

Miscellany

Research Notes

The effects of gamma radiation upon common materials such as paper, glass, rubber, and steel are described by Samuel S. Jones in the July issue of the *General Electric Review*. The working arrangements for testing these effects, which make use of cobalt-60, are described in some detail in this article, along with assorted information on the behavior of various substances after irradiation. Some kinds of rubber, for example, become hard and brittle when exposed to gamma radiation, while others are rendered "as sticky as molasses taffy".

A report on the intelligibility of various speech materials is presented in the July *Journal of the Acoustical Society of America*, the testing having been performed under various noise conditions and with some frequencies filtered out. The results show that monosyllabic words, nonsense syllables, and polysyllabic words decreased in ease of recognition in that order, and that "the intelligibility of easy material increased more rapidly as a function of the signal/noise ratio than does the intelligibility of difficult material". Another finding was that eliminating all frequencies either above or below 1600 cycles had very little effect on the recognition of words. The research was done at the Central Institute for the Deaf in St. Louis by I. J. Hirsh, Elizabeth G. Reynolds, and Maurice Joseph under an Air Force Contract.

The aurora is one of the most strikingly beautiful of all natural phenomena, but its origin, in physical terms, is still a matter for speculation. It is usually accepted that ion streams coming from the sun at high velocities reach the upper atmosphere of the earth and interact there with oxygen and nitrogen molecules to produce the characteristic auroral forms and colors. The means by which the ions are accelerated and their behavior between the sun and the earth are not known. The most recent approach to the latter problem is described by W. H. Bennett and E. O. Hulburt of the Naval Research Laboratory in the July 15th *Physical Review*, where a "magnetic self-focusing" effect is invoked to account for the lack of electrostatic dispersion in the beam of solar protons. Further, "it is suggested that the auroral rays are not the solar proton stream but are formed when the protons are stopped in the upper atmosphere. Due to the charges and absorbed energy of the protons, oxygen and nitrogen particles of

the atmosphere are ejected outward to great heights along the lines of magnetic force and form the auroral rays and streamers."

Mridanga and Thabala are Indian drums whose first four overtones make up a sequence of natural harmonics with the fundamental. Twenty years ago C. V. Raman discovered that only five different overtones in all were produced by the first nine modes of vibration of the drumhead; there were only two non-degenerate modes altogether. This is very peculiar behavior for a drum, and it cannot be accounted for at all by conventional theories of vibrating membranes. Actually, however, both drums are unconventional. Mridanga consists of a small cylindrical wooden shell whose leather head is loaded symmetrically in the center with a flexible paste. Thabala is longer and has an ordinary membrane across one end with a loaded one across the other. Hence the vibrating drumhead may be considered "as a circularly symmetric composite membrane of densities $\rho_1 (0 \leq r < a)$ and $\rho_2 (a < r < b)$ per unit area clamped at $r = b$ ". This can be treated as a boundary value problem, and B. S. Ramakrishna and Man Mohan Sondhi of the Indian Institute of Science at Bangalore have obtained the appropriate eigenvalues and eigenfunctions. Their theory, discussed in the July *Journal of the Acoustical Society of America*, leads to the properties observed by Raman if certain conditions of the densities and radii of the parts of the drumhead are fulfilled. Presumably anthropology is left with the problem of finding out how the native makers of the drums determined these conditions in the first place.

Publications

New editors for two journals published by the American Institute of Physics have been appointed by the AIP Governing Board. Robert L. Sproull, associate professor of physics at Cornell University, has been named editor of the *Journal of Applied Physics*, succeeding Elmer Hutchisson, dean of the Case Institute of Technology, who has served as editor from the time the journal was established in 1937. The second appointment is that of J. B. Horner Kuper, of Brookhaven National Laboratory, who has been named editor of the *Review of Scientific Instruments*. He succeeds P. H. Miller, Jr., of the University of Pennsylvania, who has been acting editor since the resignation early last year of Gaylord P. Harnwell upon his appointment as president of the University of Pennsylvania.

Noise Control, the forthcoming publication of the Acoustical Society of America, is to make its initial appearance next January. The journal will be issued bimonthly under the editorship of Lewis S. Goodfriend who will work with an editorial board having the following membership: Floyd A. Firestone (chairman), Leo L. Beranek (vice chairman), Herbert A. Erf, Robert O. Fehr, Karl D. Kryter, and Haldon A. Leedy. Designed for the "reader who has practical noise prob-