and 1/24 OB. It was determined that calibration using only an octave band filter missed 3000 Hz and 6000 Hz, and that measured deviations between the coarsest resolution (1 OB) and the highest resolution tested (1/24 OB) were 5.8 dB and 1.3 dB at 2000 Hz and 4000 Hz, respectively. A conclusion from this analysis is that when calibrating audiometers using analyzer bandwidths which do not have band centers at the pure tone frequencies to be calibrated, it is essential that correction factors be applied. Some instrumentation manufacturers provide these correction factors and they must not be ignored in practice.

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7. Immersive Simulation of Hearing Loss

Patrick M. Zurek and Joseph G. Desloge, Sensimetrics Corporation, Somerville, Massachusetts
Presented by Lorraine Delhorne

Simulation of hearing loss is useful for demonstrating the communication challenges facing hearing-impaired people. However, current 'simulations,' most of which are only recordings, do not actually elevate thresholds; i.e., they do not simulate hearing loss, per se. At this poster we will describe the development of a hearing loss (and prosthesis) simulator that is immersive—the user's detection thresholds for ambient sounds are shifted by a prescribed degree. This threshold shift is achieved through a combination of passive attenuation (from muff-type hearing protectors), additive masking noise (introduced by within-muff earphones) and automatic gain control applied to the signals picked up by microphones near each ear. Listeners' subjective reactions to even moderate degrees of simulated hearing loss suggest that the system may be an effective motivational tool in hearing conservation programs. The simulator will be demonstrated at the poster. [Work supported by NIDCD].

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8. Apprentice Carpenter Hearing Levels from 1995 to 2003

Pamela S. Graydon, B.S.; Mark R. Stephenson, Ph.D.; and Christa L. Themann, M.A., NIOSH, Cincinnati, Ohio

As part of an ongoing study, the National Institute for Occupational Safety and Health (NIOSH) measured apprentice carpenter hearing levels in 1995 and again in 2002-2003. These two samples will be compared to see if apprentice carpenter hearing levels have changed during this interval. Results will also be evaluated against data from the National Health and Nutrition Examination Survey 1999+ (NANES) to see how apprentice carpenters' hearing compares to that of an age and gender-matched sample from the general population.

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9. Options in Defining Background Noise During Audiometric Testing

Elliott H. Berger, M.S., INCE, Bd. Cert., E-A-R/Aearo Company, Indianapolis, Indiana

Background noise in audiometric testing continues to be an issue of concern in the regulatory and audiological communities. A well-refined and scientifically tested ANSI standard (S3.1-1999) exists that clearly defines acceptable ambient sound pressure levels and the associated errors in threshold measurement that they create. Yet some in the hearing conservation community would like the permissible levels changed, arguing that the existing specifications are predicated on misassumptions. The facts are, however, that the S3.1 standard is based on objective measurements and includes options to adjust its tabled values, depending upon the amount of masking that the experimenter is willing to tolerate. This paper briefly reviews the data and theory behind the standard, clarifies the proper interpretation of the tables in the standard and the options that it provides, compares its specifications to the values proposed by the National Hearing Conservation Association (NHCA) and the American Speech-Language Hearing Association (ASHA) (NHCA, 1994), and summarizes actual room noise measurements reported in the literature.

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10. Prevalence and Risk Factors of Hearing Loss in Farming and Construction

Majorie McCullagh, Ph.D., RN, and Madeleine Kerr, Ph.D., University of Minnesota School of Nursing, Minneapolis, Minnesota

To describe prevalence of hearing loss and related risk factors among workers in farming and construction. Methods: Hearing thresholds and demographic data were obtained from NHANES III (1988-94). Results: Hearing thresholds (500-8000 Hz) and risk factors for hearing loss are compared for these groups of workers. Conclusions: Implications for prevention programs is discussed.

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11. Revisiting the Quartic Model for Early Identification of Noise-Induced Hearing Loss

William J. Murphy, Ph.D., and John R. Franks, Ph.D., NIOSH, Cincinnati, Ohio

In a 1976 article by Cooper and Owen (Audiologic profile of noise-induced hearing loss, Arch. Otolaryngol. 102:148-150), they advanced a quartic model to perform a least-squares fit to an audiogram for the purpose of identifying a noise-induced notch indicative of early onset of noise-induced hearing loss. This model has been revisited for the purpose of better quantification of a set of rules that will best identify the presence or absence of a noise-notch. A subset of 1660 subjects' right and left audiograms collected for the National Health and Nutrition Examination Survey (NHANES IV) were fit with a quartic model. As well, several hearing scientists and audiologists within NIOSH examined and classified the audiograms as having a notch or not. Preliminary results suggest that the choice of notch criteria dramatically affects the identification accuracy when correlated with clinical judgments. This paper will present how these rules were developed and how the quartic model may be interpreted and applied in a hearing conservation program.

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