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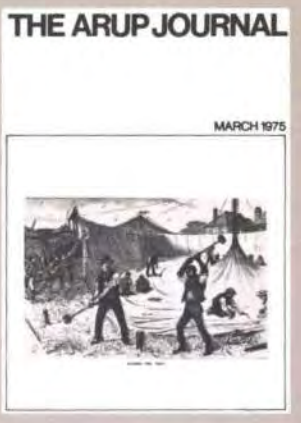

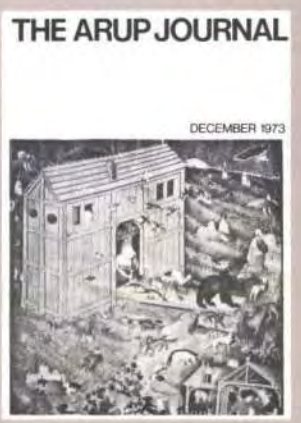

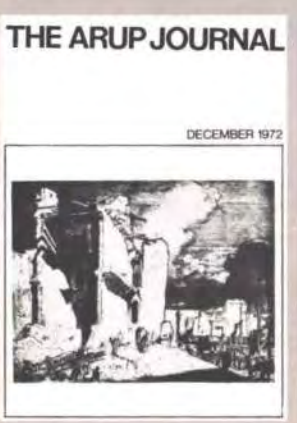

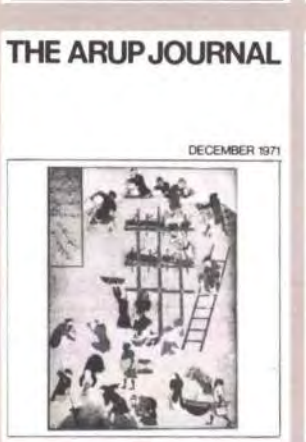

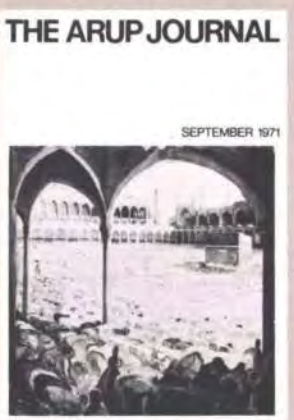

Scottish Opera, Theatre Royal, Hope Street, Glasgow

Richard Frewer

The first 'Theatre Royal' was designed by the Glasgow architect, Mr George Bell. It was called Bayliss's Coliseum Theatre and Opera House and was opened on Thursday, 28 November 1867. The opening night was the production of a sensational drama called *The sea of ice or the gold seeker of Mexico*, prices of admission being from sixpence to two shillings and sixpence. The first opera performance was given on Monday, 9 December 1867, with a production of Verdi's *Il Trovatore* by Madame Florence Lancia's Grand English Opera Company.

The name was changed to the Theatre Royal in May 1869 when Messrs Glover and Francis acquired the lease. Under their new management, the theatre opened with a performance of Offenbach's *Grand Duchess* on 8 June 1869.

On 2 February 1879, the theatre was totally destroyed by fire and was rebuilt to the design of the London architect, Charles John Phipps, who was responsible for the design of more than 30 well-known London theatres and provincial opera houses, including Her Majesty's in the Haymarket, London, the Theatre Royal, Brighton, and the Lyceum, Edinburgh. In 1891, he became involved in a serious professional dispute with T. F. Knightley over the authorship of the design for the famous Queen's Hall, London, built in 1891 and destroyed in the Second World War. For 15 years, he was consultant architect to the Drury Lane Theatre and was consulted by committees of the House of Commons and colonial governments on questions of theatre construction and acoustics.

The new theatre was opened on 26 October 1880 under the management of Miss Marie Litton, otherwise Mrs W. Robertson, with a performance of *As You Like It*. On 7 February 1881, Miss Litton started a series of promenade concerts of which Signor Foli and Signor Runcio were amongst the singers who appeared on the opening night.

There were different managers from 1881 and it was closed for some long periods until Messrs Howard & Wyndham Ltd. took possession in July 1888. The theatre was reopened on 10 September 1888 with Mr Henry Irving and the Lyceum Company in *Faust*.

On 1 March 1895, the Theatre Royal was again destroyed by fire. The architect for the reconstruction was again Charles John Phipps and the theatre was reopened on 9 September 1895.

In 1924, the directors of Messrs Howard & Wyndham Ltd. carried out improvements to the Theatre Royal and in the *Evening Citizen* of 5 April 1924, a short article recalls the history of the 'Royal'.

The theatre was sold to Scottish Television in October 1956.

Our first contact with Scottish Opera was a letter from Peter Hemmings, the General Administrator, in August 1972. This asked Arups to give their view about the possibility of renovating the theatre which, at that stage, was a makeshift studio and administration building for Scottish Television.

After inspecting the building and deciding that the possibilities were worth pursuing, the Opera Company had to be convinced that the cost, which was much greater than they had expected, could be met and that the money was worth spending.

After cost studies and early design work on the stage, pit and seating, we were appointed in January 1974 to prepare designs with a view to opening the opera house in October 1975. Design work started in April 1974 and the scheme design report was presented in August. The contract was to start on 1 October 1974 with completion on 30 September 1975.

