar. Moreover, the cancer cell adapts this active sugar in a different way from normal, according to their theories.

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PSYCHOLOGY

Shocked Rats Show Individual Differences

MARKED individual differences exist among rats, it is indicated by the way in which they respond to a mild electric shock. But it is an easy matter to train all of them to scoot through a doorway when they receive shocks of 0.08 milliamperes, which is a current little more than barely perceptible to a human being. This new method of training rats was devised at the Johns Hopkins University psychological laboratory under the direction of Dr. Knight Dunlap, and a preliminary report of it will be published in a forthcoming issue of the *Journal of Comparative Psychology*. It is looked upon by Dr. Dunlap as offering an improved method for the study of the rat's mental processes.

At first the rats were greatly excited and plunged about the compartment in which the shock was given, escaping by accident into the other compartment. But after from 30 to 120 shocks the rats learned to bolt directly into the other compartment, and to turn around facing the door ready for a quick getaway as soon as they should receive the next shock.

When a current of only 0.04 milliamperes was used, however, some of the rats learned more quickly than did the rats trained on the stronger shock, but some did not learn at all, the lighter shock apparently not affecting them.

An attempt to find out why the rats differ in their susceptibility will be made this year by Miss Evelyn Gentry at the Johns Hopkins laboratory.

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IN SCIEN

ENGINEERING

Graphs Take Guesswork From Highway Design

SHOULD a new highway be built? Ought the streets be widened to care for the increasing number of automobiles?

To answer these questions in California, engineers get out pencil, paper and charts and begin to calculate; for they have found a graphic method of determining highway expansion. One of the graphs which have taken guesswork out of designing a new highway system shows by means of a curve the relation between the number of cars per person and the road space required to handle them.

In a report to the American Society of Civil Engineers, William J. Fox, chief engineer for the Los Angeles county regional planning commission, explains that if the proportion of travel in a given direction is known, as well as the ultimate population of a community, then the graph serves as a very accurate means of designing the highways system in a manner consistent with natural demand.

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PLANT PATHOLOGY

New Disease of American Elm Trees Discovered

THE PROMISE, "Seek and ye shall find," has been unexpectedly fulfilled in a research problem conducted at the Ohio agricultural experiment station of Wooster, Ohio, by Curtis May. He was hunting for infections by the Dutch elm disease, which has caused some alarm among nurserymen and foresters in this country, and he found instead a brand-new, or at least hitherto unrecognized, native American disease of elm trees. Specimens of elms suspected to have the Dutch elm disease proved to have, in about ten per cent. of all cases, a fungus infection of a different type — which, however, was doing a good deal of mischief to the trees.

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CE FIELDS

MEDICINE

Long Light Waves Used In Treating Sunburn

A NEW method of treating severe sunburn has been tried by a Swiss physician, Dr. F. Bircher.

The method consists in exposing the patient to light rays of long wavelength, Dr. Bircher reported to the *Schweizerische Medizinische Wochenschrift*, Swiss medical journal.

He has tried it on only one patient so far, but the results were surprisingly favorable. The method is based on the fact that the effects of prolonged exposure to rays of short wavelength, especially ultraviolet rays, can be counteracted by rays of long wavelength. It is the short wavelength rays of sunlight that produce sunburn.

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ARCHAEOLOGY

Pueblo Apartments Found Within Arizona Caves

A PARTMENTS within caves, inhabited as transient quarters by Pueblo Indians of the thirteenth century, have been found in Arizona by Neil M. Judd of the U. S. National Museum.

Mr. Judd set out for the San Carlos Indian Reservation, on which the caves are located, with the hope of finding cave dwellers even more ancient than Pueblos. Local rumors said that hunters had looked into these caves and had seen old baskets, which they described as remarkable. No archaeologist had ever probed into the recesses to read the story there. Perhaps the baskets were very old indeed, made and used by Basket Maker tribes, whose existence has been traced in other parts of the Southwest.

