

Session 2pEDa

Education in Acoustics: Education in Acoustics for Children

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Chair's Introduction—1:00

Invited Papers

1:05

2pEDa1. Sound education in urban environment. Yoshio Tsuchida (Kanazawa Inst. of Technol., 7-1 Ohgigaoka, Nonoichi, Ishikawa, 921-8501, Japan)

There are various viewpoints for education and there are various levels for a sound. We have some cases to teach a "sound." A certain person teaches a sound as music, another person teaches it as physics. But education is not teaching. It is more important to feel and enjoy. Then, one's sensitivity for a sound will be nourished. Experimental listening is called Sound Education based on soundscape. The case of a workshop on Sound Education is addressed in this paper. Sound Education finally aims at improvement of our environment. Many activities of Sound Education were devised by R. Murray Schafer [A Sound Education, 100 Exercises in Listening and Soundmaking, Arcana Editions]. Some activities were devised by Joseph Bharat Cornell as Nature Game [Sharing Nature With Children (Sharing Nature Series), Dawn Publications.] Sound Education has several aims. It differs according to the group that sponsors it. Here are the workshops executed by me. One aim for environmental preservation, and another one aim for community design.

1:25

2pEDa2. Music as a vehicle to do science in the elementary classroom. Uwe J. Hansen (Dept. of Phys., Indiana State Univ., Terre Haute, IN 47809)

During the past several years, a number of workshops were conducted for public school teachers at the elementary levels. Training and materials were provided to help teachers use music as a vehicle to introduce science concepts. Tools used in these workshops include a long spring to introduce standing waves and the concept of harmonics, a monochord to relate frequency ratios to musical intervals, and simple computer software to introduce wave addition and spectral analysis. All of these will be demonstrated and ways of introducing them in the elementary classroom will be discussed. [These workshops were supported with ASA and Eisenhower funds.]

1:45

2pEDa3. Exciting demonstration in acoustics by high-school teachers' group: "Stray Cats." Kanako Ueno (Inst. of Industrial Sci., Univ. of Tokyo and Tech. Committee on Education in Acoust. of ASJ, Komaba 4-6-1, Meguroku, Tokyo, 153-8505, Japan), Takayuki Arai, Fumiaki Satoh, Akira Nishimura, and Koichi Yoshihisa (Tech. Committee on Education in Acoust. of ASJ, Meguroku, Tokyo, 153-8505, Japan)

In Japan, to get students interested in a subject, high-school teachers often form a group to share their ideas and inventions on education. "Stray Cats" is one of the most active groups in physics. The group has been proposing many exciting demonstrations, which were contrived to support students' learning process with intuitive understanding of physics. Here, instead of using commercial equipment, they developed simple teaching tools that show physical phenomena in an exciting and attractive way, using quite common materials and daily goods. For example, the velocity of sound is measured by a pipe filled with a gas (air, CO₂, helium, etc), setting a loudspeaker and two microphones in the pipe. Interference of sounds is demonstrated by two pipes with attached cone-shaped horns at one end, which collect a source sound in different phase, and merging them into one at the other end, which produce louder or quieter sound as a result of interference. Hitting or rubbing different length of aluminum rods aids students' understanding of longitudinal waves and transverse wave with the relationship between rod's length and pitch, as well as a pleasant experience with beautiful tones. These educational tools will be presented with videos taken with the Stray Cats group.