Scottish Opera had asked us to provide them with a home; a fully equipped opera house which was also suitable for ballet and theatre. We were to house 100 artists and form a pit big enough to hold a Wagner orchestra. It was hoped that at a later date the whole company, including its administration, could be housed in the opera house. The auditorium was to seat between 1500 and 1600 people.

Fig. 1
Henry Irving in characteristic pose – as Wolsey in *Henry VIII*
(Photo: Courtesy of Mary Evans Picture Library)

Design references

For design work on the Theatre Royal, Glasgow, the major references were not books and plans, but the existing theatres at Brighton, Edinburgh and, of course, Her Majesty's in the Haymarket. From the study of these buildings, the atmosphere of the Theatre Royal and the Phipps' design approach were reconstructed. At no stage was it considered that a faithful reconstruction of his design was being made. The layout of the Theatre Royal, Glasgow, separated strongly the social classes and the different entrances were clearly segregated. What was astonishing was the discovery that although the top tier in the theatre is very sheer, it is said that originally there was yet another one on top. The theatre is now only ably to accommodate just over 1500 people – in the 1890s, 4000 were crowded in. The theatre was not over-endowed with lavatories and the ventilation was very primitive. Conditions must have been appalling by present-day standards.

Tradition of Victorian theatre

By the second half of the 19th century Glasgow had become one of the major trading centres of Europe, and as such it developed a great theatrical tradition. The music hall, theatre and opera were enormously popular.

The style of the period was paper-thin, theatrical for its own sake, a style in which classical forms were misused to satisfy self-indulgent flights of fancy. The late Victorian eclectic style was a contemporary 'pop' style; an age of glamour, glitter and frippery, which of course had the most vulgar and debased aspects as well as some of the finest.

The greatest single influence on Victorian theatre decoration was the Paris Opera, designed by the 25-year-old Charles Garnier (Fig. 3) and the introduction by him of the red interior. In those days, this was considered the ultimate in plushyness. However, any style was used and on theatre buildings the decoration tended to be added as a paper-thin aesthetic on a 'sound' structure: 'Shall we have instant Tudorbethan, Chinoise or French Renaissance'; you name it, they had it. It was 'a creative pastiche'. Their use of the classic idiom would have made Vitruvius turn in his grave, but the buildings had spirit.

As far as the mechanics of performance are concerned, to produce the spectacular, the Victorians developed highly sophisticated

Fig. 2
Trongate, Glasgow, in the 1880's
(Illustration: Courtesy of Mary Evans Picture Library)

Fig. 3
The foyer of the Paris Opera House
(Photo: Keystone Press Agency Ltd.)

Fig. 5
West façade of Glasgow School of Art
(Photo: Annan Photographer, Glasgow)

Fig. 4
The AEG Turbine Factory, Berlin
(Photo: Firmenarchiv)

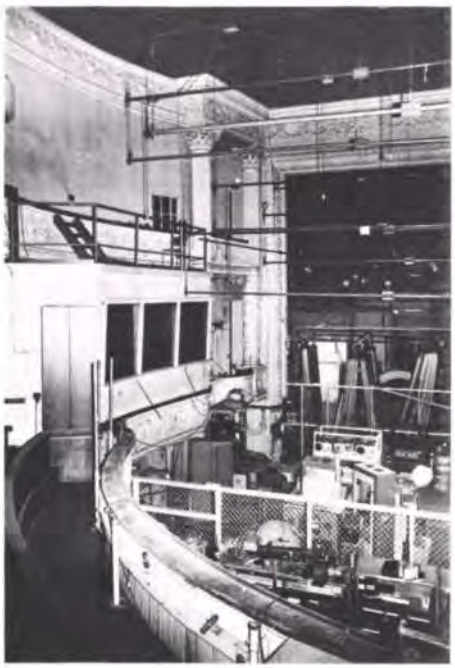

Fig. 6
The auditorium interior
before conversion

mechanical devices for the stage. Revolves, traps, flying mechanisms all existed and, although machinery has become more sophisticated, most devices now used were existing in the 1880s. The only major developments since then have been electrical.

To keep the right historical perspective on the Theatre Royal, this type of theatre, never highly ornate, has as great an affinity to the Odeon style as to 'French late baroque' which was its stylish label. 1895 is only some 12 years before the establishment of the Werkbund in 1907 and only 14 years before Peter Behrens designed the AEG Turbine Factory in 1909 (Fig. 4) with both Mies van de Rohe and Gropius in his office. Charles Rennie Mackintosh (Glasgow Art School 1898–99) (Fig. 5) was practising in Glasgow and Stravinsky composed *The Firebird* for Diaghilev 15 years later in 1910.

The challenge

Arup Associates were asked to provide a home for the Scottish Opera Company from a shell which had been used for the past 15 years as a television studio. The whole theatre had been fitted with a conglomeration of spaces, totally unrelated to its original use. The only area which had survived with any of its former splendour was the auditorium where the fibrous plaster, by some miracle, was left more or less intact and had sufficient of its original style to be the basis of a restoration or rather a design in style (Fig. 6). When design work started we had only 18 months to complete, with the finishing date fixed as 15 October 1975. To have any chance of completing on time a year on site was essential, and we were working with a tight budget in the worst inflationary conditions in our history.

