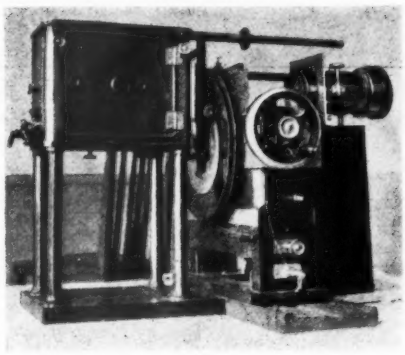
CINEMA AND CINEMATOGRAPH

TWO ENGLISH ACHIEVEMENTS

Above, the first cinema of architectural interest in London, the Shepherd's Bush Pavilion, designed by Frank T. Verity, and opened in 1924. It was awarded the R.I.B.A. London Architecture Medal.



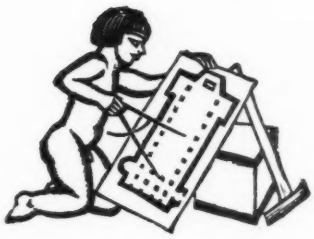
Right: the earliest moving picture machine, the zoophraxiscope. It was invented in 1881 by Edward Muybridge. (From Cassell's "Book of Knowledge.")

THE SPELL THAT STILL ENCHANTS

Those who forget that the film is a work of art enjoy it most. Its imitations, like the realities from which they are taken, are subjects for affection and resentment, laughter and tears. They are not subjects for connoisseurship. The moment the skill of the artist is perceived the spell of the art is broken.

It is one function of the cinema to preserve this peculiar spell. It must provide, in mental and physical comforts, for a portion of the mind that is impatient of being circumscribed and pent up in the world around us.

The photo shows the filming of a scene in "Paris Love Song" in the Paramount studios in Hollywood.



MOVIE

THIS special issue of the JOURNAL deals exclusively with the cinema and is presented under three main heads : planning ; construction ; and the interior. The first section contains analyses of the plans of a typical modern super cinema for a provincial town. and a variety of schemes for news reel theatres both at home and abroad ; the second deals with latest developments in the construction of cinemas, including a selection of the more recent work of prominent architects ; and the third is devoted to the interior—design, equipment and acoustics. The foreword is written by Mr. Sidney L. Bernstein, chairman of the Bernstein Theatres, Ltd., a company which has been responsible for the erection of a large number of cinemas in this country.

Oddly enough, the opinion is sometimes expressed today that the demand for cinemas is declining. This is difficult to believe when one remembers that several hundred cinemas have been erected in Great Britain during the past year. And there is no reason to suppose that this demand will not be maintained for several years at least. Every city and town has its super cinema, but much still remains to be done to meet the needs of the suburbs of London, and of the provincial towns. The biggest developments, however, are likely to take place in connection with the news reel theatre. This section of the film industry is still in its infancy, and its value as a popular means of education is by no means fully realized.

The cinema began seriously to court public favour about thirty years ago. First came the converted shop, with a few chairs to accommodate the audience ; then the theatre proper, with its entrance hall, auditorium and confectionery bar ; now, the super cinema, with all the amenities of the theatre and the additional advantages of a café, foyer, waiting lobby and, often, ballroom. First, the moving picture, with its wheezy piano ; then the silent film, with its stringed orchestra ; now, the talkie, with its organ and stage bands. First, the star earning some £10 per week ; now, the Garbos and the Arlisses receiving some £60,000 for one picture. First, the inventors, Muybridge, Eastman and Edison ; now, the producers, the de Milles, Kordas and Claires.

Edward Muybridge, a mechanical genius with a penchant for photography, was born at Kingston-on-Thames just over a hundred years ago. In 1881 he invented a zoophraxiscope, designed for the specific purpose of reproducing the actions of animals in motion. After that year a considerable number of men in England, France and the United States of America were simultaneously engaged in working out the problem of animated photography, and it is difficult to name the actual inventor of the cinematograph machine. But Eastman, in 1890, produced the first machine for making rollable films, which made modern cinematography practicable. Eastman was approached by Edison, and for years both men experimented on their connected problems. In that time Edison perfected the first film projector and Eastman produced a celluloid film that would pass light through itself, solving both his own problem of popular photography and Edison's problem of the moving picture. In 1896 the first public exhibition of the cinematograph, beyond the experimental stage, was given in London, by Lumière of Lyons.

The earliest films were introduced as an extra turn in the music halls, and the first cinema in London, built for the purpose, was somewhere in the East End, admission, it is said, being by jam-jar. In London the earliest cinema of architectural interest was the Shepherd's Bush Pavilion, designed by Mr. Frank T. Verity, and opened in 1924. In the same year it was awarded the medal of the R.I.B.A. given annually to a building of exceptional merit completed during the previous three years within a radius of eight miles from Charing Cross.

Few architects will quarrel with the theory of Mr. Bernstein that cinema-building can never be the work of one person. As he says in his foreword to this issue : " It must be the work of a group inspired by the idea of producing a theatre that is at once efficient in operation and appealing in appearance. This can be done without pandering to mass vulgarity. Experience has taught me that such a group must be comprised of the architect, the interior decorator, the electrical engineer, the ventilation engineer, and the owner, who must, because of his practical knowledge of theatre management, guide the experts in producing the theatre which his public will appreciate and which can be efficiently and economically run."

Mr. Bernstein, however, is on dangerous ground when he contends that " the owner should guide the experts in creating an atmosphere of ' theatre,' by which I mean the combination of luxury and restfulness which patrons subconsciously demand." The typical cinema owner does not know the real meaning of the words " theatre," luxury or restfulness. His idea of what the public wants is generally a combination of gin palace and fun fair. The public is conditioned to this style because the owners know of no other. It is time that some owners gave the architect his head.

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NOTES & TOPICS

FOREIGN IDEAS FORCED ON BRITAIN

ACCORDING to the reports of the protest meeting called last week by the Hampstead Heath and Old Hampstead Preservation Society, Mr. B. S. Townroe, the Mayor of Hampstead, has branded town planning as a foreign system which is being forced on Britain.

*

This is such an extraordinary statement that, if he is correctly reported, it is to be hoped that he will enlarge upon it. The Town and Country Planning Act, with all its safeguards, rights of appeal, time allowances and other means of delay, has always seemed to me a typical piece of English legislation.

*

If what Mr. Townroe is attacking is the growth of centralized as opposed to purely local authority, it is rather late in the day to do so, as that appears to be the trend of most modern legislation, and, in addition, do not town planners clamour (in so far as town planners do clamour) for a Central Planning Board?

FLATS

The Hampstead meeting was held to "call upon the Ministers of Health and Transport and the L.C.C. and other authorities to preserve the residential character of Hampstead as it exists today," and the reason for this call is the proposed erection of some blocks of flats.

*

In London, and Hampstead is no exception, there are thousands of houses originally built for single families which are now occupied floor by floor as flats, and very indifferent flats many of them are, but it is not against these that protest is made. It is against flats which look like flats.

*

Everyone sympathizes with the desire of the inhabitants of a neighbourhood to make that neighbourhood as pleasant as possible, but surely more would be gained by concentrating upon the density at which flats are built than by blindly attacking flats which are designed as such.

PRESIDENTIAL ADDRESSES. . . .

Within a week I have listened to two of the best presidential addresses it has been my pleasure to hear, first at the A.A. and then at the R.I.B.A.

AT THE A.A. . . .

Mr. Humphrey Pakington gave us a brilliant analysis of the English scene now and of its future possibilities, and then reminded us time and again that it was up to us to say what sort of England we wanted.

*

His personal contribution was the idea of an England returned to the well-sited village as the important unit—but not the village as we know it now. I noticed with some amusement that Mr. Pakington's description of the compact and vertically developed village unit was seized upon as "news" by most of the daily press.

*

That architecture and eugenics would have to be closely related is a pretty thought. The great danger of too scientific a control in this direction was forcibly stated by Mr. Goodhart-Rendel, who declared, amid a curious mixture of acclamation, laughter and loud cries of "No," that under such a system his would be one of the types to be "bred out."

*

I must admit that I had never before considered Mr. Goodhart-Rendel as a "type."

. . . . AND THE R.I.B.A.

Mr. Percy Thomas, for his inaugural address as President of the R.I.B.A., chose a subject which promises well for his term of office. He spoke with strength and purpose on the urgent need for the greater employment of qualified architects in our public and private life.

*

I found his introduction to this subject broad, adequate and to the point. He deplored the wastage of effort (and, I might add, money) which produces offensive buildings "conceived with an utter lack of imagination, sited with stupidity, and built in ignorance."

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Mr. Thomas spread the blame for the present unhappy and uneconomic state on many shoulders; architects taking their full share. I liked particularly his concluding appeal that we should examine ourselves and remove any traces of unpractical or purely academic reasoning.

*

More important still, I left the meeting to find that I shared with several colleagues the view that in Mr. Percy Thomas we have a President whose appreciation of real issues instils confidence . . . a man who means business.

SILVER JUBILEE

The new venture of the L.N.E.R. may be said to come very near to contemporary standards of perfection. It is

The portrait of Sir Giles Gilbert Scott, R.A., the retiring president of the R.I.B.A., which was painted by R. G. Eves, A.R.A., and unveiled and presented to the Institute at the inaugural meeting last Monday night.

very fast, just a little romantic, quite well designed—and it pays handsomely ; an enterprising company can hardly wish to do better than that.

*

At King's Cross the "Silver Jubilee," which normally covers the 270 miles to Newcastle-upon-Tyne in rather under four hours, has its departure platform crowded with young men and women admiring its dull pressed steel panels and stainless bandings, and enviously examining travellers ; whilst the latter get a generous measure of self-consciousness and false nonchalance for their three extra shillings. And, finally and promptly, "Silver Jubilee" starts with a long blast from a most beautiful low-toned whistle.

*

Internally, the train is, considering, very well designed. In the dining-cars flush walnut panelling is kept perfectly plain, and if the dark green, shot with brown, upholstery is not entirely happy it is at least functional in showing neither dirt nor wear ; fixed windows are, I suppose, inevitable. But the palm goes to the "Toilets." The fabric walls are not particularly hygienic, but the compartment is wonderfully roomy, the fittings excellent, the ash-trays in the right places, and, for the first time, there are plenty of towels.

*

In performance the train does more than is claimed, since upon my journey it had 42 minutes in hand for the last 36 miles, and its acceleration must make tube trains look closely to their laurels. The last two coaches might possibly have been a little more unsteady than elsewhere, but otherwise a tour of the train showed no obvious penalties for high speed.

*

I am left wondering why more trains can't reach this standard, and, technically, how the L.N.E.R. engineers prevent the "Silver Link" from excessive wheel spin when it starts.

POSTERS . . .

On Monday morning this week I was able to see the best posters submitted in competition by the four London Schools of Architecture to advertise the forthcoming production of Hope Bagenal's play "You English."

*

They were produced in one day, as sketch designs, and as such I thought the standard very high. The influence of McKnight Kauffer is, as one might expect, very strong, though I deplore that our students are more expert in handling the surréalist cloud than in using a straightforward and legible lettering.

. . . AND LETTERING

Which reminds me of another poster I saw at the R.I.B.A. . . . a dull and dismal affair advertising the new series of dances in the Institute.

*

I have attended several of these dances in the past and have thought them unusually good. But this new poster, with its inappropriate bulbous letter shapes and crude spacing, suggests some back street "hop" in a converted warehouse.

JUNIOR MEMBERS

The first Informal General Meeting at Portland Place, on November 13, is to discuss "Registration and its Future Effect upon the Architect." This choice of subject at first surprised me, until I realized that the future of registration will be in the hands of the present junior members of the profession.

*

And I am much intrigued by the list of speakers who are to take part in the discussion, for they include some of the most respected members of the R.I.B.A. and some youngsters who can be relied upon to express at least an entertaining point of view.

FACTORIES TO LET

In its election manifesto the Government announces its intention to set up trading estates in the depressed areas in which will be found ready-made factories to let with all necessary services.

*

There are, of course, several trading estates already in various parts of the country, notably at Welwyn, where the results have been pretty successful, as new industries can be provided with any number of machine-shop bays and administration block units for a year or so until they either close down, or can afford to build a specially-designed factory of their own.

*

But it is clear that there must be, as there is at Welwyn, plenty of room for industries to expand into new buildings if and when they are needed. ASTRAGAL

NEWS

POINTS FROM THIS ISSUE

NO PARLIAMENT SQUARE GRANT

The Office of Works has sent the Parliamentary Committee of the Middlesex County Council a letter stating that the proposed improvement to Parliament Square is not, in the Government's opinion, of sufficient national importance to justify a contribution from the national revenue. The scheme proposed to make into a public open space the site occupied by various office buildings.

HOUSING SURVEY BEGINS

The housing survey called for under the new Housing Act began in London on November 1. It will be confined to working-class houses, of which there are between 600,000 and 700,000. When the inspection is completed, the L.C.C. will submit to the Ministry of Health proposals for the provision of new houses and flats.

LIVERPOOL ARCHITECTURAL SOCIETY

A vigorous protest against the employment of unqualified and "uneducated" persons on work which should be done by trained architects was made by Lieut.-Colonel Ernest Gee, president of the Liverpool Architectural Society, at the Society's first meeting of the session on Thursday last.

It was announced that the H. W. Williams Prize for the promotion of architectural design in concrete had been awarded this year to Mr. R. E. E. Beswick, a fourth-year student in the Liverpool School of Architecture. The prize is worth £50, and it is open to all members of the Liverpool Society and its allied branches. The subject was an ice rink with an ice surface area of at least 15,000 square feet, designed to occupy a site in Liverpool bounded by London Road, Monument Place, Pembroke Place, and Anson Street.

THE ARCHITECTS' DIARY

Thursday, November 7

ARCHITECTURE CLUB. *At the Fishmongers' Hall, E.C.3. Conversazione.* 6 *p.m.*

INSTITUTION OF STRUCTURAL ENGINEERS, 10 *Upper Belgrave Street, S.W.1.* "*The Authority and Liability of the Engineer under Contract with his Employer, whether such Engineer is employed by the Owner or Contractor; with special reference to Arbitration Acts, 1889–1934.*" *By Ernest Wetton.* 6.30 *p.m.*

ARCHITECTURAL ASSOCIATION, 36 *Bedford Square, W.C.1. Exhibition of water colours, etchings and other drawings by members of the Association. Until November 17.*

SOCIETY OF ANTIQUARIES, *Burlington House, Piccadilly, W.1.* "*Mediæval and Renaissance Sculpture recently found at Thetford Priory, Norfolk.*" *By the Rt. Hon. Ormsby-Gore.*

GEFFRYE MUSEUM, *Kingsland Road, Shoreditch, E.2.* "*English Furniture of the Oak Period.*" *By Ernest R. Gribble.* 7.30 *p.m.*

HERTFORD COMPETITION. *At the Building Centre, 158 New Bond Street, W.1. The premiated designs and a selection of other drawings submitted in this Competition are now on exhibition. Until November 16.* 10 *a.m. to 6 p.m.* (*Saturdays, 1 p.m.*)

Friday, November 8

INSTITUTION OF HEATING AND VENTILATING ENGINEERS. *Liverpool and District Branch. At 312 India Building, Water Street, Liverpool.* "*Automatic Control in Heating.*" *By N. L. Lewis.* 7 *p.m.*

Saturday, November 9

INSTITUTION OF STRUCTURAL ENGINEERS. *South Western Counties Branch. At Torquay. Chairman's Address, by W. T. Hills.*

Monday, November 11

CHARTERED SURVEYORS' INSTITUTION, 12 *St. George Street, Westminster, S.W. Presidential Address by Harry M. Stanley.* 6.30 *p.m.*

Tuesday, November 12

ILLUMINATING ENGINEERING SOCIETY. *At the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W.* "*Visual Perceptions under Modern Conditions.*" *By R. J. Lythgoe.* 7 *p.m.*

Wednesday, November 13

INSTITUTION OF STRUCTURAL ENGINEERS. *Lancashire and Cheshire Branch. At the College of Technology, Manchester.* "*The Earthquake Resistance of Structures.*" *By C. W. Hamann.* 7 *p.m.*

INSTITUTION OF HEATING AND VENTILATING ENGINEERS. *Birmingham and District Branch. At 95 New Street, Birmingham.* "*Steam Practice.*" *By F. R. White.* 6.45 *p.m.*

INSTITUTE OF WELDING. *At the Institution of Mechanical Engineers, Storey's Gate, St. James's, S.W.* "*Shipbuilding.*" *By A. S. Lillicrop.* 6.30 *p.m. Scottish Branch. At 207 Bath Street, Glasgow.* "*Some Notes on Oxygen Metal Cutting.*" *By A. F. Drinkwater.* 7.30 *p.m.*

CARDIFF CIVIC SOCIETY

In an address entitled "The City Beautiful" at the annual meeting of the Cardiff Civic Society, held on Thursday last, Lord Tredegar said that while Cardiff had many of the features which entitled it to the name of a beautiful city, he urged them not to claim too much on that score because there were so many features which still hurt the eye and must offend the sensibility of all. Cardiff was not yet the "City Beautiful," but there was hope and almost the assurance —which the existence of the Civic Society provided—that one day it might indeed merit that title.

DINNER AND PRESENTATION TO PROFESSOR ABERCROMBIE

A large number of Professor Patrick Abercrombie's old students and colleagues from the University of Liverpool were present on Friday, October 25, at a dinner which was held in his honour at the Sandon Studios Club, Liverpool. The Chairman was Lord Leverhulme, whose father, the first Viscount Leverhulme, founded the Chair of Civic Design which Professor Abercrombie held for twenty years before his recent appointment as successor to Professor Adshead at University College, London. During the evening Professor Lionel B. Budden presented to Professor and Mrs. Abercrombie, on behalf of former students, colleagues and other friends, a walnut filing cabinet and Georgian silver tea and coffee service. The filing cabinet was designed by Professor Budden and executed by Mr. W. R. Burden.

MR. PAKINGTON AT THE A.A.

In his Presidential address last week to the Architectural Association, the Hon. Humphrey Pakington discussed the future of town planning and the form that the town of the future would take. He visualized towns as becoming progressively smaller and more compact, with a composite two or three-storeyed building to house essential services with a possibility of bachelor flats above it. The residential unit, whether we liked it or not, would probably be the semi-detached cottage.

Finally, said Mr. Pakington, the preservation of the beauties of the past was almost as important as the destruction of the horrors of the present. What would England be without its prim parklands and shining meadows, without the Georgian High Street of the market town, or the cobbled street falling steeply down to the sea between the fishermen's cottages? It would not be the England we know. The process of preservation had begun, but a comprehensive scheme was wanted. What sort of England did we want? The keynote of England's future must surely be orderly development, and he felt it was the supreme task of the architect to bring order into the visual aspect of our land, to produce harmony between the works of man and the works of nature. The England of the future must be designed to express a sense of order, but we must above all remember that true orderliness did not mean ruthless imposition.

OBITUARY

WILFRED BOND

We regret to record the death, which took place on Thursday last, of Mr. Wilfred Bond, F.R.I.B.A., senior partner in the firm of Messrs. W. and L. H. Bond, of Grantham.

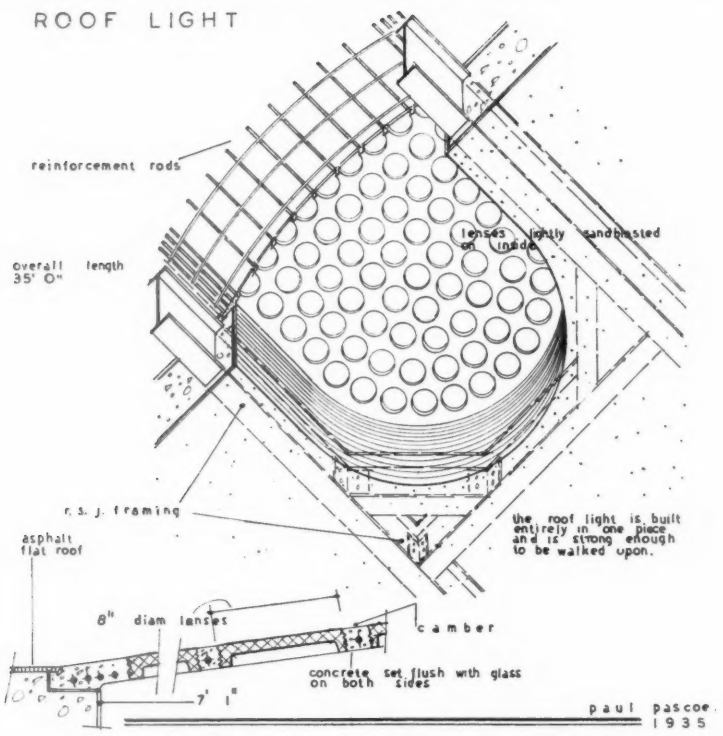
Mr. Bond, who was educated at Rugby School, was sixty-five years of age. He was particularly noted as an authority on ecclesiastical architecture and in this capacity he executed work all over the country.

HERBERT W. CRUICKSHANK

We regret to record the death, which took place on October 16, of Mr. Herbert William Cruickshank, F.R.I.B.A., a partner in the firm of Cruickshank and Seward, of Manchester. He was 49 years of age.

Born in Aberdeen, Mr. Cruickshank was articled to Mr. A. Marshall Mackenzie, of Aberdeen. Subsequently he went to the London office of the firm, where he was concerned in a number of important works.

When the war came he joined the Artists Rifles, and was with the 5th Gloucestershire Regiment in France and Italy. Later he



From the Regal, Margate. Designer: Robert Cromie.

joined the Royal Engineers. After the war he went to Manchester and started in partnership with Mr. H. T. Seward, F.R.I.B.A.

ARCHITECTS' WILLS

Mr. Claude W. Ferrier, F.R.I.B.A., of Old Queen Street, London, S.W., left £54,624.

Mr. Harry Quick, F.R.I.B.A., of Abbey Hill, Kenilworth, left £47,098.

R. I. B. A.

THE INAUGURAL ADDRESS

The first general meeting of the new session of the R.I.B.A. was held on Monday last. The President, Mr. Percy Thomas, O.B.E., delivered his inaugural address; and a portrait of Sir Giles Gilbert Scott, R.A., the retiring President, was unveiled and presented to the Institute. Following are some extracts from the inaugural address:

In the short address which I propose to read to you this evening, I have chosen a subject which, though not appealing so much to the popular imagination as planning, preservation, and the battle of the styles, is yet one of even more vital importance. I refer to the greater employment of the architect in our public and private life. I say of even more importance, for what use is their training in town planning, or their skill in any style, unless the people of the country are willing to utilize their services? I have not been able to obtain statistics, but I am sure it would stagger the general public if they knew what a very large proportion of the millions spent every year on building construction was carried out without the supervision of a properly qualified architect.

What is wanted is a national campaign on the necessity of having a properly qualified architect in every building operation. The man who is building a small bungalow should be just as certain that he needs the services of an architect as are the dean and chapter of a cathedral. Indeed, I am not sure that we should not call it a national campaign for the love of beauty. Beauty of architecture is only a part of the work, but it is the one which is most evident, and if we can get the general public to appreciate good architecture, they will soon demand a higher standard in the other amenities of our social life. I am not referring to whether a building is up to the standard of what a modern architect may consider good design. I am referring to the hundreds and thousands of really ugly, offensive buildings which, conceived with an utter lack of imagination, sited with stupidity, and built in ignorance of what is real architecture, are daily disfiguring this land of ours.

Let us for a brief moment consider the position that the architect has occupied in the community in the past. From ancient Greece, where architects were so famous that many schoolboys of today remember their names; from Rome, where not only the temples and palaces, baths, theatres, circuses and open spaces, but the basilicas and forums were designed and developed on a scale of architectural magnificence never since equalled, to the Renaissance, when architects were held in such high esteem that it is said that when Bernini travelled to Paris, he was welcomed with all the splendour and homage of a prince. In all these ages the architect was held in honour and esteem among the citizens of his country.

The patrons of architecture have varied with the ages. In some periods it was the ecclesiastical buildings which were the outstanding ones; in others, military. Then, again, many great architectural schemes have been developed to give expression to the power of the aristocracy, until we come down to our own times, when architects are working, broadly speaking, in the interests of the whole community; national and local administration buildings, hospitals, schools, museums and art galleries forming the principal architectural work of our age.

Now it seems to me that therein lies one of the explanations of the present-day lack of appreciation of the services which architects can render to the community.

The patrons of architecture in the periods to which I have referred were men of culture, men with some knowledge of architecture themselves. Indeed, we know that in the eighteenth century a knowledge of the orders was considered an essential part of the education of a gentleman, but it is difficult to instil the same culture and love of fine architecture into the patrons of our time, who are, in the majority of cases, ordinary members of the great British public. But that is, I venture to think, the task which lies before us.

Whatever may have been the motives in the past for their employment—and I have shown that they were many and various—history is full of examples of the benefits which come from the wise use of architects, and of the disastrous results of failure to utilize their services.

Broadly speaking, our cities and towns have never been planned at all. They have just grown up in an accidental way, extending here, there, and all over the countryside as the demands of industry, or the needs of individuals, seemed to dictate. The results are painfully evident to all of us. Traffic congestion, slums, unhealthy living conditions, infinite waste of time and strength in travelling, ugliness and disorder.

There are just a few shining examples in this country and more on the Continent which show what can be done when the skill of the planner and the art of the architect are brought to bear upon the problem at the right time—the beginning, and not the end of the city's development. Cheltenham, Bath and Edinburgh are examples that leap to the mind.

London is, on the whole, a horrible example of how not to do it. There was a great chance once when the Fire destroyed most of the mediæval city, and our greatest architect—Christopher Wren—produced a plan for the rebuilding which would have saved us from most of the evils that we endure even to this day. But the citizens were in a hurry, and they just rebuilt the place on the old, narrow, congested, disorderly lines. All that Wren was allowed to do was to design individual buildings, and they

are still the glory of London. In London we have only isolated examples of the art of the city planner—the lay-out of the great Bedford estate with its beautiful squares, Belgravia, the Adelphi, and the Portland estates, where the Brothers Adam had their chance, and greatest of all, the vast scheme, stretching all the way from St. James's Park to the north of Regent's Park, which the genius of John Nash actually carried into execution. In our day we have done our best to spoil all these schemes, and the results must be painfully familiar to all of you. When we look overseas we find, of course, many fascinating illustrations of the art of the city planner. Paris was once a huddled mass of houses and narrow streets like mediæval London. The great architects of the seventeenth, eighteenth and nineteenth centuries created the Paris that now draws the whole world to admire it. Vienna had the same good fortune in the nineteenth century, and smaller cities such as Carlsruhe and Nancy, or villages such as Richelieu, are brilliant examples of design applied to civic development. In our own time, Washington, Algiers, Amsterdam and Hilversum have all faced their problems in a big and bold way.

Perhaps I have said enough to remind you of what the architect can do for a city if he is given the opportunity, and to warn you of the disastrous results where the architect has not been employed, or has been brought in too late.

Our concern now is for the present and the future. What can we do to ensure better results?

I spoke just now of the difficulty of inculcating appreciation of fine buildings into our present-day patrons, that is to say, into the general public. The same difficulty and necessity applies, of course, to all the arts. The difficulty can only be effectively overcome by gradually spreading the appreciation and enjoyment of art and architecture, not merely among those who are going to practise it, but among those who will become its patrons—the boys and girls of our schools—and we must consider whether the teaching of architecture cannot be made an essential part of education in our schools, colleges and universities.

There are other steps which the Institute and its Allied Societies must take themselves. They must bring to the notice of public bodies time and again by exhibitions, by letters, and by deputations, the services which the architect can render. In many cases they are ignorant of these services. In others they are prejudiced against him, wrongly believing that his services mean an additional charge upon the building. There are other cases where important municipal work is being carried out by totally unqualified men, and we must see that the letter which was addressed to all local authorities last year on this point is not allowed to be forgotten. If our municipalities devoted one fraction of the energy which they display in regard to public health, education and other municipal activities, to cultivating among their citizens the love of beauty, our cities and towns would be better places to live in, and our people would be a happier people. There will be no real victory in the war against ribbon development and the spoliation of our towns and villages until we have instilled in the people a real spontaneous love for better things.

There is another aspect of the architect's services which must not be forgotten, namely, that these services do not begin and end with the building. The architect is the skilled designer of the present day, and his work should include not only town planning and buildings, but the numberless other items which contribute to the amenities of our modern civilization. The bus shelter, lamp standard, the little transformer station, all these can be made things of beauty as well as of utility. We should look forward to the time when the press will take notice and publish photographs when such a course is not adopted. I would like to see a national competition organized for the design of these civic accessories. The cost would be relatively small even to supplying the designs free to municipalities and manufacturers. By such means firms would be induced to standardize a beautiful article instead of the present-day ugly ones, and public bodies would soon appreciate the improvement in their public places.

With regard to our public buildings, the competition system of the Institute provides an easy means for public authorities to obtain the best design which the country can produce, and the Institute is every ready to help in the promotion of competitions for every class of building. In recent years an ever-increasing number of promoters, both public and private, are availing themselves of this method of obtaining designs. We should aim at expanding this system, which can render the most valuable and inspiring service both to the profession and the community.

In conclusion, we must examine ourselves, and see to what extent our own shortcomings are responsible for the neglect of which we complain. It may be that some of our predecessors have not always been practical, that they have not always considered the real needs of their clients. If any trace of this remains we must work steadfastly to remove it, and to prove to the community that the work of the architect satisfies the practical needs of our daily life as well as the creation of beautiful buildings.

COUNCIL MEETING

Following are some notes from a recent meeting of the Council of the Institute :

Science Standing Committee : The Science Standing Committee reported that in accordance with the terms of Bye-law 52, Dr. R. E. Stradling (HON.A.) had been co-opted as an additional member of the Committee.

British Waterworks Association : Standing Committee on Water Regulations : Major C. F. Skipper (F.) and Mr. R. J. Angel (F.) were reappointed as the R.I.B.A. representatives on the British Waterworks Association Standing Committee on Water Regulations.

Public Relations Committee : It was resolved to ask the Board of Architectural Education and the Competitions Committee each to nominate one representative to serve on the Public Relations Committee.

Junior Members Committee : The following members of the Junior Members Committee were appointed to serve on the Committees referred to: Mr. T. Mitchell (A.) (Competitions Committee) : Mr. J. E. Kean (A.) (Salaried Members Committee) : Miss Blanco White (Student) (Town Planning and Housing Committee), and Mrs. Janet Pott (A.) (Women Members Committee).

The Salaried Members Committee : On the recommendation of the Salaried Members Committee, Mr. R. R. Barnett (A.), was appointed to represent the Institution of Professional Civil Servants on the Committee.

The Social Committee : Mrs. H. V. Lanchester was re-appointed Chairman of the Social Committee.

The London Building Act Committee : On the recommendation of the London Building Act Committee, it was resolved that the Committee be dissolved, the work for which the Committee was formed having been completed, viz., that of making recommendations for the amendment of the London Building Act for consideration by the L.C.C. Advisory Committee. It was further resolved that any matters arising from London building practice should be referred to the Practice Standing Committee.

Foreign Relations Committee : The R.I.B.A. has been invited to assist and co-operate in the work of the newly-formed British Council for Relations with Other Countries, and the Council have decided to set up a Foreign Relations Committee for this purpose.

The R.I.B.A. Architecture Medals : It was reported that the Jury appointed to make the award of the R.I.B.A. Architecture Medal for for the area of the Essex, Cambridge and Hertfordshire Society of Architects, had made their award in favour of Merchant Taylors' School, Rickmansworth, designed by Mr. William G. Newton, M.C., M.A., (F.). The award was formally approved by the Council.

Reinstatement : The following ex-members were reinstated : As Licentiates : Messrs. S. J. Alles and N. Boothroyd.

Resignations : The following resignations were accepted with regret : Messrs. W. A. Arbuckle (L.), J. Crossland (L.) ; J. Page (L.) ; and B. Sattin (L.).

Transfer to the Retired Members Class : The following members were transferred to the Retired Members Class : As Retired Associate : G. P. G. Hills. As Retired Licentiate : W. H. Woods.

COMPETITION NEWS

BRIGHTON FIRE STATION

Mr. Stanley G. Livock, F.R.I.B.A., the assessor in the competition for designs for a proposed fire station at Brighton, has made his awards as follows :

Design placed first (£200) : Mr. G. I. Highet, A.R.I.B.A., of "Verriefero," Cleardown, Woking.

Design placed second (£125) : Messrs. Cackett, Burns, Dick and Mackellar, F. and A.R.I.B.A., of 21, Ellison Place, Newcastle-upon-Tyne.

Design placed third (£75) : Mr. J. R. Leathart, F.R.I.B.A., of 39, Gordon Square, London, W.C.1.

NEW CHAPEL AND CREMATORIUM, BIRMINGHAM

Mr. Edwin F. Reynolds, F.R.I.B.A., the assessor in the limited competition for designs for a proposed chapel and crematorium at Lodge Hill Cemetery, Birmingham, has made his award as follows :

Design placed first (£100) : Mr. Holland W. Hobbiss, F.R.I.B.A., of 33, Newhall Street, Birmingham.

Design placed second (£50) : Mr. Herbert Jackson, A.R.I.B.A., of 24, Bennett's Hill, Birmingham.

Commended : Mr. S. N. Cooke, F.R.I.B.A., and Messrs. Harvey and Wicks, F. and A.R.I.B.A.

ASYLUM EXTENSION, FIFE

Mr. James Lochhead, F.R.I.B.A., the assessor of the limited competition for proposed extensions to the Fife and Kinross Joint Asylum, has made his award as follows :—

Design placed first (£200) : Mr. W. S. Allison, of Kirkcaldy.

Design placed second (£100) : Mr. A. D. Haxton, of Leven.

Design placed third (£50) : Mr. W. S. Allison.

The estimated cost of the scheme is £42,000.

COUNCIL OFFICES, HERTFORD

We are informed that the design bracketed third in the competition for proposed council offices, Hertford, illustrated in our last issue, was not by Messrs. Connell, Ward and Lucas, but was by Messrs. Connell, Ward and Lucas, in collaboration with Mr. H. Thornley Dyer.

COMPETITION BANNED

The following notice has been issued by the R.I.B.A. : "The Conditions of the limited competition for New Hall Buildings, Harpsden Hall, Henley-on-Thames, are not in accordance with the regulations of the R.I.B.A. The Competitions Committee is in negotiation with the promoters in the hope of securing an amendment. In the meantime members should not take part in the competition."

[*For the list of Competitions Open, see page 586 of the issue for October 24.*]

FOREWORD

By SIDNEY L. BERNSTEIN
Chairman of the Bernstein Cinemas, Ltd.

CINEMA architecture in England has not yet reached the level of the best American and Continental design. During the past few years, the ambitious cinema proprietor, prompted by the impulse to build on the boom wave, has been responsible for the many vulgar, inefficient, jerry-built cinemas that are to be found in all the prosperous districts.

Cinema building in pre-war and immediately post-war days was invariably the work of an architect who accepted sole responsibility for the job. Although this system produced some intelligently fashioned buildings, it is difficult to point to many the design and decoration of which have stood the test of time.

Alas, the great modern artists—the Cezannes, the Monets, and the Piccassos—engendered an outburst of so-called modernism which, when interpreted by cinema decorators, follows neither the original conception of the artist, nor the basic laws of functional architecture. Rather it reveals itself as a fake art, trying vaguely to imitate the purity of African negro design ; using great masses of paint, generally plastic, and crudely coloured, in an effort to conceal artistic ignorance and initial architectural errors. This school, which misrepresents the twentieth century, further illuminates its ignorance of design by such characteristics as hiding hundreds of electric lamps in cornices and corners, thus creating an atmosphere better suited to captive fish than films (with, incidentally, an excessive labour bill for maintenance).

This is not an attack on modern architecture as a whole, but on cinema design in particular. Cinemas seldom fulfil the needs of their patrons for a sense of comfort, for change from the limitations of their home, for surroundings that will give them week by week an exciting and refreshing background to their entertainment.

Most cinemas decorated in the alleged modern manner already look old-fashioned. Perhaps their architects were afraid that by taking lessons from Michelangelo, Wren, Inigo Jones and other great masters they would prove they were just passengers in an age of mediocrity. I regret this one ability on their part.

All of this may not prove, but certainly tends to support, my theory that cinema building can never be the work of one person. It must be the work of a group inspired by the idea of producing a theatre that is at once efficient in operation and appealing in appearance. This can be done without pandering to mass vulgarity.

Experience has taught me that such a group must be comprised of the architect, the interior decorator, the electrical engineer, the ventilation engineer, and the owner, who must, because of his practical knowledge of theatre management, guide the experts in producing the theatre which his public will appreciate and which can be efficiently and economically run.

The owner should guide the experts in creating an atmosphere of " theatre," by which I mean the combination of luxury and restfulness which patrons subconsciously demand.

The owner's knowledge of staff routine, functional requirements, running costs and maintenance must harness the efforts of the experts into fashioning a building that is practically planned in every detail.

Such factors in cinema construction would seem to be elementary ; yet examine the greater number of cinemas in this country, and you will find them inefficient in practically every respect, and it is solely the enthusiasm of the public for films which has protected them from the fate they deserve.

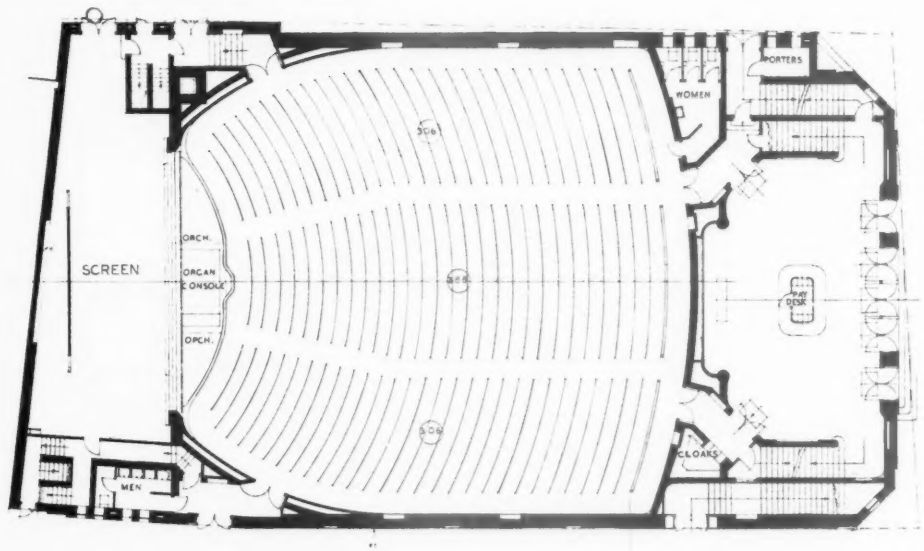
A: PLANNING

I: THE SUPER CINEMA

By Robert Cromie

The subject of this analysis is a modern cinema in a provincial town. The site has three frontages; and the clients desired a cinema with the maximum seating accommodation (1,714). The plans comply with all the regulations governing the erection of cinemas, and with present-day requirements as regards the circulation of the public, film projection, acoustics, seating, sight lines, café, and the like. All the salient points of the plans are referred to by Mr. Cromie in his analysis. His observations indicate generally the fundamental principles to be followed in designing a super cinema in any part of the country. Some counties, like Middlesex and Surrey, have their own regulations for the erection of cinemas. In counties and in towns where there are no regulations, the county and municipal authorities usually request that cinemas shall be designed to conform with those of the London County Council. These are published under the title of *Places of Public Entertainment*, by P. S. King & Co. Price 1s. 6d. net.

ANALYSIS



STALLS PLAN

ENTRANCE HALL.—*Front of house planning is difficult on a cramped site. Points to note in the plans are the reduction of staircases to the minimum, and the provision of a separate entrance from the main street to the café. Forthcoming programmes are shown inside the entrance hall, the staircases being decorated only by stills.*

It is impossible to use any front staircase without seeing the café.

