(MJC + MIC) Physics
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Acoustics of Buildings:

This gradual dying out of Sound is known as reverberation.

Sabine made an extensive study of the Problem of reverberation. He found that there is an optimum Period of reverberation depending upon the size of of the hall at which best results are obtained. The Period is greater for music than the Speech.

Sabine formula:— Sabine observed that period of reverberation depends upon the size of the hall, and the absorbing power of the objects in it and its wall. He Showed that

$$T = \frac{0.16V}{A}$$

where T is the Period of reverberation in Seconds. V is the volume of the hall in $meter^3$ and A is the total absorption of Sound in the hall and is given by

$$A = a_1S_1 + a_2S_2 + a_3S_3 + \cdots$$

where $a_1, a_2 \cdots$ are the absorption co-efficients of the Surfaces of areas $S_1, S_2 \cdots$ respectively of different materials Present in the hall. If V and A are in ft^3 and ft^2 then $T = \frac{0.05V}{A}$

Sabin defined the absorption co-efficient of a Surface as the ratio of Sound energy absorbed by the Surface to that absorbed by an open window. Thus in big halls, the reverberation Period can be reduced to its optimum value by increasing absorption of Sound. This is done by taking Some of the following Steps:— (a) The windows and ventillators are opened.
(b) The floor is covered with carpets or tapestries.
(c) The walls and ceelling are lined with absorbent materials.

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