The design approach

Two possible approaches were examined:

(1) Restore the auditorium and redesign the adjacent areas to be in style so that the whole place had a unity and clarity related to the original. This is similar in approach to the musician who completes or realizes another composer's work.

(2) Restore the auditorium and design all other areas as a modern building so that the centre was held like a rich jewel in a highly disciplined contrasting framework.

It was decided that the first approach was the only one in the short time that was allowed. It was impossible to know what the construction would reveal when everything was opened up (as the building was in use by Scottish Television until after a start was made on site). To produce a modern design with any clarity needs a framework with a clear structure. It was known that as the theatre had been changed so much over the years, it would be impossible to achieve this without a greater time scale and much more money than was available.

Using the existing framework, it was possible to give back to the theatre a sense of style by the way in which the existing structure was remodelled, and the way in which the finishes were matched. Having made this decision and tested it with pilot schemes for the services and space planning, it had to be trusted that the rest would follow. We were in the position of having to trust our intuition and stand by it.

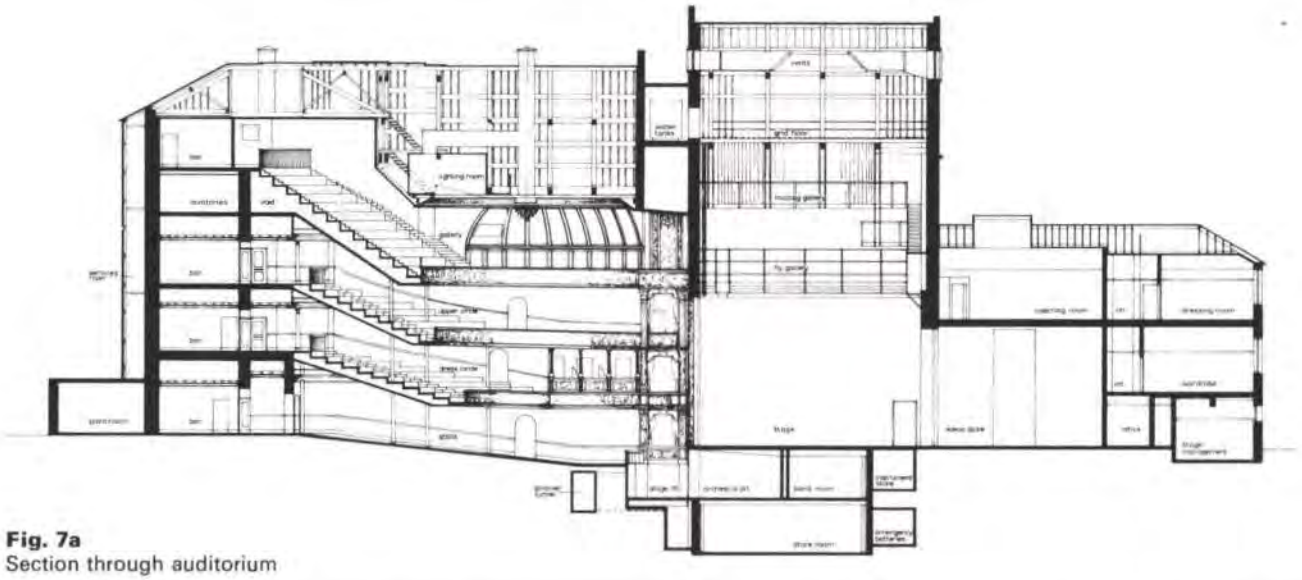

Fig. 7a
Section through auditorium

Fig. 7b
Sub-basement and basement plans

Tactical design decisions

(a) The auditorium design was studied and expanded in style.

(b) Front of house areas (i.e. bars, foyers, staircases) were to be realized as an extension of the auditorium aesthetic.

(c) Dressing room and working areas were to be designed in a simple way which would make it consistent with the rest.

Approach fixed, the rest must follow

Having produced a vision of what was to be achieved, the greatest problem was to hold that picture intact while making quite radical changes at a late date in the building programme. The problem was once described as 'trying to hold a half-set jelly in one piece through a year of very bad weather'. However, the original design by Phipps proved to be rigorous enough to set out a very logical set of design decisions which were followed right through to the colour schemes.

