4-ACOUSTICS

Early photographs
GOOD MUSICAL TONE HAS TWO CONSTITUENTS—CLEAR DEFINITION AND WHAT Hope Bagenal calls ‘singing tone’, a lingering background note which greatly enhances the total effect (by no means to be confused with an echo, which is always disastrous). The physical conditions needed to produce these qualities differ widely from those appropriate for a theatre or cinema. There has never been any suggestion that the main auditorium should be designed as anything but a hall in which its prime purpose—good musical tone—should be aimed at and, if possible, achieved. Good definition depends on direct sound paths from every instrument of the orchestra to every seat in the audience; if all the instruments are visible from every seat, as is here contrived, good definition results. The floor is raked in two directions—from the conductor’s rostrum forward to form the orchestra platform,
These diagrams show what happens when violinist, tympanist and singer emit a note at the same instant. Approximately one-tenth of a second later the sound waves have reached the strong yellow, red and blue lines respectively (many minor reflections have been omitted). A rich tone is achieved by hearing a large number of separate reflections so that the ear accepts them as a single sound.
Unfortunately, some internal surfaces which were part of Bagenal’s design were changed during construction (due to cost?) and the anticipated acoustic performance was never achieved. The conductor Simon Rattle is said to commented that the poor acoustics made performers “lose the will to live.” Even after the major renovations of 2007 there is disagreement over today’s acoustic responses.
Panelled walls of polished wood assist the high frequencies, absorbing the bass and middle. The panelling was designed so that it could be adjusted by varying the amount of air space behind, and so that, if necessary, in the final 'tuning' of the hall, the surface could be perforated. The ceiling is constructed in sections, so that it will not develop its own vibrations, and its wave-like form gives random sound reflections. It also contains a large number of small holes; during the 'tuning' process some of these have been drilled out, and, together with the side panelling adjustments, this has ensured that no frequencies are unduly stressed and that no echo is heard. The timber used in the orchestra flooring and canopy is birch; the main walling areas are elm.
A concert in progress
Horace W Cullum & Co Ltd, suppliers of acoustic materials

Measured in terms of value, or area of material, or bulk, 75% of all acoustic materials installed in buildings since the war, for the purpose of acoustic correction and absorption of noise, has been executed by Horace W. Cullum & Co. Ltd.

In the Royal Festival Hall we were entrusted with the installation of sound absorption treatment to prevent transmission of external noise into the auditorium through the ventilating ducts.

From analysis to installation we provide a complete acoustic service.

HORACE W. CULLUM & CO. LTD.
ACOUSTIC AND SOUNDPROOFING CONSULTANTS AND CONTRACTORS

FLOWERS MEWS, LONDON, N. 19
TELEPHONE ARCHWAY 2662-3-4
Specify

NEWALLS PRODUCTS

FOR HEAT, COLD AND SOUND INSULATION FROM MINUS 300° F. TO 2000° F.

NEWALLS Technical Staff is available for your Insulation Problems.

Why not Consult them?
Catalogue Supplied on Request.

NEWALLS INSULATION CO. LTD.
WASHINGTON, CO. DURHAM, ENGLAND

(A member of the Turner & Newall Organisation)

OFFICES AND DEPOTS AT LONDON, GLASGOW, BELFAST, MANCHESTER, NEWCASTLE, BIRMINGHAM, BRISTOL and CARDIFF.