Exits lead to different streets.

Stalls lavatories are approached from the auditorium.

CIRCULATION.—*Rear stalls are entered on one side, the check-taker directing patrons to gangways inside the auditorium.*

Balcony is served entirely by one staircase from the vomitory entrance, thus the entrance hall queuing is divided into two in the simplest manner.

Issue of tickets for admission is centralized in one pay-office containing two machines operated when necessary by one girl.

Chocolate counter is accessible after the pay-box has been passed and cannot be overlooked.

Small cloak room provided—this is often used only for parcels.

THE STALLS FLOOR.—*This is "dished" with a continuous one-in-ten rake—the maximum permitted by authorities, and is found to be sufficient if the screen is correctly positioned. It allows 6 ins. rise over each second row, i.e., allowing 2 ft. 6 ins. for stalls spacing. All floors taking screwed-down seating should be finished in 1¼ in. wood, laid diagonally.*

SEATING.—*All seating should be concentric. It is not practicable to stagger theatre chairs. The slope of the chair back and the standard are arranged in accordance with the rake, whether designed for balcony or stalls.*

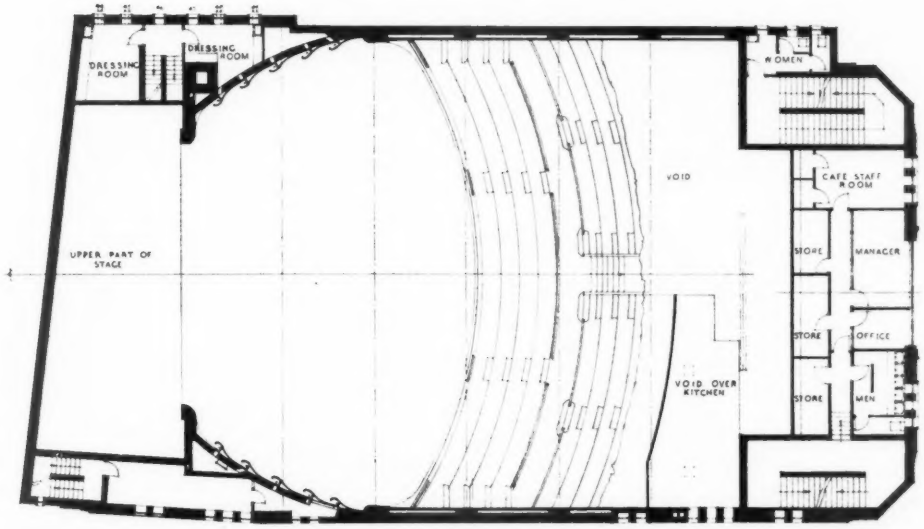
Space saving may be effected by side seats next walls, but this is undesirable.

Rows should if possible be of even numbers.

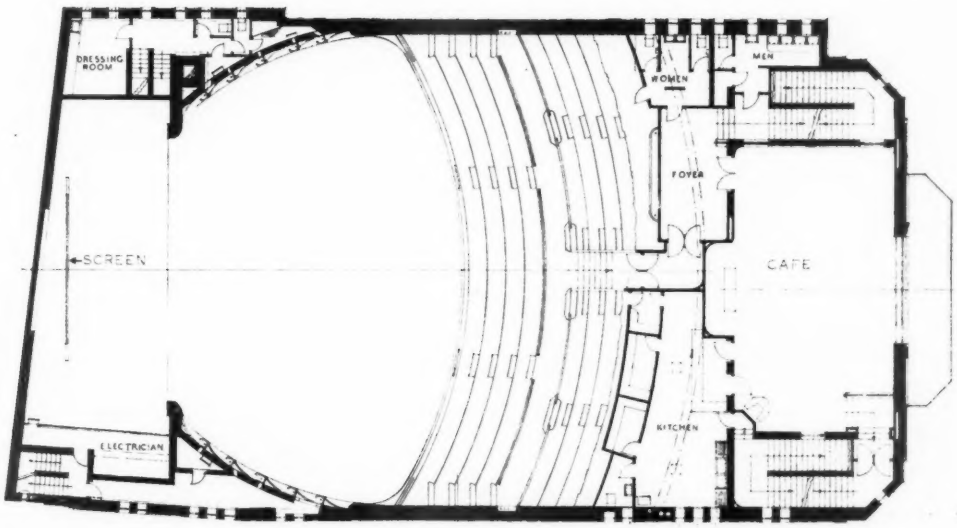
Stalls seating should not be less than 2 ft. 6 ins. rear; 2 ft. 4 ins. front.

FRONT OF HOUSE ACCOMMODATION.—*Staff rooms for men and women fitted with lockers are best planned at the front of the house.*

Separate lavatories should be provided.



INTERMEDIATE PLAN



LOWER BALCONY AND CAFÉ PLAN

FIRST FLOOR ACCOMMODATION.—*Separate staff room for kitchen staff.*

Common room.

Storage-room desirable near offices.

Offices for management and local publicity only. (Administration will be from Circuit headquarters.)

PROSCENIUM SPLAY WALLS.—*Splay walls on either side of the proscenium are the logical outcome of economical planning and are typical of British and American cinemas. The open spaces so often featured in photographs of continental theatres are often the result of wasteful design. In this instance a space of about 18 ins. is added to the curved splays for decorative effect—a simple treatment of concealed vertical lighting, the lamps being accessible from the rear.*

CAFÉ.—*Café is planned over the entrance hall in the usual way. It does not interfere with access to the lower balcony.*

Kitchen occupies all available space and is sufficient for the business expected.

Kitchen staff access is from the balcony exit stairs.

Kitchen staff accommodation is next the offices at higher level.

A small office is required for the manageress and as much storage space as possible (ventilated).

BALCONY.—*The sight line from rear of balcony should strike the foot of the orchestra rail. The sight line under the balcony front from the rear of stalls should at least reach the top of the screen, allowing 5 ft. 4 ins. for eye line at the barrier.*

Access to the balcony should be by centre vomitory (i.e., tunnel) from foyer level.

Vomitory should be "lobbied" to cut out light and noise.

Balcony steppings are: rear 2 ft. 9 ins.; front 3 ft.

STAGE.—*Invariably required except in smallest cinemas.*

Stage depth is defined by the distance of the screen from the front row. This is decided by an angle of 35 degrees taken from the end seat of the front row at 3 ft. 6 ins. above stalls floor to the top of the picture.

Reasonable wing room is required.

Note: Pass doors, exit doors and property doors.

The minimum height of stage should be sufficient to exclude the battens and tracks from view of front end seats.

The stage should not slope.

ACCOMMODATION ACCESSORY TO THE STAGE: (*Minimum*).

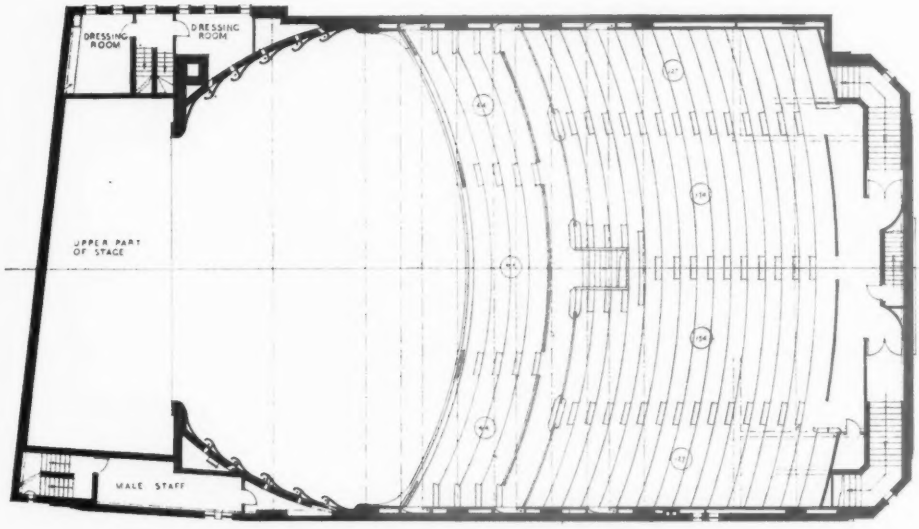
Two dressing rooms.

Separate lavatories essential.

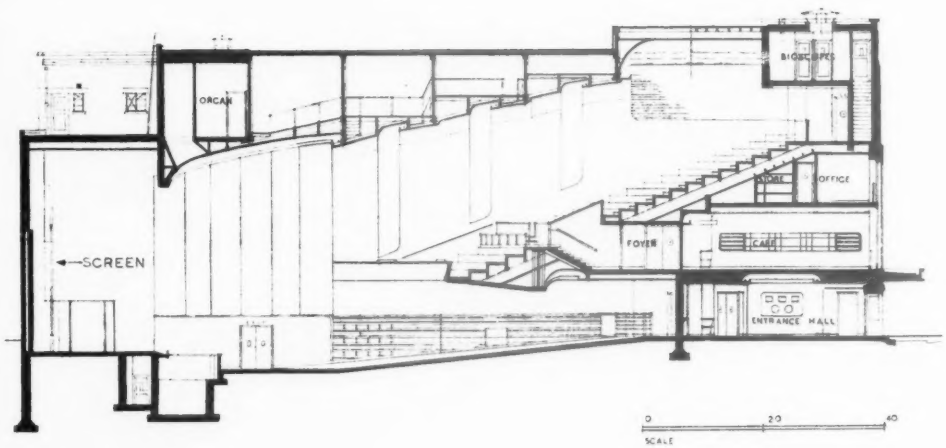
Musical director or organist's room.

Music store.

Electrician's store.



BALCONY PLAN



LONGITUDINAL SECTION

ORCHESTRA.—*Since the advent of the cinema organ, the orchestra is usually dismissed from theatres of this size, but the desirability of placing the console on the centre line of the stage necessitates the usual rail to guide the audience to the front stalls exits. Continental cinemas are usually without this feature—hence their stage fronts can be treated in a less stereotyped manner.*

ORGAN.—*The console is shown in the best position, visible from every seat. It is placed on an electric drum-and-cable lift switch operated by the organist.*

Provision is made for the motor under the stage in a ventilated chamber. The console-well is guarded by a metal surround.

The organist approaches his seat by an under-stage corridor at the stage end.

By means of an electric attachment a piano placed on the stage can be played from the console.

The organ itself is housed in the roof over the proscenium. (This is in some respects a better position than under the stage.)

The sound duct is "reversed" to avoid time-lag between the speaking pipes and the organist. The duct is a horizontal slot in the ceiling fitted with a fibrous-plaster grille and covered with heavy mesh on light steel (for safety).

The chambers are plastered and ventilated, also electrically heated.

The blower chamber is adjacent—the air intake is from the auditorium, not from the exterior.

PROJECTION DEPARTMENT.—*Should be accessible from inside the building. Projection chamber must be approachable through the open air.*

Alternative means of escape are required to the chamber and rewind room and usually to other parts.

The accompanying plans show provision for two projectors 5 ft. 6 ins. apart; two spot lanterns; non-synchronous machine (if required); dimmer-bank.

All the apertures must be glazed and guarded by automatically closing shutters.

The customary employment of rectifiers and batteries demands accommodation accordingly.

A small ante-room should be provided for the operators.

Operators' w.c. should be placed near the projection chamber.

Battery rooms should be well ventilated. They should be lighted only by a small window or skylight.

HEATING AND VENTILATION.—*Plenum system essential—preferably with a "mist spray" water washer.*

The boiler house, necessarily under the stage in this case, includes provision for a fuel store. A mechanical stoker is employed with automatic feed.

The plenum chamber is on the top floor over the boiler room.

ACOUSTICS.—*The acoustical demands of a cinema are extreme. "Wide-range frequency"—from a sibilant whisper to full-tone organ playing is best satisfied by a streamline section.*

The auditorium ceiling should rake closely to the operators' sight line.

Sound-absorbent material is not necessarily required.

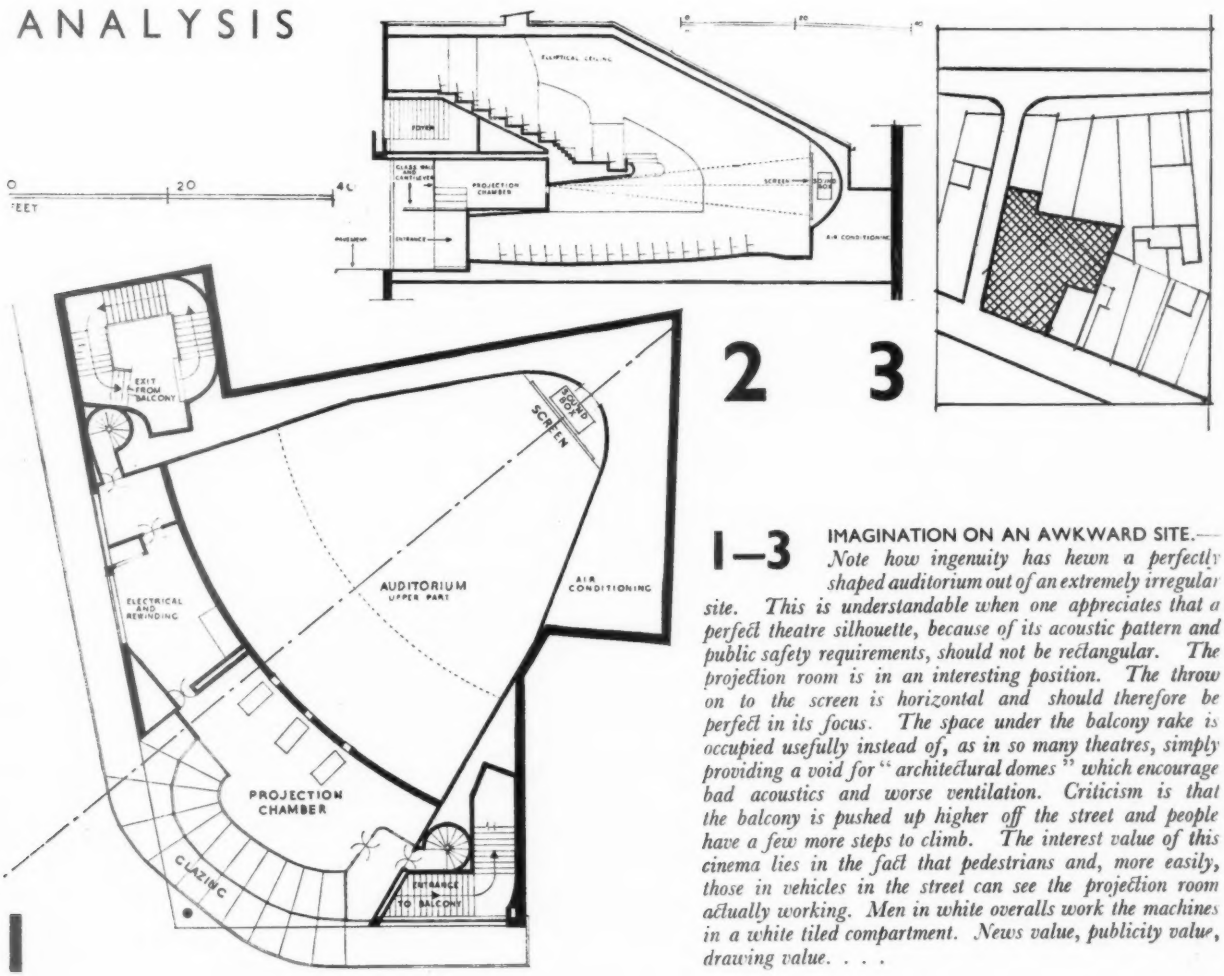
A: PLANNING

2: NEWS REEL

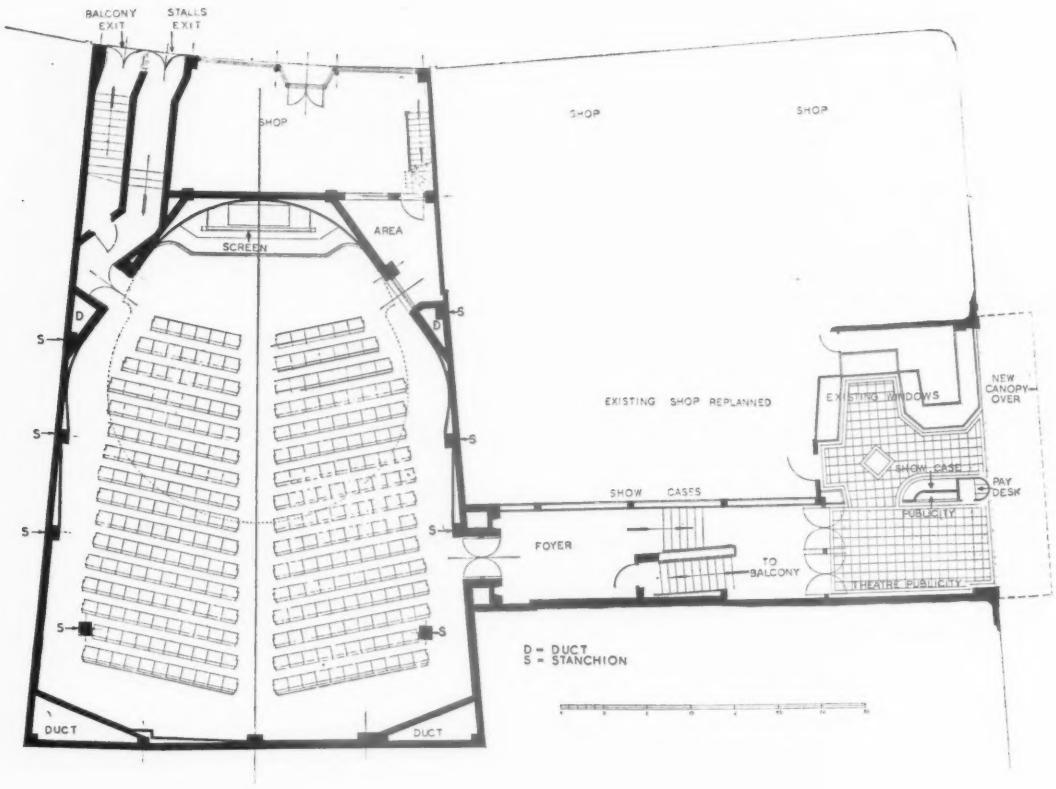
By Alister G. MacDonald

Funnily enough, the architecture of the news theatre is something new like the news theatre itself; it is still feeling its way like the reels shown on the screen. These diagrams and notes illustrate some of the problems connected with the design of a real news theatre. It is not enough that this new form of public entertainment and education should be housed in converted halls where the acoustic and ventilating conditions are adapted, and where the whole compromise is called "modern," because a new pay-box has been installed and the theatre given a fresh coat of paint. The news reel and "shorts" programme must be developed by people of imagination, because the field of presentation is enormous. Exhibitors and the public will be demanding special buildings for this type of entertainment—one might rightly say educative entertainment. The sites must be carefully chosen in busy spots. Values of property dictate that the theatre will have to be enclosed in larger buildings, that the theatre must be individual, and yet be a small part of another building. The plan must conserve space and yet produce a big effect. Ingenuity out of imagination will be the sire of this architecture.

ANALYSIS



1–3 IMAGINATION ON AN AWKWARD SITE.—*Note how ingenuity has hewn a perfectly shaped auditorium out of an extremely irregular site. This is understandable when one appreciates that a perfect theatre silhouette, because of its acoustic pattern and public safety requirements, should not be rectangular. The projection room is in an interesting position. The throw on to the screen is horizontal and should therefore be perfect in its focus. The space under the balcony rake is occupied usefully instead of, as in so many theatres, simply providing a void for "architectural domes" which encourage bad acoustics and worse ventilation. Criticism is that the balcony is pushed up higher off the street and people have a few more steps to climb. The interest value of this cinema lies in the fact that pedestrians and, more easily, those in vehicles in the street can see the projection room actually working. Men in white overalls work the machines in a white tiled compartment. News value, publicity value, drawing value. . . .*



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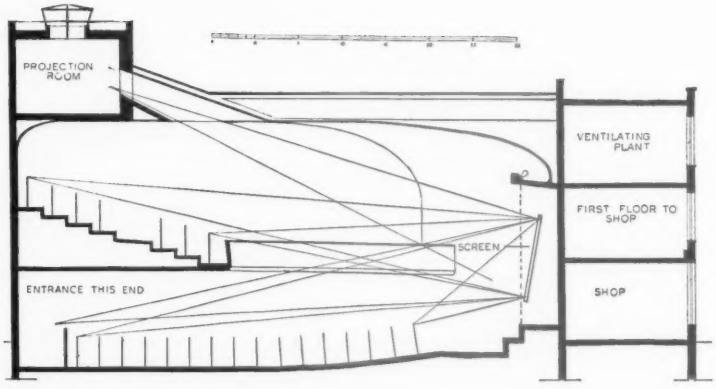

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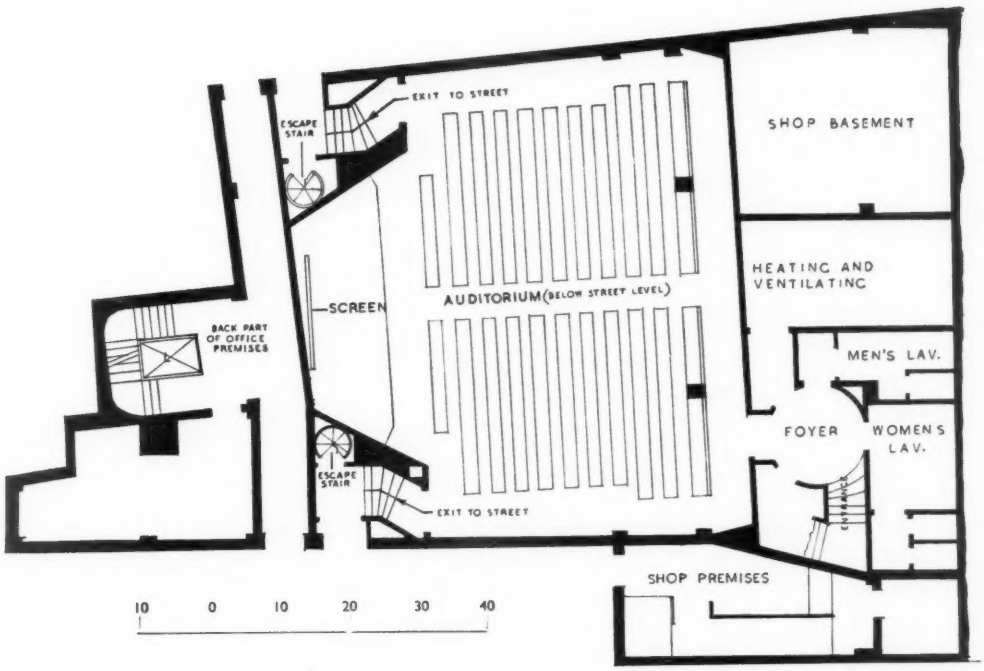
4 **MAKING THE BEST OF BOTH WORLDS.**—*The existing shop owner had spare land at the back. A ten-foot minimum width was required for the exit to the main street. Such a narrow entrance standing alone would have been insignificant; and a wider entrance would have taken away too much from the shop. The whole frontage in this case is turned into a combined entrance arcade with show-cases displaying goods and news reel stills, and the light from an illuminated canopy along the entire frontage both attracts patrons to the small theatre and to the shop. Both shop and theatre entrance look twice as big. To get over the difficulty of stanchion bases projecting too much into other people's property the stanchions themselves are placed inside the theatre wall. This breaking up of the wall surface is good for acoustics if properly handled. An example of a little thought going a long way.*

5 **NO NEED FOR A STAGE.**—*The usual proscenium opening does not exist in its usual shape. The performance consists of a continuous show of news pictures and other short films. No need for a stage or stage curtains. The screen is set up on its own base, clear of the auditorium walls. A canopy over contains a roller blind to pull down over the screen to keep off the dust when the theatre is being cleaned. Changes of colour on the screen can be controlled from the canopy. The auditorium walls glide in behind the screen frame; they do not lead up to a proscenium opening.*



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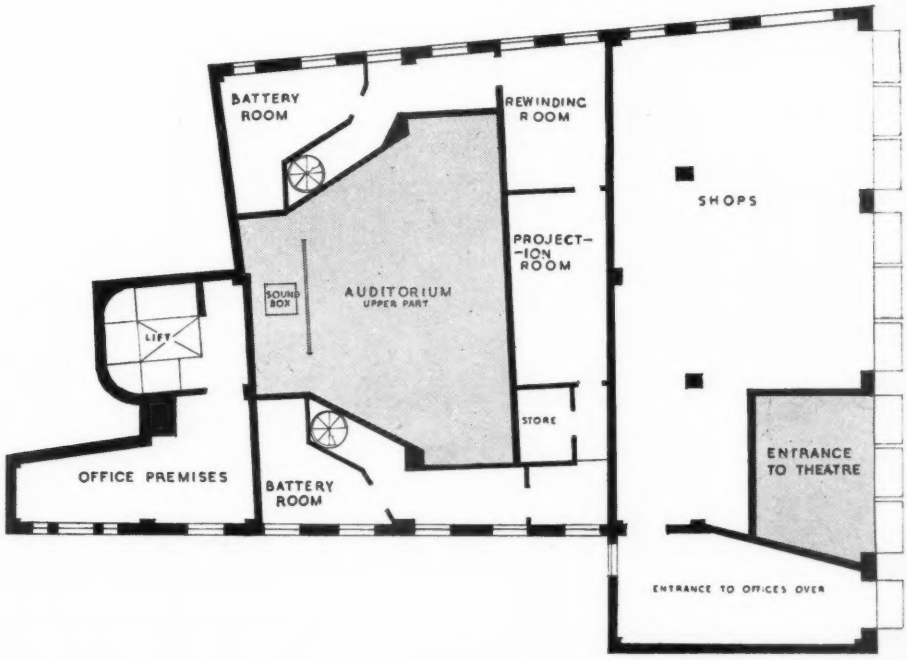

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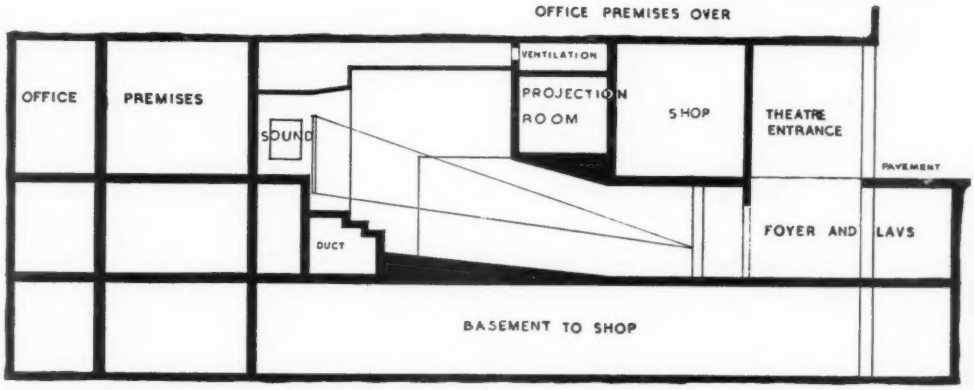
6-8 MULTUM IN PARVO.—*As every news theatre ought to be. Dealing with an expensive street frontage, news theatres cannot pay the rentals that shops can command. Therefore give just enough entrance to the new theatre—preserve maximum floor space for a well functioning shop with its own basement. Attract with an alluring staircase, not too large, your theatre patrons to the lower ground floor, dive under the shop and have your main auditorium in the back part of the premises occupying lower ground and ground floor, in order to have sufficient height for auditorium. Note that the projection room is tucked in at the back of the shops, hanging over the auditorium, with open air exits to street level as all regulations require.*



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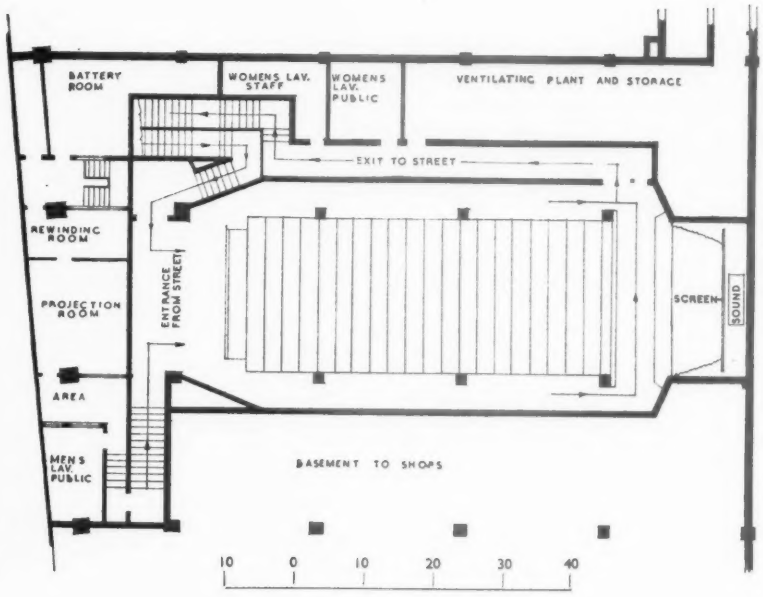

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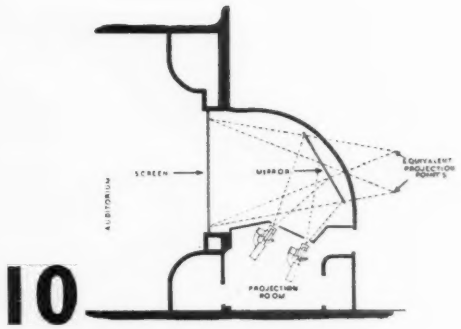
9 THE LONG WAY ROUND IS THE SHORTEST WAY HOME.—*One of the essential points in the plan of a news theatre is to have well distributed means of circulation. With programmes that last only for an hour patrons will be moving in and out continuously. At the same time those sitting down watching the screen must not be disturbed, physically or visually. The physical side is, or should be, looked after by having seats well spaced apart so that those passing do not scrape the sitters' knees. Visually, gangways should be used either for ingress or exit, not both. One is apt otherwise to be conscious of a crowd jostling about instead of a regulated stream—the easy moving of which acts on the senses like a quietly burbling brook—so that one's attention is on the screen, not on the auditorium. Public safety demands also that exits should be well distributed round the auditorium. These exits must be properly smoke and fire proofed from the auditorium and all other exits so that if they eventually do lead back to the same vicinity (in a small theatre like this) both the safe working and the comfort of the auditorium have been safeguarded. Note that to achieve this on this plan the exit from the auditorium at the screen end "doubles back" along the auditorium wall.*



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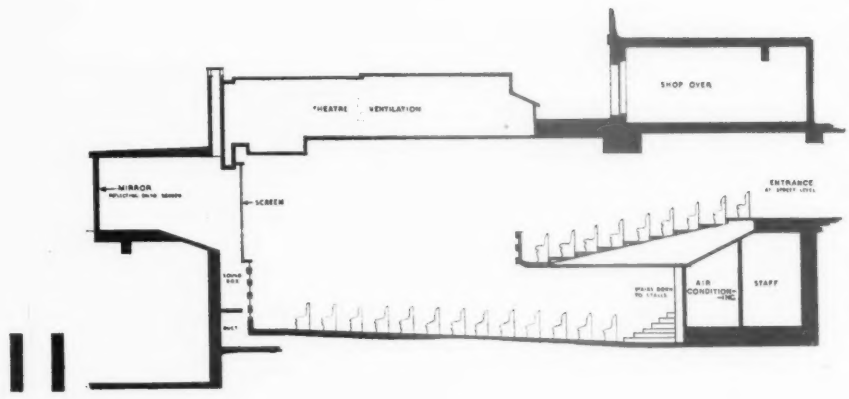
10-11 TRICKS IN OPTICS.—*Overcoming the very often difficult question of projection room planning. The projection room is a most delicate piece to plan. It requires fresh air, proper ventilation, and its beams of light require definite auditorium conditions. It is not possible to accommodate all these in the usual way on many sites, and science offers compromises. Figure 10 shows the projector machine beam shining on to a mirror and being reflected on to the back of a transparent screen in front of which the audience sit. The picture is not too clearly defined, but is not bad. This means that no sound horns can be placed behind the screen. In the present case the screen was sufficiently high to introduce the sound box immediately underneath it. The sound is isolated and occupants of the front rows have to stretch their necks, but it is an interesting experiment in the conservation of space, and people do use the theatre. The auditorium floor is sloped up to the screen to ease the sighting. Note in Figure 11 that the balcony has no steppings, gangways are all gradients: good for easy getting in and out, which is an obvious necessity in a news theatre.*



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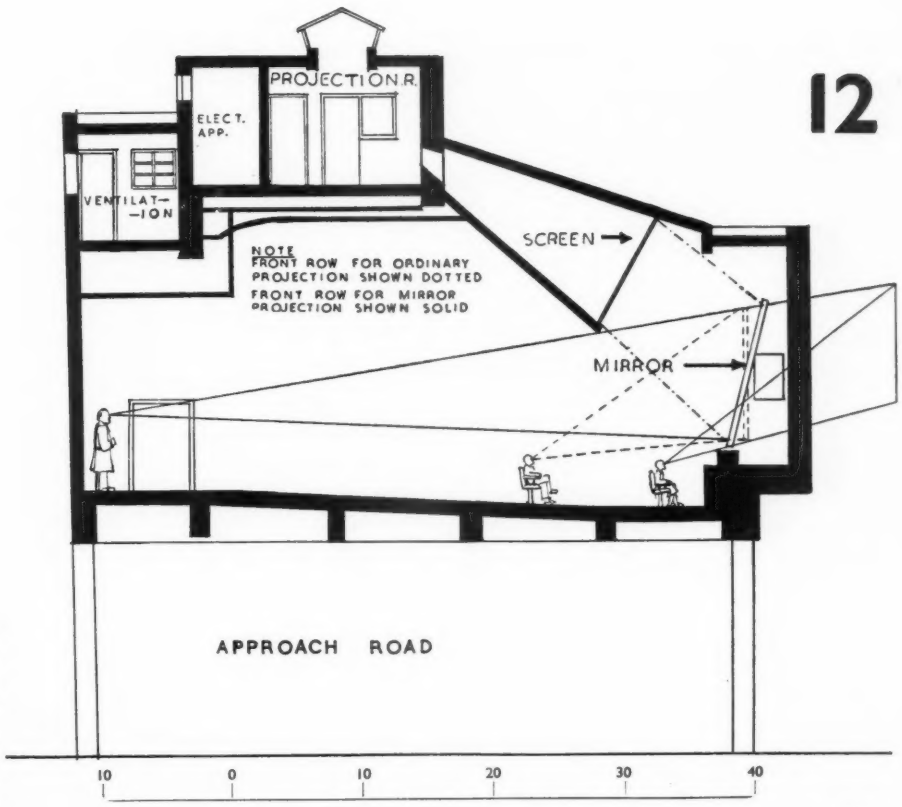
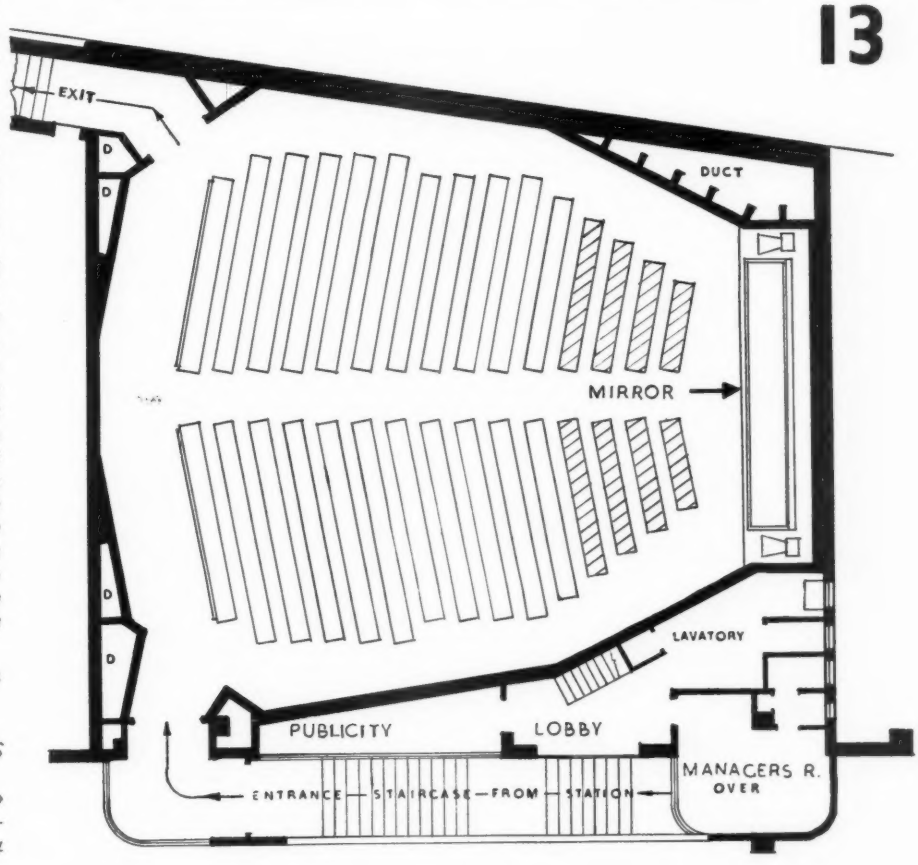
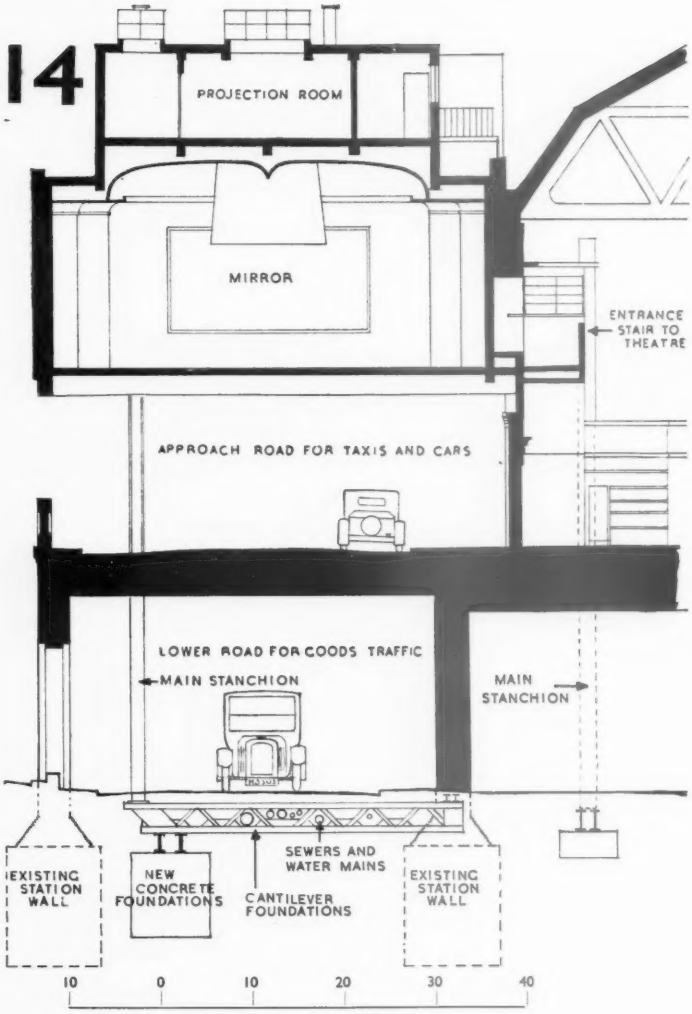


12-13 A MIRROR WITHOUT EYESTRAIN. —*A development of the mirror idea making full use of the fact that the virtual image is the same distance behind the mirror face as the object is in front of the mirror. The picture is projected on to a screen which is transparent and in turn reflects on to a mirror into which the audience gaze. There is no eyestrain as in Figure 11. In fact, more seats can be put into the same auditorium space because the angle of eyestrain is measured from outside and behind the auditorium external wall on to the virtual image. The audience are looking at a picture which is not tangible. It is impossible, at present, for sound to come directly through a mirror, therefore the horns are at either end of the mirror itself. The front part of the auditorium has to be designed to obviate any reflections in the mirror. A black ceiling is part of the decoration therefore—and quite modern at that. In a small auditorium as required by a news theatre, the decoration should not be entirely "applied." The ribs shown on the walls in Figure 4 are there to help the acoustics primarily, they decorate the wall surfaces at the same time.*

Seats lost by ordinary projection shown hatched.

