Summary:

Practically, all over, the productive organizations are faced with noise menace. Where noise conservation programme through engineering modifications is not feasible, the use of personal protective devices (ear protectors) is probably the only immediate solution. Hence, the study of psychological test performance, physiological parameters and production in weavers wearing ear protectors, was undertaken.

The noise level was measured, and the frequency band analysis was carried out in a few industries. The weaving shed of a textile mill was found to be the most suitable site, because of sustained loud noise with a sizeable number of weavers being exposed to it.

The subjects were selected through a thorough medical and B.N.T. examinations.

Audiometry was carried out in a portable audiometric booth before, and after 4 hours and 8 hours of noise exposure.

Attenuation characteristics of the ear protectors were evaluated.

Attitudes of the weavers towards noise and the ear protectors were obtained.

Psychological tests in relation to weaving operations were selected.
The weavers were divided into five groups following a stratified random sampling procedure:

(a) group I (without ear protector) – the physiological parameters were observed and the psychological tests were administered in a relatively quiet environment;

(b) group II (without ear protector) – the same experiment as that of group I was conducted in the noisy loom shed;

(c) groups III, IV and V wore ear plugs, ear muff, and ear plugs in combination with ear muff respectively, for a month, and the experiment as that of group II was repeated. Production data was collected subsequently.

Work environmental conditions like thermal and illumination were measured concurrently throughout the study period.

The effects of noise exposure for a short period of 15 minutes on human subjects and animals (mice) were studied in the laboratory condition.

Studies on brain monoamine oxidase (MAO) of the mice were conducted.

The results showed that:

1. Loud continuous noise (102-104 dB) at 'All Pass' was present in the weaving shed of a textile mill. Sound pressure levels on all the octave frequencies were more or less same.
2. Audiometry in the portable booth could be possible at ambient noise level of up to 90 dBA.

Almost all the weavers suffered hearing loss on all the audio-frequencies, with a noticeable loss at 4000 Hz and 6000 Hz. Temporary threshold shifts between different periods of exposures were only slight.

3. The ear plugs provided little attenuation values on all the frequencies, while the ear muff, and the combination of the ear plugs with the ear muff, reflected higher attenuation characteristics at higher frequencies (4000 Hz and 6000 Hz).

4. Maximum percentage of the weavers did not like the weaving shed noise. They reflected favourable attitude towards the ear protectors.

5. The psychological tests, viz. motor coordination, manual dexterity (place and turn), and finger dexterity (assemble and disassemble) showed correlations with the different weaving operations.

6. The groups using the ear protectors reflected greater physiological adjustment, better psychological test performance and higher production, relative to the control group.

The weavers in the height range 150 cms to 159 cms showed higher production compared to that of weavers
with height 160 cms and above.

7. Thermal conditions and illumination were more or less same throughout the study period.

8. In the laboratory studies, the sedentary workers showed better performance in specific psychological tests in the short noisy environment, compared to that in the quiet condition.

The mice exposed to noise for a short duration learned the maze alleys relatively quickly, compared to the unexposed group.

An attempt has been made to explain the maze learning from the viewpoint of brain MAO activity of the mice.

Recommendations include:

1. The use of ear protectors in the loom shed,

2. and to improve upon:
   - the design of the audiometric booth,
   - the design of the ear protectors,
   - the existing ventilation system in the loomshed,
   - the general and local illumination.