OPTICS

# Seeing Violet Light

➤ THE VIOLET light that is often noticed to pervade the early moments of twilight may be explained by a new discovery about the human eye reported in *Science* (Sept. 10) by Drs. Edgar Auerbach and George Wald of the Biological Laboratories, Harvard University.

Among the cones of the eye, they found, are some that are particularly sensitive to violet light. The cones are the cells located predominantly in the center of the retina that are responsible for bright daylight vision.

When you step from a brightly lighted room into the darkness, your eyes gradually become accustomed to the dark. During the first few minutes, your eyes rapidly become more sensitive until your vision reaches a plateau. This is due to the adaptation of the cones of your eyes.

Later, there comes another even more striking increase in visual sensitivity due to the adaptation of the eye's rods. The rods are the cells responsible for night vision. In general, the cones are especially sensitive to yellow, orange and red light; the rods see best in the violet end of the spectrum.

However, after adaptation to orange light, the Harvard scientists found, something very different occurs. At first, the cones of the eyes are more sensitive to violet light than to orange. After about two minutes in the dim light, a change takes place and the eye then becomes more sensitive to orange than it is to violet. This is the reverse of what scientists call the Purkinje shift.

After about 15 minutes of dark adaptation, the rods take over the task of vision. Then comes a true Purkinje shift and the eyes are again more sensitive to violet.

Study of the special sensitivity of the cones to violet light during the first two or three minutes of dark adaptation was stressed by the Harvard scientists. They exposed their subjects repeatedly to intense orange-to-red light and then measured their sensitivity to light of various wavelengths from 405 millimicrons to 546 millimicrons.

After one minute of adaptation, they found, the eye is most sensitive to violet light, but there is another wavelength to which it is more sensitive than to others; that is at about 555 millimicrons, which is yellow light. After ten minutes of dark adaptation, the yellow light alone is seen best.

In another experiment, the investigators measured the sensitivity to light of various wavelengths in a period of dark adaptation after exposure to orange-to-red light or to blue light.

The red light, they found, spared the cone receptors sensitive to violet. After one minute of dark adaptation, the eyes were especially sensitive to violet light and also slightly less sensitive to orange-red light.

After exposure to the blue light that dulled the sensitivity of the violet receptors, the sensitivity after one minute of dark adaptation showed only a single peak for the orange-red light.

Science News Letter, October 2, 1954

MEDICINE

## Earnings Increased For Polio Patients

➤ EARNINGS OF a group of poliomyelitis patients was increased more than ten times through rehabilitation, Dr. Chester S. Keefer of Washington reported at the Third International Poliomyelitis Conference in Rome.

Dr. Keefer is special assistant to the secretary for health and medical affairs in the U. S. Department of Health, Education and Welfare.

Annual earnings of the group of 3,801 polio patients before the rehabilitation was estimated at $728,000, Dr. Keefer reported. Of the group, 85% were unemployed, 31% had never worked, 69% were dependent on their families and six percent were on public welfare rolls at the start of the program.

The following year, their earnings totaled $7,400,000.

Dr. Keefer cited these figures to show that rehabilitation, although long and costly, pays off in dollars and cents as well as in happiness for the individual.

Keeping the public informed about the disease and everything known that can be done to control it is "essential," Dr. Keefer declared, if the total problem of poliomyelitis is to be solved.

Science News Letter, October 2, 1954

BIOLOGY

## Spadefoot Toad Breeds Only During Hurricanes

➤ ALTHOUGH HURRICANE warnings send people in Florida scurrying for cover, at least one group of state residents looks forward to a good heavy storm.

The spadefoot toad, known scientifically as *Scaphiopus Holbrooki,* is the strange little animal that needs the death-causing hurricanes to bring new life to its species, for it can only breed during heavy storms.

Scientists are still baffled as to what the triggering mechanism is that tells these toads when a storm is approaching or is upon them. Some speculate that the toads have a pressure-sensing device, and others believe that they come to the surface of the ground only after their holes have become filled with water.