No. of seats by ordinary projection	*206*
No. of seats by mirror projection	*250*
Gain in No. of seats by mirror projection ...	*44*

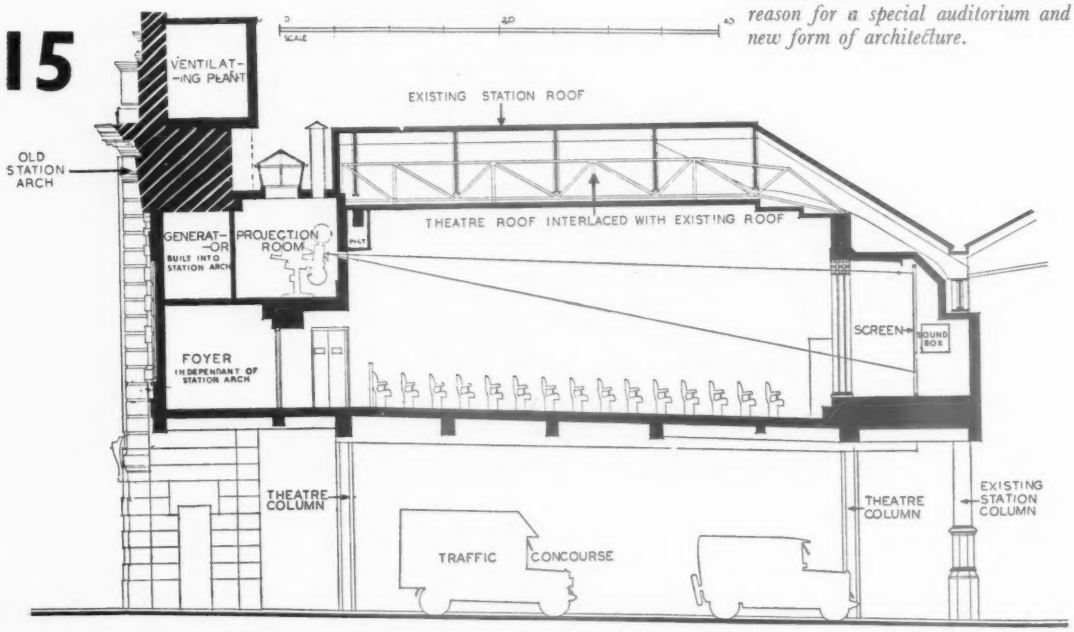




14 A POCKET PALACE OF AMUSEMENT.—*The auditorium had to be adjacent to the railway station concourse and there was only one possible spot. It stood on four stanchions which went through the taxi road and then into the ground under the goods traffic road under the taxi road. The stanchions required to be 45 ft. long, the bases of two of them should have underpinned the taxi road supporting wall—actually a patch of very quick quicksand was discovered when excavating. So a cantilever foundation had to be designed to go across under the goods traffic road and anchor under the station itself. When the road was opened to put in the steel cantilever beams all the important gas pipes and water mains for the neighbourhood were found and the levels made it impossible to cut or divert them except at great expense. And so the cantilever beams became lattice girders in sections which were threadled through the various pipes and bolted together—which has nothing to do with the designing of news theatres, but all goes to show that ingenuity is definitely required in this branch of architecture.*

15 THE SOLUTION OF A JIG-SAW PUZZLE.—*Every piece fits and has its function to perform. The station roof could not be disturbed (except, as usual, at great cost), the roadway could not be lowered (except at great cost). The noise of trains and taxis, both very adjacent, had to be kept out of the auditorium. The shape and materials used in the auditorium were practically imposed on the design. There was no room to "bury" the heating and ventilating system, and as the surface of the back wall of the auditorium required to be broken up to make good sound the ventilation ducts were planted on its face and allowed to roam, within the limits of good proportions. Practically every "feature" arose out of sheer necessity.*

The theatre steelwork, although "amongst" the station structural work, does not touch it anywhere. The railway signal-box is in direct telephone communication with the operator in the projection room, so that the latter can show a slide giving train movements on a screen on the wall beside the ordinary screen. Patrons waiting for trains have the latest news, therefore, in all respects. This idea of providing specialized news as well as news reels will spread. Another reason for a special auditorium and the growth of a new form of architecture.



B: CONSTRUCTION

I. STRUCTURE AND FACING

By J. R. Leathart

The photographs chosen by Mr. Leathart to illustrate his article are as comprehensive as regards the use of different facing materials as it was possible to select from recent cinemas. Faience predominates as a facing material ; it has been used in combination with brick, stone, granite, marble and stucco. Brick follows in order of popularity ; reconstructed stone, except at Wimbledon, is chiefly adapted as a dressing material in conjunction with brick. Glass occurs once only, at Weston-super-Mare, and then only sparingly. The author points out that there is not a completely glass-fronted cinema in England at the moment ; neither is there a cinema built entirely in reinforced concrete, with the walls left naked and unashamed from the shuttering.

TIME is the essence of all building contracts, but in cinema building it is, perhaps, the most vital factor of all. It is not overstating the urgency of this matter to describe cinema building operations as an unceasing headlong rush from the time the hoarding surrounds the vacant site to the moment when the last painter and chair-fixer are being " shushed " out of the back door whilst the mayor and corporation are crossing the red carpet from their cars to the front door for the opening ceremony. The last week prior to the opening date, which, incidentally, is always fixed by those least acquainted with the technicalities of construction and decoration, is spent by the architect and builder in a feverish whirl of hustle and anxiety ; the workmen labouring under conditions which exasperate them and which are certainly not conducive to first-class results.

There have been instances where the licence has been refused by the local authority at the last moment before opening because of the scamped work inevitable when men work long hours of overtime and under the most trying conditions.

RACING FOR A FILM RELEASE

The whole trouble arises from the necessity for the cinema owner to book his opening films months ahead of delivery date, and as he must start off with a " feature " film of alleged importance, he has to time his opening to coincide with the release of such a film. Thus it is that everyone connected with the building of the cinema has to curse and sweat his way along for the sole purpose of allowing some film god or goddess to speak his or her little piece on a white screen at a predetermined moment of time. The gigantic effort involved is, quite possibly, out of all proportion to the result achieved. There is, therefore, no reason for condemnation at the poor craftsmanship displayed in many of our cinema buildings ; indeed it is a matter of wonderment that the average quality is as high as it is—particularly when it is borne in mind that the cinema is a most complicated structure containing a vast amount of highly specialized mechanical equipment, the like of which is possessed by no other type of building.

The fundamental consideration in cinema building must be concerned with the selection of a time saving form of construction—not of necessity the least costly, but the most speedy. To enable the equipment and decoration to commence at the earliest possible moment it is essential that all voids should be roofed in without delay. This question of roofing-in is the crux of the whole of the building operations. It is so urgent, that often the suspended fibrous plaster ceiling work is commenced at one end of the covered-in auditorium to follow a bay or so behind the covering-in process to the main roof.

MAIN TYPES OF CONSTRUCTION

Of the three main types of construction : reinforced concrete, the steel framed structure and that built of load-carrying brick walls of statutory thickness, the steel framed structure has been found to be the only type capable of fulfilling all the essential requirements of speed in erection. It possesses further advantages in that it is flexible—that is to say it is capable of being altered and readjusted with facility and economy to suit possible changes in planning ; it saves space—in this consideration it compares favourably with statutory wall construction ; it produces a drier building initially than one erected in reinforced concrete, by reason of the semi-dry character of the thin enveloping walls of brick ; and in auditorium construction the cavities resulting after stanchion casing between the outer wall and the thin inner flush skin can be used for the upcast ducts in connection with the ventilation system. These advantages offset the increase in cost of a steel framed structure over the statutory wall and reinforced concrete forms of construction.

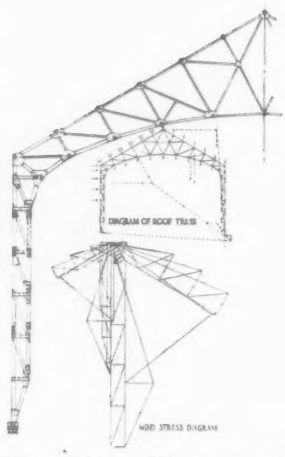
NO REINFORCED CONCRETE CINEMA

In England no cinema has yet been erected entirely of situ-cast reinforced concrete and the probability is remote. Patents have been taken out for a combined form of pre- and situ-cast concrete construction for which are claimed the triple advantages of cheapness, speed and an initially dry structure. The need for a form of construction which is comparatively dry during erection processes is an urgent one. Decorators particularly require a minimum moisture content in the shell of the building for their internal decorative finishings. Situ-cast concrete and mortar, especially the former, have a high water content which tends to evaporate internally when the heat is first applied as a test during building operations. Sweating walls and ceilings play havoc with paintwork and are the decorators' constant source of anxiety, trouble and expense.

In the system of concrete construction just mentioned the filling panels to the walls are made of pre-cast reinforced concrete slabs in fairly large squares, faced up on both sides. At the main points of support the slabs are specially formed to function as the permanent shuttering to the situ-cast reinforced

concrete piers carrying the point loads. As the wall slabs are made and matured with a true internal face before erection, it is possible to eliminate plastering and to substitute instead a sprayed texture painted finish. Thus there are two main advantages: increased speed by saving plastering and a dry wall for immediate decoration. Like many other good things in theory, this patent has not yet been tried out in a cinema building, although it has been used with success in flat building.

For the moment, therefore, and, indeed, for many moments to come, the steel framed structure is pre-eminent in cinema construction. Its advantage for the auditorium has been indicated already, but a similar benefit is applicable to entrance hall and foyer construction; and economy of space, ease of construction and an unlimited scope for planning irrespective of the structural walls all outweigh the extra cost involved.



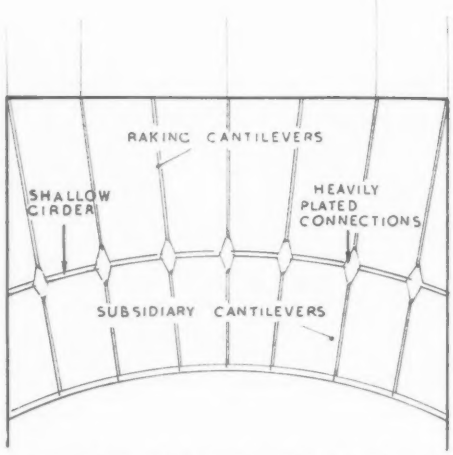


Figure 1 (*left*). *Walls and roof detached from balcony effects speedy roofing in and enables interior to be proceeded with during inclement weather.* **Figure 2** (*right*). *A costly method of balcony construction justified by the maximum seating capacity obtained within a prescribed minimum height between the tiers.*

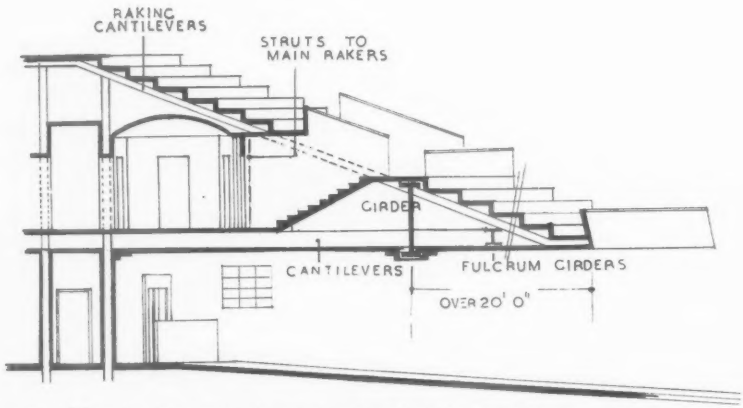


Figure 3. *When the foyer or tea lounge floor level in balcony void is arranged at approximately the same level as front balcony stepping there are several constructional advantages.*

STAGE AND PROSCENIUM

In stage construction the steel frame is again an advantage, particularly so as stage walls, if built of brick to the statutory thicknesses for walls of unsupported length and height, tend to become so thick that the floor area is inordinately restricted. The interpretation of the regulations by some local authorities gives the architect no option but to adopt the steel frame with its thin panel walls. It is necessary to provide lateral support for the high walls by means of wind braces to compensate for the reduced stability due to the omission of thick load-carrying brickwork.

Similar consideration must be given in design to the stability of that part of the auditorium between the balcony and the proscenium opening which again has a great unsupported height. At the Kensington Cinema, which was one of the earliest post-war steel framed theatres, the walls and roof of the auditorium were detached from the balcony construction and were carried on a form of steel arch construction resting on pin-bearings at foundation level (Fig. 1). This dissociation of the main structure from the balcony construction effected a speedy roofing-in and enabled the internal construction to be proceeded with under satisfactory conditions during inclement weather.

At Dreamland, Margate, the adoption of the steel framed structure produced many advantages. It is doubtful whether any other form of construction would have been possible under the special conditions dictated by the plan requirements. It was necessary to bridge the auditorium across a main approach road to the amusement park behind, and the main balcony girder weighing 60 tons ran almost parallel with and over the axis of this road. Due to the special advantages of frame construction this great girder was placed in position without any interference with the traffic using the road beneath.

ROOF: PITCHED OR FLAT?

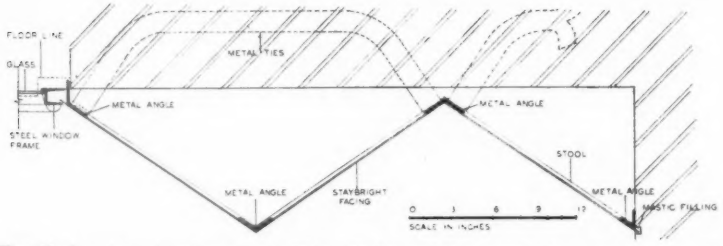
Two other considerations in cinema construction are the type of roof and the balcony shape. Of the former, the pitched roof covered with asbestos sheeting is the cheapest and, therefore, the most commonly used; but the flat roof with a light steel deck spanning between the purlins and covered in with bituminous sheeting and insulating tiles has certain advantages which cannot be ignored. Not the least of these is concerned with æsthetics, and architectural considerations, when concerned with the preservation of local amenities, may rule out the pitched roof. The flat roof, from a practical point of view, offers no surface resistance to wind pressure, and its construction has been cheapened and lightened by the introduction of the steel deck; these factors have assisted in bringing its use into greater popularity. In instances where the auditorium ceilings rake downwards towards the proscenium, the opportunity may be taken to reduce the cube of the auditorium shell by stepping the flat roof in a compensating series of planes as at the Sheen Cinema. This also effected a saving on the brickwork to the wall-panel fillings between stanchions by lowering the height.

BALCONY CONSTRUCTION

Balcony construction varies according to the planning of the entrances and exits, to the seating accommodation, and to the utilization of the void for tea-lounges or other purposes. The simplest form is that consisting of a main girder with subsidiary wing girders

A façade in faience tiles, in graded tones of amber and cream. The ground floor piers are faced in black glass panels, in silvered metal frames. In the parapets are sunken bands of inlaid tiles, in jade green. The Odeon, Weston-super-Mare. By T. Cecil Howitt.

Walls of reconstructed stone and brick: black fluted flanking pilasters to central window, which is lined with stainless steel sheets, see detail drawing reproduced below. Blacks Regal Cinema, Newcastle-upon-Tyne. By Edwin M. Lawson.



Detail drawing showing construction of the stainless steel sheets to the central window of the Regal Cinema. See photograph reproduced above.

supporting cantilevers carrying the overhanging front rows of seats. This cantilevered overhang is generally limited to a distance of approximately twenty feet, beyond that some further auxiliary construction is advisable to ensure rigidity. Where a greater distance is desired it is expedient that the foyer or tea-lounge floor level in the balcony void is arranged at approximately the same level as the front balcony stepping (Fig. 3). By this arrangement it is possible to provide three or four cantilevers projecting beyond the main balcony girder in order to carry a fulcrum girder of shallow depth. This shallow girder in turn supports the smaller cantilevers of the front balcony overhang. An additional advantage of this form of construction follows by strutting up off the top of the main cantilevers to support the rakers carrying the back portion of the balcony; by this means the depths of the rakers are reduced and the height of the void correspondingly increased.

An interesting type of balcony construction occurs in a double tier theatre, such as the Coliseum and the Palladium, London. For economic reasons, it is essential that the tiers should be separated by only the minimum height of 10 ft. clear prescribed in the regulations; a main supporting girder of normal depth usually makes it impossible to obtain the minimum clearance. Accordingly, a more homogeneous type of suspension is found to be necessary consisting of a main member segmental on plan to follow the balcony steppings which is minimized in depth by incorporation with the cantilevers (Fig. 2). This device entails heavily plated connections at the junctions between the girder and the cantilever to counteract the natural tendency for the main member to twist due to its plan curvature. This method of construction is a costly one, but it is justified by the maximum seating capacity obtained within a prescribed minimum height.

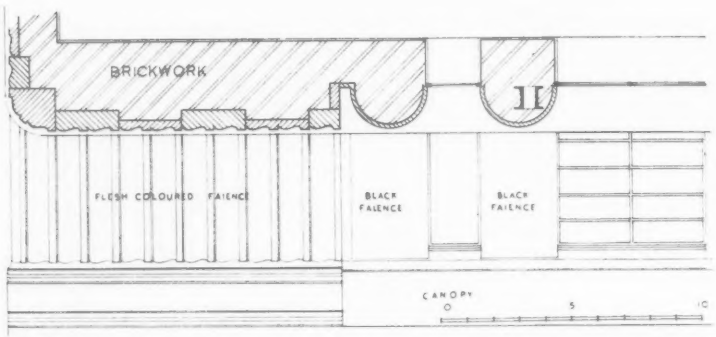
FACING MATERIALS

It is just as impossible to speculate on the ultimate character of film entertainment as it is to foretell the probabilities of it obtaining a permanent hold on public taste. It is a mere infant in arms when measured against the stature of the theatre and the circus, and no one can predict its ultimate survival against the approaching competition of television. When sound and movement on a screen can be enjoyed in the comfort and privacy of the home, who shall say that the cinema will grow to maturity?

The possible transiency of film exhibitions in halls specially planned for

that purpose must be borne in mind, and it is perhaps permissible to regard the cinema as a contribution to a temporary phase of current building. Cinema architects are free, therefore, to experiment with new expressions in design and with new forms of materials with a certain degree of confidence that their mistakes and lesser successes will not trouble posterity to too great an extent. Not the least of these experiments is concerned with the introduction of colour to the cinema front in some intrinsic form of material other than the application of paint. Two materials, faience-ware and glass, are media in which permanent colour can be applied. Both possess the advantage of an easily cleaned surface which enables the pristine delights of the original colouring to be enjoyed at regular intervals of time by the simple process of washing down with water. The restoration of temporarily departed glory by such economic means possibly accounts for the vast number of cinemas faced with glazed terra-cottas. Now that the architectural expression of this material no longer partakes of the character of imitation masonry work, it has achieved a significance which has removed it from the mere commonplace.

Reconstructed stone, with a granite finish; relieved by black faience columns to windows. Regal, Wimbledon. By Robert Cromie.



Detail of black faience columns to the centre windows of the Regal Cinema, Wimbledon. See photograph above.

FAIENCE, GLASS AND GLASS MOSAIC

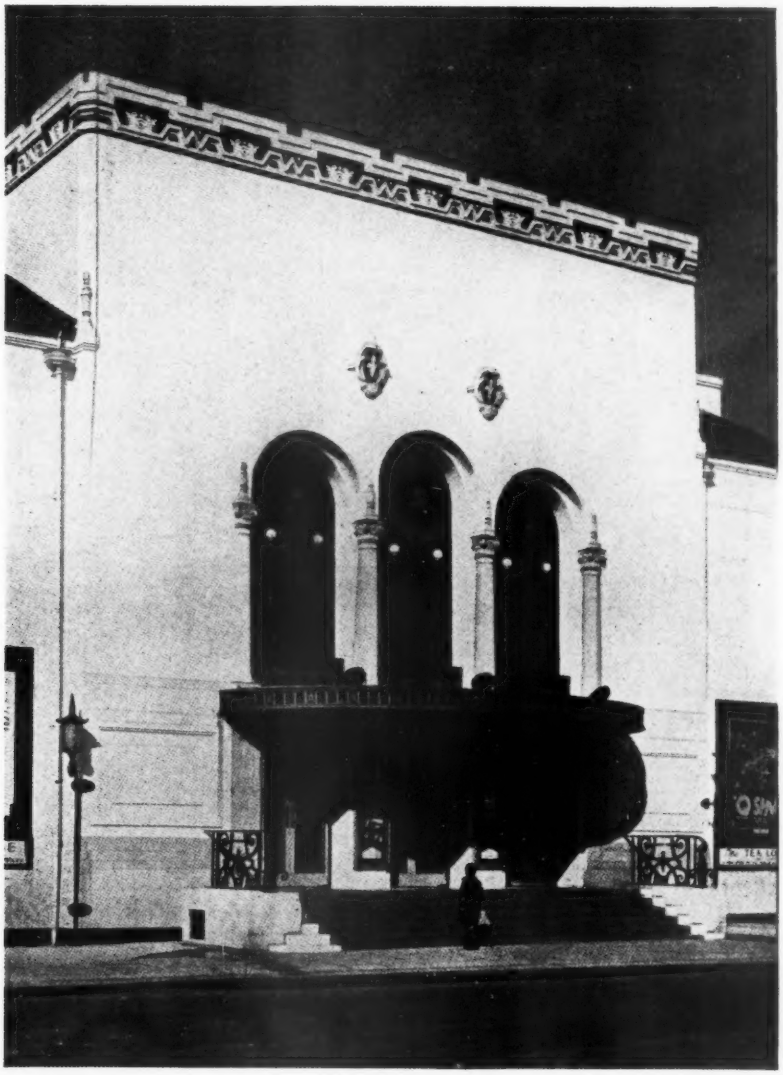
Faience, used alone or in combination with brick, stucco, glass or synthetic resin, possesses decorative qualities which the accompanying illustrations show to be of importance to the architect. It has been used as a predominating material in conjunction with glass at the Odeon, Weston-super-Mare. Here the broad surfaces of the façade have been sheathed in 2 ft. unit squares of faience tiles, set off by wide 1 in. joints. The tiles have a graded colour range of tones between amber and cream, blended to neutralize the deadness of tone inherent to large wall surfaces of one colour. Broad parapets terminate the wall heads against the skyline and carry slightly sunken bands of inlaid tiles in jade green, against which the neon lighting tubes are hidden during daylight. Below the marquise, irridescent black armoured plate glass panels fixed in silvered metal frames are used to face the ground floor piers. In addition to reflecting the colour and movement of the street panorama, these black panels accentuate the posters which are arranged against them. Hand painted shutters, brightly coloured casement frames and flower boxes add to the gaiety of the composition and express the recreational character of the building.

Colour has been introduced to a stuccoed front at the Twickenham by means of a faience cornice and cartouches in the patriotic colours of red, white and blue, and also by green glazed Roman tiles to the two side roofs. The main field of stuccoed wall is relieved by the reconstructed stone attached columns to the triple series of semi-circular headed window openings, each of which contains a brightly painted decorative wrought iron grille. The wall faces are painted grey below the level of the marquise and cream above.

At the Avenue Theatre, Northfields, Mr. Masey has experimented with colour in the form of brightly coloured vitreous glass mosaic which he has used with effect on the frieze panels of the cornice crowning the stuccoed walls. The glass squares are embedded in white cement stucco in the form of decorative patterns. Broad colour effects to the main wall surfaces are obtained by using a tinted cement stucco.

STAINLESS STEEL

Black's Regal Theatre, Newcastle-on-Tyne, is particularly interesting for the use of a synthetic resin material as an external decorative medium. The two black fluted



Stuccoed front, painted grey below marquise, and cream above ; faience cornice and cartouches in red, white and blue. Reconstructed stone columns to semi-circular headed windows. Green glazed Roman tiles to side roofs. Twickenham Cinema. By Leathart and Granger.

Left : many materials, brick, faience, concrete, natural marbles, bronze, cast iron and oak are used in this façade. No material, however, is used which has not withstood the test of time. This policy was dictated by the exposed position of the cinema and the rigorous weather conditions with which it has to contend. Dreamland, Margate. By Iles, Leathart and Granger.

flanking pilasters to the central window on the extreme angle have been made locally in this material, built up on hardwood cores and finished with a highly glossed surface. The central window is lined with stainless steel sheets which contrasts in an emphatic manner with the black pilasters adjoining. The walls are faced with a reconstructed stone and brick. Black, silver and green are the predominating tones used in the composition of this elevation, which is noteworthy for the architect's experiment with a material, the weather-resisting qualities of which have yet to be proved. Time will show also whether the joints between the metal sheets and the junctions between metal and surrounding stonework will be impervious to corrosion.

WHERE NOT TO EXPERIMENT

At Dreamland, Margate, many materials have been employed—brick, faience, concrete, natural marbles, bronze, cast iron and oak. Brickwork

of a warm fawn colour is used in broad unbroken masses above the projecting balcony at first floor level ; wall heads are crowned by green coloured copings of glazed terra cotta, which is also the material for the projecting horizontal divisions between the publicity panels over the main entrance ; these dividing members or fins have been built up on reinforced concrete cores. The balcony, which has a reinforced concrete soffit, is faced with brick and large faience tiles, tinted cream. Below this level, the ground floor piers, entrance lobby and steps are lined with Travertine and golden Travertine marbles, and the bulkheads below the shop windows are faced with black Belgian marble. Bronze grilles and door furniture, the metal left in its natural condition to oxidize with exposure to sea-air, have been used at ground floor level. The letters and frames to the publicity signs, the directional sign suspended from the balcony soffit and the terminals to the tower are also in bronze metal. Doors and shop window frames are in oak painted green to match the colour of the faience ware.

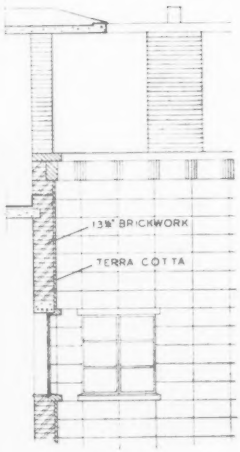
No material has been used in this building which has not withstood the test of time ; the especially exposed position of the front, and the rigorous weather conditions with which it has to contend, dictated the policy of caution in selecting the materials. It is noble to adventure, but the cost of so doing may be, on occasions, more than a client is prepared to face with that degree of equanimity an architect expects of him.

BRICK AND STONE

Two-inch multicoloured facing bricks with artificial Portland stone dressings have been used at the Plaza, Sutton, with most successful results. The secret of the charm of this elevation lies in the patterning of the stonework to the great central window feature against a broad unfretted field of brickwork. The extreme simplicity of the design enhances its effect and it is an elegant example of a stone-dressed brick cinema façade.

Mr. Cromie has also used a similar reconstructed stone, this time with a granite finish, for his Regal Cinema at Wimbledon. The whole of the main wall above the marquise is so faced with accentuated vertical mouldings. As at the Plaza, Sutton, where the brick field was relieved by the white stone central feature, so at Wimbledon is the grey stone of the upper wall broken by black faience columns to the windows. Below the canopy the plinth is faced in black and flesh coloured faience.

A combination of brick and terra-cotta, the last material being used as a decorative surface covering or veneer in tile-like form. Right, a detail of the central feature. Odeon, Worthing. By Whinney, Son and Austen Hall.



Two - inch multicoloured facing bricks with artificial Portland stone dressings. Plaza, Sutton. By Robert Cromie.

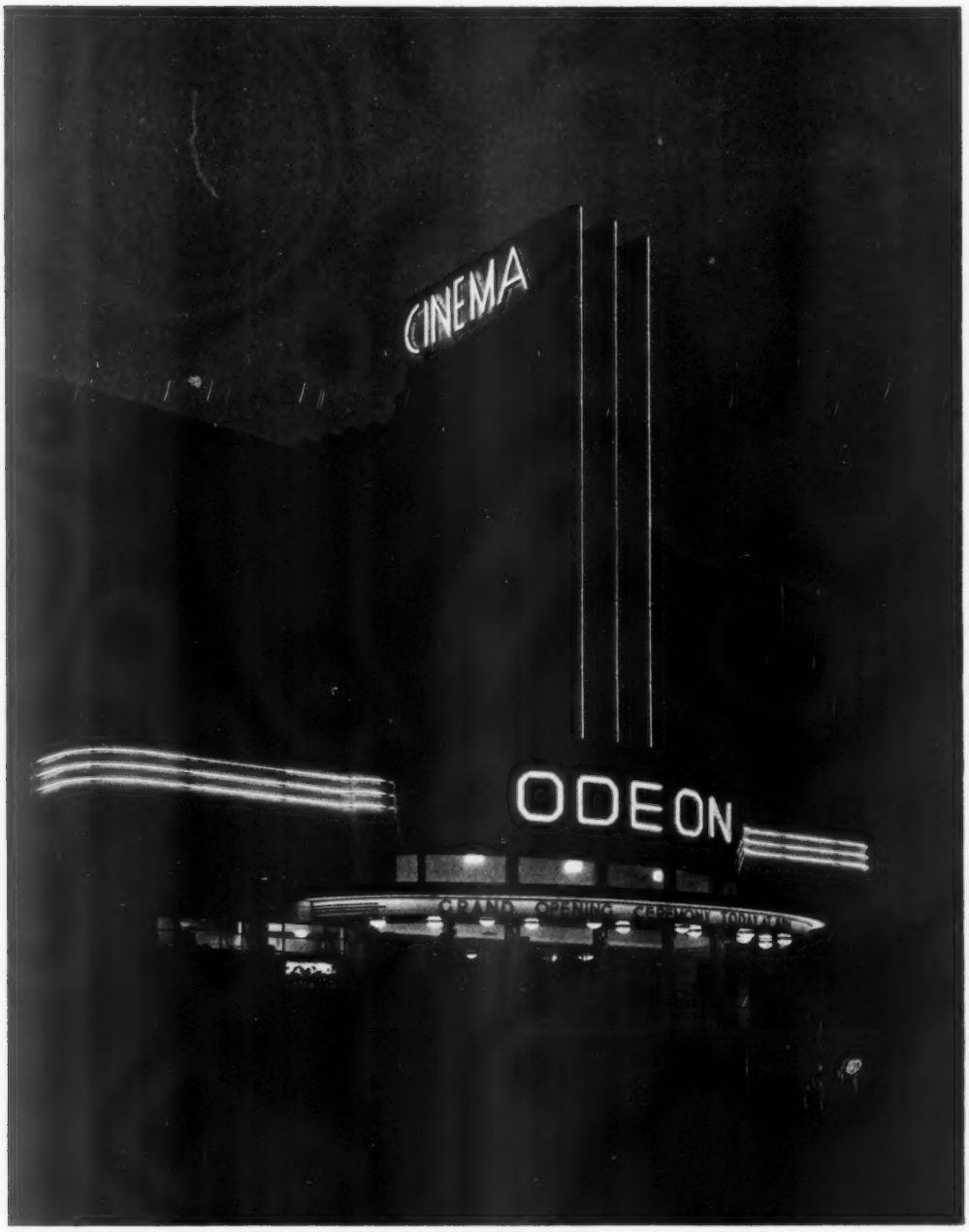
The Odeon Cinema at Worthing is another example of the felicitous combination of brick and terra-cotta, this last material being used as a decorative surface covering or veneer in tile-like form. Joints run in unbroken lines both vertically and horizontally ; and the patterning of the two materials, brick and faience, in broad and individual masses, produces an agreeable largeness of scale which is often absent when faience is used as a dressing to brickwork.

Fawn tones predominate the colour scheme of the glazed-ware, but there are accentuations of brilliant green, blue and black to the tower and the plinth which impart an air of gaiety appropriate to the purpose of the building.

B: CONSTRUCTION

2. COMPLETE SCHEMES

On this and the nineteen pages following are illustrated some complete schemes by prominent cinema architects. Every big city has been provided with its super cinema and the new work is found mostly in the suburbs and in the smaller provincial towns. The illustrations have been selected solely to show the different architectural treatments favoured in this country today for cinemas of various sizes. They are not necessarily the largest cinemas built by the architects whose work is shown.



ODEON, KINGSTANDING. BY HARRY W. WEEDON

Tubular lighting used to emphasize the main lines and mass of the cinema, and not to provide additional forms. A photograph of the building taken by day appears overleaf.

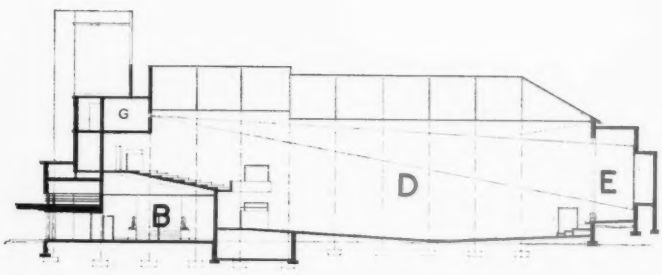
ODEON, KINGSTANDING

DESIGNED BY HARRY W. WEEDON

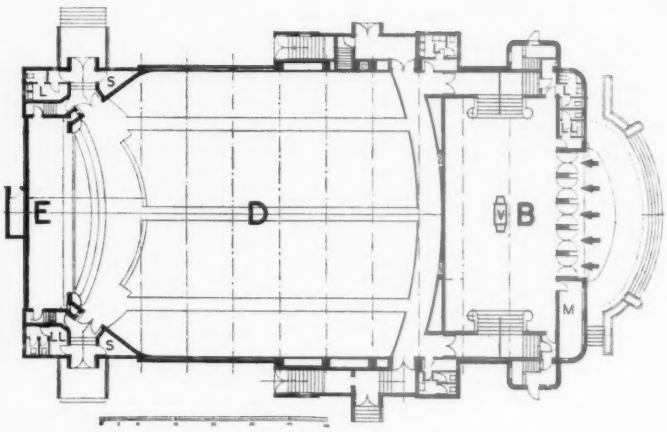
SEATING ACCOMMODATION.—Stalls 1,022; Balcony 324; Total 1,346.

EXTERIOR.—Faced with mottled biscuit-coloured faience, with ¾ in. joints; black faience base; and thin grey-green bricks with wide joints. The centre feature is of Medici green vitreous enamel. The vertical faience fins, as shown on the previous page, are illuminated at night with tubular lighting.

AUDITORIUM.—Decoration relies mainly on a special system of lighting, which gives various ever-changing colour effects.



SECTION



STALLS PLAN

B, Entrance Hall.
D, Auditorium.
E, Stage.
G, Projection Room.
L, Men's Lavatory.
LL, Women's Lavatory.
M, Management.
S, Store.

ASTORIA, SOUTHEND

DESIGNED BY

E. A. STONE

IN ASSOCIATION WITH

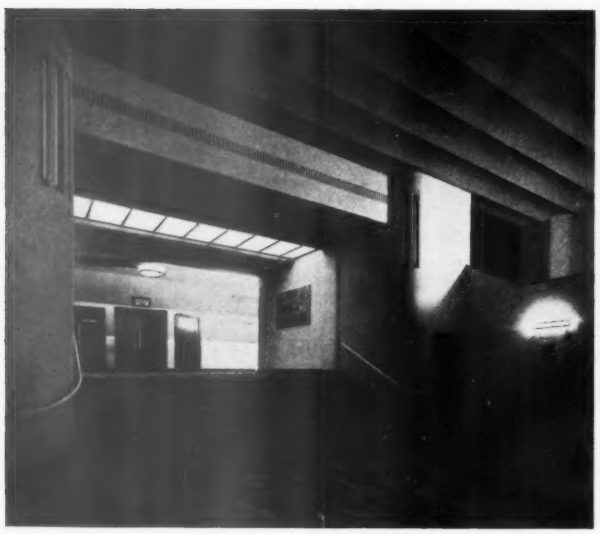
T. R. SOMERFORD

SEATING ACCOMMODATION.— Stalls 1,750; Balcony 1,000; Total 2,750.

EXTERIOR.—Faced with polished biscuit-coloured artificial stone; windows, metal. Bronze-and-green canopy forms a basis for floodlighting upwards. Coloured tubular lighting outlines the canopy, the windows, the name sign and its surrounding panel, and the whole of the upper façade, including the vertical lines of the central section.

STAIRCASE HALL.—Walls, neutral tint of spray plastic paint, relieved with gold speckling. Carpet: black, blue and green. Flat lighting panels flush with surface of wall pilasters. Fluting in the ceiling coloured trifle darker than the walls.

The photographs show: above, the main front; below, the central stairway leading from the staircase hall to the stalls vestibule; and, right, the staircase hall.

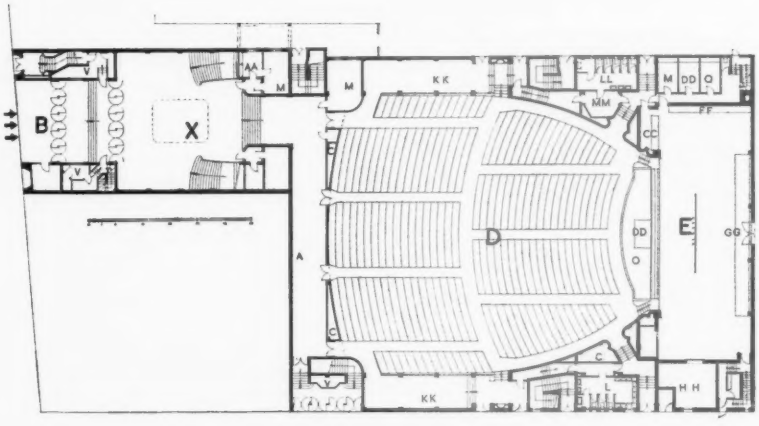


ASTORIA, SOUTHEND : DESIGNED BY E. A.

AUDITORIUM.—Walls, warm pink, shaded with bronze. There is not a visible light source in the whole auditorium. Tabs are pale pink; seats, blue. A layer 1 in. thick of patent asbestos was applied to the rear walls of the auditorium, on the balcony front and on the projection box front for acoustical reasons. The side walls were also treated with this material in panel form, the whole being sprayed with a textural paint.

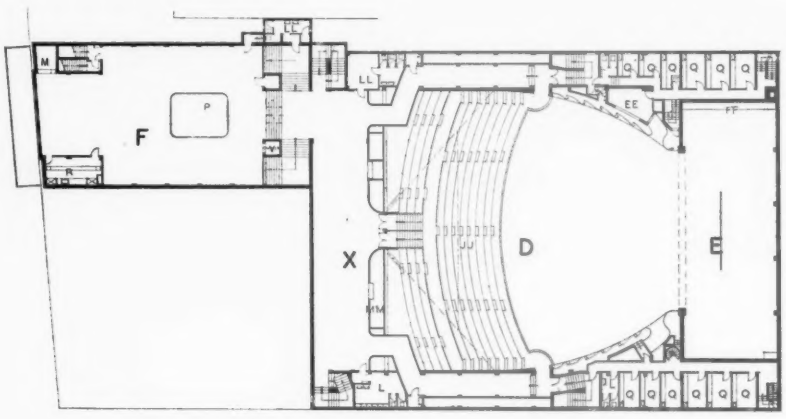
CAFE.—Wall treatment in a kind of plant motif in black-blue, blues and bronzes.