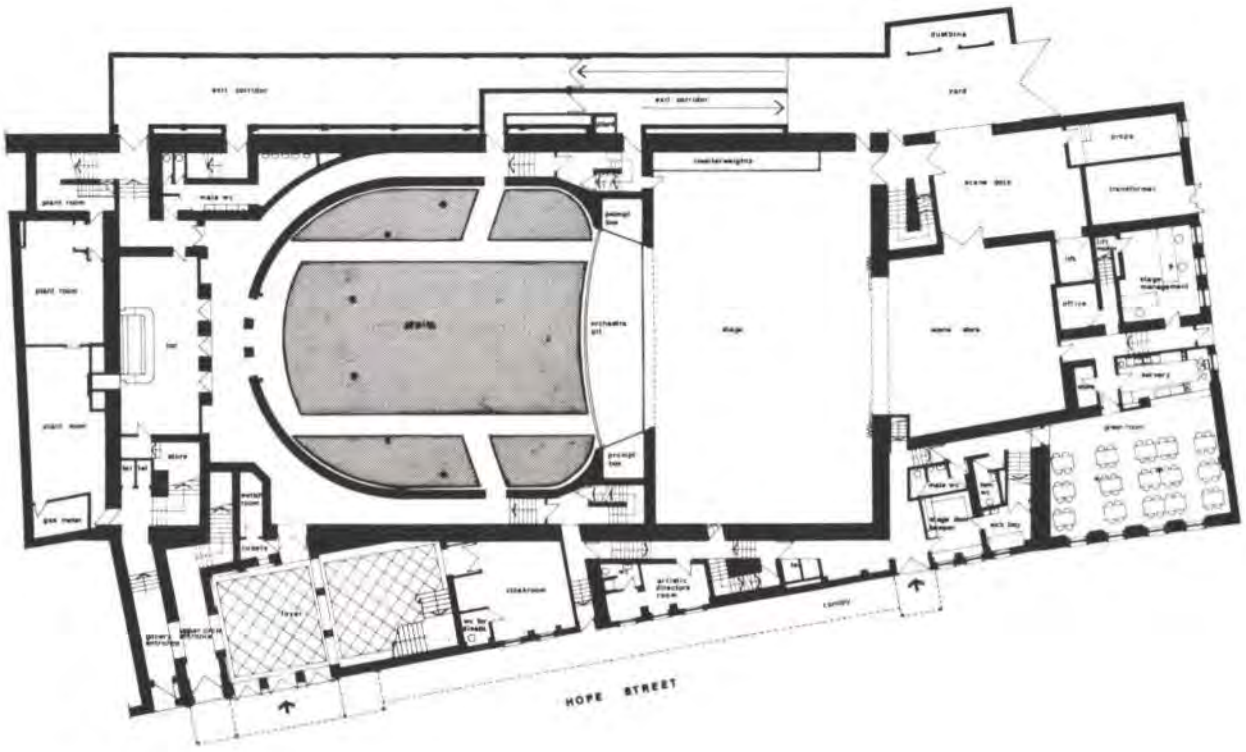

Fig. 7c
Ground floor plan

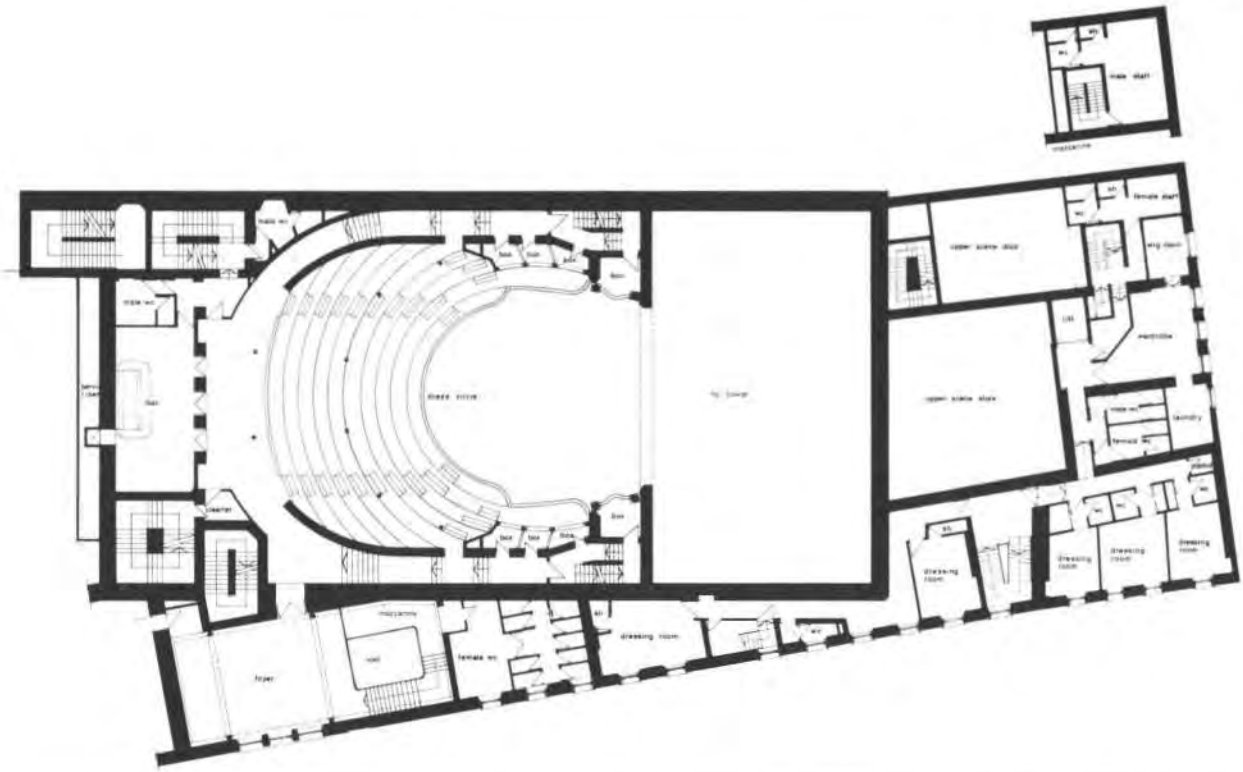

Fig. 7d
1st tier plan

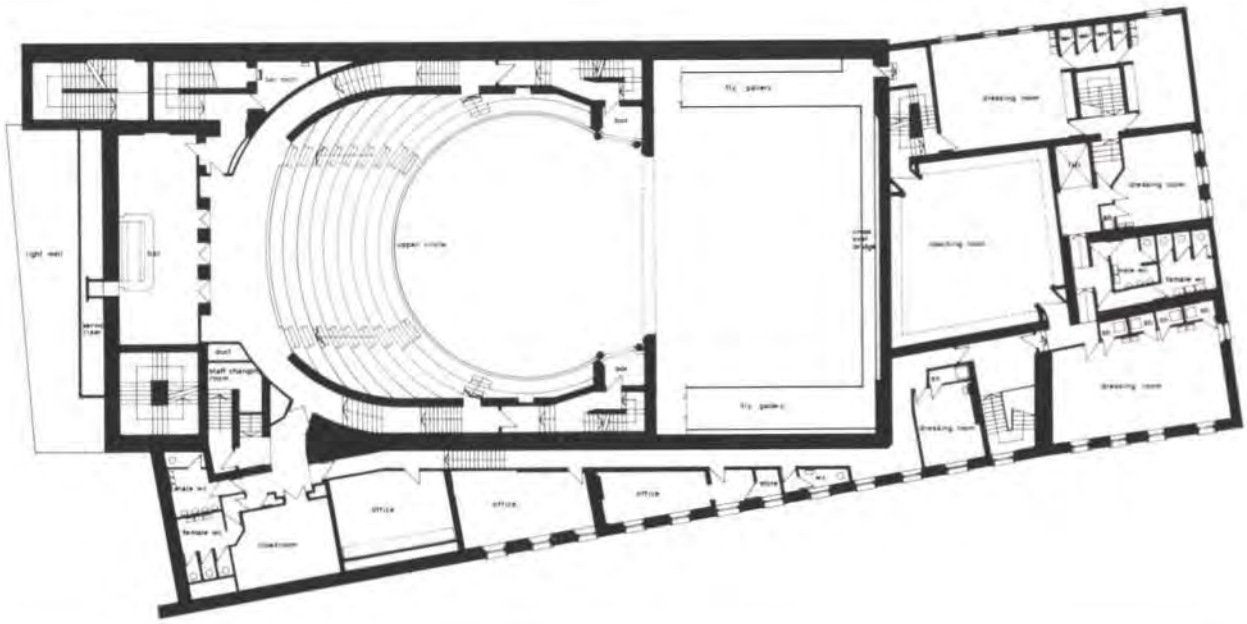

Fig. 7e
2nd tier plan

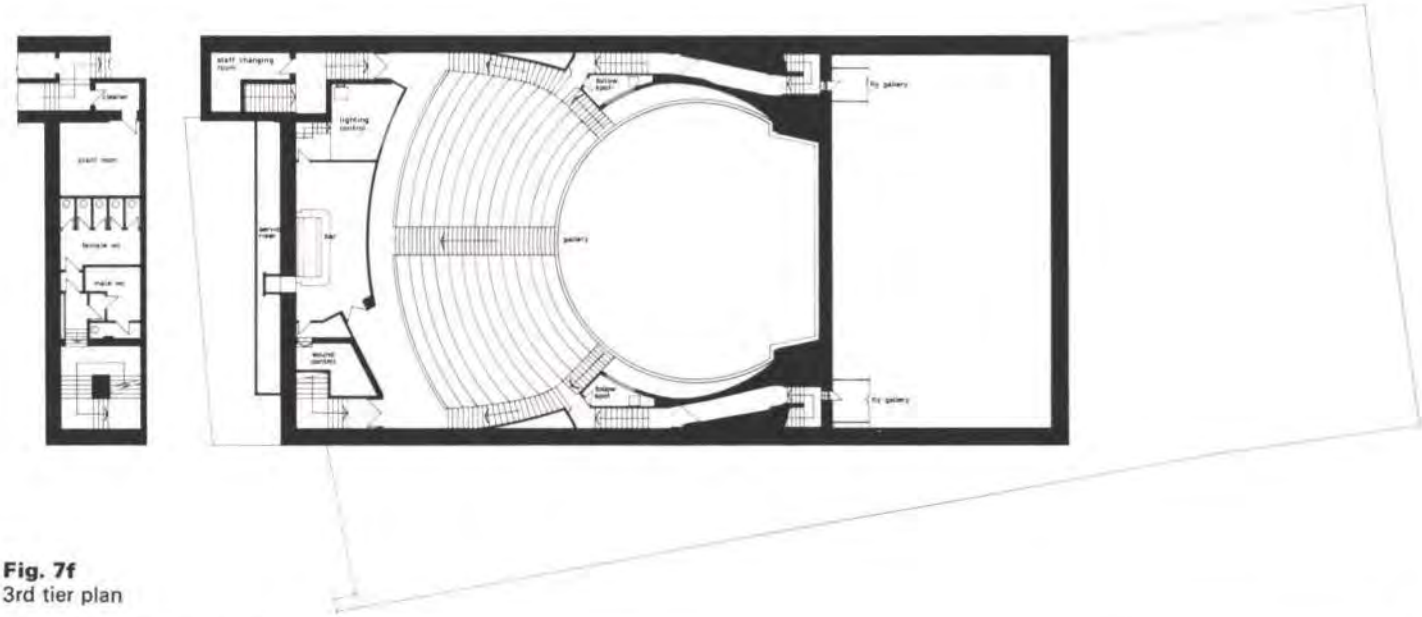

Fig. 7f
3rd tier plan

Fig. 8
Detail of joinery in the foyer

Use of the traditional crafts

Much of the work, which was involved, relied on traditional crafts. In 1895 much of the fibrous plaster work, joinery, metalwork and wallpaper could be factory-produced and the architects would have been able to choose their patterns directly from the book. Of course, most of their tradition has now stopped and so the designers were in the position of going right back to earlier craft methods to produce their effect. Fibrous plaster moulds had to be especially made, by one of the few master plasterers left in Scotland. Joinery, which was all in mahogany for the front of house, was redesigned using the old pattern books of mouldings and the colour carefully matched to achieve the Victorian French-polished richness. A consistent use of brass ironmongery required specials to be made. Cast-iron rails were modified and redesigned to be recast in aluminium, and the wallpapers were modified from existing ranges to get nearer to the reality. These details are the ones which make the place and give the tactile quality so much a part of a Victorian interior (Figs. 8 and 9).

Building anatomy related to the services

The aspect which has most destroyed the atmosphere of the Victorian theatre is the insensitive intrusion of modern techniques into stylish public areas. In many Victorian theatres, modern peppermint light fittings or even neon tubes now fight with cluster lights on the tier fronts. Outsized biscuit tins house gigantic spot lights over the decorated balcony fronts and miles of wiring, ducting and piping festoon the ceilings. We were determined that these services would be installed within the disciplines of the interior. (Figs. 8 and 9).