So adapted are the young to this way of birth that the tadpoles will not survive in an ordinary pond, but will only live in a storm puddle. As the puddle dries, the tadpoles are also equipped to speed up their development into adulthood.

This particular toad has some cousins in the desert that apply this storm-breeding technique to take advantage of flash floods.

Since Florida has escaped a heavy storm or a hurricane so far this year, the spadefoot tadpole has not made its annual appearance.

Science News Letter, October 2, 1954

ORNITHOLOGY

## Always Spring for Birds in Tropics

➤ HOW DO birds in the tropics, where there are no seasons, know when it is time to find a mate?

In temperate zones, the problem is solved by the seasons: all members of a bird species nest at the same time, and then rest the rest of the year. Where it is forever summer, birds get no guidance from the weather.

Some answers to the dilemma of the tropic bird have been found by Dr. Alden H. Miller, professor of zoology at the University of California and president of the American Ornithologists' Union.

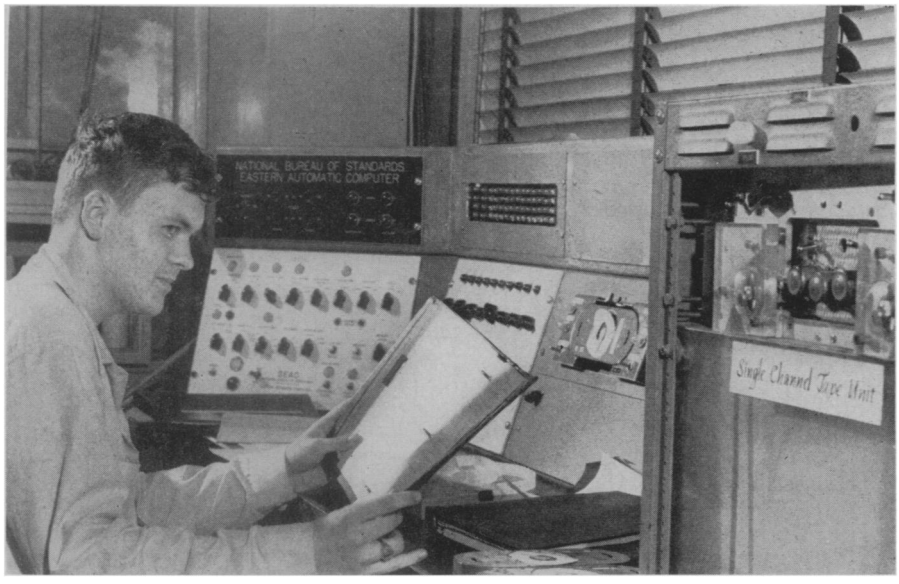
Dr. Miller revealed his findings, made on a trip to the Magdalena River Basin in Colombia, South America, at a meeting of the union in Madison, Wis.

The tropic birds, he said, just nest all the year round. The breeding cycle appears to be determined by the time each individual hatches. When the bird becomes of age no matter what time of the year, he finds a mate. Then he rests for an appropriate period before breeding again.

So in the tropics individuals of a single species may be found nesting at any time of the year, while others of the same species are resting instead.

Science News Letter, October 2, 1954

*"TORCH" SWEATER — Testing a sweater for its flammability is Janet Rountree, 17, of Evanston, Ill., a 1954 Science Talent Search winner who worked this summer at the National Bureau of Standards.*




***SUMMER WORK FOR SEARCH WINNER—Everett C. Dade, 17, of Dover, N. H., a top winner in the 1954 Science Talent Search (see SNL, March 13, 1954), spent this summer at the National Bureau of Standards programming problems for the electronic computer.***

GENERAL SCIENCE

# Talent Search Under Way

➤ A NATIONWIDE search is now under way to find the 40 most promising science-minded high school seniors in the country.

The Fourteenth Annual Science Talent Search was launched with an invitation to seniors in 27,000 public, private and parochial schools throughout the land. They will have the opportunity to compete for $11,000 in Westinghouse Science Scholarships and a five-day visit to Washington. Valuable honorable mention status will go to 260 others.