On the left is a view of the cafe, showing the entrance hall well.



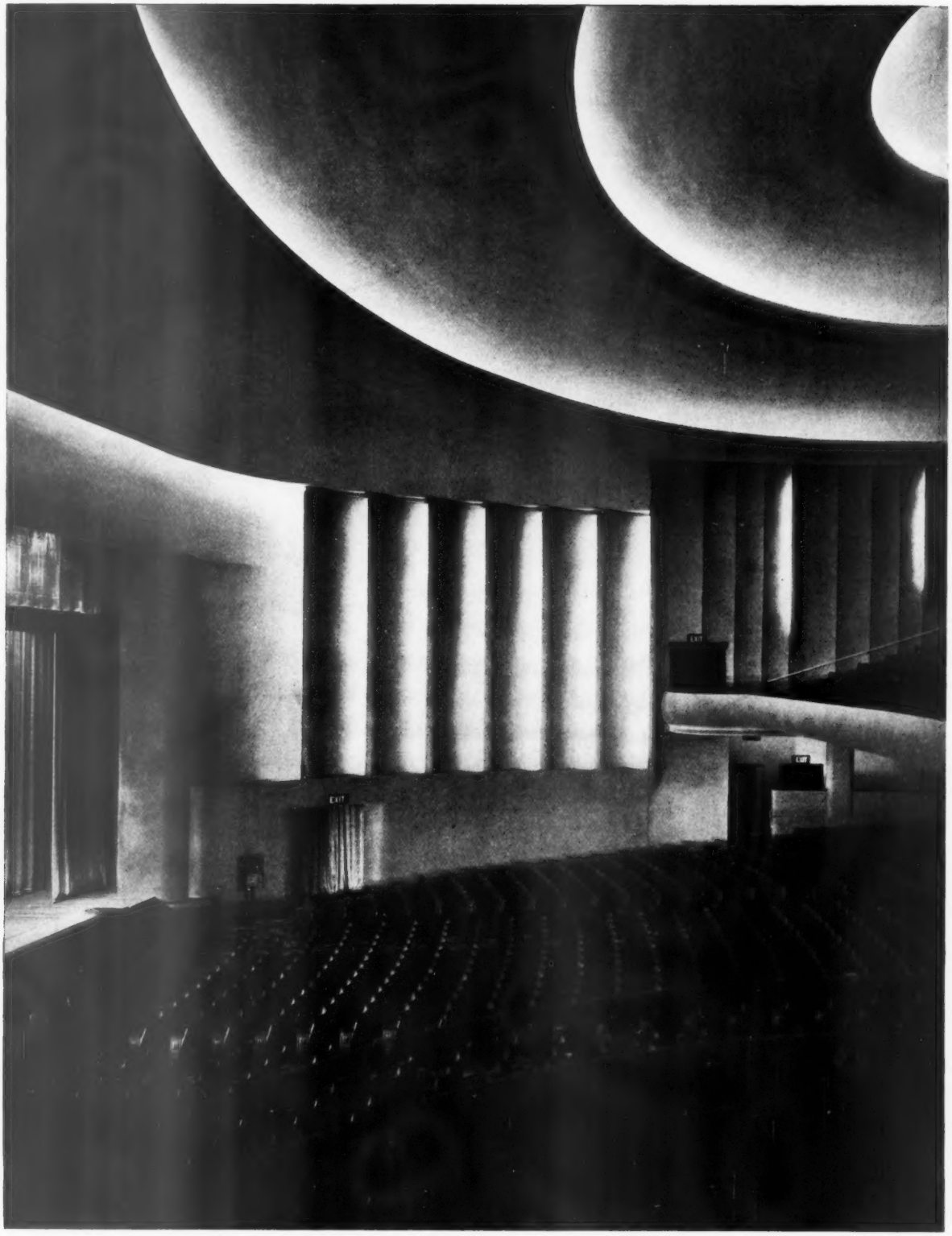
A, Vestibule.
AA, Offices.
B, Entrance Hall.
C, Duct.
CC, Electrician.
D, Auditorium.
DD, Organist.
E, Stage.
EE, Organ Chamber.
F, Cafe.
FF, Counter Weights.
GG, Cyclorama.
HH, Property Room.
JJ, Balcony.
KK, Promenade.
L, Men's Lavatories.
LL, Women's Lavatories.
M, Management.
MM, Cloaks.
O, Orchestra.
P, Open Well.
Q, Dressing Room.
R, Kitchen.
V, Pay Box.
X, Staircase Hall.

STALLS PLAN



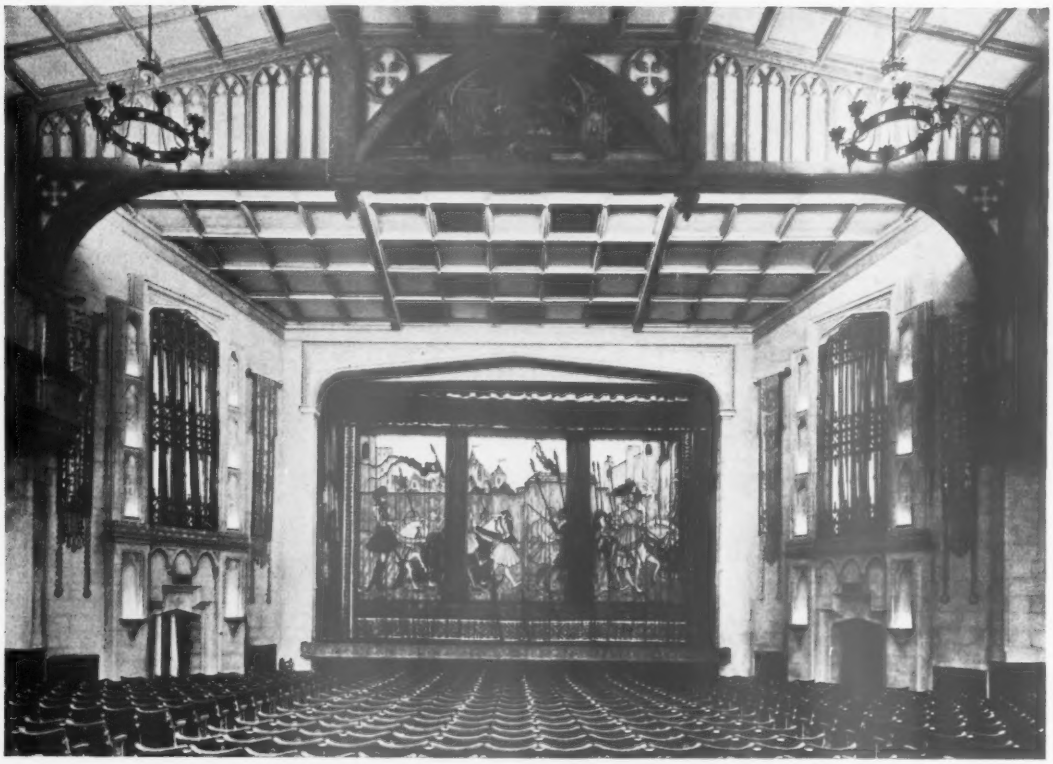
LOWER BALCONY FLOOR PLAN

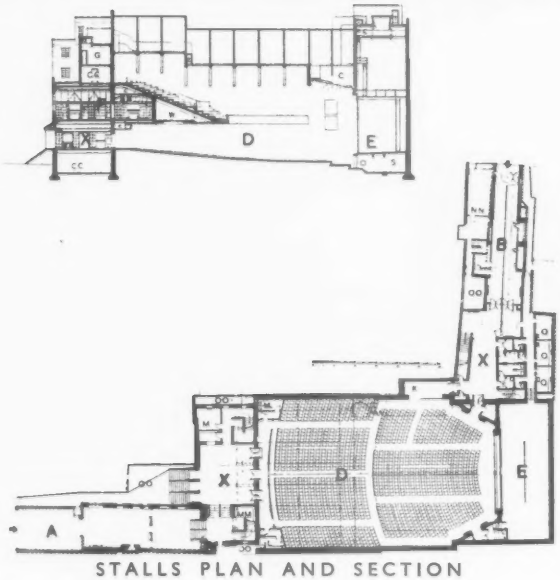
STONE AND A. T. SOMERFORD



Above is a view looking across the auditorium.

GAUMONT, SALISBURY: W. E. TRENT,





STALLS PLAN AND SECTION

SEATING ACCOMMODATION.—Stalls 1,125; Balcony 550; Total 1,675.

EXTERIOR.—This remains unaltered, except that the woodwork has been cleaned and dressed with oil; the decorative shields and arms have been picked out in bright colours; and neon lighted letters have been added.

AUDITORIUM. — Treated in a manner suggestive of a fifteenth-century hall, to preserve the atmosphere of the old halle of John Halle, which forms the approach to the cinema. The architects decided that a break from this early halle to a theatre designed and treated in the modern manner would be too abrupt and hard. The photographs show: top, a general view of the auditorium; bottom, the main front.

A, Vestibule.
B, Entrance Hall.
C, Duct.
D, Auditorium.
CC, Electrician.
E, Stage.
G, Projection Room.
M, Management.
MM, Cloaks.
NN, Shop.
OO, Area.
S, Store.
W, Void.
X, Foyer.

ARCHITECT; E. F. TULLEY, ASSISTANT

THE HALLE OF JOHN HALLE forms the approach to the cinema and is entered from the entrance hall. It was built by John Halle, citizen and wool merchant of Salisbury, about 1470, and has been little changed since that date. His coat of arms and merchant's mark appear on window and chimney piece; and the open timber roof and the walls remain as he knew them. The three openings through the old carved oak fitting, shown in the photograph, lead to a further room of somewhat later Tudor period. Parts of this fitting are very old, but it is almost certain it had nothing to do with the original halle. One might hazard a guess that it formed part of the furniture of the tavern, for which the halle was used in the seventeenth century. The entrance front shown on the facing page is said to have been designed and built by Pugin, who superintended the restoration of the halle in 1834.

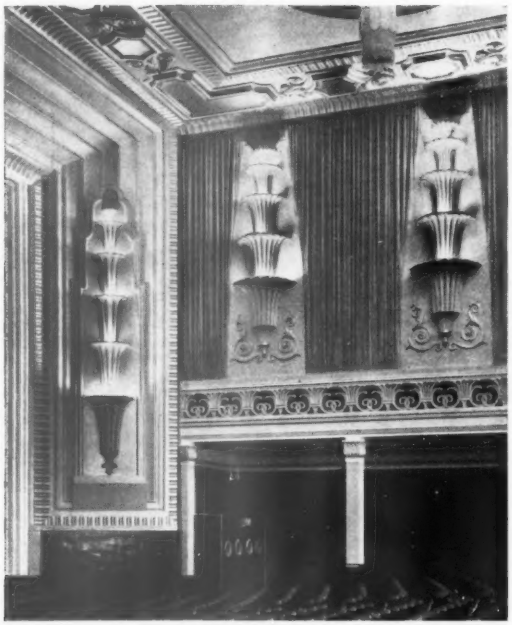
GAUMONT, TAUNTON: DESIGNED

SEATING ACCOMMODATION.—Stalls 982 ; Balcony 494 ; Total 1,476.

EXTERIOR.—Taunton sand-faced bricks, of somewhat rough texture and in colours, ranging from rich dark brown, lighter browns and yellows. Windows, entrance, balcony, etc., on main front, Ham Hill stone. Entrance doors, mahogany, french polished to a black colour, with beads, etc., picked out in Chinese orange and gold. Canopies, at front and side, bronze, left a natural colour and lacquered. Windows throughout in hardwood, painted ; the majority being coloured orange with the beads picked out in gold.

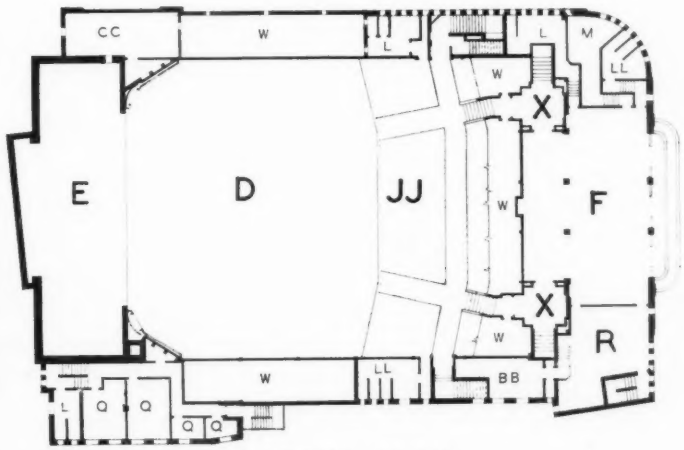
The photographs show : above, the side elevation ; left, the main entrance front.

BY WILLIAM T. BENSLYN

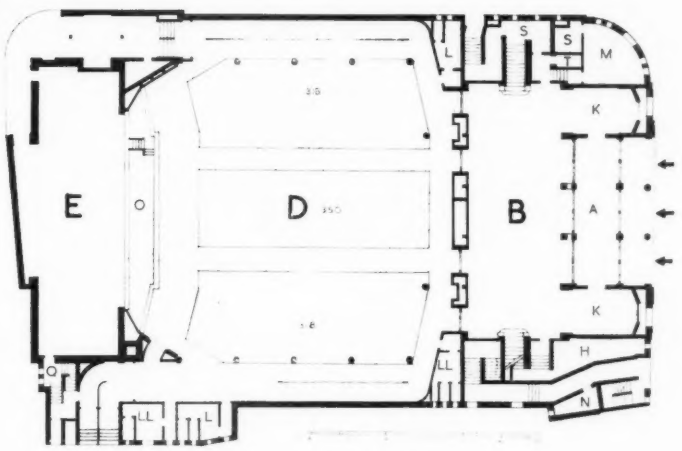


AUDITORIUM.—Walls, plastered ; side walls covered with golden colour velour, fireproofed, and hung in folds near the proscenium end for acoustical absorption. Ceiling, fibrous plaster. Colour scheme, ivory ground lined with Chinese orange, with a number of reflective surfaces treated in theatre gold and a certain portion in leaf gold. Proscenium curtains and pelmet, gold coloured velour. Carpets, arabesque type with general rose tone ; seats, rose colour.

Above is a view of the side wall of the auditorium.

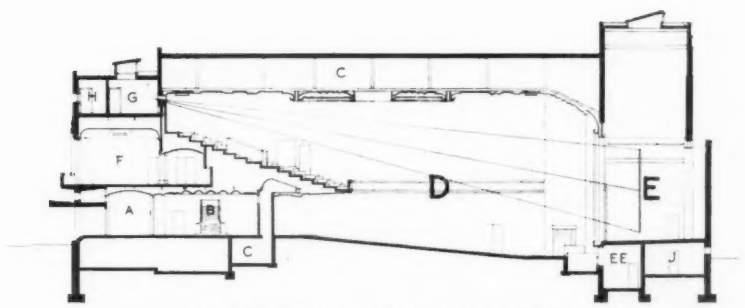


BALCONY PLAN



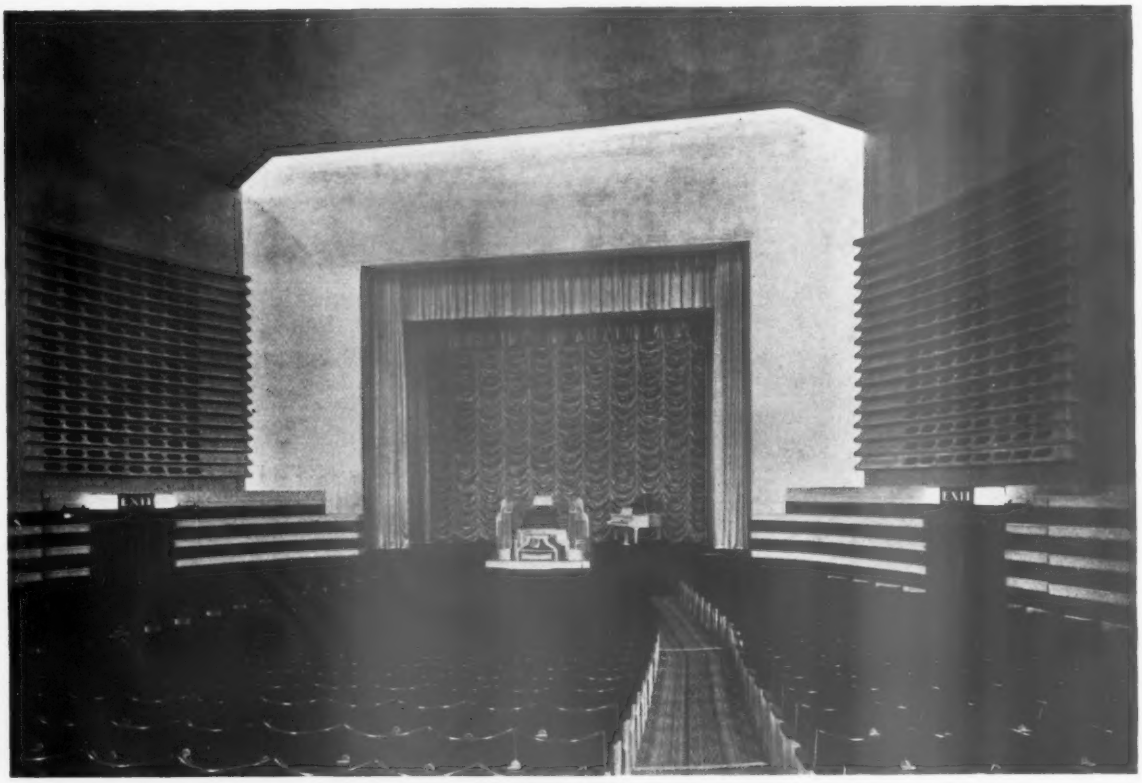
STALLS PLAN

A, Vestibule.
B, Entrance hall.
BB, Staff room.
C, Duct.
CC, Electrician.
D, Auditorium.
E, Stage.
EE, Organ chamber.
F, Cafe.
G, Projection room.
H, Switch room.
J, Band room.
JJ, Balcony.
K, Waiting space.
L, Men's lavatory.
LL, Women's lavatory.
M, Management.
Q, Dressing room.
R, Kitchen.
S, Store.
W, Void.
X, Foyer.



LONGITUDINAL SECTION

REGAL, MARGATE: DESIGNED



SEATING ACCOMMODATION.—Stalls 1,315; Balcony 480; Total 1,795.

EXTERIOR.—Metal and glass, with black terrazzo columns on either side of entrance. Upper portion of façade moulded stone; entrance doors, mahogany ebonized; canopy contains a double feature lighting box.

AUDITORIUM.—Walls, plastic paint texture; ceiling, fibrous plaster slabs, sprayed with plastic paint; splay wall grilles and main ceiling grille, fibrous plaster. Colour scheme generally, gold and black speckle relieved with red; laylight coloured red and gold. Proscenium curtains are of green material and there are silver stage festoon curtain and cream screen curtains, the whole scheme shading down from green to cream. The carpet is modern abstract design in grey, green and black; seats, green.

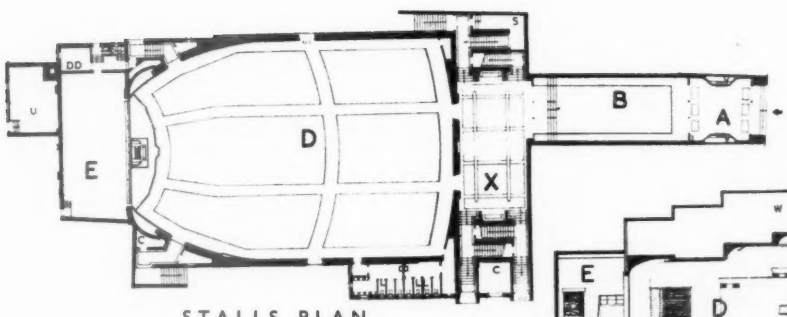
The photographs show: the auditorium looking towards the proscenium; and the entrance front.

B Y R O B E R T C R O M I E

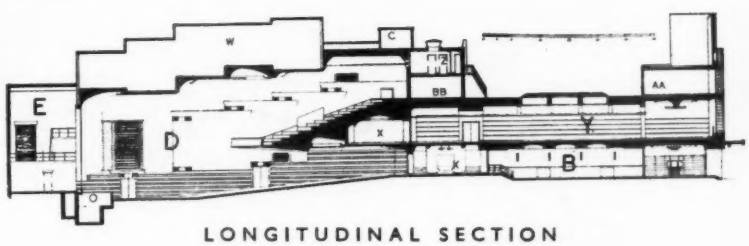
FOYER.—Walls generally are gold speckle, relieved with red. Carpeted floor with terrazzo margins ; carpet in grey, green and black.

A, Vestibule.
AA, Offices.
B, Entrance Hall.
BB, Staff Room.
C, Duct.
D, Auditorium.
E, Stage.
G, Projection Room.
L, Men's Lavatories.
LL, Women's Lavatories.
S, Store.
U, Boilers.
X, Foyer.
Y, Café.

The photographs show : the auditorium looking from the stage ; right, the foyer.



STALLS PLAN



LONGITUDINAL SECTION

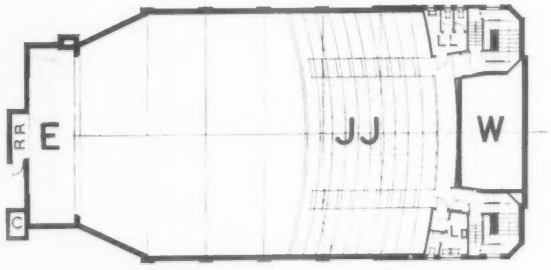
ASTORIA, RUISLIP, MIDDLESEX

DESIGNED BY STANLEY BEARD AND BENNETT

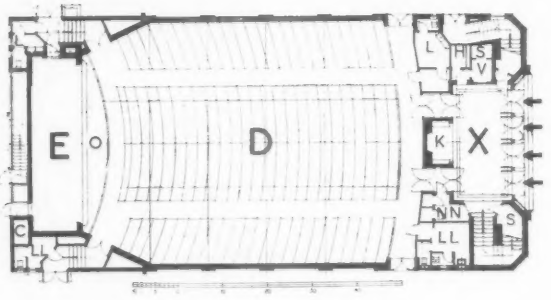
SEATING ACCOMMODATION.—Stalls 647; Balcony 270; Total 917.

EXTERIOR.—Centre feature of brickwork is rendered with cement, tinted a pale cream. Coping, terra cotta; plinth and surround to main entrance doors, black terra cotta. Central windows, steel; projecting masts between windows and circular tympanums in cast metal.

AUDITORIUM.—Colour scheme generally in beige, with green and gold decoration. Proscenium, fibrous plaster, with the splayed walls treated in bands of texture paint; grilles, fibrous plaster.



BALCONY PLAN



STALLS PLAN

C, Duct.
D, Auditorium.
E, Stage.
H, Switch Room.
JJ, Balcony.
K, Waiting Space.
L, Men's Lavatory.
LL, Women's Lavatory.
O, Orchestra.
RR, Horn Chamber.
S, Store.
V, Pay Box.
W, Void.
X, Foyer.

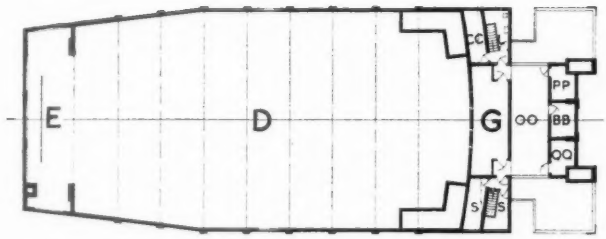
REGAL, ABINGDON: BY HAROLD S. SCOTT

SEATING ACCOMMODATION.—Stalls 750 ; Balcony 250 ; Total 1,000.

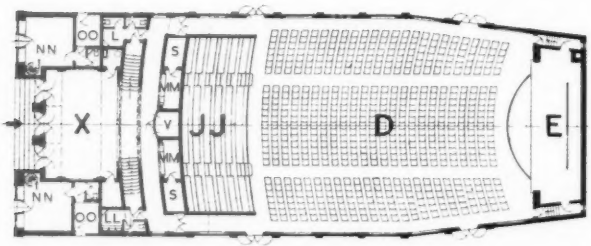
EXTERIOR.—Rustic multi-coloured 2 in. facing bricks ; windows, steel. Canopy, green and gold ; entrance doors, ebony with plate glass, sand-blasted.

AUDITORIUM.—Walls, plastic paint in deep peach colour at base, fading out to light peach at frieze. Ceiling, pale peach ; proscenium curtains, carpets and seating, rose colour.

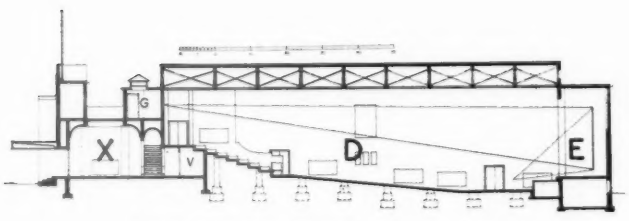
BB, Staff room.
CC, Electrician.
D, Auditorium.
E, Stage.
G, Projection room.
JJ, Balcony.
L, Men's lavatory.
LL, Women's lavatory.
NN, Shop.
PP, Rectifiers.
S, Store.
X, Foyer.



PLAN AT PROJECTION ROOM LEVEL

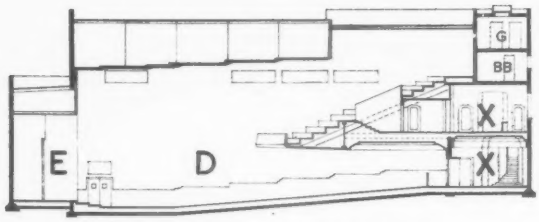


STALLS PLAN

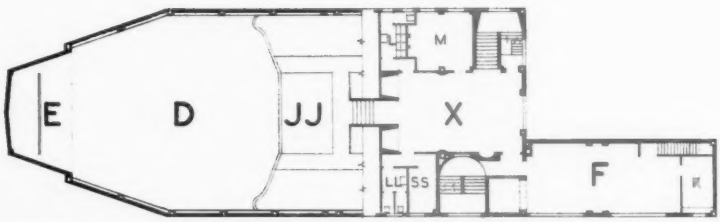


LONGITUDINAL SECTION

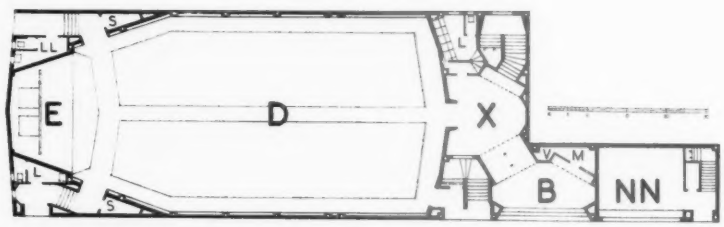
THE PLAYHOUSE, MONTROSE, ANGUS:



LONGITUDINAL SECTION



PLAN AT CAFÉ LEVEL



PLAN AT STALLS LEVEL

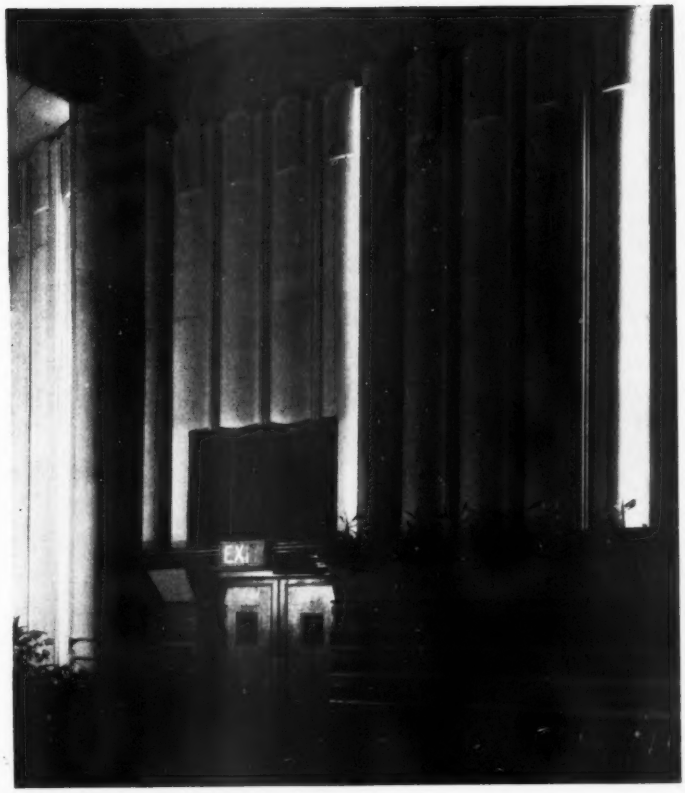
SEATING ACCOMMODATION.—Stalls 694; Balcony 319; Total 1,013

EXTERIOR.—Treated in buff and light brown coloured cement, finished in varying textures. The metal canopy is illuminated at night. The tall metal grille window contains decorative scroll work.

B, Entrance Hall.
BB, Staff Room.
D, Auditorium.
E, Stage.
F, Café.
G, Projection Room.
JJ, Balcony.
K, Waiting space.
L, Men's Lavatory.
LL, Women's Lavatory.
M, Management.
NN, Shop.
S, Store.
SS, Boudoir.
V, Pay-office.
X, Foyer.

The photographs show: the entrance, foyer; proscenium; and main front.

DESIGNED BY ALISTER G. MacDONALD

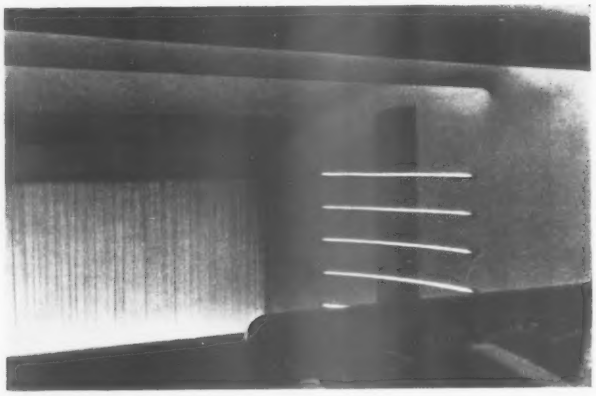


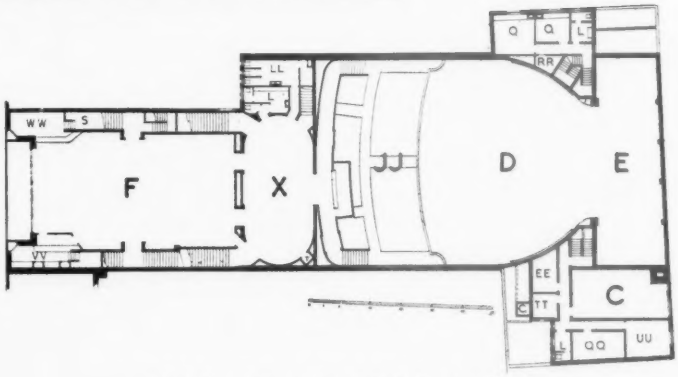
ENTRANCE FOYER. — Lined with wallboard, with bands of gaboon mahogany panelling. Over each of the recessed panels for the display of posters is a low relief plaque, modelled in plaster by Edward Carrick. On the ceiling are silver gilt stars in relief on a lavender grey sky.

AUDITORIUM. — Lined with wallboard. On the wall surfaces the vertical joints are overlapped to produce a light and shade effect. The ceiling is stepped for acoustical purposes. Colour scheme, green and lavender grey.

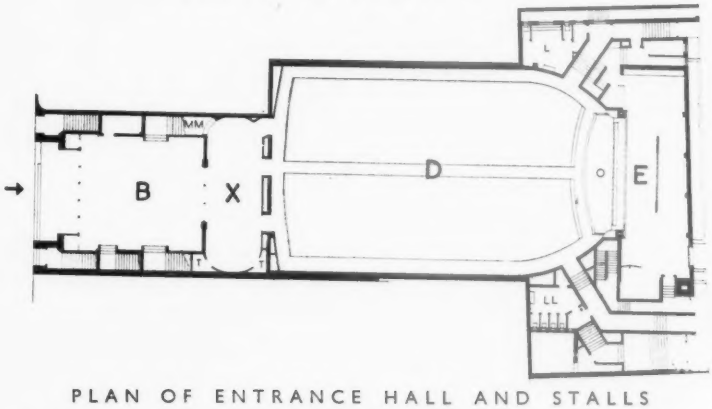
The photographs show two views in the auditorium.

ASTORIA, FOLKESTONE: DESIGNED BY

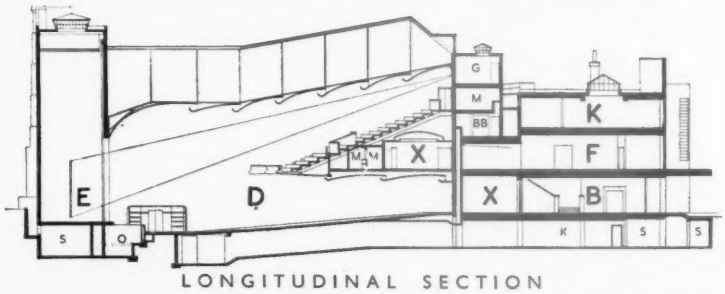




PLAN AT BALCONY LEVEL



PLAN OF ENTRANCE HALL AND STALLS



LONGITUDINAL SECTION

SEATING ACCOMMODATION.—Stalls 1,120; Front Balcony 160; Back Balcony 390; Total 1,670.

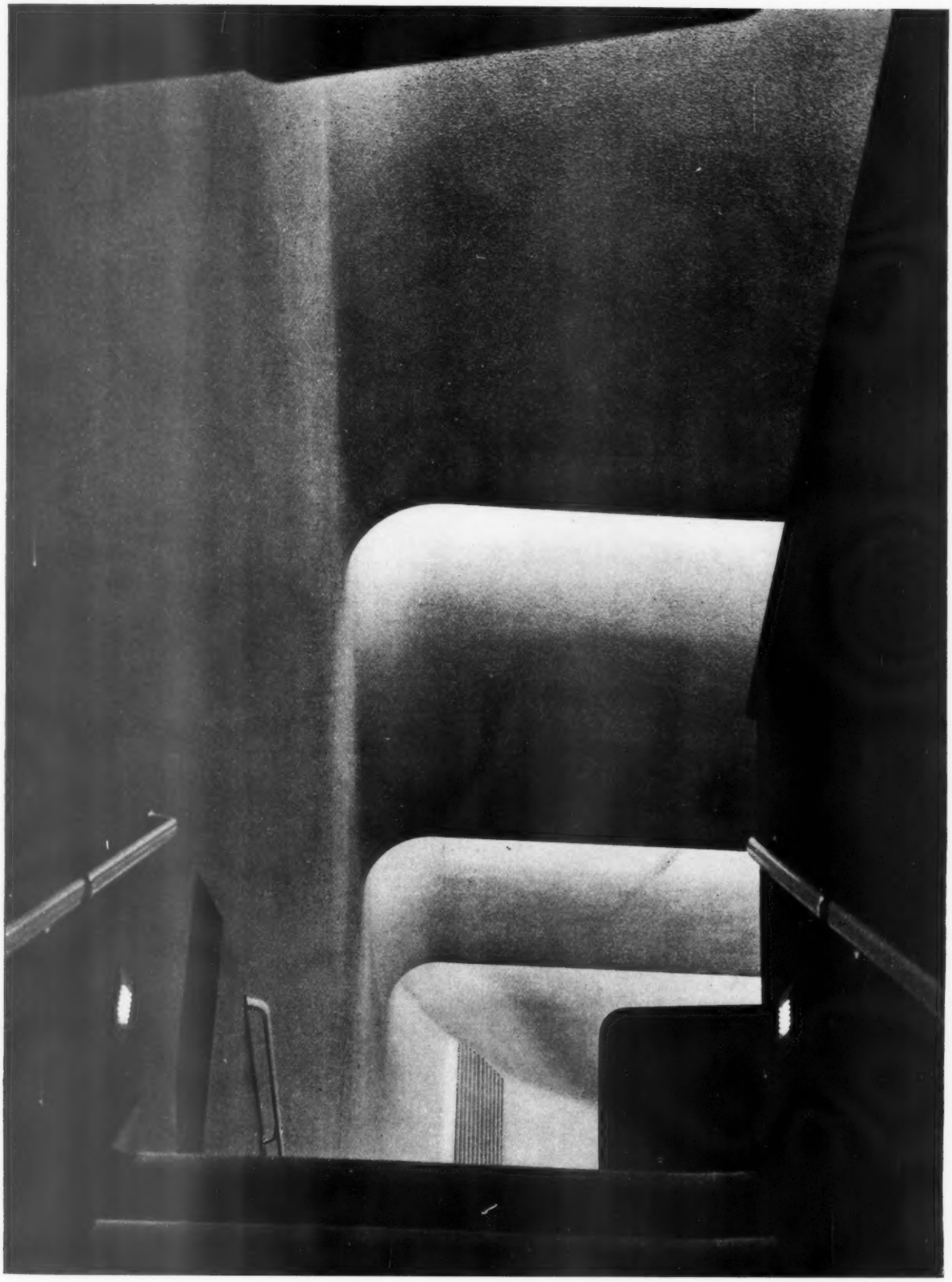
EXTERIOR.—Walls, patent concrete surface finish, hammered and tooled below balcony level. Windows, metal, painted green. Canopy, concrete and sherardised metal with panelled effects and giving space for lights. Entrance doors, laminated hardwood, with flush black surface.

AUDITORIUM.—Walls, stone texture paint. Columns, pink, gold and grey. Proscenium curtain: white as a background for artificial lighting effects. Orchestra grilles and hand-rails, metal, of oval section, painted cream. Organ grille, vertical lines of plaster, with spaces between.

B, Entrance Hall.
BB, Staff Room.
C, Ventilation.
D, Auditorium.
E, Stage.
EE, Organ Chamber.
F, Café.
G, Projection Room.
JJ, Balcony.
K, Waiting Space.
L, Men's Lavatory.
LL, Women's Lavatory.
M, Management.
MM, Cloaks.
O, Orchestra.
Q, Dressing Room.
QQ, Rewinding Room.
RR, Horn Chamber.
S, Store.
TT, Organ Blower.
UU, Battery Room.
V, Pay Office.
WW, Snack Bar.
X, Foyer.

The photographs show: the entrance front, and the proscenium.

E. A. STONE IN ASSOCIATION WITH EWEN BARR



Looking through the balcony vomitorium showing the main auditorium ceiling. The coves are built of expanded metal with concealed lighting swept into the walls.

EROS NEWS REEL, PICCADILLY CIRCUS:

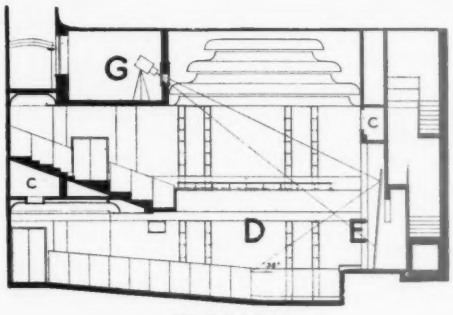
SEATING ACCOMMODATION.—203.

ENTRANCE HALL.—Colour scheme: brilliant red, black dado. The decoration has a darker red background and is picked out in silver and gold.