Four specific solutions are pointed out to illustrate the approach:

(1) All lighting for the stage, which is usually hung from tier fronts, was placed in the dome or in the slips. This dome was modified to be a plaster-covered trap door which, during the intervals, is closed, giving the illusion of an undisturbed Victorian painted ceiling. (See Fig. 10.)

(2) The follow spots, which are large, cumbersome and unsightly, are built into the springing of the dome. This has the effect of improving, rather than detracting from, the interior. (See Fig. 11.)

(3) All air vents, which relate to ducts behind plastered and moulded false ceilings, are hidden behind the old device of a large cornice used in its correct classical context. This device also improves rather than detracts from the interior.

(4) All soffit lights in the auditorium are recessed in a dark ceiling giving not a sense of disturbance but adding to the intimacy of the space. (See Fig. 12.)

We have attempted to turn items which are usually unsightly intrusions into architectural bonuses.

Fig. 9
The bar. All the woodwork visible is completely new, but copied from Victorian patterns

Fig. 10
Interior of the dome, showing trap doors concealing lighting for the stage

Fig. 11
Auditorium interior, showing follow spots

Fig. 12
The 1st tier, showing soffit lights and the fibrous plaster profiles which mark the air distribution outlets

Sequence of spaces and their changing moods

Theatre is an art of illusion and when a theatre is visited a sense of excitement is expected. The Victorians also expected the illusion of grandeur from the building.

The sequence of space which is experienced as a theatre is entered should prepare you and acclimatize you to the idea of watching the stage.