When he checked up on the rumors, Mr. Judd found that the baskets were only half a century old, for all their look of gray, broken antiquity. They are Apache baskets, Mr. Judd explains. From the Apache relics in the caves it appears that Apache Indians used the caves as storage places during the Apache uprising in the 1880's.

The Pueblos, who occupied the caves five hundred years before the Apaches, had built crude rooms inside the caves. With adobe and stone they made rough walls, leaving the cavern roof to serve as ceilings. Smoke from the camp fires still stains the ceilings. That the Pueblos did not set up permanent housekeeping in the cave homes is deduced from the absence of refuse heaps.

Mr. Judd sets the time of Pueblo occupancy as late thirteenth century because of the type of pottery which the people used. The fragments of dishes and jars are similar to those of Showlow, another Pueblo settlement which has been dated by the famous tree ring calendar evolved for southwestern archaeology.

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MYCOLOGY

Fungi Make U. S. Cars Unpopular in Philippines

A MERICAN automobiles are losing popularity in the Philippine Islands. They are attacked by the little thread-like feeding organs of fungi. These organisms cause decay in the wooden parts of autos, with the result that the doors begin to sag and the top starts rattling or gives way entirely.

Most automobiles in the Philippines are American made, using temperate-zone woods. European cars are few, but some of them, to circumvent the fungi, use tropical woods which are not susceptible to fungus decay.

Ravages of the fungi occur within the first or second year of the car's life. Replacing decayed timbers in car bodies has now become a sizeable Philippine industry.

Spores of the fungi, spread by the wind, fall on automobiles and germinate. Moisture necessary for the fungus growth gains entrance to the wood used in the car, usually at the joints. Assisted by hot weather and plenty of rainfall, the fungi grow rapidly. They send out cotton-like threads, secreting ferments, which spread throughout the wood tissues and destroy them.

Two remedies are suggested by C. J. Humphrey, mycologist of the Bureau of Science, Manila, in a report to the *Philippine Journal of Science*. Resistant Philippine woods could be shipped to the U. S. for the manufacture of cars destined for the tropics, or American woods could be treated with substances, such as creosote, to render them reasonably safe from decay.

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ASTRONOMY

All-American Telescope Now Undergoing Tests

THE BIGGEST telescope mirror ever to be made entirely in the United States, 69 inches from rim to rim of its concave face, is now undergoing its final tests at the factory of the J. W. Fecker Company at Pittsburgh. If it passes them successfully it will soon be on its way to Delaware, Ohio, to be mounted at the Perkins Observatory of Ohio Wesleyan University.

Supervising the tests are Director Harlan T. Stetson of the Perkins Observatory and officials of the U. S. Bureau of Standards and of the Dominion Astrophysical Observatory at Victoria.

The block of glass from which the mirror has been ground was cast and annealed some time ago at the U. S. Bureau of Standards, in Washington. The task was undertaken to ascertain whether it was possible successfully to produce large pieces of optical glass in this country. Previously the great center for this kind of highly technical manufacture was the famous St. Gobain works in northern France, overrun and wrecked during the war. It was at St. Gobain that the 100-inch mirror of the great Mt. Wilson telescope, still the greatest in the world, was cast.

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PHYSIOLOGY

Return Traffic Slow Along Two-Way Nerves

N ERVES that carry traffic in both directions have been found in catfish by Prof. G. H. Parker and V. L. Paine of Harvard University. In this they are quite unlike the majority of nerves, which are strictly one-way affairs operating in pairs, one line to carry news to the brain and other centers, the other to bring back orders to the muscles and glands.

But the two Harvard zoologists, who reported their research before the National Academy of Sciences meeting at New Haven, Conn., found that the lateral line nerve of the catfish not only transmits sensory impulses in one direction but carries trophic or response impulses in the opposite. The returning impulses must find it hard going against the inbound traffic, however, for they travel slowly, approximately two centimeters, or less than an inch, in a day.

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