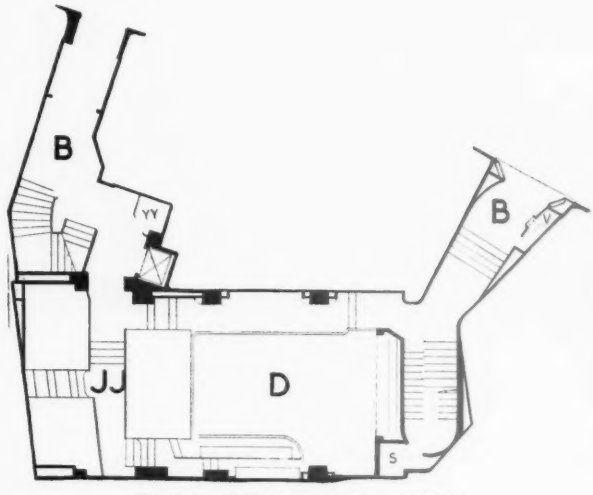
AUDITORIUM.—Colour scheme: shades of pale apricot, picked out in red. Proscenium curtain, yellow, edged with vermillion. Below balcony, walls are silver, with green dado; carpets, grey; seats, stalls, green; balcony, buff. Peach coloured mirrors and lighting.

The photographs show: left, the entrance hall; below, a general view of the stage, taken from the balcony.

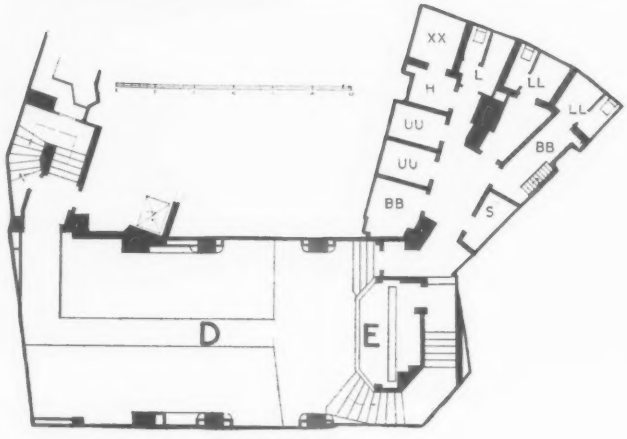
B, Entrance hall.
BB, Staff rooms.
C, Ventilation.
D, Auditorium.
E, Stage.
G, Projection box.
H, Switch room.
JJ, Balcony.
L, Men's lavatories.
LL, Women's lavatories.
S, Store.
UU, Battery room.
V, Pay Office.
XX, Electrical intake room.
YY, Enquiry Office.



SECTION

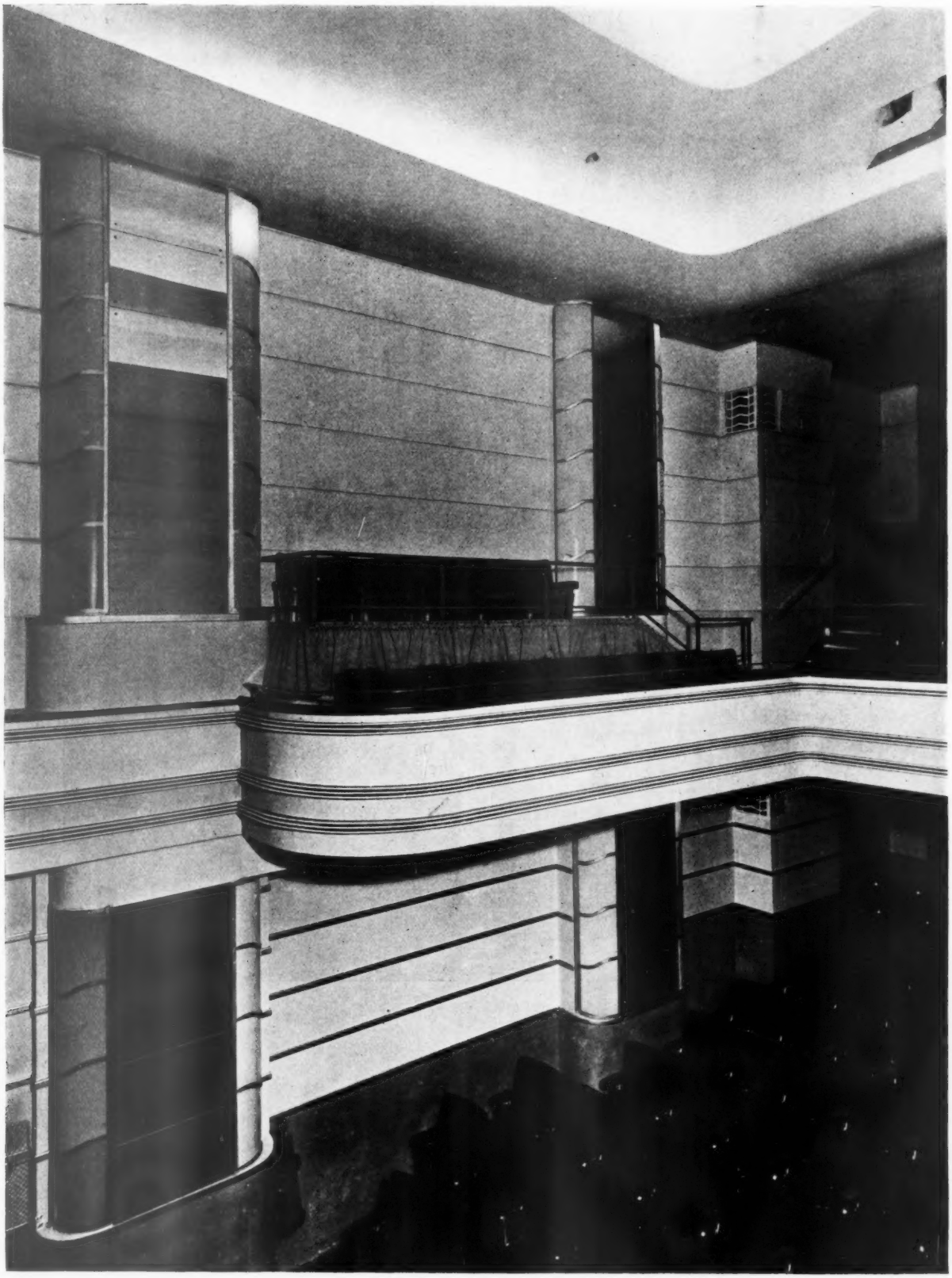


PLAN AT STREET LEVEL



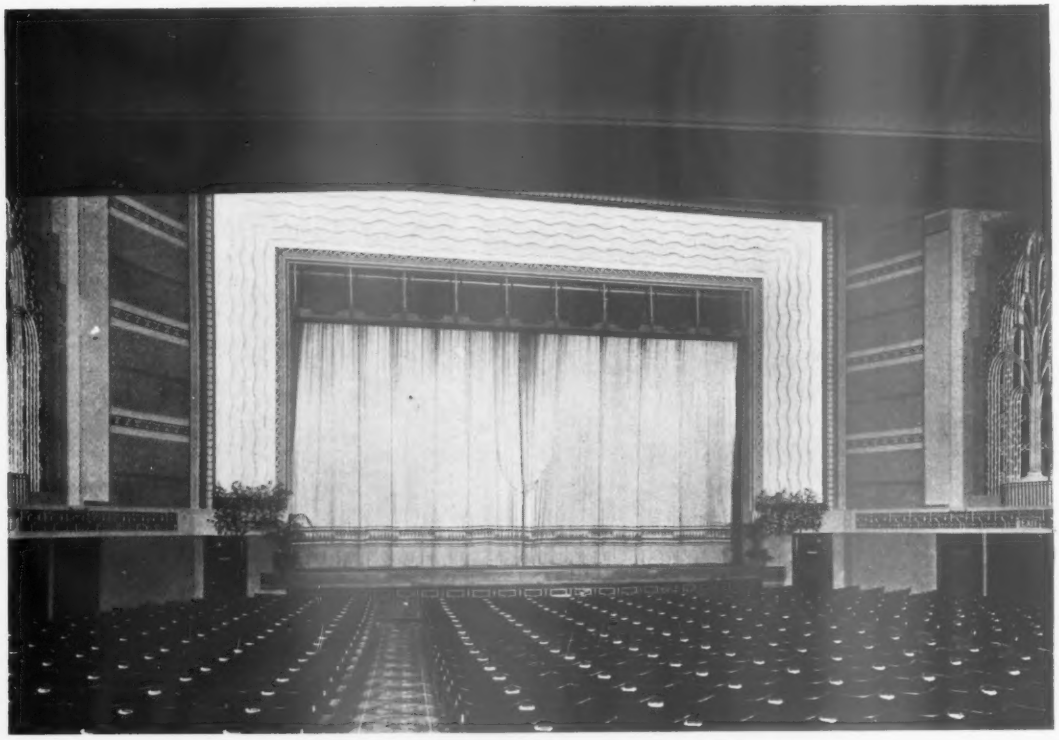
BASEMENT PLAN

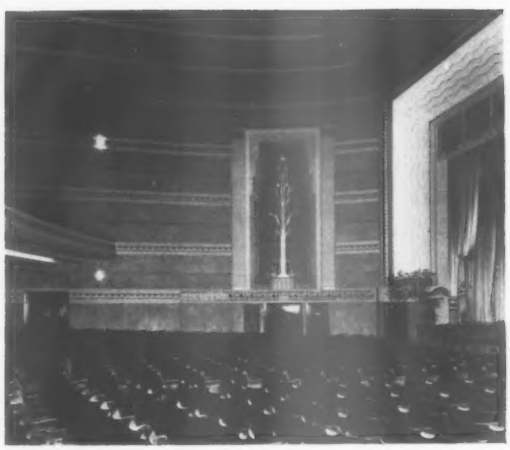
DESIGNED BY MESSRS. ROBERT ATKINSON



The side wall of the auditorium, looking from the stage.

R I O , B A R K I N G





SEATING ACCOMMODATION.—Stalls 1,350; Balcony 850; Total, 2,200.

EXTERIOR.—Walls, red bricks and white cement; windows, wrought iron and cast iron. Canopy, wrought iron; entrance doors, wood cellulosed enamel.

AUDITORIUM.—Colour scheme in light fawns and buffs, picked out with blues and reds; proscenium curtain and seats in gold.

The photographs show: two views in the auditorium; and the entrance front.

D E S I G N E D

B Y

G E O R G E

C O L E S

C: INTERIOR

I: DESIGN AT HOME

By Walter Goodesmith

The design of the interior of the cinema is an all-embracing subject including broadly every part from the entrance hall to the sanitary block. It is assumed for the purposes of this section that planning in general, acoustics, etc., which are dealt with elsewhere, are not included, and that the services such as heating, cooling, ventilation and fire protection, are taken for granted.

IT is impossible to design the interior without designing the whole building. The absence of any relationship between the design of the exterior and the interior of many cinemas is often responsible for the lack of dignity of the building as a whole. Too often the interior is looked upon as a structural shell which has to be decorated, whereas the auditorium, as the heart of the cinema, should be designed from the inside, outwards.

The architect who designs the cinema should follow right through, designing everything except standard articles and materials which he suitably selects for use. Until it becomes general practice that the architect also designs the decoration—what a misused word this is—as a matter of course, thus co-ordinating the whole scheme, the quality of design in the cinema will continue to suffer. In the past the interiors of many English cinemas have been unduly influenced by American design with a resultant display of excess ornament and an air of sumptuousness. A marked change is taking place, however, and a more logical approach to the problem is noticeable.

The interior planning should be good in every cinema. There is no excuse for inefficient results. The choice of materials, kind, quality and colour and their juxtaposition and effect under various intensities and colour variations of light, make for the final success of the design.

The materials of the interior are governed mainly by requirements of suitability, acoustic value, permanence, upkeep, finish, colour, value, etc., and are mostly expressed as flat dust-proof surfaces which have taken the place of excessive plaster decoration of yesterday.

The lighting can make or mar an otherwise successful interior and must bear a definite relationship to the shape and treatment of the surfaces upon which it impinges. It is now generally accepted that it is better to light a surface, thus obtaining greater diffusion than to depend upon isolated sources of lighting; good workmanship in producing true and flat surfaces is, however, necessary where the angle of incidence of light is very small.

There is a tendency to treat the science of acoustics as a trick agent to rectify bad volume planning. Acoustically it is most important to design for an even optimum result, so that the difference in sound value when comparing a partially empty auditorium with a full capacity house is least noticeable. The seating upholstery helps most in attempting to maintain this balance, an empty upturned seat with an absorption coefficient equal to that of a seated person being an ideal seldom attained.

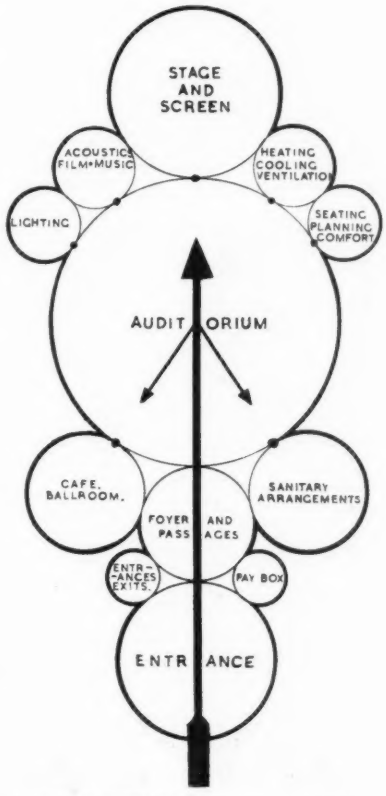
The accompanying diagram is intended to represent the influences of the various parts and services of the design upon the normal patron of the cinema.

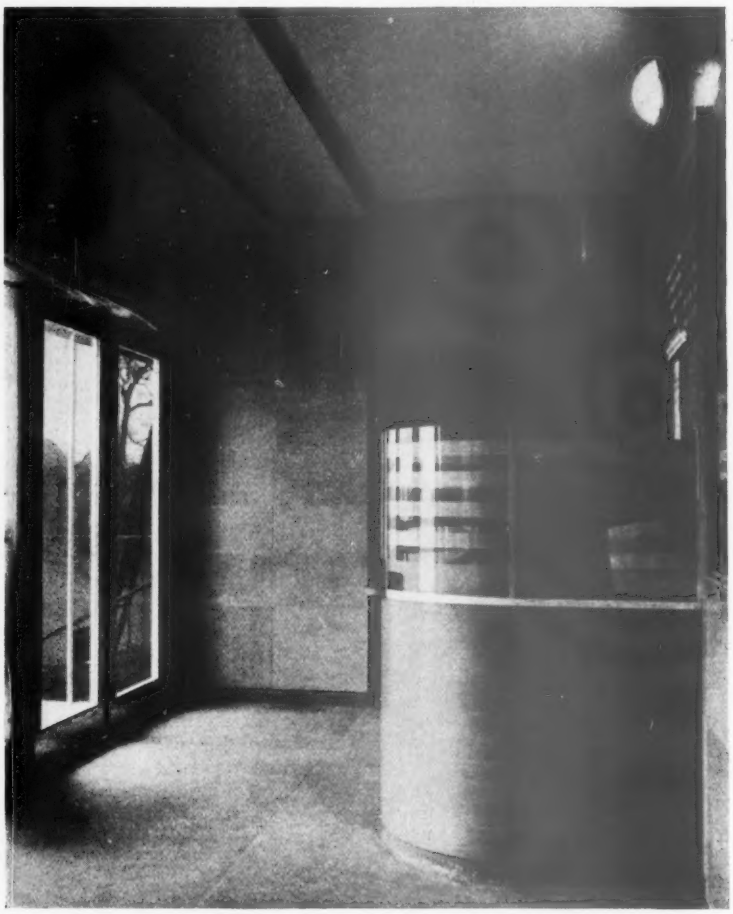
From the entrance hall—linked with the pay-box entrance, passages, staircases, etc., sometimes through a foyer or vomitory into the auditorium—there should be a relationship between the various parts of the building, thus providing a definite feeling of continuity in the design. In the auditorium the focal point is the screen and its surround which at once attracts attention and is closely followed by the reaction to the acoustical value of the auditorium and the condition of the air.

The lighting may or may not be next noticed, according to what is happening at that moment; the general comfort is felt underfoot and in the chair. Normally anything behind the patron is not seen until the lights go up, so that the back of the auditorium is the last part to register its effect.

The retiring room and lavatory block next call for attention, with the influence of the café occurring sometimes before or after the show.

All this is mentioned to stress the homogeneity of things inside the cinema, their inter-relationship, and the collective psychological reaction upon the patron. It is therefore most necessary for the design of the interior to be related in all its parts, if the building is to register as a whole. It is not a simple matter, but if cinema architecture is to rise to great heights and take its place amongst the community's important buildings it must be designed.





1

ENTRANCE HALL

In the entrance hall the first contact with the interior is made. The importance of creating the correct atmosphere cannot be overstressed. It is the cinema's show window. The first interior part that the patron sees and the last (unless he leaves by a side exit). The size of the entrance should bear some relationship to that of the auditorium. Poster and direction signs are always a problem, but ample provision for these by wall cases and recesses will invariably avoid disfiguration afterwards, except when a super event occurs and the showman comes out in the manager with temporary results with which we are all familiar.

2

1 *This small entrance hall expresses a quiet dignity not often found in cinemas. The pay-box with its glazed top screen produces a lightness happily contrasting with the base. Capitol, Mill Hill. By Robert Banks.*

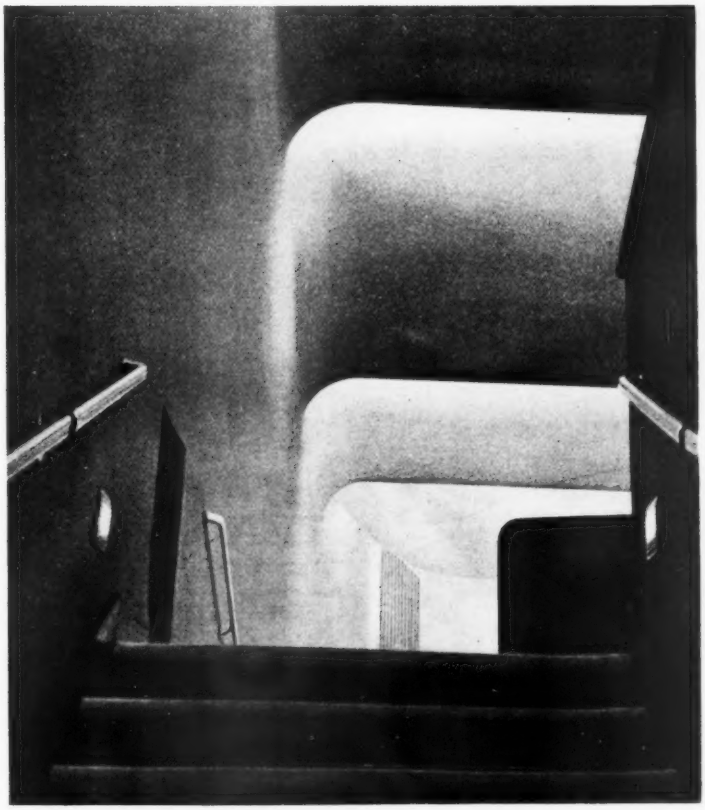
2 *A large entrance hall. The island pay-box is of curved glass with chromium supports; the base is of sycamore with composition rails. One naturally assumes a larger auditorium in this case than in Fig. 1. Astoria, Folkestone. By E. A. Stone, in association with Ewen Barr.*

3

FOYER

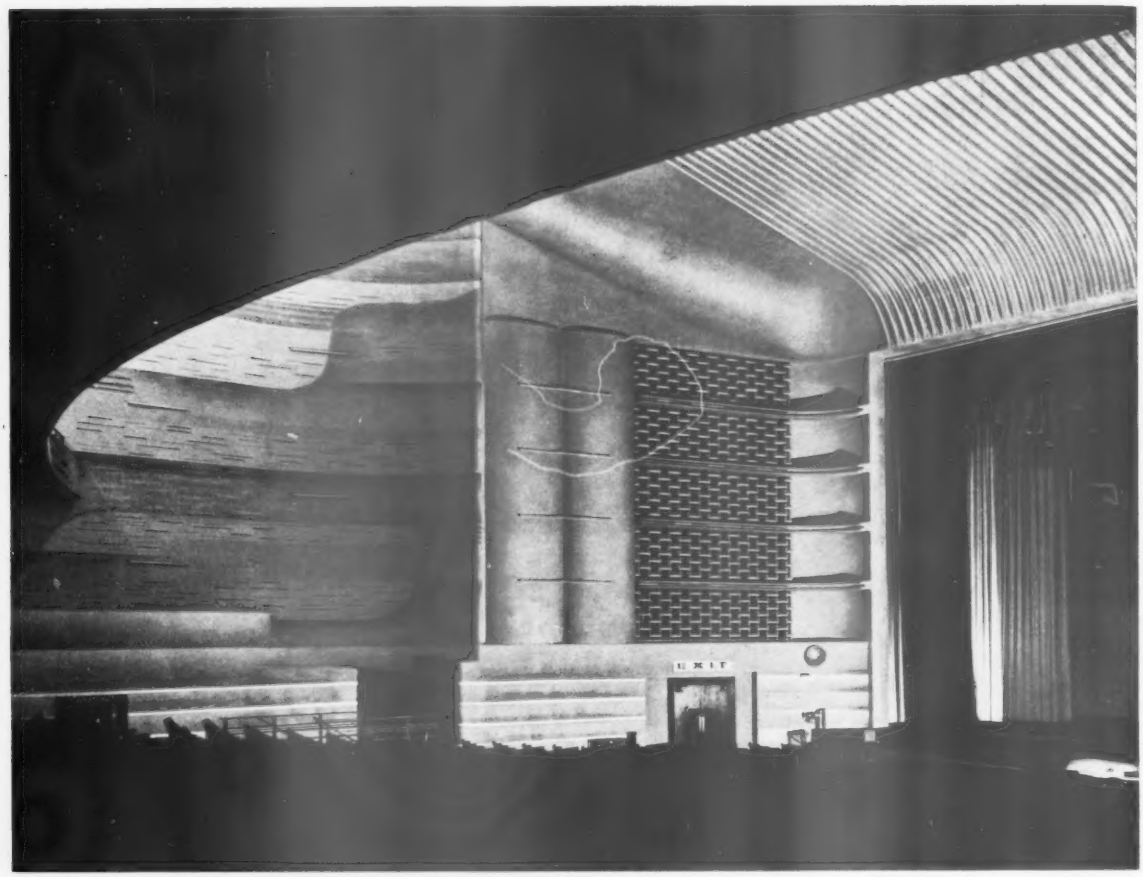
The design of the foyer is seen more often than that of the auditorium itself. It is therefore necessary that this "reception room" should echo the design quality of the whole cinema.

3 *In this balcony foyer the strong tones in the design on the carpet express the "directional" use of the foyer to advantage. Odeon, Worthing. By Whinney, Son and Austen Hall.*



4

4 *Simplicity is the keynote of this vomitory entrance. As one ascends the stairs continuity of wall surface immediately leads the eye to the auditorium ceiling and screen. Astoria, Folkestone. By E. A. Stone, in association with Ewen Barr.*



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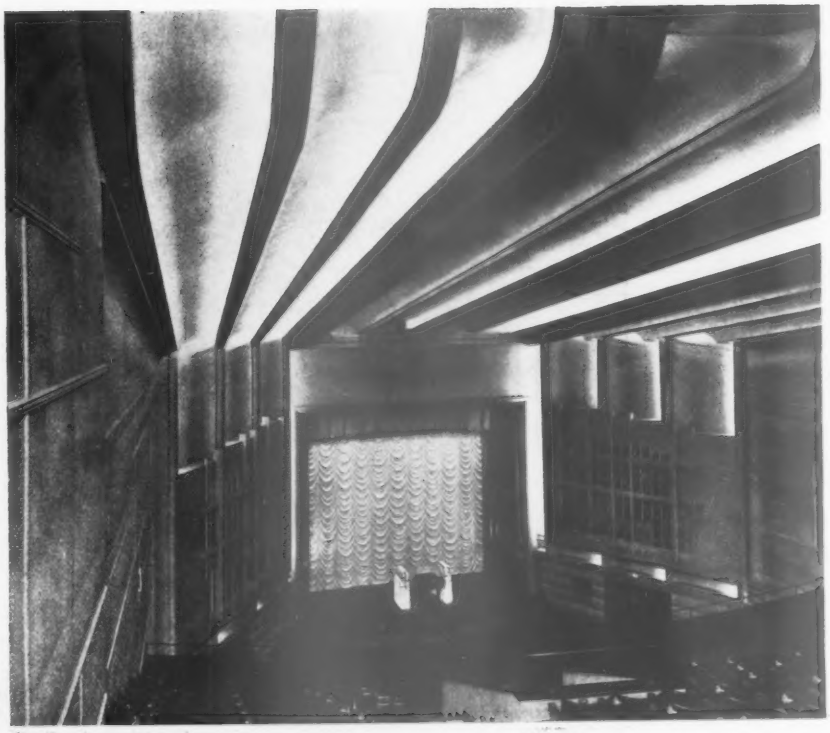


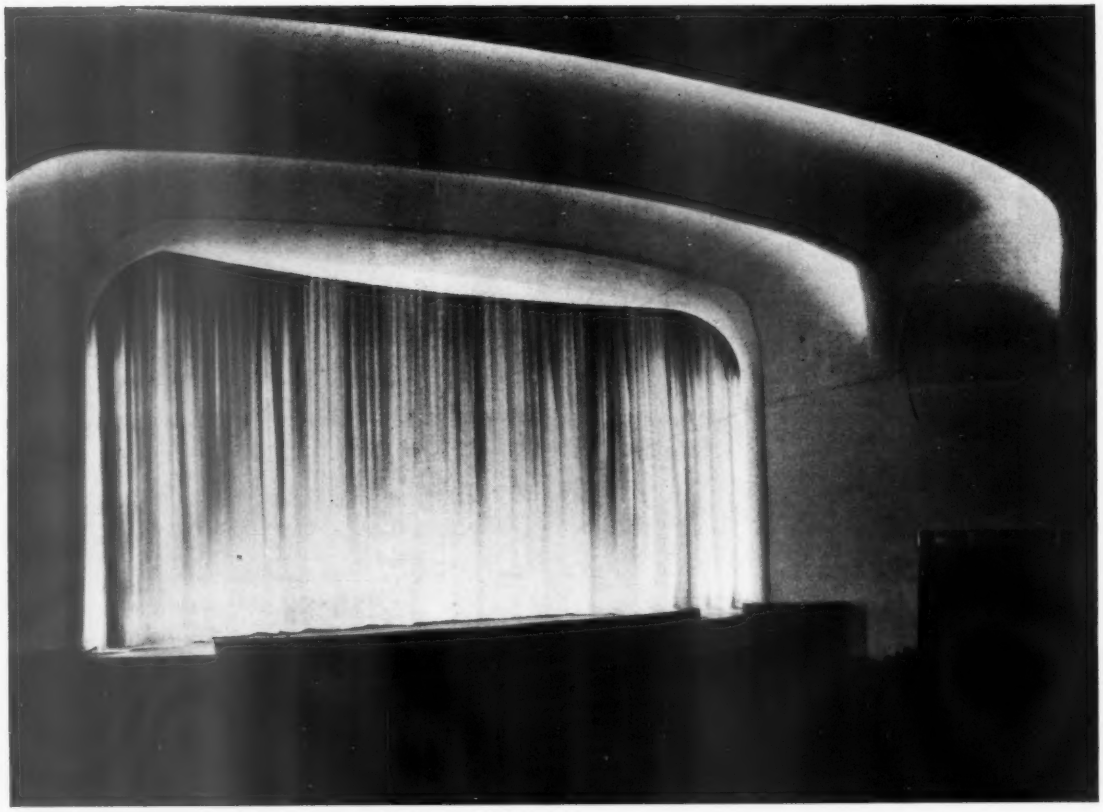
6

AUDITORIUM

The problem of the proscenium and adjacent parts is affected considerably by the presence of an organ. In many cases these "one man bands" have replaced the orchestra; and if both can be dispensed with, a very simple and straightforward solution is possible. Where an organ is installed the grilles complicate matters. Instead of isolating them on the flanking walls, these grilles are now invariably linked with the proscenium and surrounds in one complete design.

5 *Here is an example in which the organ grille, proscenium and reflecting ceiling have been designed as an ensemble. Plaza, Sutton. By Robert Cromie.*

6 *A successful attempt to produce long bands of lighted surfaces on the ceiling extending from front to rear of the auditorium. Regal, Southampton. By Verity and Beverley.*



7

AUDITORIUM

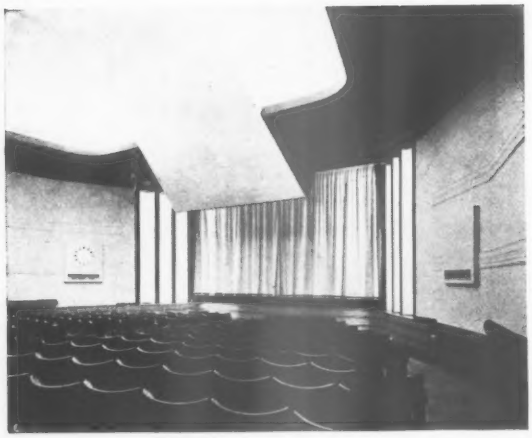
8

7 *A simple proscenium treatment. The combined lighting and ventilation coves in the ceiling are very successful. The Curzon, Mayfair. By Sir John Burnet, Tait and Lorne.*

8 *An illuminated organ console. There is still much room for improvement in the external design of these consoles, although progress has been noticeable recently. Regal, Margate. By Robert Cromie.*

9

10



11

NEWS REEL

9, 10, 11 *Stereoscopic projection enables seats to be placed within 3 ft. of the mirror shown in the top view. The projection tunnel may be noted in No. 10 and also in No. 11. The problem of seat spacing in news cinemas is extremely important. In this theatre sufficient depth between seats has been given to enable persons to pass to and from seats without compelling the whole row of occupants to stand up at irritating and frequent intervals. News Cinema, Waterloo Station. By Alister G. MacDonald.*

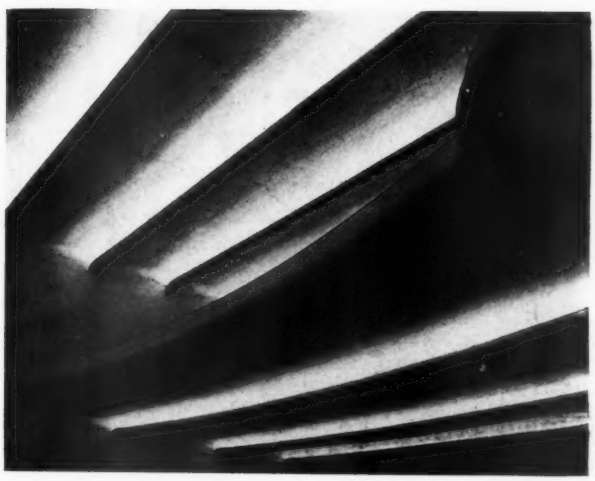
12

BALCONY AND LIGHTING

The tendency to use concealed lighting as a definite feature of the design, as opposed to spotty individual or collective fittings, is rapidly gaining ground. Properly designed and shaped troughs correctly placed with relationship to the surface to be illuminated are the modern architect's substitution for the excess decoration of yesterday.

12 *The back of the auditorium is generally the last to be noticed by the audience. It is nevertheless essential that it should not be treated as a separate rear wall. Here it is linked with the remainder of the auditorium by the unusual lighting cove treatment of the ceiling. Astoria, Southend. By E. A. Stone, in association with A. T. Somerford.*

13 *Bands of light from coves extending across both the auditorium ceiling and underside of balcony. Astoria, Folkestone. By E. A. Stone, in association with Ewen Barr.*



13

14

15

CAFÉ AND BALLROOM

The provision of a café is now taken for granted in a cinema of even medium size. In addition, a ballroom or dance floor is sometimes added.

Last, but not least in importance, are the retiring rooms and sanitary arrangements, first-aid room, etc. The retiring rooms should be comfortable but not filled with period pieces. The lavatories should be as simple as possible in treatment.

14 *This café is also a ballroom with orchestral platform and stage. Its interior design is in keeping with that of the auditorium. Plaza, Worthing. By H. Weston.*

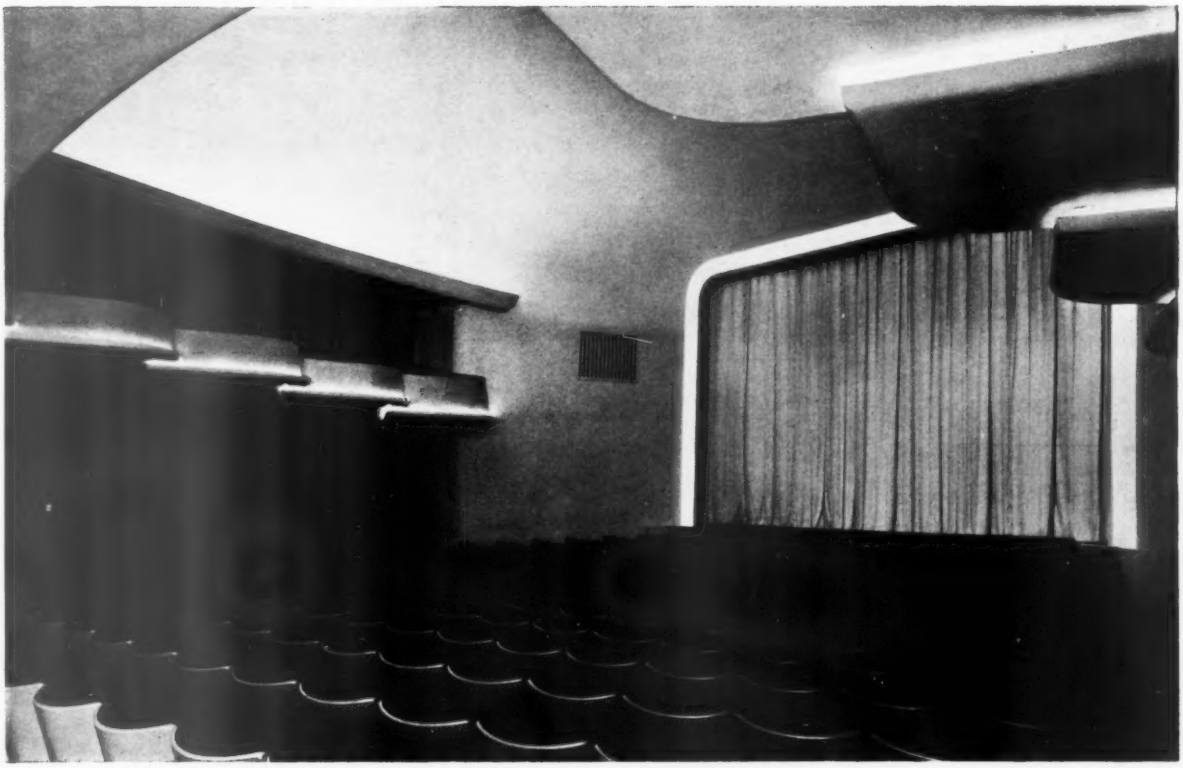
15 *A concrete and glass laylight successfully surmounts this café. Regal, Margate. By Robert Cromie.*

C: INTERIOR:

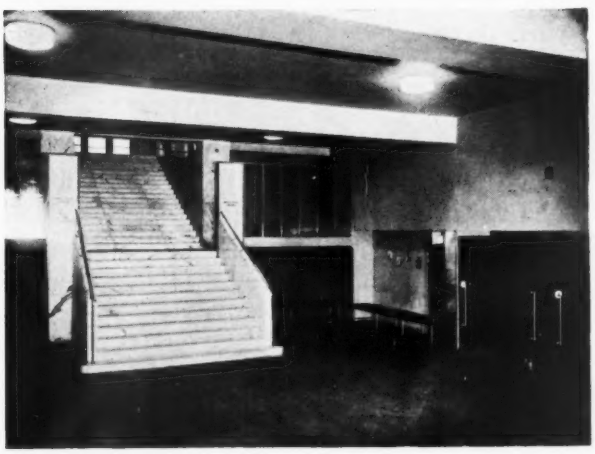
2: DESIGN ABROAD

By P. Morton Shand

During the last few years the number of cinemas designed logically from the inside outwards has grown steadily on the continent. Which, of course, is only another way of saying that the cinema is becoming more and more stabilized as a semi-standardized type of building. It has, in fact, ceased to be a prey to those misguided efforts to articulate two quite separately designed compositions : an "arresting" façade and an "appealing" auditorium. The latter has become a definitely "sedative" interior which is calming instead of stimulating ; while the former is content to be no more than the sign-post of its entrance.