The pavement outside the theatre entrance should welcome you, give a sense of arrival, and be the first semi-formal space for meeting friends. The north end of Hope Street, where the theatre stands, has little charm. A traditional canopy, which has yet to be erected, will add enormously to the presence of the theatre and prepare for an entrance to the foyer.

Few people who visit the theatre realize that the foyer is totally new. It is remoulded with its staircases and mezzanines within the envelope of the building and is much smaller than we had originally planned. The Opera Company tried to purchase the adjacent public house – failed to do so and we found ourselves without a foyer two weeks before starting work on site.

The total usable area for the foyer and staircase was only approximately 7 m × 15 m, very small and, when first considered, thought to be quite unacceptable. As it was worked upon, it was realized that the Victorians often gave themselves an identical problem. By the use of grand architectural devices in a small space, a strange mix can be achieved which is particularly Victorian. A formal, classical space was constructed with a large chandelier in the centre using mirrors at high level. These give the impression of space and continuity. The staircase with its mezzanine gives views at high level of the foyer below and the dress circle foyer above. The fact that there is a crush in the space and people are seen moving up and down the staircase acts to heighten the excitement and feeling of occasion as the theatre is entered. There is a feeling of grandeur. In reality, the space is only about one-third of its apparent size. The colour is neutral and the lighting is crisp and bright (given by three chandeliers which we found in Glasgow and whose owners were persuaded to give them to Scottish Opera).

The hardness of materials, the neutrality of the colour and the formal mood were chosen to give the audience a clean and neutral reference point, after the streets of Glasgow, before entering the richness of the interior.

