

## ORNITHOLOGY

# Heartbeats Counted

Using an extremely sensitive electrical instrument known as a cardio-vibrometer, the extra-rapid heartbeats of birds are accurately measured.

► EXTRA-RAPID heartbeats of birds, which normally have rates several times that of human beings, have been accurately counted in experiments by Dr. Eugene P. Odum of the University of Georgia, using an extremely sensitive electrical instrument known as a cardio-vibrometer. This has the advantage of not constraining the bird in any way, since nothing is attached to its body; there is thus no falsification of the record through fear or excitement. The instrument is attached only to the twig on which the bird perches, or even under the nest, and the very slight vibration caused by the heartbeat, translated into terms of electric impulses and amplified, is recorded by an automatic pen.

Dr. Odum measured the heartbeat rates for the tame canary and for nine species of wild birds, ranging in size from the mourning dove down to the ruby-throated hummingbird. In general, the smaller the bird the faster the pulse rate: the average basal rate for the ruby-throat was found to be 615 beats per minute, while that of the mourning dove is only 135—approximately twice the human heartbeat rate.

Heartbeat rates in birds can be speeded up terrifically under conditions of excitement or exertion: five of the ten birds tested had maximum rates of over 1,000 beats per minute, and all except the dove had maxima in excess of 800 per minute.

These extreme rates were maintained for only short periods; normally the rates were much lower, though still very high as compared with the rates in human beings. Thus, the basal rate in the dove was 135, while the maximum was 570. The cardinal had a basal rate of 445, a maximum of 810; the English sparrow's basal rate was 350, its maximum 902; the chipping sparrow had a basal rate of 440, a maximum of 1,060.

One peculiar phenomenon was noted in the case of naked young birds in the nest, which are cold-blooded, like lizards or frogs, when first hatched. Their heart rate at hatching changes directly with rise and fall in temperature, as a frog's heart does. However, as they be-

come a little older and assume their character as warm-blooded animals, increases in temperature bring a slowing-down of the heartbeat, and decreases speed it up.

Dr. Odum gives details of these and other observations in a report in *Science* (Feb. 9).

*Science News Letter, February 17, 1945*

## CHEMISTRY

## First Baekeland Award To Be Given Dr. Gilliland

► THE Leo Hendrik Baekeland Award of the North Jersey Section of the American Chemical Society will be presented in May to Dr. Edwin Richard Gilliland, professor of chemical engineering at the Massachusetts Institute of Technology, and formerly Assistant Rubber Director. He will be the first recipient of this award, which will be made biennially to an American chemist under 40 years of age for achievements in pure or industrial chemistry.

The Baekeland award, a gold medal and \$1,000 cash, was founded to commemorate the technical and industrial achievements of Leo Hendrik Baekeland, who died a year ago at the age of 80, after a life of activity in the chemical research field. He is best known for the invention of bakelite, the first commercial synthetic resin. This invention and the subsequent development of synthetic resins, commonly known as plastics, have had far-reaching effects on modern civilization.

Oklahoma-born Gilliland, who joined the teaching staff at M. I. T. in 1934, is the author of numerous published papers, and is known as an advocate of the maintenance of a postwar synthetic rubber industry in the United States as essential to the national interest.

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## BIOGRAPHY

## Dr. William H. Howell, Physiologist, Dies

► THE DEATH of Dr. William H. Howell, distinguished physiologist of the



WILLIAM HENRY HOWELL

Johns Hopkins University, in his 85th year (Feb. 6) marks the end of an epoch in medical education. He was the last surviving member of the first faculty of the Johns Hopkins Medical School, which included the school's internationally known "Big Four," Dr. William H. Welch, Dr. Howard A. Kelly, Dr. William Stewart Halsted and Sir William Osler.

As professor of physiology, dean of the medical faculty and director of the School of Hygiene and Public Health, Dr. Howell contributed in no small measure to the achievements of the Hopkins which, from its start, pioneered a new trend in medical education in this country.

Isolation of the anti-blood clotting substance, heparin, was one of Dr. Howell's own achievements in the medical research for which the institution is famous. His teaching reached far beyond the Hopkins through his *Textbook of Physiology*, widely used and standard text now being prepared for its fifteenth edition.

Besides his role of medical educator, Dr. Howell was interested in education of the general public in science and served for 10 years as chairman of the executive committee of Science Service.

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