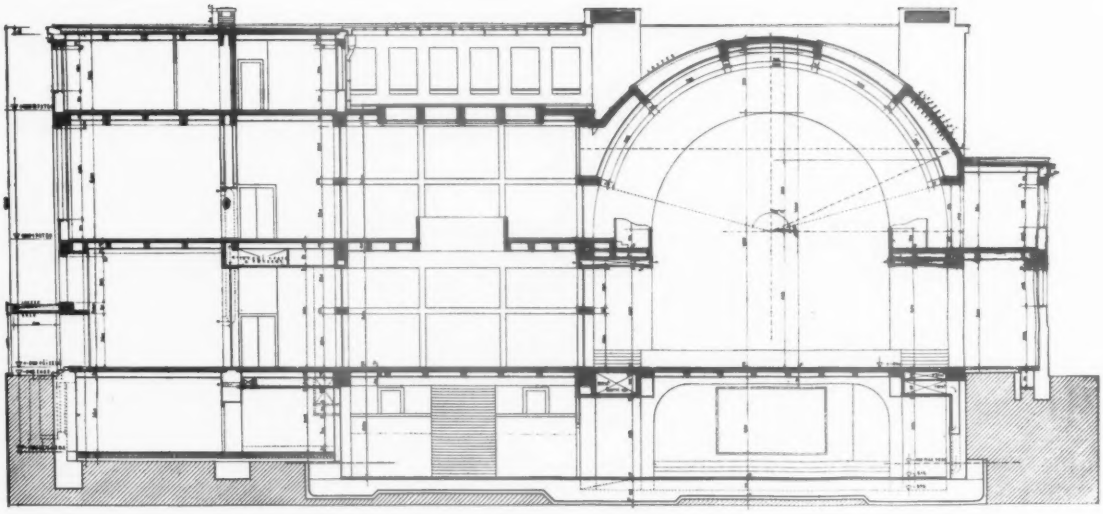


1 *This cinema is situated in the basement of a building in Pardubitz, Czechoslovakia (Designer, Josef Gočár). On the floor above is a concert hall which can be adapted for cinematograph purposes.* *(See figure 3 overleaf.)*



2 *The foyer to the cinema illustrated above.*

3



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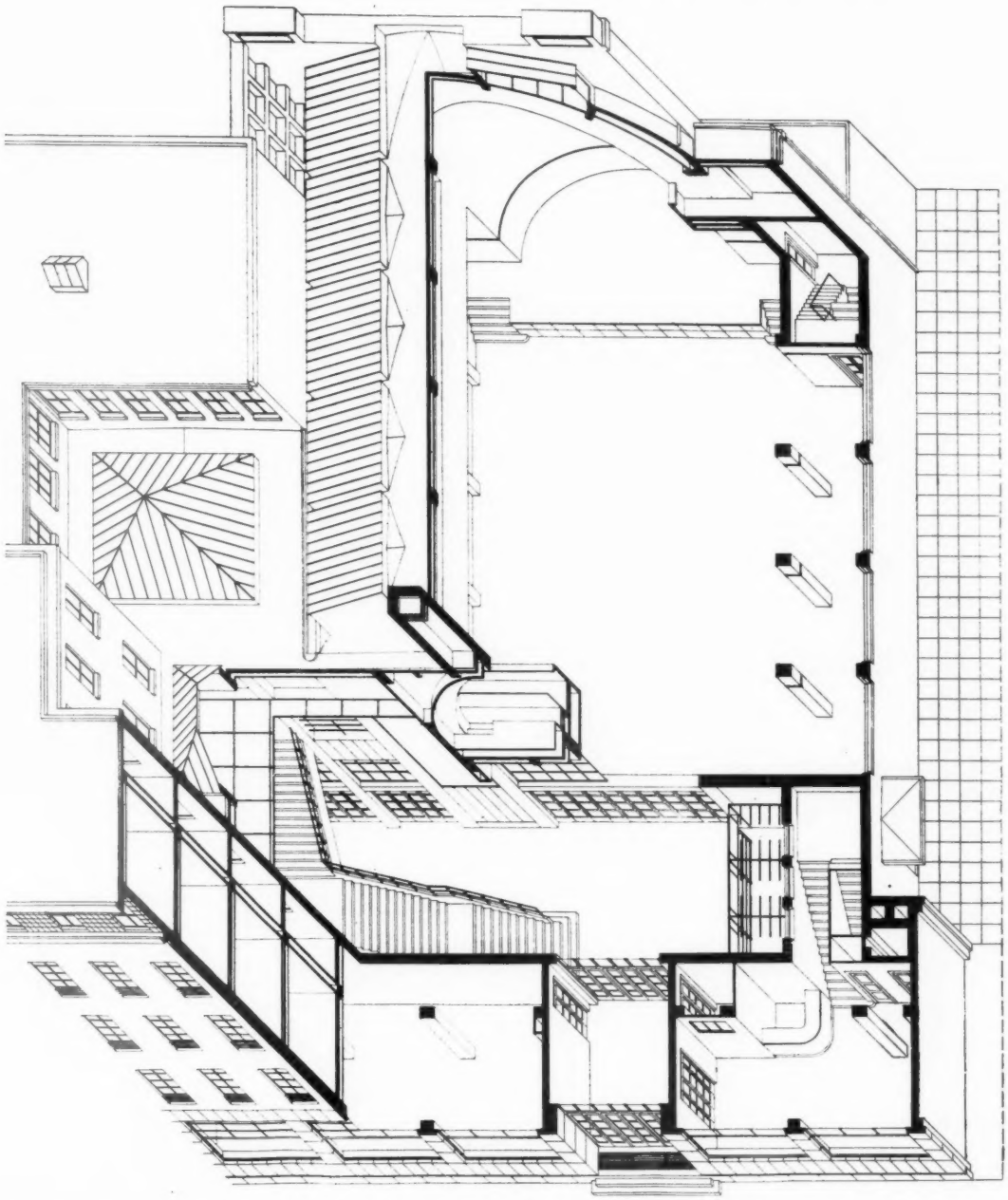


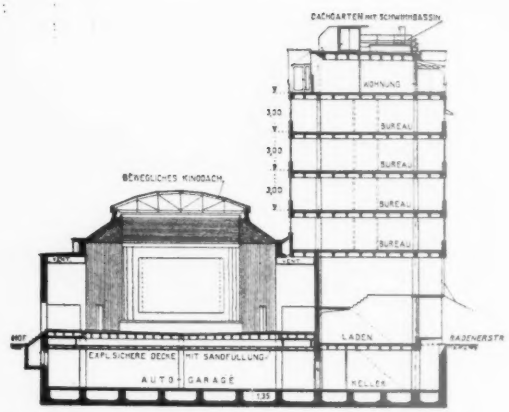
5

3-5 *A multi-purpose cinema designed for use as a theatre, dance-hall or concert-hall in the relatively small town of Pardubitz, Czechoslovakia (Designer, Josef Gocár). For film purposes a screen is fixed over the stage and the windows and top-lights are equipped with light-tight blinds. The theatre is part of a large building which contains an hotel, restaurants, bars and offices, as well as a cinema in the basement (see section on facing page and figure 1, page 701). The illustrations show: 3, a view of the upper hall: 4, cross section: 5, axonometric.*

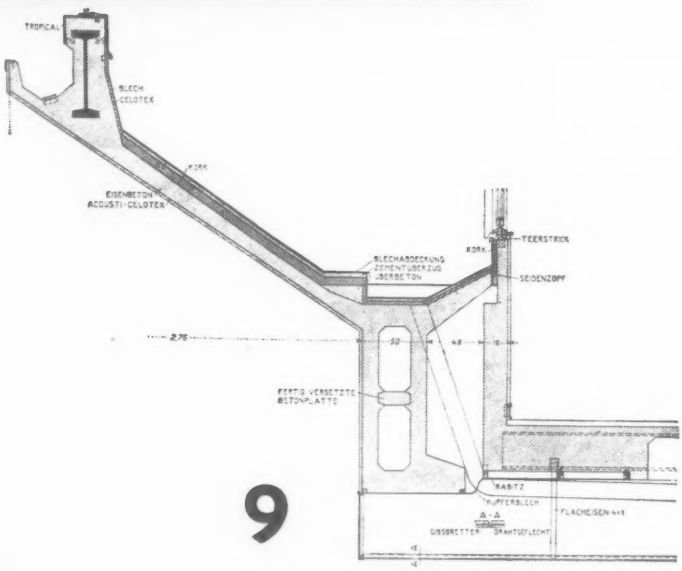
6

6 *The cinema forms a part of the Zett-Haus buildings in the centre of Zürich, which occupies a third of an important island site. The planning of the cinema was complicated by its position between a tall office block and a four-storey restaurant and over a basement garage. Roxy, Zürich. By Hubacher and Steiger. (See figures 7-11 overleaf.)*

7


DACHGARTEN mit SCHWIMMBASSIN
WOHNUNG
BUREAU
BUREAU
BUREAU
BUREAU
BEWEGLICHES KINODACH
LADEN
AUTO-GARAGE
KELLER

8


TROPICAL
BLECH CELOTEX
KORK
EISENBETON ACOUSTI-CELOTEX
BLECHABDECKUNG ZEMENTÜBERZUG BERBETON
TEERSTRICH
KORK
SEIDENZOPF
FERTIG VERSETZTE BETONPLATTE
RABITZ
KUPFERBLECH
FLACHEISEN
A-A
DIELBRETTER
DRAHTGEFLECHT

9

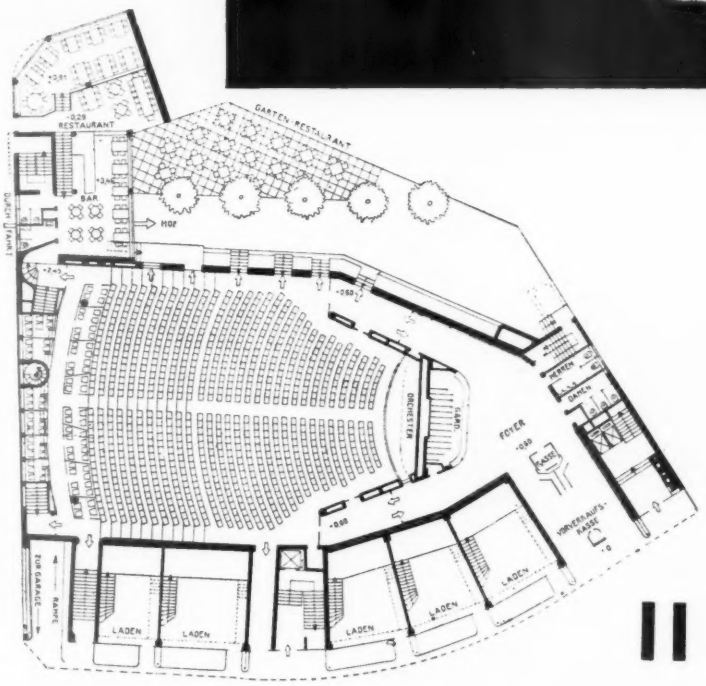
7-11 *The principal controlling factor in the design of this cinema (Roxy, Zürich), was the sliding roof over the auditorium. This, opening in two halves, allows the major portion of the auditorium to be thrown open to the sky in summer—a very important contribution to the all-year-round popularity of the cinema in a city where extreme heat during the summer is quite usual. To this dominating element in the auditorium design the rest of the decorative treatment is carefully related.*

The soffit of the roof is of glass, the V-setting of the panels being determined by acoustical considerations, and the varying illumination of laylight so formed emphasizes the importance of the roof. The remaining decorative treatment is restrained,

The seating is of tubular steel, plainly upholstered in fabric, and the seats are designed to fold up closely, leaving 1 ft. 8 ins. clear between seats, thus facilitating movement and cleaning.

The illustrations show, 7: The cinema with the auditorium sliding roof open. 8: section through the cinema and adjoining office block. 9: detail section showing construction of R.C. bearer and runways for sliding roof. 10: a detail of the restaurant adjoining the cinema. 11: plan of auditorium and adjoining buildings at ground level.

10



11

12

13

14

15

12 *The Flamman Cinema at Stockholm is situated in the sub-basement of a block of flats, and its façade is therefore really confined to its entrance, space for neon lettering and vertical decorative volutes being rented on the face of the flat block over. By glazing the whole of its entrance in clear glass the illumination of the stairways becomes also the principal illumination of the façade, assisted by soffit lighting on the marquise. (Designer : Uno Ahrén.*

13 *The foyer ceiling and one wall is finished in black plate glass. Lighting is by rows of ordinary bulbs sunk in the glass so that only a portion of their ends project ; these rows converge towards the stairways to the cinema. The white walls of the stairways are decorated with film posters changed weekly.*

14-15 *The auditorium has a flat ceiling, the soffit of the gallery being a flat cyma in section with a single lighting trough at the rear. The auditorium is distempered royal blue throughout, and is lighted by a circle of translucent white bulkhead lamps. Upholstery is in a slightly darker blue, as is the close carpeting.*

C: INTERIOR

3: EQUIPMENT

By E. F. Tulley

Mr. Tulley deals with the equipment, mechanical and otherwise, of the modern super cinema theatre. His remarks apply to any super cinema of the present day, but to enhance their value, are based on the requirements at the Gaumont Palace, opened in Chelsea, S.W., a month or two ago. All the accompanying drawings and photographs are of that cinema. It seats 2,700 persons, and was designed by Mr. W. E. Trent and Mr. Tulley, the author of this article.

THE operating box suite is the nerve centre of the modern cinema. In general practice the most suitable position for it is immediately behind the rear wall of the circle, where it should be planned as a self-contained unit. Alternative positions are either immediately under or in the centre of the circle. From the circle a shorter and, perhaps, straighter throw is obtained from the machines, but there are disadvantages which greatly outweigh any advantages gained by this position.

OPERATING BOX SUITE

The operating box or projection booth, say about 28 ft. long by 14 ft. wide, should be planned on the centre axis of the theatre, and equipped with at least two projector machines, usually a third as a stand-by, probably two spot machines and the sound equipment. To reduce the excessive heat from the arcs each machine is fitted with a trunk taken up through the flat concrete roof and terminating in an archimedean cowl. The portholes in the front wall of the operating box are glazed and fitted with metal drop shutters, operated by lever. The drop shutters are also connected to a thin wire cable running to the haystack type lantern light, which must be provided of ample size in the roof. The cable is fitted with a fusible link over each machine so that on the parting of the link in the event of fire the shutters are immediately lowered. On the wall in front of the machines are the press button controls for the decorative lighting of the auditorium and the curtains on the stage.

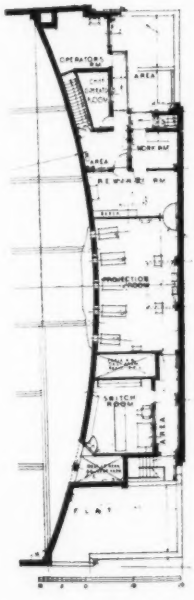
Adjoining the operating box is the rewind room fitted with bench, film rack and containers. Curiously enough, although there has been a striking advance made in the projector machines themselves, it is still found expedient to rewind the films by hand. A haystack type lantern and fusible link gear is also fitted in this room.

The remaining rooms of the operating box suite comprise a large switch room, say of 200 ft. super floor area, housing the distributing boards, dimmers, switchgear in connection with the auditorium lighting, mercury arc rectifiers and transformers providing the electrical current to the projectors; operators' room, with toilet accommodation, workshop and store. The entrance both to the operating box and the rewind room must be from the outside air, if necessary open areas being planned in order to comply with this regulation.

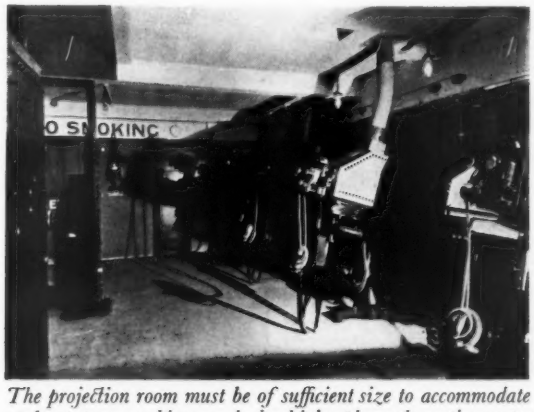
PROJECTORS AND SOUND EQUIPMENT

The "sound on film" system now in use has the sound accompaniment recorded on the edge of the film in terms of light and shade. The projection apparatus, therefore, consists of, A, a projector arc and lens system with the necessary mechanical apparatus to project the picture on the screen; and, B, photo electric cells and amplifiers whereby the light and shade on the sound track of the film is converted into electrical impulses, and then conveyed, through the amplifiers, to the powerful loud speakers installed behind the picture screen, placed there in order to convey the illusion of the sound proceeding from the screen characters.

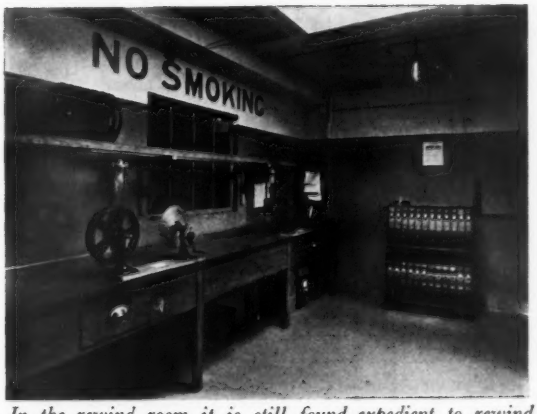
(Continued on page 709)



Projection room suite. Alternate means of escape must be provided from the projection room and from the rewind room. If necessary open areas must be planned to comply with this regulation.

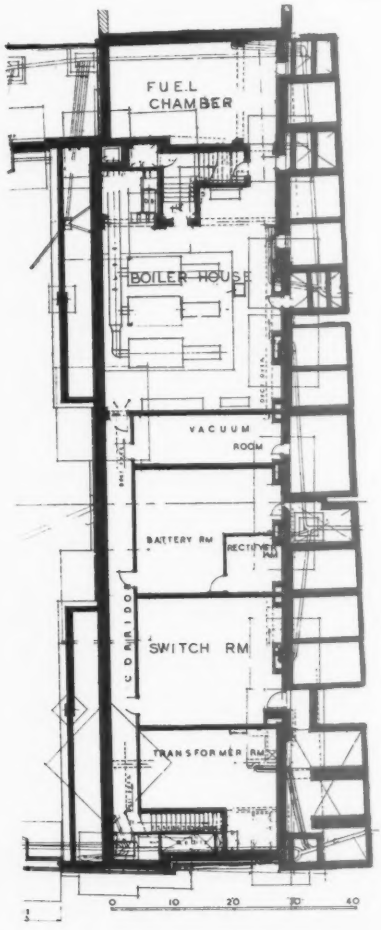


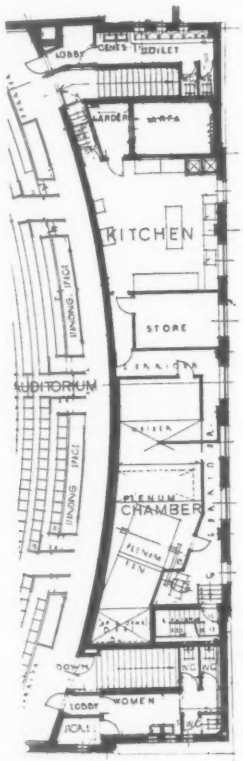
The projection room must be of sufficient size to accommodate at least two machines and should be planned on the centre axis of the cinema. On the left of the photograph is the talkie apparatus.

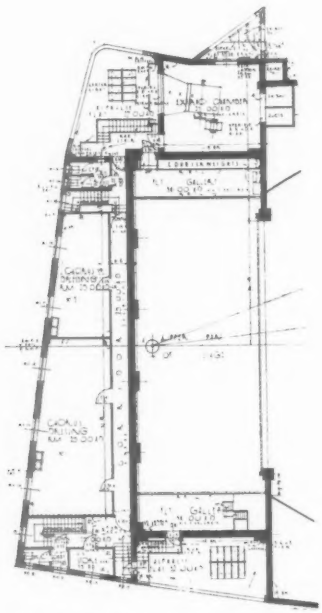


In the rewind room it is still found expedient to rewind films by hand. This is curious in view of the striking advances made in the projector machines.

The boiler house usually accommodates three hot water circulating boilers, domestic hot water supply boiler, incinerator, circulating pumps, and electrical starting gear.

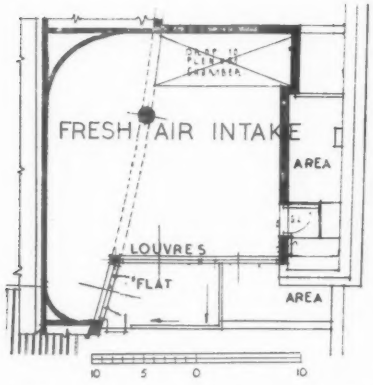




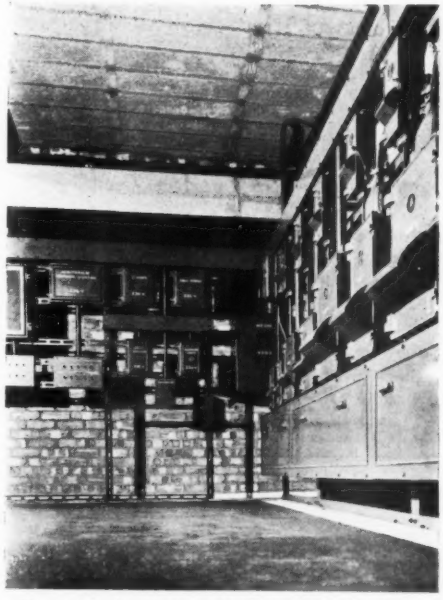


Plans of the accommodation for warming and ventilation. In this case the boiler house is in the basement, the plenum chamber on the third floor, both units being planned in the south—the main—front of the cinema. The extract chamber above the property room at the stage end—the opposite end of the building—contains the centrifugal fan, which extracts approximately 75 per cent. of the air to ensure a balanced plenum system.

In the air washer the air is drawn from the back, through a series of banks of fine water sprays into the chamber shown and over the ceiling. It is then forced through the gilled type heaters and into the theatre at convenient points.



The fresh air intake, planned in the roof at the front of the building. As its name implies, it is from here that fresh air is drawn into the cinema at the rate of 1,000 cubic ft. per person per hour.



Part of the main switchboard in the large intake switch room.

The light source universally used for cinematograph projection is the carbon arc, which at present can only be efficiently operated from a direct current supply at a voltage of approximately 100; hence the necessity for the provision of motor generators, or the more modern mercury vapour rectifier, in order to convert the alternating current supply, usually available, to direct current at the correct voltage.

WARMING AND VENTILATING

Warming and ventilating necessitates the provision of a boiler house, plenum chamber and extract fan chamber. The boiler house is usually planned in the basement of sufficient size to accommodate three hot-water circulating boilers, domestic h.w. supply boiler, incinerator, circulating pumps, and the necessary electrical starting gear, with, say, a ten-ton capacity solid fuel store adjoining. It is very economical and satisfactory to equip the boilers with underfeed mechanical stokers as this permits of the use of small, cheap coal. Except for the occasional filling of the hoppers the stokers are entirely automatic in action, and can be thermostatically controlled from points in the auditorium when any desired set temperature is reached.

The plenum chamber is planned in the most convenient position to take the supply of fresh air, and houses the large centrifugal intake fan and motor, washer plant, circulating pumps, preheaters, etc. The fresh air is drawn through a series of banks of fine water sprays to extract the impurities, then through the gilled type heaters, and passed into the theatre at convenient points through sheet metal or builders' ducts at the rate of 1,000 cu. ft. per person per hour in the auditorium, and at the rate of four changes per hour to the vestibules, foyers and café. Staircases, toilets, stage, dressing rooms, staff rooms, etc., are heated by radiators.

The extract chamber is usually placed at the stage end. It houses the centrifugal fan the duty of which it is to extract the equivalent of approximately 75 per cent. of the volume of air forced into the building by the inlet fan to ensure a balanced plenum system. In a cinema equipped with a stage and fireproof curtain two-thirds of the vitiated air is extracted from a position immediately in front of the proscenium, together with a separate extract from the stage itself. Broadly speaking this means in practice that the fresh-air inlet grilles are placed at the back and sides of the auditorium, and the extract grilles in front of the proscenium. This very necessary provision for the changing of the air often proves a thorn in the architect's side when designing the interior decoration. How many of the general public realize that this adjunct to their comfort and health incurs an expenditure of from six to eight thousand pounds?

ELECTRICAL

The modern super cinema with its resplendent lighting schemes entails a considerable amount of equipment, which must be housed properly. The main accommodation is usually planned in the basement under the entrance vestibule and comprises a transformer chamber (in the event of the supply being H.T.) with direct access from the street for the supply company, a large intake switch room for the main switchboards, etc., and a battery room equipped with storage batteries to give an independent supply to the maintained safety lighting points, thus enabling the public to leave the premises without panic should there be a failure in the main supply. The batteries are kept constantly charged by a rectifier, housed in a separate compartment off the battery room.

A subsidiary switch room should be provided adjacent to the entrance vestibule, where the board controlling the lighting in the front of the cinema

can be installed. When there is a fully equipped stage the cables are run from the main intake switch room to a chamber under the stage in which the gear and contactor panel dealing with the stage lighting is installed. The elaborate stage switchboard is installed either on the stage or more conveniently on a platform or electrician's perch, about 10 ft. above the stage floor. Thus the installation is split up into three main sections, auditorium lighting (controlled from the operating box), front of house lighting and stage lighting.

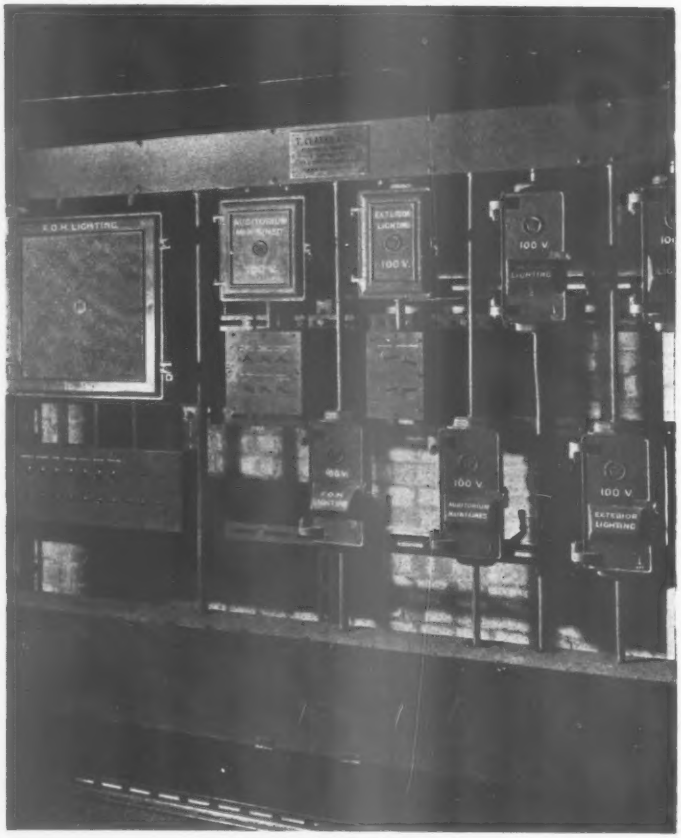
ELECTRICAL FITTINGS

These should be designed *en suite* with the decorative scheme, and provision should be made for relamping and the cleaning of glass, the large fittings in the auditorium being suspended from a winch so that they can be lowered to the floor for this purpose. Where concealed cornice lighting is employed it is essential that access should be provided for relamping from the back.

STAGE AND SCREEN

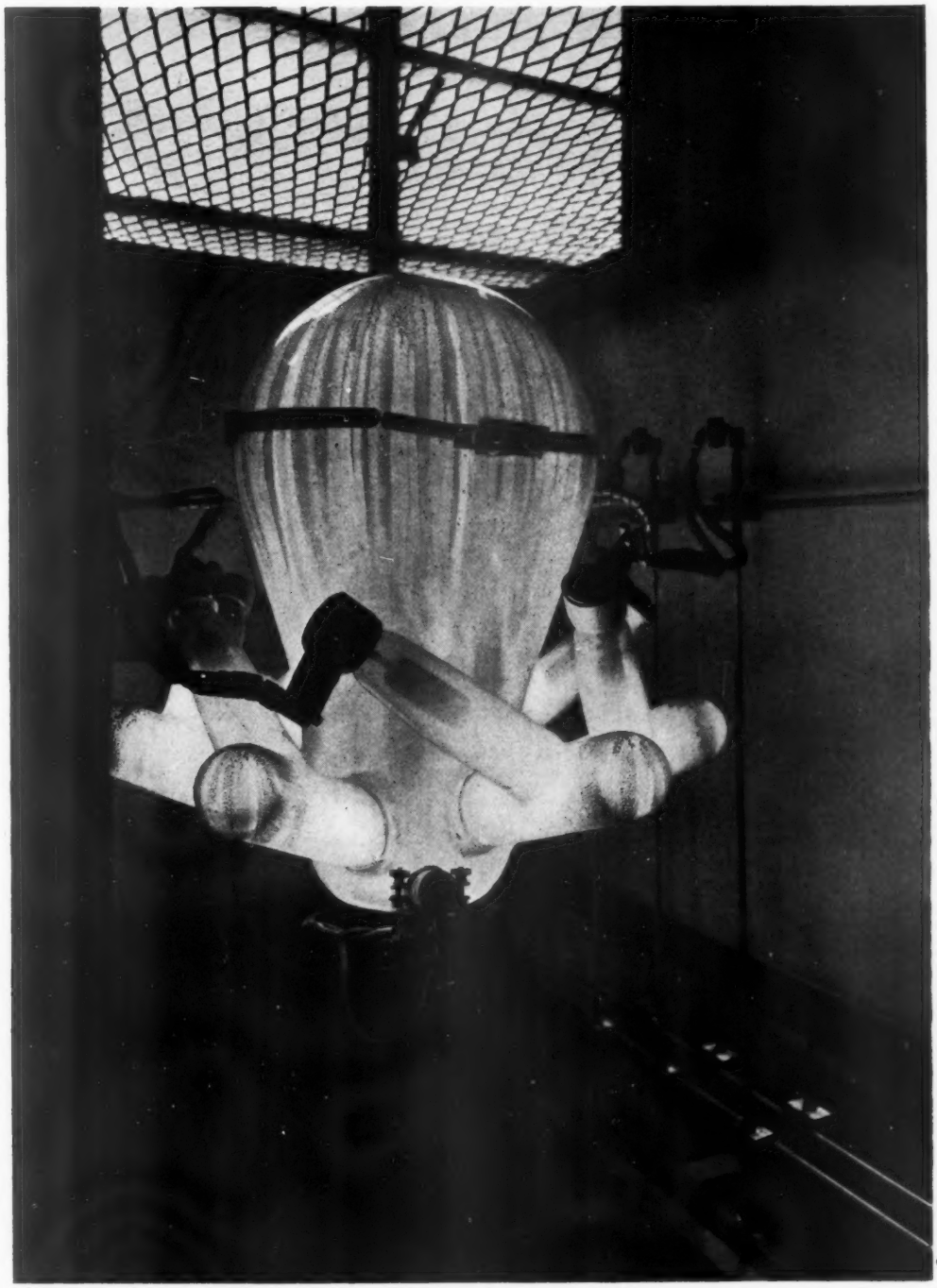
In the development of the modern super cinema there has been a tendency to provide for elaborate stage presentations by installing a fully equipped stage of a depth of about 30 ft. with ample off stage room each side of the proscenium and a height of about 65 ft. to allow for the flying of the scenery, etc. The fly platforms on each side extend the full depth of the stage, but where the scenery is counterweighted these are not strictly essential, their original use being primarily for the tying off of the hand lines, etc.

The grid, as it name implies, is virtually a battened platform about 60 ft. above the stage level, nowadays preferably constructed of steel. The lines carrying the scenery, etc., consist of horizontal barrels suspended from three or four wire ropes which run over grooved sheaves, fixed on the grid, and connected to counterweights running in frames on the side wall. The screen and the talkie horns are both counterweighted, so that they can be taken up out of the way for stage presentations. In order to compensate for the somewhat shallow depth of the stage compared with that of a legitimate theatre a cyclorama is sometimes installed, of a permanent type consisting of a plastered surface of the rear wall or of a cloth type, running on a shaped overhead track. The float front, or footlights, as they are more popularly termed, consists of a concrete trough running the full width of the



The subsidiary switchboard.

Storage batteries for the independent electric light supply. They are kept constantly charged by a rectifier, housed in a separate compartment. Their purpose is to provide an independent electric light supply in case of a breakdown in the main supply.



One of the two rectifiers. It charges the batteries used for the operation of the projecting machines and talkie apparatus; the other, the batteries for the independent electric light supply.

proscenium, in which battens are placed, using three or four different colours, the blending of which provides a comprehensive range of coloured lighting effects.

Stage amplification, where employed, can be either a portable stand microphone or microphones concealed in the footlights, wired to a mixing panel, much on the same principle as the more famous B.B.C. dramatic control panel, wherein the various microphone imputs are blended as desired and then passed to a main amplifier, thence to loud speakers concealed in or about the proscenium front. In cinemas where the stage spots are operated from the operating box an additional monitor speaker is often installed in the box itself, so that the operator can follow the stage programme.

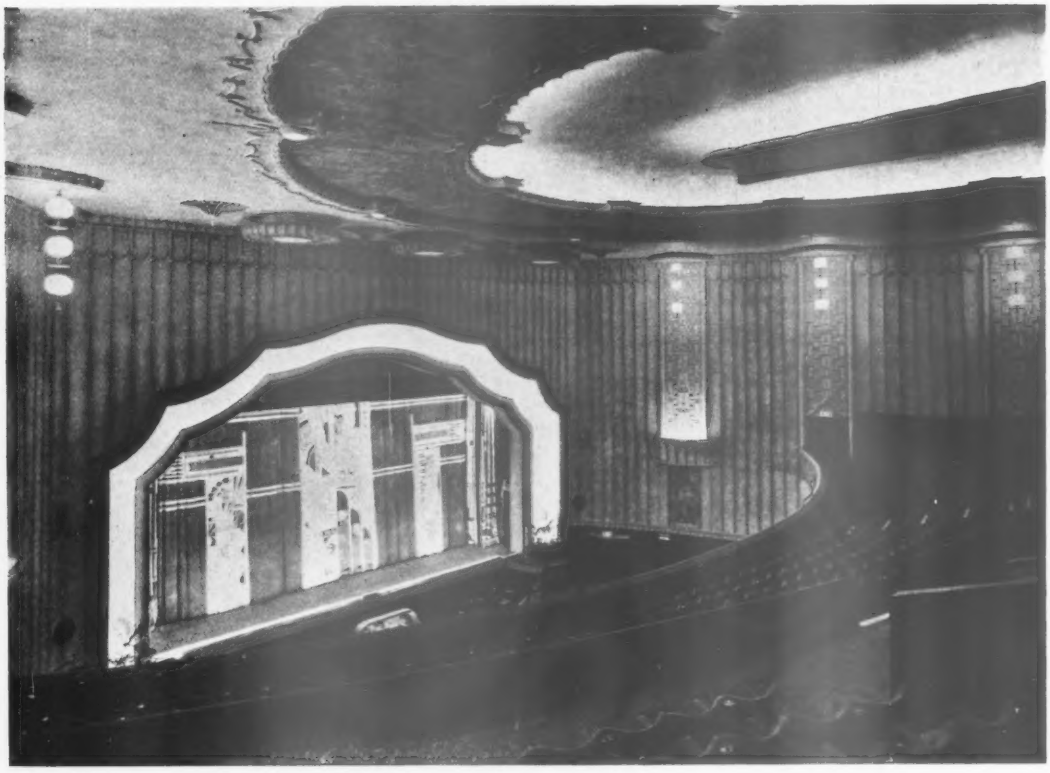
"Deaf" installations, such as the Ardente used at Chelsea, consist of a microphone placed near the main speakers behind the screen and wired back in parallel to plug-in sockets in the seats at different parts of the house. Ear phone sets are usually available free of charge.

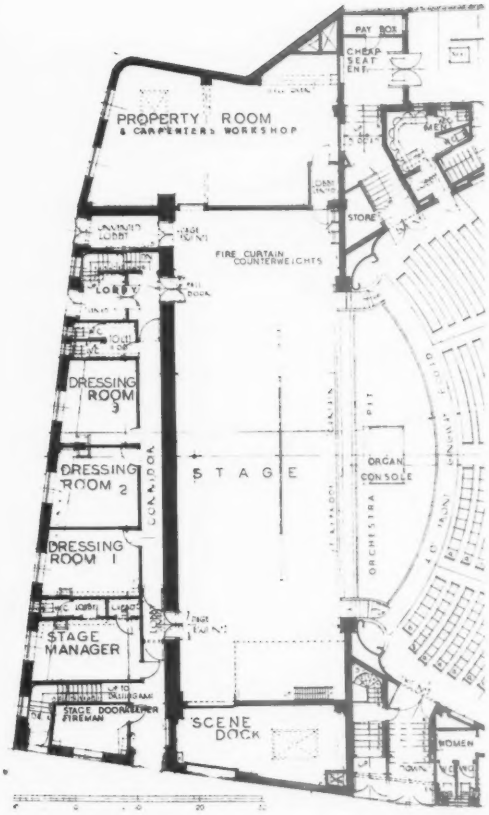
FIREPROOF CURTAINS

The fireproof curtain separating the stage from the auditorium is constructed of braced steel to form a rigid frame. It is lined on the auditorium side with brass wire woven asbestos cloth and on the stage side with 16-gauge flattened steel plates. The curtain overlaps the proscenium opening by at least 1 ft. 6 ins. at the sides and the top, the top being fitted with an overlapping plate covered in asbestos cloth to form a smoke tight joint when the curtain is down.

The curtain rises and falls in rolled steel channel guides, carried up to within a few feet of the curtain travel, and is operated by an electrical winch, fitted with an emergency hand control, connected to a centre hauling wire rope. In addition there are two ropes fitted with independent sets of counterweights. The descent of the curtain is

[*Continued on page 713*

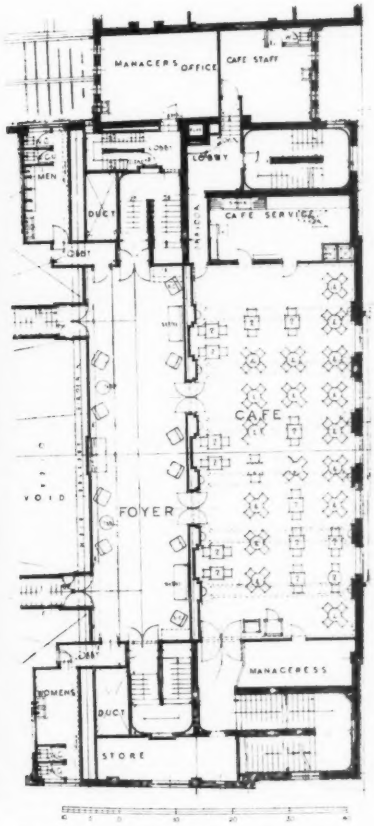




A photograph of the proscenium at the Gaumont Palace, Chelsea, and a plan of the stage, which is fully equipped for variety turns and musical performances. The stage is about 30 ft. deep and has ample off stage room on either side. The scene dock is provided with steel roller shutters to the stage and to the street. The property room and carpenter's workshop is separated from the stage by a roller shutter. There are ten dressing rooms on two floors.

The café service. It is connected by a lift on the left to the kitchen above and has two doors on the right leading into the café for the use of the waitresses.

The organ is fitted with glass panels and colour lighting to give special lighting effects under the control of the organist.



Plan of café and the service (shown above). The café is approached from the main entrance to the cinema and by a separate one from the street.

controlled by an automatic compressed air check, and after the release of the hand brake it should descend in no longer than 30 seconds. Two releases are installed, one at the proscenium opening and the other adjacent to the fireman's office off the stage. A curtain drencher pipe is fixed immediately behind the head of the curtain when down and the release placed alongside the curtain release.

DRESSING ROOMS

The dressing rooms are equipped with long benches with towel rail under and mirrors on the walls above ; wash hand basins with hot and cold supply, clothes racks and, if possible, wardrobe cupboards.

A scene dock should be provided, with steel roller shutters to the street or passage way and to the stage ; and a carpenter's shop also fitted with roller shutter from stage. The shutters in the stage wall should be fitted with quick release gear operated from either side.

STAGE LANTERN

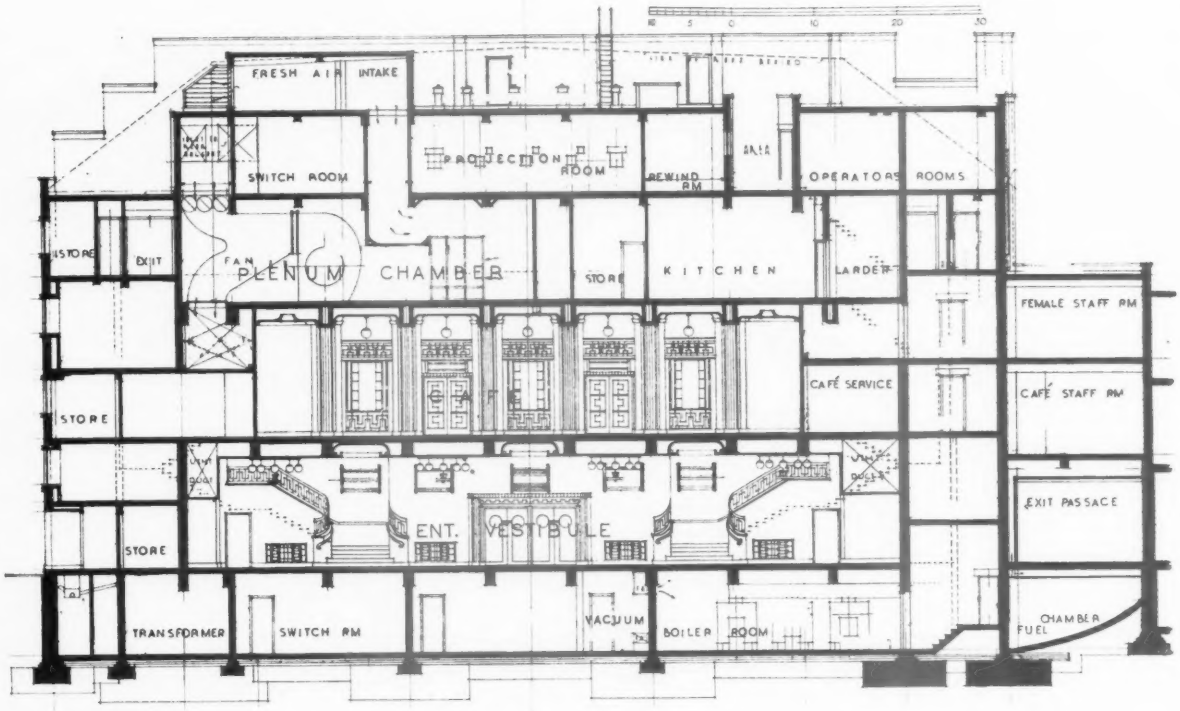
Where a fireproof curtain is installed a haystack type lantern light must be provided in the roof, the opening casements in the sloping sides being of an area equal to a sixth of the floor area of the stage. The casements are fitted with fusible link gearing so that in the event of fire the link parts and the casements fall open. The cable is taken down to stage level and fitted with gearing for manual operation, together with a trip release.