On leaving the foyer, a contrast is experienced. The staircases which lead from foyer to the top two tiers are carpeted, papered and lit in the same way as the auditorium. Consequently, they are quiet, warm and inviting. When entering the horseshoe corridors of the auditorium from the stalls or dress circle foyer, the experience, it is hoped, is one of expectancy, mystery and to some extent nostalgia. The colour is dark leather brown, offset with gold on the wallpaper which varies in effect according to the way it is lit. The tactile quality is soft and the people, pictures and mirrors, become the only focus in the area.

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Fig. 13
The foyer – before conversion
(Photo: Eric Thorburn, Photographer)

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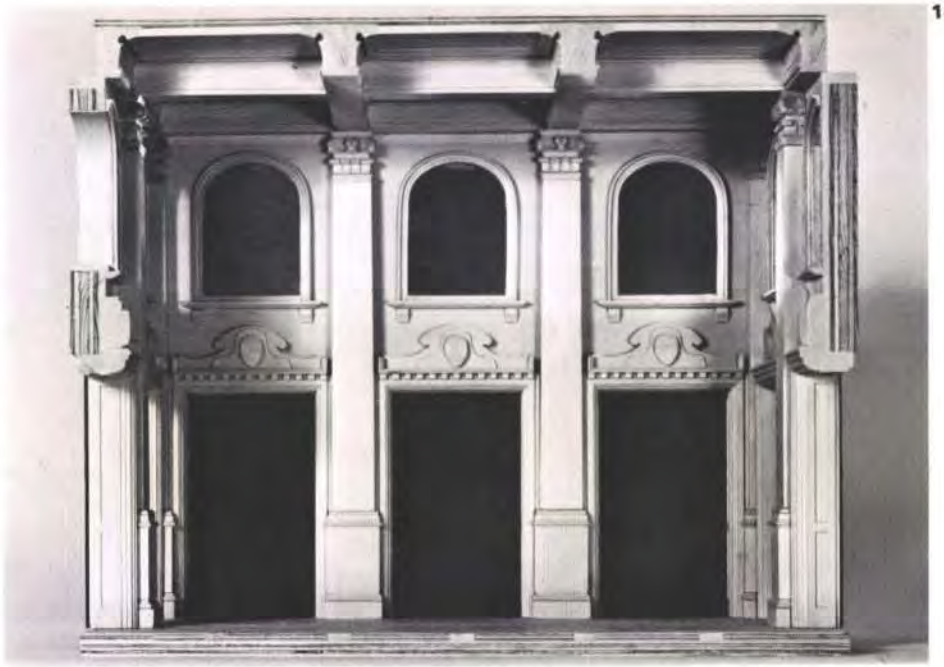

Fig. 14
Model of the new foyer

Fig. 15
The new foyer

15

Fig. 16
The new foyer

Fig. 17
Balustrade detail from the foyer staircase

Fig. 18
Artists' dressing room

Fig. 19
View of the auditorium interior

As the velvet seating is passed, one becomes aware of the only bright focus in the auditorium – the front of the tiers. When the centre is reached, the inner crust is entered; this is like a roofed arena. The tier fronts, boxes and proscenium arch, which form the crust, are decorated plaster, painted in a range of creams, touched with gold and lit with brackets set onto the fronts; a deep orange velvet finishes the tops. The dome is set as a contrast in a blue with the decoration picked up like strap work floating in a sky.

As the lights are dimmed and the audience quietens, the eye is focused on the thick dark brown velvet curtain, lightened with gold decoration and lit from the auditorium with a red colour which is picked up in the depth of the pile. The curtain opens, and all being well, the illusion is complete.

Back-stage areas

Although the floor area of the building was only slightly changed by small infill additions, the circulation backstage had to be completely redefined and the rooms rebuilt. Levels had to be tied together in a logical way and the whole area had to be provided with washing facilities for 100 artists. The idea of hiding all the services was out of the question, so simple rules were made which would allow services to be put in. A cornice was applied about 2ft below the ceiling. The exposed services were run above the cornice and the ceiling and services were painted a dark colour. Below the cornice everything possible was done to eliminate evidence of these services.

Lavatories were given another set of simple rules and furniture was made to fit the visual grammar that resulted. By this means, the sub-contractors who started in this area of the building could proceed with little information – not an ideal situation but one forced on us by the speed with which the work was carried out.

Future possibilities

Scottish Opera have already formulated plans to add to the building. A canopy is to be added to the outside along Hope Street. A dome is to be added to the existing entrance tower to give a larger gallery bar, and a large bar which was once part of the theatre is to be re-used. But there are problems at present with each of these. Even longer-term projects are being discussed. All of them are possible but at present we must wait.

The first season

Scottish Opera's first winter season has now finished and the percentage capacity audience speaks already for the success of the project. 85 to 90 per cent average capacity of the 1500-seat audience has been filled throughout the season. This must add even more to the very high reputation of Scottish Opera.