The results of the search will reveal who among this year's seniors will be the nation's leading scientists of the future, and will stimulate others to undertake scientific training.

The Science Talent Search is conducted by SCIENCE SERVICE and supported by the Westinghouse Educational Foundation. Watson Davis, director of SCIENCE SERVICE, in announcing this year's Search, called attention to the growing shortage of scientists and engineers, a shortage that hampers the nation's industrial and defense programs.

"Creative scientists and technologists so urgently needed by our civilization are being found and nurtured by the National Science Talent Search," Mr. Davis said. "The success of those who have won previous honors shows that this method of selection works with effectiveness.

"Colleges are justified in the weight they give National Science Talent Search ratings when they give scholarships and grant admissions," Mr. Davis said.

Principals and science teachers in secondary schools throughout the country are now receiving instructions on "How You Can Search for Science Talent." They will learn how to recognize science talent among their students.

All entries for the Search must reach the Washington office of Science Clubs by midnight, Monday, Dec. 27. Winners and honorable mentions will be announced late in January, 1955, and the 40 winners will come to Washington Feb. 24-28, 1955.

For complete details of the national and state Science Talent Searches write to Science Clubs of America, 1719 N St., N.W., Washington 6, D. C.

Science News Letter, October 2, 1954

OPHTHALMOLOGY

## Cataracts Caused by Allergy to Penicillin

➤ AN ALLERGIC reaction to penicillin, famous mold remedy for germ infections, has caused cataracts in a 39-year-old man, Dr. Ruby K. Daniel of Dallas, Tex., reported at the International Congress of Ophthalmology meeting in New York.

The patient took penicillin for an ear infection. This brought on a severe and incapacitating skin trouble which lasted two months. The cataracts seemed to have followed. The patient insisted that his eyesight was normal until he had the skin trouble.

The case is the latest of a number of allergy-caused cataracts in young people which Dr. Daniel has seen. Not all were due to penicillin allergy.

Science News Letter, October 2, 1954

AERONAUTICS

## Helicopter Booster May Save Lives

➤ A LIGHTWEIGHT power booster for helicopters could spell life or death for wounded Marines awaiting rescue from mountain clearings.

Although the whole system weighs only 67 pounds, including its fuel tank perched atop the helicopter's rotor, it permits a Marine Corps HRS-2 helicopter to lift six men per load from a 5,000-foot hilltop clearing. Because of the thinner air, the machine ordinarily could evacuate only three wounded at this altitude.

Used momentarily for extra take-off power, the booster consists of three small rockets attached to the three blades of the HRS-2. The rockets burn hydrogen peroxide.

The power booster helps the loaded machine climb into the sky. After forward speed has been attained, the main piston-type engine easily keeps the machine aloft.

To gain the same extra take-off lift without rockets, the helicopter's engine would have to be increased about 200 pounds and its power-transmission gears strengthened.

Although designed to "fit" Marine HRS-2 'copters, it can be adapted to any helicopter, its manufacturers, Reaction Motors, Inc., say.

Science News Letter, October 2, 1954

PEDIATRICS

## High Altitude Babies Lightweights at Birth

➤ BABIES BORN at the high altitude of 10,000 feet at Leadville, Colo., and surrounding Lake County are lightweights. They average three-quarters of a pound less at birth than babies born in Denver, which is at half that height.

This puts many of these babies technically in the premature class since doctors classify babies as premature if they weigh five and one-half pounds or less at birth.

The Lake County lightweight babies, however, are not otherwise abnormal and seem to be as healthy as full-weight babies. Mothers of these lightweight babies do not eat any differently and their general social and economic status does not seem any different from mothers of so-called normal weight babies. There does not seem to be any racial difference, either.

About the only factor that can account for the babies being born lightweights seems to be the lower oxygen supply at the high altitude of Lake County. Scientists of the University of Colorado School of Medicine will make a two-year study of this factor at St. Vincent's Hospital, Leadville, with the aid of a $10,000 grant from Playtex Park Research Institute of Dover, Del.

The findings are expected to be important for small, technically premature babies everywhere.

Science News Letter, October 2, 1954