FIRE PROTECTION

In London and some of the larger provincial towns the regulations call for a sprinkler installation for the stage and possibly for the dressing room block, projection and rewind room ; those on the stage being installed on the underside of the grid. Even where not specifically called for by the authorities it is usually advantageous from the insurance point of view to install this protection. Hydrant points, with the requisite length of hose, must also be provided in the auditorium ; and portable extinguishers, buckets of sand, and blankets fixed in positions agreed upon with the authorities.

ORGANS

Two chambers—each approximately 16 ft. × 10 ft. × 10 ft.—are required, with blower room on side, provision being made for these either under the stage in the anti proscenium, or immediately over the proscenium. The usual place for the console is in the centre of the orchestra, and it is frequently installed on a lift with press-button control to bring the console up to stage



Cross section through the Gaumont Palace, Chelsea. All the photographs and plans accompanying this article are of that cinema. Every one of the plans on the previous pages shows, as far as possible, the accommodation required to house one particular branch of the mechanical or other equipment. By the aid of this section it is possible to visualize how the plans of these individual units fit into the cinema as erected.

level for recitals. Quite a number of consoles are now fitted with glass panels and colour lighting to give special lighting effects under the control of the organist.

HEATING AND CARPETS

The provision of a well-sprung, comfortable seat in even the cheapest parts of the house has no doubt contributed largely to the popularity of the large cinema as we know it today. Care, however, must be taken to see that the comfort of the seat itself is not negatived by the too close spacing of the rows to give insufficient leg room. A minimum of 2 ft. 6 ins. back to back should be allowed for the cheaper seats, 2 ft. 8 ins. to 2 ft. 9 ins. for the medium priced, and 3 ft. for the highest prices ; and not less than 20 ins. centre to centre of arms. The blocks of seats must be arranged so that no seat is more than 10 ft. from a gangway and that there is a clearance of at least 12 ins. between the rows when the seats are up. It is advisable not to close carpet the floor under the seats. A runner between the seats will be found more convenient when the question of repairs or renewals arises.

PAY BOXES

These are usually situated in the inner entrance vestibule. They can be of the portable or built-in type and be so arranged in a convenient position to serve both the stalls and the circle entrances. They are equipped with either hand operated or electrical three- to five-way ticket machines, complete with till, wired up with controls to the illuminated electrical seat indicator boards, and fitted with either a telephone or a microphone set connected to points in the auditorium so that advice can be given of the number of seats available from time to time and control kept or the issue of tickets.

PUBLICITY

It is most important for the architect to provide for publicity when designing both the façades and the interior decoration. Actual requirements vary considerably. On the façade publicity is secured by neon lighting, either outlining the building or by some applied design, neon interchange letter sign announcing the current programme, interchange letters on the canopy fascia, and glazed metal poster frames, usually of six sheet size (90 ins. by 40 ins.) ,recessed flush with the building face and adequately illuminated.

Inside the cinema announcements of current programme and next week's attractions are made by means of glazed poster frames, streamer frames, and special display panels.

The transformers in connection with the neon lighting installation are preferably placed in the open, but if found necessary to instal in a room inside the building, the room itself must be adequately ventilated direct to the outside air as in the event of a transformer burning out, the smoke might filter into the public parts of the building. It can usually be found convenient to house them on the flat roof immediately behind the parapet out of view. The number of transformers necessary naturally vary with the size of the tube and colour, but on a rough average one is required for every 12 to 20 feet length of tubing. A fireman's switch must be installed in an accessible position so that the H.T. supply can be cut off in the event of fire.

CAFE

The café should be planned if possible with a separate and additional entrance from the street. Supplementary rooms are a large kitchen service, equipped with cooking range, bain marie, steamer, griller, toaster, stockpot stove, carving table, hot closet, sinks and draining boards, plate racks, cutlery bins, etc. ; larder and vegetable store, manageress's room off café and staff rooms for kitchen and café.

VACUUM PLANT

The exhauster plant and motor should be planned if possible near boiler house. From here wrought iron piping is run to various points in the building terminating with gun metal hose connections. The accessories consist of lengths of hose with swivelling carpet, cleaning tools, upholstery tools, brushes, etc.

C: INTERIOR

4: ACOUSTICS

By C. W. Glover

For the most desirable acoustic conditions in the talkie cinema auditorium, the average sound emitted by the loud-speakers should rise to a suitable intensity in every part of the auditorium without echoes or distortion, and should die out quickly enough to prevent overlapping and interference with succeeding sounds.

THE ideal conditions set forth above can be obtained by giving due consideration to the following points :—

1 : The power output of the speakers should be adjusted to suit the volume or the seating capacity of the cinema.
2 : The reverberation should be optimum for the required conditions (see below).
3 : The shape of the auditorium should be such that discreet reflection of sound is avoided with the object of minimizing echo and interference.
4 : The acoustic properties of the interior surfaces of the building and the furnishing should be such as to avoid unequal absorption of sound on various frequencies with the object of avoiding distortion of tone.

INTENSITY OF SOUND AND REVERBERATION

The power output of the speakers is a matter usually dealt with by the engineers installing the equipment and is, therefore, not dealt with in these notes.

The introduction of wide range reproduction of sound in the modern cinema has brought into prominence acoustical problems relating to the reverberation characteristics of the theatre hitherto considered of little account.

Cinemas which had been " corrected " with acoustical treatment satisfactory for the old conditions are often now quite unsuited to wide range reproduction, and the discerning audience, daily becoming accustomed to improved quality of music and speech, detects without much difficulty acoustical defects apparent in the high and low register.

Reproduction over a greater range of frequencies necessitates in many cases the " brightening " of the auditorium with the object of preserving to the fullest extent the brilliance in music and the sibilants in speech, whilst the impressiveness of music and the naturalness in speech are greatly enhanced by increasing the reverberation at the lowest frequencies.

The expedients to be adopted with these ends in view may vary with each particular case, but the notes set down hereunder may be taken as a general guide to the treatment likely to be effective in most cases.

It is a mistake to provide uniform reverberation time throughout the frequency range, although hitherto it has been generally accepted as a desirable property of acoustical materials that they should have a " straight line " absorption over a wide range.

The optimum reverberation varies with the frequency and is not equal throughout the frequency range from 64 to 8,000 cycles as is frequently supposed.

In auditoria in which the acoustics are considered ideal the reverberation is invariably greater at the lower frequencies.

Walter A. MacNair, of the Bell Telephone Laboratories, argues that it is more reasonable to specify that the loudness of all pure tones shall decay at the same rate for all frequencies, as it is the loudness which takes into consideration the ultimate appreciation of the ear. For the frequencies between 700 and 4,000, loudness and sensation level are equal, but outside this band the loudness sensation level curve is steeper. MacNair thence deduces an optimum frequency curve, which is reproduced in modified form in figure 1.

Knudsen, on the other hand, recommends a reverberation characteristic such that on the average all frequency components reach inaudibility at the same instant.

His curves for speech and music are also shown on figure 1. It must, however, be borne in mind that the frequency distribution of sound energy to which the average audience is accustomed is influenced principally by the selective absorption characteristics of the audience and the theatre. The absorption of the audience has by far the greater influence, and " the characteristic of the audience " is therefore shown on the figure. It is interesting to note that all curves indicate an increase in reverberation as desirable at the highest and lowest frequencies.

Too much reverberation at the lower frequencies causes an unnatural booming effect, but an increased reverberation at the higher frequencies, whilst desirable from the point of view of intelligibility in speech, is not desirable in music.

Whenever there is a tendency to excessive reverberation in the higher frequencies, the acoustical properties of the room are regarded as unpleasant, and musicians dislike the hard tone which is imparted. Experience seems to indicate that intermediate curves such as those indicated in heavy lines, and marked " Music " and " Speech " in figure 1, provide the most desirable reverberation characteristics. The " datum " of time on this figure is for 512 cycles, for which frequency the optimum time is taken as unity.

To find the optimum time at any other frequency it is only necessary to multiply by the appropriate time factor read off from the graph, or taken from the following table :—

Table of Time Factors

Frequency cycles per sec.	Multiplier speech	Multiplier music	Multiplier speech and music
64	1·75	2·30	2·03
128	1·38	1·55	1·4
256	1·15	1·20	1·18
512	1·00	1·00	1·00
1,024	1·00	1·00	1·00
2,048	1·00	1·00	1·00
4,096	1·14	1·04	1·09
8,192	1·35	1·15	1·25
16,384	1·60	1·35	1·47

It has usually been considered that the actual reverberation times desirable in cinemas of normal design vary with the volume from, say, 1·55 sec. at 512 cycles in 100,000 cubic feet volume to 2·58 sec. at 512 cycles in 1,000,000 cubic feet volume.

In the theatre, the reverberation time must be adjusted to optimum for

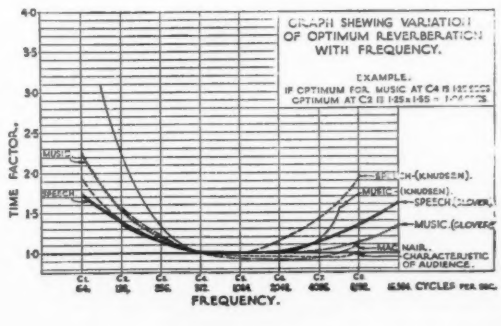


Figure 1. *Variation of optimum reverberation with frequency.*

direct music and speech, whereas in the cinema, owing to the fact that there is a certain amount of reverberation already recorded on the film, optimum for reproduced music is some 15 per cent. less. Apart from this the general tendency is to reproduce the sound at somewhat too high a level in the mistaken belief that this makes for clear reception throughout the auditorium.

Considerable calculation will be saved by the use of the graph reproduced in Fig. 2. By the use of this the total acoustic absorption required in open window units, including one-third audience averaged at 200 cubic feet per person, can be read off direct for optimum reverberation at 512 cycles.

Figures for the theatre are given on the left and the cinema on the right. For example, an auditorium of 500,000 cubic feet capacity is suitable for an audience of 2,500, and the total absorption required, including one-third of the audience, would be as tabulated below for the conditions stated :—

	Direct Sound. O.W.U.	Reproduced Sound. O.W.U.
Speech only	10,750	12,700
Music and speech ..	9,300	10,900
Orchestral music ..	8,100	9,550
Choral music	6,600	7,800

These figures can be read directly from the curves.

In order, however, to secure uniformly reliable acoustic conditions in cinemas, the ideal arrangement would undoubtedly be to standardize the acoustics of cinemas, keeping the reverberation down to the figures given in the following table :—

Frequency and Cycles per sec.	Standard Reverberation Time (sec.)
64	3·00
128	2·20
256	1·77
512	1·50
1,024	1·50
2,048	1·50
4,096	1·63
8,192	1·87
16,384	2·20

If the above suggestion were properly carried out there would be no risk of excellent film product being adversely criticized due to unsuitable acoustic conditions in the cinema.

To carry these proposals into effect it would be necessary to install seats fully upholstered top and bottom, and thickly to carpet the seating area to avoid material changes in the acoustic absorption by a change in the number of the audience. That additional absorption would be introduced by an increased audience will be evident, but this could easily be corrected by the use of adjustable absorbents to suit the size of the audience.

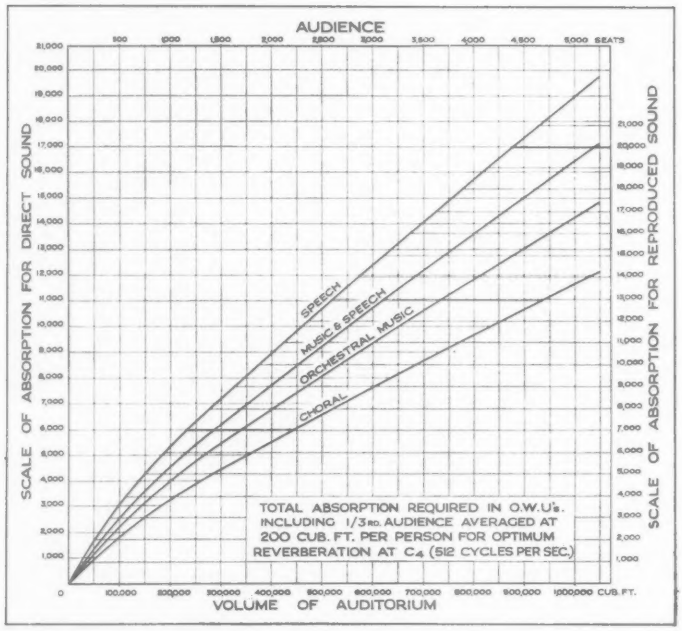


Figure 2. *Total absorption required for optimum conditions against the volume and seating for direct and reproduced sound.*

SHAPE OF AUDITORIUM

As a rule it is desirable to avoid curvilinear interiors as these are often productive of echo-producing conditions and at best accentuate interference phenomena. Unavoidable concave surfaces may, however, be rendered harmless if covered with highly absorbent materials. As a general rule it is desirable to dispose the reflecting surfaces near the source of sound and to incline them in such a way as to bring the acoustic images close to the origin. By this means the sound emanating from the source advances towards the audience reinforced by reflection, which is not delayed sufficiently to cause excessive reverberation or echo. The absorbing surfaces should always be placed remote from the source, and especially over offending surfaces liable to produce discreet reflections.

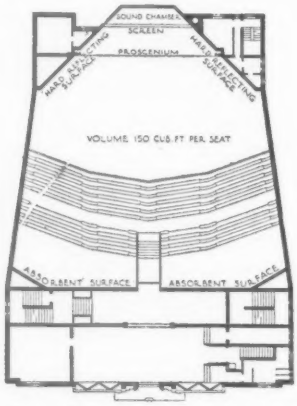


Figure 3. *A desirable shape for the talkie auditorium with an indication of the best distribution for reflecting and absorbent surfaces.*

In the legitimate theatre it is desirable to produce " bathroom " conditions on the stage and absorbent conditions in the auditorium. In this way the actors obtain good response from the atmosphere and speech and song advance towards the audience well reinforced by natural means.

In the cinema, however, reverberant conditions on the stage house or in the horn chamber are distinctly undesirable, as this would bring about selective resonance and too much reverberation for open-air conditions depicted at times on the screen.

Fig. 3 shows a desirable shape for the talkie auditorium with an indication of the best distribution for reflecting and absorbent surfaces. If the volume of the hall is kept down to 150 cubic feet per seat it will not be found so difficult to keep the reverberation down to the desirable figure.

ACOUSTIC PROPERTIES

The importance of the careful selection of absorbents to give optimum reverberation throughout the frequency range is emphasized in the tabulated results of suggested treatments for a faulty auditorium, as given on page 717. The results are plotted on Fig. 4, which shows the reverberation characteristics of the auditorium corrected to optimum at 512 cycles.

Although each of the suggested treatments gives optimum reverberation at

TABULATED RESULTS OF SUGGESTED TREATMENTS FOR A FAULTY AUDITORIUM

Auditorium 70 ft. by 21 ft. by 17 ft. high, 200 seats, 25,000 cubic feet.
Optimum 1 sec. at 512 v. (Music and Speech).
Audience present, 100.

		128	256	512	1,024	2,048	4,096
Absorbent							
Lino, 1,000		20	25	30	35	40	40
Carpet, 470		42	28	113	113	132	52
Plaster, 4,700		61	71	94	132	188	235
Unoccupied seats, 100		15	16	17	18	20	23
Persons, 100		360	430	470	470	500	500
Total		498	570	724	768	880	850
Required		353	490	526	482	370	297
Optimum absorption		851	1,060	1,250	1,250	1,250	1,147
Optimum time (secs.)		1·47	1·18	1·00	1·00	1·00	1·09
Treatment A.							
Acoustic plaster	1,820	485*	518	526	477	473	436
Total absorption		983	1,088	1,250	1,245	1,353	1,196
Reverberation time		1·27	1·15	1·00	1·01	0·925	1·05
Treatment B.							
Cotton fabric draperies, 14 ozs. per square yard, draped to half its area	1,120	64	330	526	876	695	550
Total absorption		562	900	1,250	1,644	1,575	1,400
Reverberation time		2·23	1·39	1·00	0·76	0·79	0·90
Treatment C.							
1 in. acoustic down mattresses	720	135*	350	526	542	490	454
Total absorption		633	920	1,250	1,310	1,370	1,304
Reverberation time		1·98	1·36	1·00	0·96	0·92	0·95
Treatment D.							
Perforated fibre board	837	223	339	526	587	610	602
Total absorption		721	909	1,250	1,355	1,490	1,452
Reverberation time		1·74	1·38	1·00	0·93	0·85	0·86

* Coefficients for these frequencies estimated by the writer.

512 cycles, treatments B and C show considerable departure therefrom at other frequencies, and the room, if treated by these methods, would be satisfactory for the soprano voice, but too reverberant for the bass, and too "dead" for the piccolo.

The desirable acoustic conditions in an auditorium can only be secured by a judicious selection of the materials used in its treatment and their correct disposition.

SELECTION OF ACOUSTIC MATERIALS

What is the best acoustic material? Each manufacturer of acoustic materials will unhesitatingly give a definite answer and all will refer to different materials, yet no doubt all will be more or less correct. (There is a choice of some 250 materials with a wide range of qualities.)

In endeavouring to answer this question it is first necessary to ascertain :—

1 : The actual requirements.
2 : The particular use to which the material is intended to be put.
3 : The proposed method of fixation.
4 : The after-treatment of the surface.
5 : The local authorities' regulations, and
6 : The cost of the material and its application.

The factors determining the efficacy of any acoustic material are so varied and so complicated that it is folly to expect to find a material which satisfies all conditions. On the other hand, all materials worthy of claiming definite acoustic properties can generally be expected to fulfil one or other of the acoustical requirements superlatively well.

The desirable qualities of acoustic materials are set out below, but we have yet to find a material fully up to such a specification in all respects.

ACOUSTIC MATERIALS

Desirable Qualities

1 : Acoustic absorbents should have a high coefficient of sound absorption. This enables the quantity to be used to be cut down to a minimum.
2 : The absorption should have the correct value at each frequency over the full range of audio-frequency. This will maintain the correct balance of tone in complex sounds.
3 : Sound-absorbent materials should be reasonably fire-resistant. This is especially desirable where board type of absorbents are fixed clear of the wall or roof and with an air space behind. Most of the acoustic materials not normally fire-resistant can be treated with "fire-proofing" solutions without materially affecting their acoustic qualities.
4 : They should possess structural strength. Specially is this necessary in the case when acoustic partitions are constructed or an absorbent is used as part of the structure of a wall or ceiling.
5 : They should be durable, and not subject to decay by access of moisture.
6 : They should possess a high degree of heat insulation. Most good sound absorbents have this quality, and their judicious use will improve the fire-resisting qualities of the structure and minimize heat transmission.
7 : They should be non-hygroscopic, and moisture condensing on the surface should not be taken up and the acoustic qualities thereby inpaired.
8 : They should possess a high light-reflection coefficient. This is particularly necessary in the case of undecorated linings.
9 : They should not be subject to excessive moisture movement—the expansion and contraction with changes of atmospheric humidity should be negligible.
10 : Board absorbents should resonate over a wide range of audio-frequency.
11 : They should be reasonably easily handled, cut, worked, bent and fixed.
12 : They should be odourless, decorative and hygienic.
13 : They should be free from, or be rendered immune from, the attacks of insects and vermin.
14 : They should be economical. A rough comparison can be made by considering the cost per 100 o.w.u. absorption, but fixing costs and area required also enter into the calculation, and it is undoubtedly better to compare estimates for complete alternative schemes.

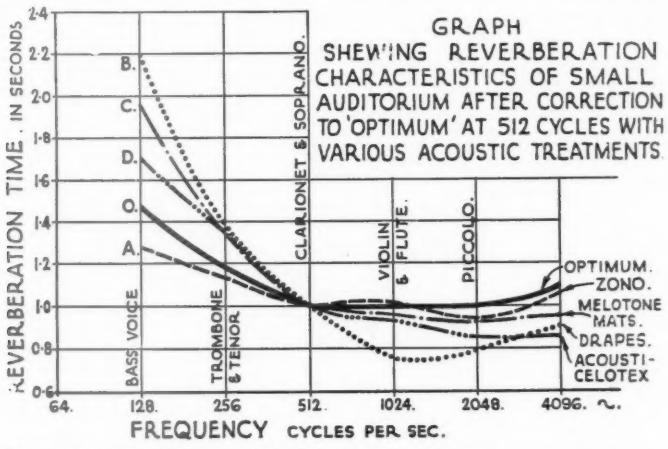


Figure 4. *Reverberation characteristics of the auditorium shown in Figure 3 corrected to optimum at 512 cycles.*

CINEMA ORGANS

The installation of cinema organs should have its consideration in the design of auditoria and the organ builder should preferably be consulted when the work is in the drawing-board stage.

The modern cinema organ consists of five essential parts :—

1 : *The console for the control of the organ*, usually situated on a lift in the orchestra pit, and connected with flexible cables to

2 : *The motors and blowers*, installed in a concealed and sound-proof motor-room in which the current for the relay control gear is generated and the "wind" provided.

3 : *The electric relay gear*, accommodated in a separate room conveniently situated for

4 : *The first organ chamber*, containing all the drums, cymbals, glockenspiel, bird whistles and other effects, and also all the ranges of pipes usually used in solo playing. Adjoining

5 : *The second organ chamber*, containing all the sets of pipes usually used for accompaniment—the diapason, string stops, flutes, etc.

THE CONSOLE

The console should be placed in such a position as to provide :—

1 : Good hearing of the sound in the auditorium for the organist.

2 : A clear view of the screen by the organist, who may frequently have to provide accompaniments to pictures.

3 : A clear view of the console by the audience.

THE MOTORS AND BLOWERS

These should be situated conveniently near the organ chambers in a room sound-insulated to the amount of 65 db. The machinery should be isolated on vibration damping pads and the blower ducts connected with non-metallic sleeves and isolated from the structure. The air for the blowers should be drawn in through air filters and delivered through silencers constructed with sound-absorbent baffles.

The interior of the motor-room should be finished in hard enamelled plaster with a view to avoiding the collection of dust.

The room for the electric relay gear should be similarly constructed, and special precautions taken to protect the gear against the accumulation of dust.

THE ORGAN CHAMBERS

Each of the organ chambers should adjoin the auditorium, to which one side should be open through swell shutters, which are used to control the volume of the tone. The organ chambers must be placed so as to get a wide distribution of "direct" sound to all parts of the auditorium, and in modern theatre design the possible positions are restricted to the following :—

1 : *Under the stage*—as in the Roxy Theatre, New York, and as shown in Figure 5. This is not an ideal position, as it is too close to the console and is likely to be masked when the orchestra lift is up.
If care is taken, however, to avoid such masking effects, the organ music coming from under the stage can usually well penetrate to the seating area under the balcony.

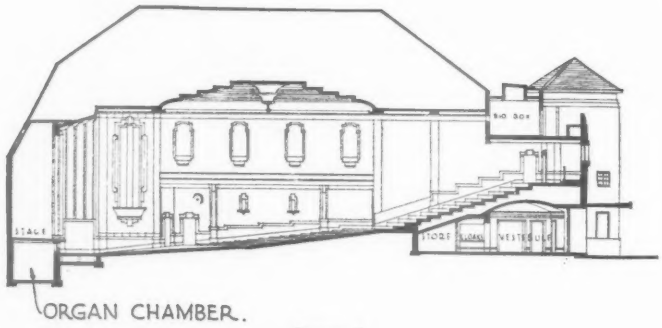


Figure 5.

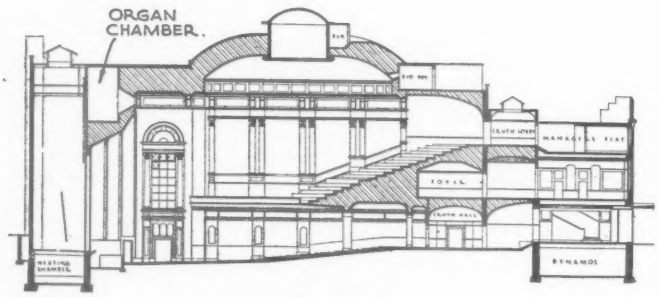


Figure 6.

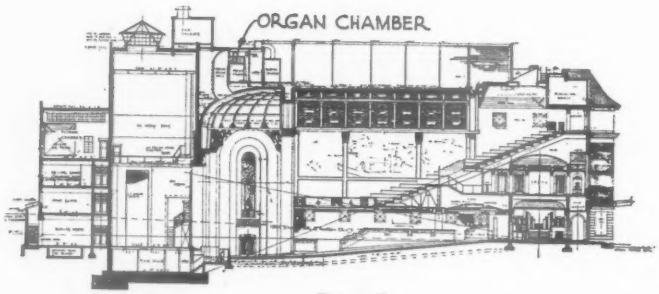
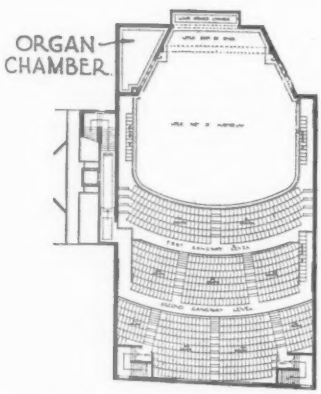


Figure 7.



Left, Figure 8.

2 : *Over the proscenium arch*—as in the Gaumont Palace, Coventry, shown in Figure 6.
In this theatre the organ chamber is remote from the console and distributes the sound evenly over the whole theatre.
The organist hears exactly the same as his audience and the arrangement is ideal.
The organ installation at the New Victoria Theatre, London, is spoilt by the masking effect of the vent extractors over the proscenium arch. which screen stalls and organist from direct sound.

3 : *One chamber on each side of the proscenium.* This is a distinctly bad arrangement, except in cases of long, narrow or fan-shaped auditoria with narrow stage openings.
The Empire, Leicester Square, provides an example of the defects of a "split" organ, distraction in the audience and acoustic interference effects being very noticeable.

4 : *Both chambers on one side of the proscenium opening.* This is shown in Figure 8, and is an arrangement particularly suited to all fan-shaped auditoria.

Organ chambers should be as roomy as the exigencies of the design permit, and although organ-makers can accommodate the pipes in a restricted space by "knuckling" the pipes, accessibility for cleaning, tuning and repair should have due consideration. The minimum head-room required is 10 ft. 6 ins., and the floor space 200 sq. ft., though 300 sq. ft. would be a more suitable allowance.

THE CINEMAS ILLUSTRATED

GENERAL AND SUB-CONTRACTORS

ODEON, KINGSTANDING, BIRMINGHAM (page 674). The general contractors were Housing, Ltd. The principal sub-contractors and suppliers included :—

Structure.—British Steel Construction (Wednesbury), steelwork.

Finishes and Equipment.—W. W. Turner & Co., Ltd., chairs, carpets, linos, etc. ; Couzens and Akers, heating and ventilating ; Shaw's Glazed Brick Co., Ltd., faience ; Boro' Electric Signs, neon lighting.

ASTORIA, SOUTHEND (pages 675–677). The general contractors were Griggs and Son, Ltd. The principal sub-contractors and suppliers included :—

Structure.—St. Mary's Wharf Cartage Co., Ltd., excavation ; Aston Construction Co., Ltd., steelwork ; Trussed Concrete Steel Co., Ltd., reinforced concrete retaining walls ; Caxton Floors, Ltd., floors, balcony and staircases ; British Reinforced Concrete Engineering Co., Ltd., steel reinforcement ; Patent Impervious Stone and Construction Co., Ltd., artificial stonework ; Turners Asbestos Cement Co., roofing ; Ragusa Asphalte Paving Co., Ltd., asphalt ; Williams and Williams Ltd., metal windows ; British Challenge Glazing Co., Ltd., lantern lights, including stage lanterns.

Finishes.—Universal Metal Furring and Lathing Co., Ltd., furring and metal lathing ; H. E. Gaze, Ltd., fibrous plaster ; Newalls Insulation Co., Ltd., acoustic plaster ; Mollo and Egan, decoration ; Central Perivale Ltd., joinery ; F. Knight & Co., Doverite handrailing and ironmongery ; J. Starkie Gardner, Ltd., canopy, collapsible gates and laylights ; V. Ramsden, Ltd., terrazzo paving, wall tiling and composition flooring.

Equipment.—J. W. Gray and Son, Ltd., lightning conductor and flag pole ; Carrier Engineering Co., Ltd., heating and ventilation ; Benham and Sons, Ltd., kitchen equipment ; Dennison Kett & Co., Ltd., steel shutters ; Drake and Gorham, Ltd., electrical installation ; Hoffman Sprinkler Co., Ltd., fire appliances ; Sturtevant Engineering Co., Ltd., vacuum cleaning ; F. A. Norris & Co., Ltd., iron staircase and ladders ; Matthew Hall & Co., Ltd., plumbing ; George Jennings (Lambeth), Ltd., sanitary fittings ; J. and W. Shale, exit gates and wrought iron hand-railing ; Margolis Bros., Ltd., office furniture.

Specialist Suppliers.—Gimson & Co. (Leicester), Ltd., stage rigging, counter-weighting and lifts ; Knight & Co. (Engineers), Ltd., orchestra lift and organ console lift, fire curtain ; Franco-Signs, Ltd., neon lights ; Walturdaw Cinema Supply Co., Ltd., booth equipment and stage draperies ; Western Electric Co., Ltd., sound equipment ; Fredk. Sage & Co., Ltd., pay-boxes ; E. Pollard & Co., Ltd., kiosk fitting ; W. W. Turner & Co., Ltd., carpets, chairs, curtains, act-drop and tea-room furniture ; Lingerin, Ltd., settees and armchairs for foyer ; Automaticket, Ltd., automaticker machines ; Cinema Signs, Ltd., display frames ; Alfred Harold, Ltd., uniforms.

GAUMONT PALACE, SALISBURY (pages 678–679). The general contractors were McLaughlin and Harvey, Ltd. The principal sub-contractors and suppliers included :—

Structure.—H. Young & Co., Ltd., constructional steelwork.

Finishes and Equipment.—G. N. Haden and Sons, Ltd., heating and ventilating ; Clark and Fenn, Ltd., fibrous plaster and decoration ; Garton and Thorne, Ltd., ornamental wrought ironwork ; Korkoid Decorative Floors, Ltd., cork dado.

Specialist Suppliers.—Benham and Sons, Ltd., kitchen equipment ; W. W. Turner & Co., Ltd., seating and carpets ; Frank Burkitt, Ltd., fireproof curtain and counter weighting.

GAUMONT PALACE, TAUNTON (pages 680–681). The general contractors were McLaughlin and Harvey, Ltd. The principal sub-contractors and suppliers included :—

Structure.—A. D. Dawnay and Sons, Ltd., steelwork ; Thos. S. Penny, Ltd., facing and common bricks : Aerocrete Units (Lancs.), Ltd., fireproof flooring ; Williams and Williams, Ltd., standard windows ; James Gibbons, Ltd., special windows ; The Ham Hill, Doulting and Portland Stone Co., Ltd., stonework to front.

Finishes.—W. H. Fraley and Sons, Ltd., marble work ; Bryan's Adamanta, Ltd., fibrous plaster work and colour decoration, solid plastering ; The Venetian Flooring Co., terrazzo work and tiling to lavatories ; A. E. Davis, ironmongery ; Garton and Thorne, Ltd., hand-rails ; Lewis's, Ltd., special floor coverings and dadoes ; Newbury A. Trent, sculpture work.

Equipment.—W. W. Turner & Co., Ltd., seating ; A. Anderson and Son, electrical work ; F. H. Pride, decorative electric lighting fitments ; Clarke and Vigilant Sprinklers, Ltd., hydrants ; Lockerbie and Wilkinson, Ltd., spiral staircase ; Claude-General Neon Lights, Ltd., neon sign ; Thomas A. Ingram, front and side canopies ; J. Jeffreys & Co., Ltd., heating and ventilation ; Merchant Trading Co., Ltd., flush doors ; Benham and Sons, Ltd., café kitchen ; F. Barnes, decorative panels ; John Mallin & Co., Ltd., fireproof curtain.

REGAL, MARGATE (pages 682–683). The general contractors were E. D. Winn & Co., Ltd. The principal sub-contractors and suppliers included :—

Structure.—Dorman Long & Co., Ltd., steelwork.

Finishes.—H. H. Martyn & Co., Ltd., decorations ; J. Walker, Ltd., fibrous plaster ; T. Cook, Ltd., terrazzo facings and terrazzo mosaic floors ; Swanser and Son, Ltd., canopy, metal hand-rail and balustrade.

Equipment.—Chase & Co., Ltd., heating and ventilation ; Troughton and Young, Ltd., electrical installation ; Walter Cassey, Ltd., door furniture ; General Electric Co., Ltd., electrical fittings ; Sturtevant Engineering Co., Ltd., vacuum cleaning plant.

Specialist Suppliers.—J. Frank Brockliss, Ltd., projection equipment ; Western Electric Co., Ltd., sound equipment ; P. Conacher & Co., Ltd., organ ; Henrion Carbons, Ltd., carbons ; Crompton Parkinson, Ltd., motor generators ; Andrew Smith Harkness, Ltd., screen ; Ash's Manufacturing Co. (Blackfriars), Ltd., kitchen and soda fountain equipment.

ASTORIA, RUISLIP (page 684). The general contractors were Y. J. Lovell and Sons. The principal sub-contractors and suppliers included :—

Structure.—A. D. Dawnay and Sons, Ltd., constructional steelwork ; Siegwart Fireproof Floor Co., Ltd., balcony steppings, stairs and hollow floors ; Thomas Lawrence and Sons, and Ames and Finnis, multi-coloured facing bricks ; London Brick Co. and Forders, Ltd., rustic flettons ; Crittall Manufacturing Co., Ltd., windows ; Kingsmill Metal Co., Ltd., canopy.

Finishes.—Shaws Glazed Brick Co., Ltd., terracotta ; F. DeJong & Co., Ltd., fibrous plaster and internal decorations ; May Acoustics, Ltd., acoustical treatment ; Turners Asbestos Cement Co., Ltd., Trafford tiling ; Yannedis & Co., Ltd., ironmongery ; Decorative Tile Company, wall tiling ; Rust's Vitreous Mosaic Co., vitreous mosaic flooring.

Equipment.—Brooks, Phillips & Co., Ltd., sanitary fittings ; Matthew Hall & Co., Ltd., heating and ventilation ; Garton and Thorne, Ltd., still frames and laylight ; Ionlite, Ltd., neon lighting.

REGAL, ABINGDON (page 685). The general contractors were T. Elvins and Sons. The principal sub-contractors and suppliers included :—

Structure.—E. C. and J. Keay, Ltd., constructional steel ; Swanser and Sons, Ltd., canopy ; Henry Hope and Sons, Ltd., steel casements ; Haywards, Ltd., lanterns ; S. Bott and Son, shop fronts.

Finishes.—Showell Trickett, leaded lights ; Venetian Flooring Co., terrazzo ; Drytone Joinery, Ltd., panelling and doors ; Bryans Adamanta, Ltd., fibrous plaster and decoration.

Equipment.—J. S. Wright & Co., heating and ventilation ; J. Frank Brockliss & Co., Ltd., projectors, etc. ; W. W. Turner & Co., Ltd., furnishings.

PLAYHOUSE, MONTROSE (pages 686–687). The principal sub-contractors and suppliers included :—

Structure.—Robert Pert and Sons, masonry.

Finishes and Equipment.—Robert Pert, joinery ; Young Austen and Young, Ltd., heating and ventilating ; Tynecastle Co., fibrous plaster ; Morrison, plastering ; Grant, plumbing ; R. Stewart, painting ; Smith, electrical work ; Major Equipment, Ltd., electrical fittings ; Fraser, curtains ; Brown, art metal work ; Kalee, Ltd., projectors ; Western Electric, Ltd., sound system.

ASTORIA, FOLKESTONE (pages 688–689). The general contractors were Messrs. Marx. The principal sub-contractors and suppliers included :—

Structure.—The Rock Asphalte Co., Ltd., asphalt ; Trussed Concrete Steel Co., Ltd., concrete block, reinforced concrete, fireproof construction ; Modern Surfaces, Ltd., artificial stone ; Matthew T. Shaw & Co., Ltd., structural steel ; Turners Asbestos Cement Co., Ltd., special roofings ; Plastona, Ltd., waterproofing materials ; Williams and Williams, Ltd., casements ; J. A. King & Co., Ltd., pavement lights.

Finishes.—National Flooring Co., Ltd., wood block and patent flooring ; H. E. Gaze, Ltd., plaster and decorative plaster ; J. Starkie Gardner, Ltd., metalwork ; Central Perivale Ltd., joinery and cloakroom fittings ; Brookes, Ltd., marble ; Carter & Co. (London), Ltd., tiling ; W. W. Turner & Co., Ltd., furniture ; Stroud Bros., Ltd., shrubs and trees ; British Metallic Paint Co., Ltd., cellulose enamel, bronzing medium and silver powders ; Pinchin Johnson and Co., Ltd., Cementilk—plastic paint ; The Universal Metal Furring and Lathing Co., metal furring and lathing ; Newalls Insulation Co., acoustical treatment ; Mollo and Egan, decorations.

Equipment.—A. Olby, Ltd., glass and sanitary fittings ; F. A. Norris & Co., Ltd., iron staircases ; Young, Austen and Young, Ltd., central heating, boilers, ventilation ; Drake and Gorham, Ltd., electric wiring, electric light fixtures and electric heating ; F. Knight & Co., Ltd., door furniture ; Gimson & Co. (Leicester), Ltd., lifts ; Lamson Pneumatic Tube Co., Ltd., vacuum cleaning ; Hoffman Sprinkler Co., Ltd., hydrants and fire appliances ; Benham and Sons, Ltd., restaurant and kitchen equipment.

Specialist Suppliers.—John Compton Organ Co., organ ; Boro' Electric Signs, neon installation ; Western Electric Co., Ltd., sound reproduction equipment and screen and sound amplification ; Edison Swan Electric, Ltd., special fittings and lamps ; Walturdaw Cinema Supply Co., Ltd., projection equipment ; Electrical Equipment and Carbon Co., Ltd., rectifier equipment ; William Geipel, Ltd., stage switchboard ; Knight & Co. (Engineers), Ltd., organ lift.

EROS, SHAFTESBURY AVENUE (pages 690–691). The general contractors were Messrs.

F. G. Minter, Ltd. The principal sub-contractors and suppliers included :—

Structure.—Girlings Ferro-Concrete, Ltd., precast balcony slabs ; Redpath, Brown & Co., Ltd., steelwork ; Trussed Concrete Steel Co., Ltd., staircases.

Finishes.—Fenning & Co., marble ; J. Whitehead and Sons, marble and terrazzo work ; George Jackson, fibrous plaster ; Pugh Brothers, decorative glass.

