PHYSIOLOGY

If You Are Over 20 Years Old You Are Probably Partly Deaf

National Health Survey Reveals That Nearly Half Those Who Think They Have Normal Hearing Really Have Defects

IF YOU are over 20 years old, the chances are you are partially deaf. And you can blame the infections of certain diseases, including the common head cold, influenza, scarlet fever, meningitis, diphtheria. Three-fourths of the population are either totally or partially deaf.

This is the news just made public by the U. S. Public Health Service in a series of four bulletins reporting a study of hearing in connection with the National Health Survey. The hearing part of the survey was conducted by Dr. Willis C. Beasley, senior administrative officer of the Public Health Service, in cooperation with prominent ear specialists.

Of all the 9,000 persons who were given hearing tests and ear, nose, and throat examinations in the Health Survey, only 52 per cent. claimed to have normal hearing. But nearly half (44 per cent.) of these who claimed normal hearing were actually partially deaf. They were unaware of their defect because the deafness occurs principally in the very high tones, above the pitch of ordinary speech. The highest notes of the violin, flute, and piccolo are lost for them.

This loss of hearing, beginning at the age of 20, increases at a regular rate as time goes on.

Degeneration of Nerve

It is due to an actual degeneration of the nerve of hearing, the examinations revealed.

"Practically all deafness among persons over 25 years of age," said Dr. Beasley, "involves some degree of nerve degeneration. This degeneration is more circumscribed among males, rather widely distributed throughout the ear among females."

Deafness in school children is due in the vast majority of cases to congestion or injury of tissue in the middle ear without injury to the hearing nerve.

A new problem for manufacturers of hearing devices is disclosed by the findings of this survey. Men and women, it was discovered, differ significantly in the way in which they grow deaf.

Men lose ability to hear the high tones mostly. Hearing devices for them should magnify the high notes a great deal more than the lower pitches of conversation.

For women the hearing loss is distributed uniformly over the whole range of tones most essential in ordinary life. Devices for women should magnify the notes of the baritone voice as well as the high pitches of the violin and piccolo.

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PHYSICS

Rubber Bands Used to Drive Pendulum in Novel Machine

JUST as a locomotive uses steam as its "working substance" to change heat into mechanical work, scientists at the National Bureau of Standards have built an experimental heat engine which uses rubber as the working substance. The alternate heating and cooling of rubber bands keeps the pendulum device oscillating for days on end without attention.

In a report, (*Review of Scientific Instruments,* February) Drs. Lawrence A. Wood and Norman Bekkedahl describe the operation of the ingenious, but simple, device which is a refinement of earlier models originally made by W. B. Wiegand of the Columbian Carbon Company.

The apparatus, called a rubber pendulum, consists of a vertically mounted metal rod which is pivoted at its central point where a small right-angle piece of metal oscillates on knife edges.

The top of the rod holds brass weights while the bottom end is attached to common rubber bands under tension. The action of the weights is to overturn the pendulum but this action is counterbalanced by the pull of the rubber bands.

Mounted in front of the rubber bands is a sheet metal shield shaped like a piece of pie with the point downward. Nearby is an electric heater which shines its heat rays at the rubber bands.

Rubber bands have the unusual property of contracting, with an increase of tension, when they are heated. Thus as the heat rays shine on them they contract and the increased tension pulls the bottom end of the pendulum nearer the vertical.

As the rubber bands come behind the metal shield they are cooled, expand and permit the pendulum to swing outward again. By suitable adjustment of the brass weights the inertia of the system can be arranged so that the pendulum will swing from side to side, alternately heating and cooling the rubber bands. An oscillation period of about five seconds can be obtained. The rubber bands last about two weeks when in service for eight hours each day.

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RUBBER MAKES IT GO

To the uninitiated observer this novel machine looks like a demonstration of perpetual motion. Contraction of the rubber bands caused by rays from the electric heater makes the pendulum swing.

PSYCHOLOGY

Boys and Girls Pose Unanswerable Queries

ALL of us go about with many questions we can't answer or get others to answer for us. For most of us they have been so long unanswered that we have become accustomed to the situation.

For adolescent boys and girls in school,