Fig. 20
View of the auditorium interior

Fig. 21
Stage pulley systems
seen from the fly gallery

Ventilation and heating

Modern standards of heating and ventilating were required without unsightly intrusion on the Victorian interior of the theatre. An inspection of the Theatre Royal in Glasgow and in Brighton showed that Phipps incorporated natural ventilation in his auditorium design and the theatres were heated by coal fires. His method of ventilation for the auditorium was to have openable windows at stalls level to let fresh air in, and openable windows at the back of all bars with 'chimneys' at the top of the gallery and dome to draw the hot air out (the ventilation took with it any heat gains from lighting); this idea was taken in the new design and adapted. Outside air is brought in free of cold draughts and traffic noise, through low pressure nozzles at all levels of the auditorium as close as possible to the occupants. This provides steady air movement without noise generation. Mechanical refrigeration cooling was not considered necessary as opera has a winter season when free, cool, outside air is available.

It was essential in the planning to ensure that

the location of plant prevented any noise problems in the auditorium as this had to be very quiet (noise rating of 20). The boiler plant and auditorium supply fan were located on rock at stalls level behind the stalls bar. The exhaust from the auditorium was achieved naturally by stack effect without the use of fans. The timber roof trusses had an unknown natural frequency with the possibility of sympathetic vibration from any fans. This could have caused unpredictable noise. The design of these exhausts was complicated as they had to satisfy all the requirements of acoustic separation, smoke release and volume control. Interlocks with the smoke detection system ensured that if smoke were produced anywhere in the auditorium, stage or orchestra pit, it would not be circulated by the ventilation plant to other areas.

Gas was selected as the primary fuel as it is quiet in operation and requires minimum space. The boilers chosen have atmospheric burners and as the boiler plant room was long and thin, an 11-module plant was selected. This plant had the added advantage of low thermal capacity to respond rapidly to the peaky load profile of the main auditorium supply plant and the hot water supply. The hot water supply had special gauges for monitoring of flow rate and consumption of hot water, as the HWS load may peak at 120 showers in 20 minutes. As this peaks occurs infrequently, the boilers were not oversized. However, when the flow rate approaches this peak demand, unnecessary plant is switched off to dedicate the whole boiler plant to hot water supply.

To handle the special problems of heating a stage, radiant panels were provided under the fly galleries and fan convectors were fixed on the rear wall of the fly tower to warm up the large volume of cold air so that cold down draughts are minimized when the curtain first rises.

Electrical services

The electrical installation in an opera house is extremely sophisticated and covers every aspect of modern practice. There was an added problem at the Theatre Royal; the system had to be fitted unobtrusively into a Victorian interior.

The building has all the electrical systems associated with a public building. Lighting, emergency lighting, power, fire alarms, lifts, telephones, etc., are all needed, as well as those services associated with a fully equipped opera house stage. There is a 1200 ampère supply to the building, of which some 800 ampères are taken by the stage lighting.

The equipment includes:

(1) A total of approximately 700 lighting outlets throughout the building linked to the stage from the dome and the flies.

(2) A bank of 240 controlled dimmer channels with the equipment sited under the stalls level.

(3) Power for stage equipment. This includes two stage lifts, a lighting bridge and a 4.5 tonne safety curtain.

(4) Theatre sound system (sound effects and amplification).

(5) Wiring for outside radio broadcasting.

(6) Stage manager's sound system.

The stage manager's sound system controls the whole 'operation'. Artists can be paged from any part of the rear of the house to the stage and they can be cued both visually and verbally, and public announcements can be made. In addition to this, special effects, scene changes, off-stage musicians are all monitored from the one mobile stage manager's desk in the corner of the stage.

To give an idea of the money needed to run the electrical installation, each show costs approximately £35.

The contract

It was clear from the beginning that to meet the very tight programme (even without the delays that occurred later) the early appointment of the contractor was essential. The most difficult part of the work to assess was the change needed to the structure and fabric of the building. Any contract which attempted to define these in detail would have been impracticable. The 'inspired' guess of a year on site needed to be proven and related to the work content. The contract needed to be flexible to reflect the inevitable changes in a project of this type, as there was no time for haggling in mid-contract. We wanted a contractor who was experienced in this kind of work, had initiative, was forward-looking and with a streak of madness to match our own.

A management contract seemed the obvious way to deal with the early appointment and flexibility. But we had reservations about whether this kind of work could be approached from the 'distance' of a management contractor. Sir Robert McAlpine Project Management Ltd were appointed four months before site operations began.

In the event, everything except the most tricky structural operation was sub-contracted under the control of the management contract. The execution of the work in the last three months disproved all the principles of programming and the cash flow predictions, and the term 'out of sequence working' became a familiar phrase at site meetings in the scramble at the end.

The standard of programme information is critical to the success of the project. This requires a high level of expertise from both the contractor and the architect. Secondly, the standard of cost control and its monitoring related to the programme can not be overstressed. Any weakness in these aspects must be vigorously remedied.

The fact that the job was finished on time was largely due to the tremendous commitment of all the parties involved and the excitement generated on site. The conditions under which people were prepared to work speaks for their enthusiasm, and the fact that some traders were working around the clock at the end of the job shows the pride that everyone had for the new Scottish Opera House.

Credits

Architects, Engineers, Quantity Surveyors and Acoustical Consultants:
Arup Associates

Client:
Scottish Opera
Theatre Royal Ltd.

Theatre consultants:
John Wyckham Associates

Management contractor:
Sir Robert McAlpine Project Management Ltd.

Photos: Arup Associates,
except where otherwise stated