



**NO LONGER GONE GOOSE**—The Hawaiian nene, said to be the rarest bird in the world after the whooping crane of North America, seems to be making a comeback in his fight for existence.

## BIOLOGY

## Hawaiian Nenes

Once thought on the way to extinction, the Hawaiian nene population is now estimated at 68, all but 16 of which are in Hawaii. Special pens have been established for them.

► THE HAWAIIAN nene, which looked like a gone goose just a few years ago, now seems to be winning its battle for survival.

Four years ago, the world population of this attractive, pugnacious goose had reached an all-time low of 30 to 54 scattered throughout the mountains of the island of Hawaii, and 24 in captivity. Despite vigorous measures to save the bird, conservationists had begun to lose hope for its continued existence.

This spring, however, four goslings were hatched in the special pens established for the birds at Pohakuloa, Hawaii, 6,500 feet up a mountainside.

The nene population is now estimated at 68, all but 16 of which are in America's mid-Pacific territory. This is probably only a fraction of one day's bag during the hunting season in the early part of the century, when the nene flourished, but it gives hope that the goose is finally making his comeback.

An important part of the credit for saving the nene belongs to a few devoted conservationists who aroused officials to the bird's plight and to a Hawaiian rancher and businessman, Herbert C. Shipman. Mr. Shipman has one of the three captive flocks in the world, and it was from a pair of his birds which he lent to the Pohakuloa

project in 1949 that the present flock of 14 has grown.

The other captive flock, totaling 16 birds, is located at the Severn Wildfowl Trust at Slimbridge, England. This flock was started from three breeders from the Shipman ranch. Mr. Shipman sent one of the birds to the Wildfowl Trust by air express. The rancher's own flock contains six birds.

It is not definitely known what started the nene on the downgrade, but destruction by man seems to be an important factor. John R. Woodworth, Territorial Wildlife conservationist, believes that the wild pig and wild dog also had a considerable part in the damage.

The nene is a fearless fighter during the breeding season and will attack anything that seems to threaten his young. The nene puts his head on the ground, hisses, bites with his bill and tries to beat the intruder with his wings.

When the nene was plentiful, the hunting season was in January, a month when the bird was flightless. He was easy prey for trigger-happy marauders.

The nene mates in March. Pairs normally do not produce young until they have reached three or four years of age. They produce a clutch of between three and six eggs, which take about a month to hatch.

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## GENERAL SCIENCE

## Visa Application Is Denied Nobelist Dirac

► THE VISA application of Dr. P. A. M. Dirac, England's famed 1933 Nobel prize winner in physics, has been denied, SCIENCE SERVICE has learned.

Dr. Dirac was scheduled to come to the U. S. this fall as a visiting professor in theoretical physics at the Institute for Advanced Study, Princeton, N. J., as he has been doing on and off since 1934. He was also to have spoken at Columbia University's bicentennial celebration.

One reason for the visa refusal, it is believed, is Dr. Dirac's attendance at a scientific meeting in Russia shortly after the war.

Dr. Dirac has held the highly prized chair of Lucasian Professor of Mathematics at Cambridge University, England, since 1932. He was doing graduate work at Cambridge when the great blaze of advance in theoretical physics was set alight in 1925 by Dr. Werner Heisenberg, the 1932 Nobel prize winner in physics.

Developing his own mathematics, Dr. Dirac produced a still more advanced system of quantum mechanics, which he announced in 1928. Perhaps Dr. Dirac's most strikingly original and successful contribution is his relativistic theory of the electron.

The Institute for Advanced Study reported in May that Dr. Dirac was one of seven world-famed physicists with whom it had made "arrangements for a continuing or recurrent association." When asked about the recent denial, a spokesman for the Institute said that "now is not the time for publicity" concerning the visa refusal.

The State Department's visa division admits that there has been much "interest in the case," but refuses to comment further.

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## GEOPHYSICS

## Make Rain by Seeding Clouds With Salt

► CLOUD SEEDERS may some day make rain by throwing common table salt into clouds.

This is foreseen from studies being made of how bursting bubbles throw salt particles into the air. The tiny sea water bubbles, as they break, form even tinier jets. It is these jets that eject the salt-containing droplets, Alfred H. Woodcock of the Woods Hole Oceanographic Institution, Woods Hole, Mass., has found.

C. F. Kientzler, A. B. Arons and D. C. Blanchard, also of the Institution, collaborated in the motion-picture studies of how small bubbles explode.

Many meteorologists now believe that natural salt particles in the air are rain-making agents. The experiments were sponsored by the Office of Naval Research.

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