Equipment.—Geo. Jennings, sanitary fittings ; W. Cassey, ironmongery ; F. A. Norris & Co., boiler house door ; Norris Warming Co., alterations to heating pipes ; Pringle Art Metal Co., handrails and balustrading ; Haskins & Co., collapsible gate ; G. Parnall & Co., decorative metal work ; Nash and Hull, Ltd., signs ; Richard Crittall & Co., heating and ventilators ; Troughton and Young, electrical contractors, electric light fittings ; Electric Sign Co., alterations to sign wiring ; H. N. Barnes, canopy and entrance doorway ; Clarke and Vigilant Sprinkler, Ltd., fire fighting apparatus ; Hobbs Hart & Co., safe ; Kingsmill Metal Co., staircase grilles ; Minter Decorations, Ltd., furnishings.

Specialists.—Frank Burkitt, projection room fusible link gear ; Kershaw Projection Co., projection room apparatus ; Perforated Front Projection Screen Co., screen.

RIO, BARKING (page 692). The general contractors were F. R. Hipperson and Son, Ltd. The principal sub-contractors and suppliers included :

Structure.—General Asphalte Co., Ltd., asphalting; W. James & Co., Ltd., metal windows and louvred installation ; Le Grand Sutcliff and Gell, Ltd., trial borings ; Sanders and Forster, Ltd., steelwork ; Turners Asbestos Cement Co., Ltd., asbestos roofing.

Finishes.—Anselm Odling and Sons, Ltd., marble work ; Campbell Bros., Ltd., painting ; Eaton, Parr and Gibson, Ltd., mirrors ; Garton and Thorne, Ltd., ornamental ironwork ; Minton Hollins & Co., Ltd., tiling ; Malcolm Macleod & Co., Ltd., precast concrete work ; Samuel Wright & Co., Ltd., solid and fibrous plaster.

Equipment.—British Vacuum Cleaner and Engineering Co., Ltd., vacuum cleaning plant ; Borough Engineering Works, Ltd., iron staircase and ladders ; E. Coules and Son, guard railings, cowls and steel trunking, etc. ; S. Dixon and Son, Ltd., hydrant installation ; J. W. Gray and Son, Ltd., lightning conductor ; J. Jeffreys & Co., Ltd., heating and ventilating installation ; Parker, Winder and Achurch, ironmongery ; Garton and Thorne, flag poles, etc. ; Pontifex and Emanuel, sanitary ware, etc. ; Troughton and Young, Ltd., electrical work ; William Warne & Co., Ltd., rubber mats.

Specialists.—Ambassador Scenic Studios, Ltd., painting fireproof curtain ; Frank Burkitt, Ltd., fire curtain, shutters and stage lantern light ; E. Coules and Son, bio box ; Claude-General Neon Lights, Ltd., neon installation ; Gimson & Co., Ltd., counter-balance gear ; H. Lazarus and Son, Ltd., seating ; Mather and Platt, Ltd., rolling shutters ; Perforated Front Projection Screen Co., Ltd., screen and screen frame ; R.C.A. Photophone, Ltd., talking picture apparatus.

GAUMONT PALACE, CHELSEA (see article on Interior, pages 707 to 714). The general contractors were Messrs. McLaughlin and Harvey, Ltd. The principal sub-contractors and suppliers included :—

Structure.—Horseley Bridge and Thos. Piggott, Ltd., steelwork ; Siegwart Fireproof Floor Co., Ltd., precast floors ; Stuart's Granolithic Co., Ltd., precast stone ; Luxfer, Ltd., metal windows ; Universal Asbestos Mnfg. Co., Ltd., asbestos roofing tiles ; Haywards, Ltd., roof glazing.

Finishes.—G. Jackson and Sons, Ltd., fibrous plaster and decoration ; Laminated Wood Products, Ltd., flush doors ; Camden Tile and Mosaic Co., Ltd., terrazzo and mosaic flooring ; Ramsden's, Ltd., wall tiling, etc. ; N. F. Ramsay & Co., Ltd., ironmongery ; Newalls Insulation Co., Ltd., acoustic plaster ; Universal Metal Furring and Lathing Co., Ltd., light steel bracketting ; F. H. Pride, decorative lighting ; Eaton, Parr and Gibson, Ltd., mirrors and decorative glass ; Cellulin Flooring Co., cork flooring, etc. ; Duralite Flooring Co., jointless flooring.

Equipment.—J. Jeffreys & Co., Ltd., heating and ventilation ; Clarke and Vigilant Sprinklers, Ltd., sprinklers and hydrants ; Garton and Thorne, canopy and poster frames ; T. Clarke & Co., Ltd., electrical installation ; Potter Rax Gate Co., Ltd., handrailing and W.I. grilles ; Kingsmill Metal Co., balustrade ; W. E. Earley, plumbing and sanitary goods.

Specialist Suppliers.—F. Burkitt, Ltd., fireproof curtain and stage counterweighting ; British Vacuum Cleaner and Engineering Co., Ltd., vacuum plant ; Strand Signs, neon signs ; Strand Electric and Eng. Co., Ltd., stage electrical equipment ; W. W. Turner & Co., Ltd., seating and carpets ; Benham and Sons, Ltd., kitchen equipment ; John Compton Organ Co., Ltd., organ ; G. K. Jensen & Co., Ltd., console lift, etc.

Owing to pressure on our space the usual weekly features —Technical Section, Trade Notes, Rates of Wages, and Current Prices—are unavoidably held over from this issue. They will be resumed next week.

Manufacturers' Items

Cinema Acoustics

The acoustical treatment applied to the Gaumont Palace, Chelsea, illustrated on pages 707-714 of this issue, consists of asbestos applied to the walls facing the speakers, the back wall above and below the balcony, to the decorative motif decided upon by the architect of the Gaumont Circuit. Asbestos was applied to the decorative treatment in the ceiling in the form of a large horseshoe, springing from the back of the theatre. The work was carried out by Newalls Insulation Co., a branch of Turner and Newall, Ltd.

Brussels Exhibition Awards

Messrs. Twyfords, Ltd., have been notified by their Belgian agents that they have been awarded a Gold Medal for their bathroom exhibit at the Brussels Exhibition.

The Decoration of Cinemas

It is not without significance that Messrs. Cinema and Interior Decorations, Ltd., who have secured a number of contracts recently, have, as director, Mr. T. G. Richards, who is himself an architect by training and who, in 1930, when an architect's assistant, was the winner of the Street Improvement Competition for Carlisle.

An "All-In" Electrical Service

During the last three or four years Messrs. W. J. Furse & Co., Ltd., have been carrying out complete installation contracts at many of the largest theatres throughout the country.

As specialist manufacturers in this class of work they are able to offer exceptional services in this direction. Besides being capable of carrying out the whole of the electrical installation, they are also actual manufacturers of switchboards, dimmer banks, battens and footlights, operating box equipment, stage counterweighting curtain controls, frames, lifts, fireproof shutters, and are capable of carrying out a complete engineering contract for any theatre (with the exception of the sound equipment) including the wiring, projectors and heating and ventilating.

A New Fixed Trust

The new British Keystone Securities Trust which has been brought out by the British Industrial Corporation, Ltd., has several new features of special interest. The unit-holders participate in 50 per cent. of the profits of the managers in addition to the dividends of companies forming the underlying security ; as the trust grows this participation should become valuable. Investors in this new trust have the right to spread their payments for a minimum of 100 units over a period of six months. This should prove a great convenience to many small investors.

A booklet giving full particulars can be obtained from the Managers, British Keystone Securities Trust, Ltd., 24 Throgmorton Street, London, E.C.2.

Tubular Lamps

A new range of tubular lamps has recently been marketed by Evenlite Tube Lamp Developments, Ltd., who claim for their products the advantages of economy in first cost, long life, shadowless light between joints, low current consumption and suitability for design in a variety of shapes and colours. Various lengths and colours are available in two diameters and with varying loads in watts per foot run.

Concrete Floors

A new booklet from Concrete, Ltd., describes Bison precast balcony step units, with a long list of contracts recently carried out.

New Offices and Factories for Nobel Chemical Finishes, Ltd.

On September 30 the offices of Nobel Chemical Finishes, Ltd. were transferred from Slough to Nobel House, Buckingham Gate, London, S.W.1.

This removal is of more than usual interest, because nine years ago this building was occupied by Nobel Industries, Ltd., which amalgamated with other large industrial concerns to form Imperial Chemical Industries, Ltd.

Nobel Chemical Finishes, Ltd. was formed in 1926 as a subsidiary company in the Nobel Group, to manufacture nitro-cellulose finishes. The production of these finishes was started on a large scale, and they rapidly revolutionized the motor car and coach-building industry.

In order to provide a complete service, Nobel Chemical Finishes then took over the old-established paint manufacturing concern of Naylor Brothers (London), Ltd., thereby securing control of factories at Slough, Stowmarket, Birmingham and Derby ; the Headquarters of the company being located at Slough. To meet the rapidly increasing demand, the company's productive capacity is being largely developed. New buildings are being erected and increased plant installed at all existing factories, while an entirely new factory site has been bought at Stowmarket in Suffolk. This new factory will go into full production as soon as the building is complete.

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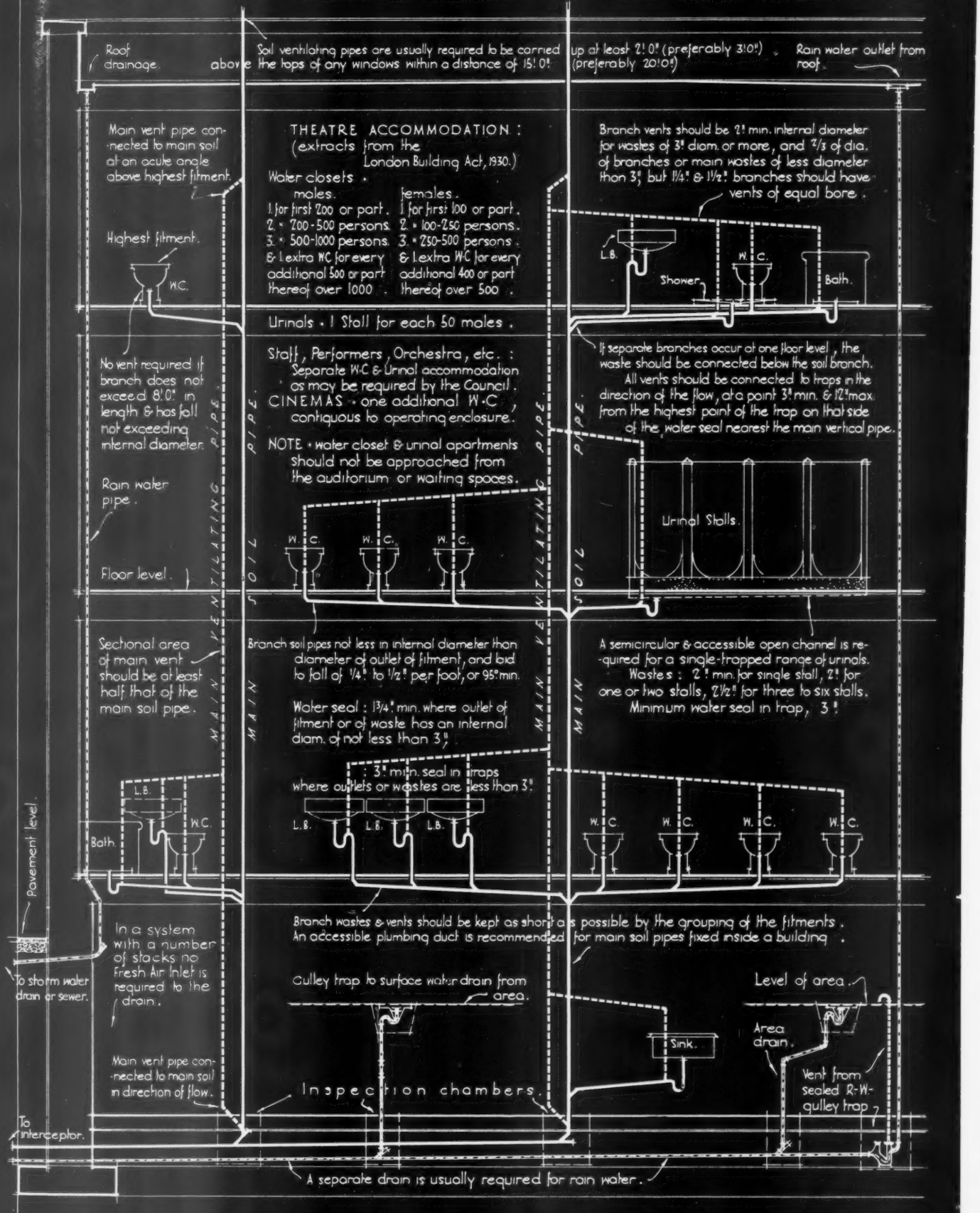

Information from the Lead Sheet & Pipe Development Council.

INFORMATION SHEET • PLUMBING • THE ONE-PIPE SYSTEM • 12.

SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON WC1 • Oscar A. Bayne.

THE ARCHITECTS' JOURNAL
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INFORMATION SHEET

• 271 •

PLUMBING

Type Illustrated : One-pipe System

This Sheet sets out in diagrammatic form the essential points in connection with a one-pipe plumbing lay-out for multi-storeyed buildings.

The One-pipe System of Plumbing :

The one-pipe system of drainage is the name given to the system in which all waste from sinks, lavatory basins, baths, etc., and soil from w.c.'s is taken into the one vertical stack.

Since, in this arrangement, all fittings are connected by their wastes to stacks carrying soil, it follows that the venting and sealing by traps of the wastes is a more vital matter than in the older plumbing systems. Deep seal traps are regarded as essential, and vents to all wastes, no matter how short the run, are necessary. The arguments usually put forward to show that the one-pipe system of plumbing should be used in preference to the more accepted system of separate soil and wastes are, briefly, these :—

(*a*) That it is more economical.

(*b*) That it entails the use of fewer unsightly vertical pipes and connections, both inside and outside the building.

(*c*) That it permits the abolition of the usually unreliable fresh-air inlet.

(*d*) That it reduces the number of gullies and manholes required for a given job.

(*e*) That it gives a better drainage flow.

(*f*) That the maintenance cost is less.

However, it should be pointed out that the type of building, the number, type, and lay-out of the fittings to be served, determine to a large extent the economy achieved. It is possible that, in certain cases, where the grouping of the fittings does not lend itself to easy connections to a single stack, it may be more expensive to run the necessary branches and connections than to separate the plumbing in different vertical stacks.

The one-pipe system lends itself particularly to multi-storey buildings of the residential type, where a repetition of flats leads to repetition of compactly grouped sanitary fittings. Wherever such conditions occur the one-pipe system will show to advantage and achieve the economies claimed for it.

That there is a reduction in the number of vertical pipes is obvious, as also a reduction in the number of gullies and manholes in certain cases. The better flow of drainage is said to be obtained by having the whole system washed through by the waste from such fittings as baths, where in the older system the soil stacks were never washed through by any great quantity of water.

Less maintenance cost would seem to be a minor item, but fewer pipes must lead to some reduction in this item.

Pipes :

The following table sets out the minimum weights of lead Pipe per lineal yard recommended by the Institute of Plumbers and the weights laid down by the British Standards Institution, for soil, waste and ventilating pipes :—

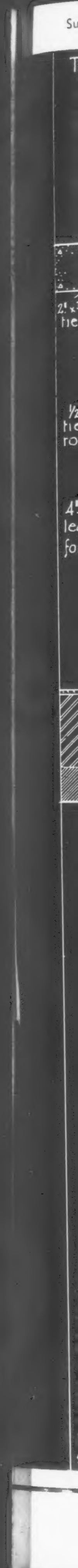
Size of Pipe inches	Institute of Plumbers lbs. per yd.	B.S.I. lbs. per yd.
1	5	—
1¼	7	7
1½	9	9
2	10	12
2½	12·5	14·4
3	15	17·1
3½	19·5	20
4	22·5	22·8
4½	29	29·1
5	41	41
6	57	57

Previous Sheets issued by the Council are Nos. 148, 149, 157, 161, 167, 182, 195, 207, 235, 245 and 261.

Source of Information : The Lead Sheet and Pipe Development Council

Address : Golden Cross House, Duncannon Street, W.C.2

Telephone : Whitehall 3715



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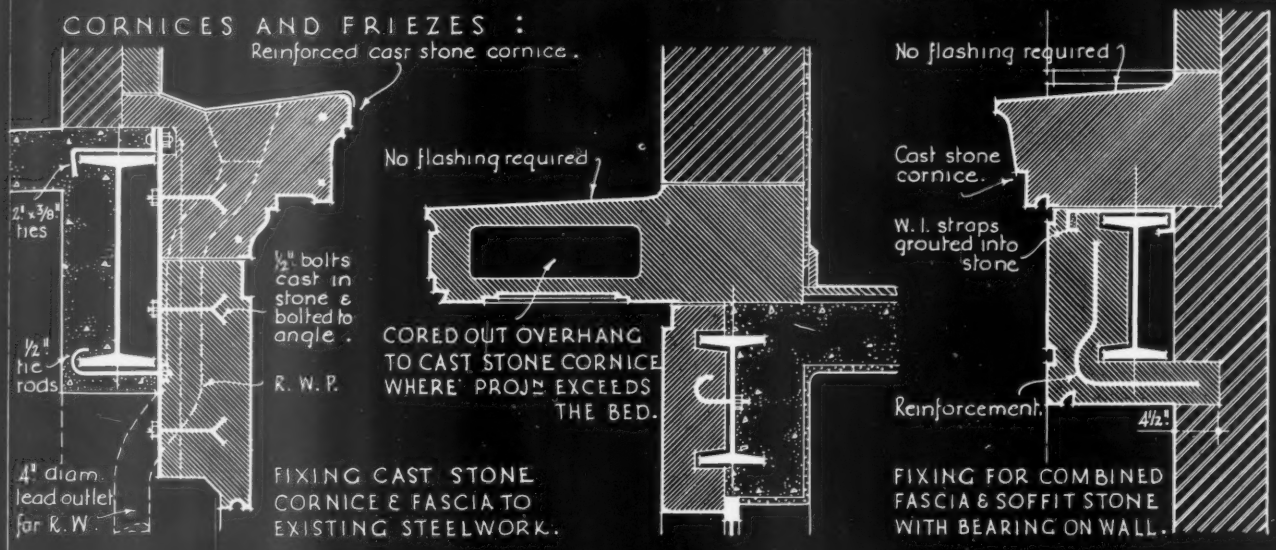
CAST STONE, RECONSTRUCTED STONE AND ARTIFICIAL STONE:

for a full explanation of these terms see the back of this Information sheet.

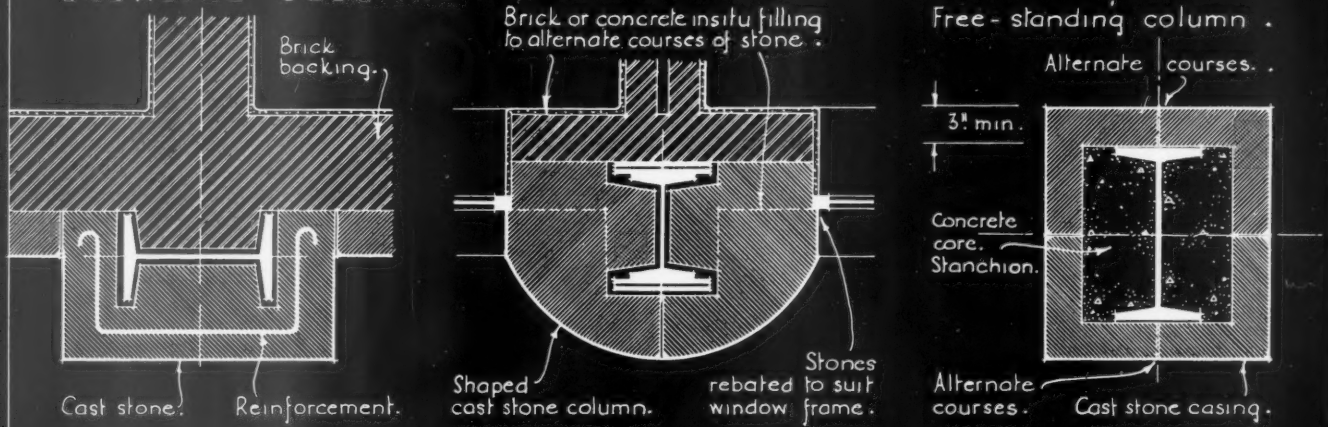
CORNICES AND FRIEZES :



FIXING CAST STONE CORNICE & FASCIA TO EXISTING STEELWORK.

FIXING FOR COMBINED FASCIA & SOFFIT STONE WITH BEARING ON WALL.

ENCASING COLUMNS :



STONE FACING WORK :

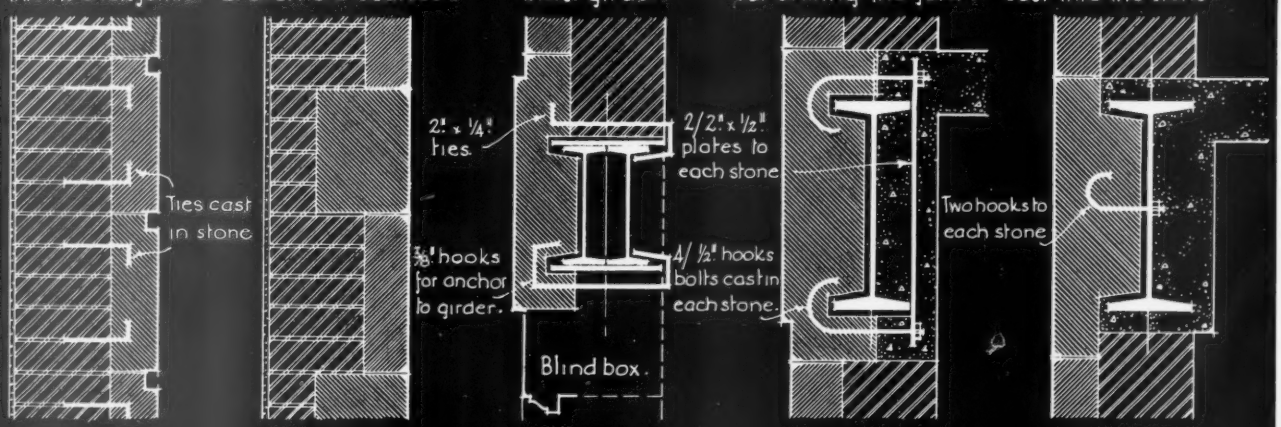
A thin stone facing held by metal ties into the brick joints.

A stonework facing bonded into brickwork at alternate courses.

Fixing a cast stone fascia to compound R.S.J. girder.

Fixing cast stone fascia to a single R.S.J. without drilling the joist.

Securing fascia to R.S.J. by hook bolts cast into the stone.



Information from John Ellis and Sons Ltd.

INFORMATION SHEET : DETAILS OF VARIOUS FIXINGS FOR RECONSTRUCTED STONE

SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON W.C.1. Oscar A. Bayne.

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INFORMATION SHEET

• 272 •

RECONSTRUCTED STONE

General :

This Sheet sets out a number of details of cast stone used in facing or encasing work. The details show a variety of methods of fixing and tying-in. These show the ease with which good fixing lugs may be cast solidly into the stone and the constructional value derived therefrom, particularly in the cloaking of modern steel construction.

The terms Reconstructed Stone, Cast Stone, and Artificial Stone are generally somewhat loosely used to describe non-natural stone; the following summary is given to explain, as far as possible, the proper meaning of the terms.

Cast Stone :

In general, this term is used to denote a stone formed of ordinary concrete faced with a mixture of cement and sand or other suitable aggregate, and often to denote stones of the reconstructed type.

Reconstructed Stone :

As the name implies, this stone is formed by crushing to the correct degree of fineness a natural stone, and using these crushings as an aggregate in the new stone.

Reconstructed stones may be solid-reconstructed stone throughout or they may be a facing 1 in. to 1½ in. thick on a solid concrete backing.

Artificial Stone :

This is an old term used many years ago to describe a precast concrete faced with a pigmented skin approximately $\frac{1}{16}$ in. thick. The result was somewhat crude and is now very rarely used; the name is, however, sometimes used incorrectly to describe cast or reconstructed stone.

Reconstructed Stone :

The manufacturers recommend reconstructed stone for the following reasons :

(a) A reconstructed stone, correctly treated during manufacture, has a lower porosity than the original stone. This reduces staining and discoloration of the stonework, when built.

(*b*) Permeability is similarly reduced, with a consequent reduction in disintegration due to weathering.

(*c*) The reconstructed stone has a greater compressive strength than the natural stone from which it is made.

(*d*) Stones can be cast in one piece to cover large spans and suitably reinforced to reduce the section where necessary.

(*e*) The suitability of reconstructed stone for reinforcing and for solid casting-in of lugs, gives better fixing and easier construction than is possible in many cases with the natural stone.

(*f*) Lifting hooks can be cast in the stone at suitable positions for convenience in hoisting and with a consequent reduction in the time required and the damage experienced.

The Facing of Blocks :

The manufacturers recommend that concrete blocks faced with 1 in. or 1½ in. of reconstructed stone should be used in preference to all-reconstructed stone blocks for the following reasons :

(*a*) Concrete backing gives increased strength.

(*b*) Concrete backing is the more suitable material for reinforcement.

(*c*) Concrete backing is dense and consequently less susceptible to moisture movement.

The facing of reconstructed stone bonds completely with the concrete backing, the two being cast simultaneously. Thus there is no possibility of lamination between them.

Types of Reconstructed Stone :

- Portland Clipsham.
- Bath.
- Ketton.
- Weldon.
- Derbyshire Sand Stones.
- Westmorland Slate.
- Leicestershire Granites.
- Aberdeen Granites.
- White Cornish Granite.
- Grey Cornish Granite.

Surface Finish :

In any of the reconstructed granites, any type of surface texture can be obtained by polishing, tooling, axing, or punching the surface according to requirements.

Manufacture :

Reconstructed stone consists of a facing of crushed stone and white cement, backed by granite concrete of high compressive strength.

The natural stone is carefully selected, crushed and graded ; the backing concrete is composed of washed and graded Mountsorrel granite mixed with rapid-hardening cement.

During mixing, accurate control is kept of the water content of both facing and backing, as this plays an important part in the production of a sound material. On casting, the facing and backing are compacted at the same time by heavy pneumatic rammers, thus ensuring that the whole is a homogeneous mass.

After initial hardening the stone is removed from the moulds and kept in a moist atmosphere by means of fog sprays.

At an age of two or three days the stone is passed into curing chambers where it remains for a period of four days at a predetermined temperature and humidity. The stone then passes out into storage sheds for further maturing until ready for delivery.

Fixing :

Stones should be bedded in a mixture consisting of five parts of suitable sand to two parts of hydraulic lime.

During winter months, a mixture of five parts of suitable sand to one part of lime and half a part of cement should be used, which will give a somewhat earlier set.

Stones should be pointed in white cement and silver sand in the proportions of five to one.

NOTE.—Rich mixes for bedding or pointing should be avoided on all occasions owing to their tendency to shrinkage on drying out.

The advisability of using lime mortar as opposed to cement for bedding cannot be too strongly stressed, as lime is a very much "kinder" material for this purpose, and it is interesting to note that this is universal practice in factory chimney construction.

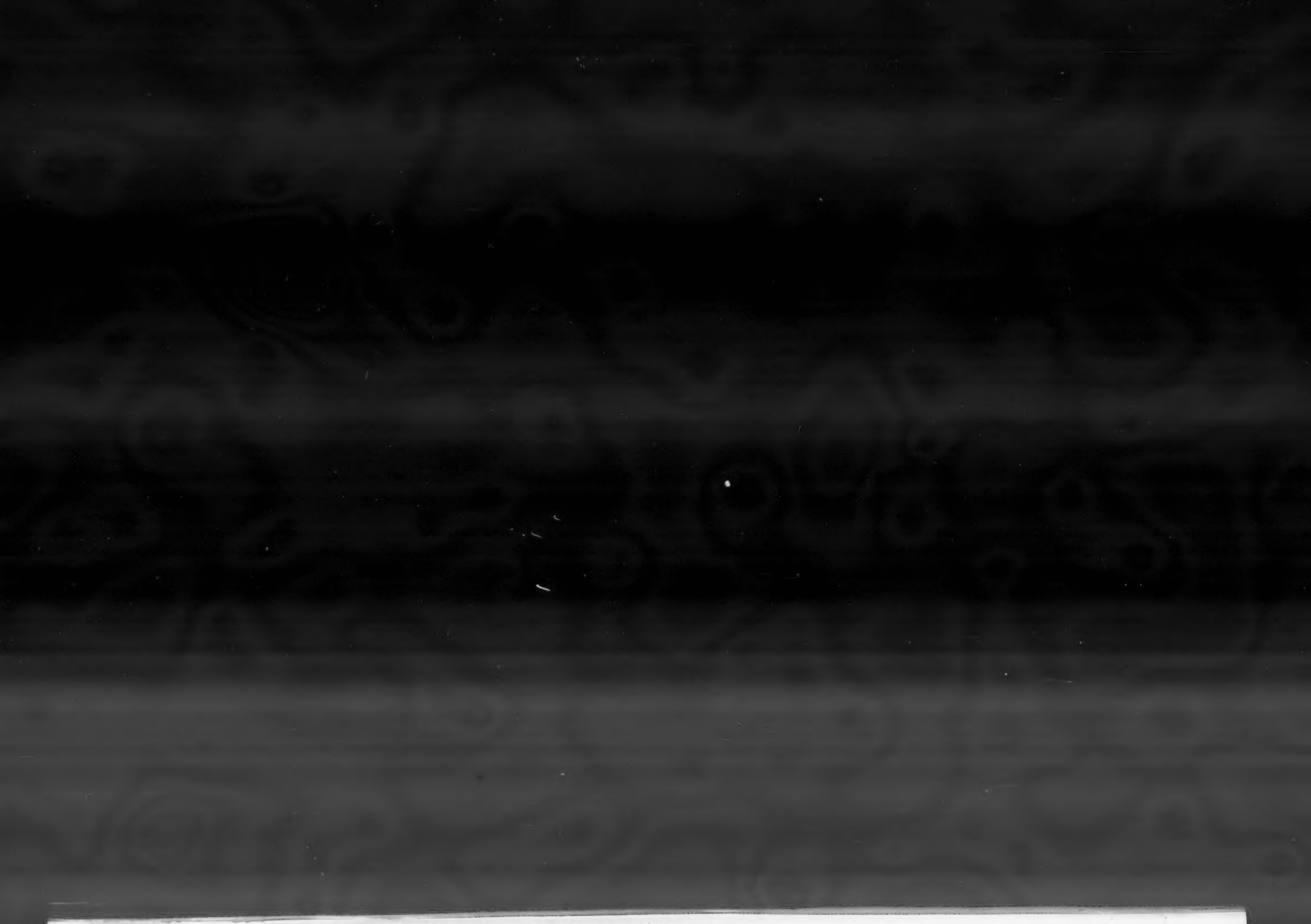
Manufacturers : John Ellis & Sons, Ltd.

Head Office : Welford House, Welford Place, Leicester

Telephone : Leicester 5682

London Office : Caxton House, Tothill Street, S.W.1

Telephone : Whitehall 5011



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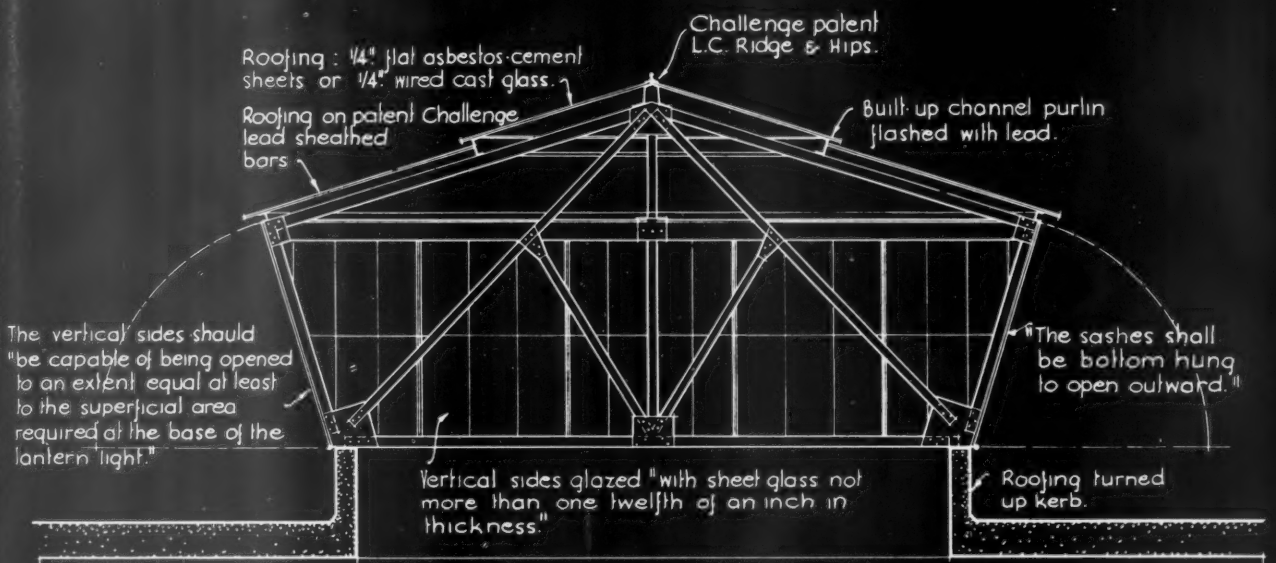
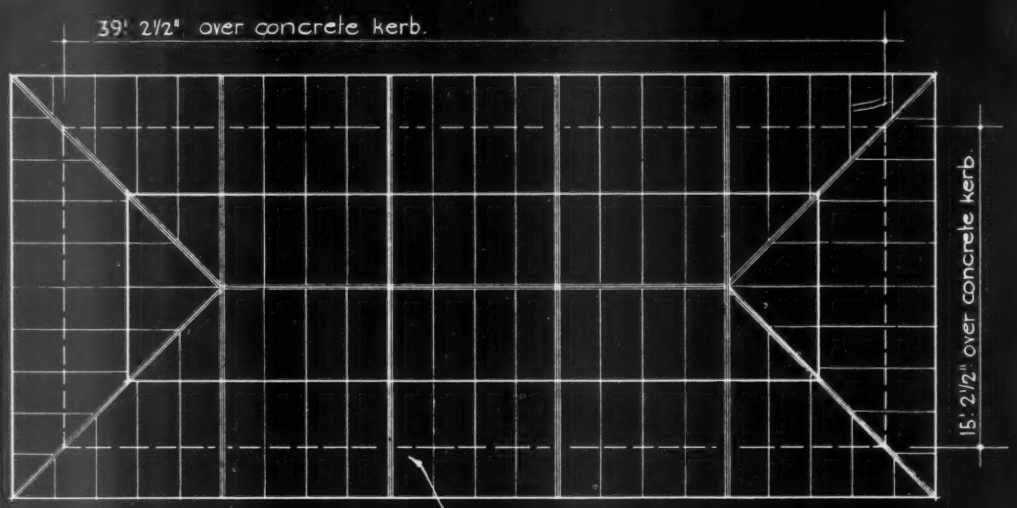


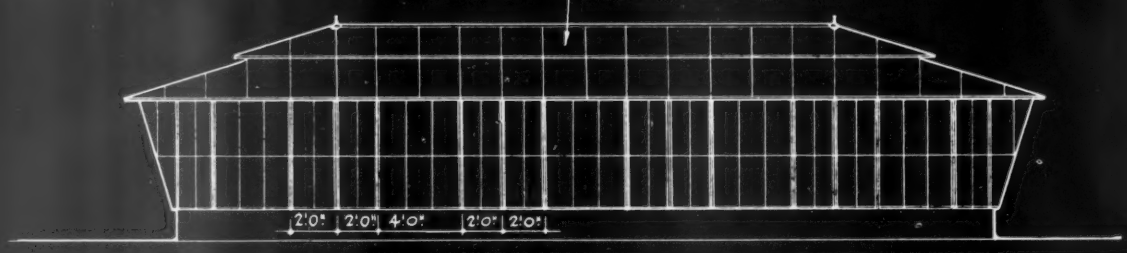
CROSS SECTION Scale : 4'0" to 1"



PLAN

Trusses, side screens and end screens are made in sections to be bolted together, for easy erection on the job.

"The roof over the stage shall be of fire-resisting material & shall be provided with a lantern light or lights at the back thereof equal at the base to one sixth of the area of the stage."



SIDE ELEVATION

The quotations given above are taken from: The Metropolis Management & Building Act Amendment Act 1878, Regulations 1927.

Information from the British Challenge Glazing Co.

INFORMATION SHEET : CINEMAS & THEATRES : LANTERN LIGHTS OVER STAGES.

SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON W.C.1. Oscar A. Bayne.

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INFORMATION SHEET

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LANTERN LIGHTS

Type Illustrated : Haystack Lanterns for Theatre Stages

Local Authorities' Regulations :

The lantern light shown on this Sheet has been designed in accordance with the regulations laid down by the London County Council under the Metropolis Management and Amendment Building Act, 1878. These regulations were amended in 1927.

In general it may be said that most local authorities controlling areas outside the London County area follow these regulations.

The following quotation is taken from the L.C.C. Regulations mentioned above :—

Regulation made for the Protection from Fire of Theatres, Houses, Rooms and other places of Public resort.

Section 26. (*a*) The space above the stage shall be of sufficient height to allow of the safety curtain being raised above the top of the proscenium opening in one piece and of all scenes being so raised without rolling.

(*b*) The roof over the stage shall be of fire-resisting material and shall be provided with a lantern light or lights at the back thereof equal at the base to one-sixth of the area of the stage. Such lantern light shall be glazed at the sides with sheet glass not more than one-twelfth of an inch in thickness and be capable of being opened to an extent equal at least to the superficial area required at the base of the lantern light. The sashes shall be bottom hung to open outward, shall be of a type that cannot be rendered inoperative by warping or settlement or by frost, snow or dirt, and shall be capable of being opened by the cutting of a cord and the fusing of a link. Such cord shall be brought down to the stage to a position near the safety-curtain release and shall be suitably indicated.

(*c*) The stage shall be ventilated to the satisfaction of the Council.

Manufacture :

The company will undertake to design, supply and fix complete the whole of the lantern light required, including steel trusses, purlins, etc., side screens, roofing glazing, sash opening, fuse link quick-release gear, etc.

Patent Challenge Glazing :

For details of Challenge glazing and for standard lantern lights, see Sheet No. 77.

Manufacturers : The British Challenge Glazing Co.

Address : Grove Glass Works, 10, Marshgate Lane, Stratford, London, E.13

Telephone : Maryland 4161

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TABLE OF FORMULAE FOR LEAD PAINTS RECOMMENDED FOR VARIOUS PURPOSES giving constituents & proportions of each.

The quantities given are related to 112 lbs. of lead paste, but the % of each constituent is also given.	GENUINE WHITE LEAD OIL PASTE.		GENUINE RED LEAD PASTE.		GENUINE RAW OR REFINED LINSEED OIL.		GENUINE BOILED LINSEED OIL.		GENUINE LINSEED OIL MIXTURE. 1 part Boiled Oil to 2 parts Raw oil.		GENUINE AMERICAN TURPS. or White Spirit.		GOOD QUALITY MIXING VARNISH.		PATENT DRIERS Paste or liquid.		YIELD IN GALLS. approx.	COVERG CAPACITY Single coat.
	LBS.	%	LBS.	%	PINTS	%	PINTS	%	PINTS.	%	PINTS.	%	PINTS	%	LBS.	PINTS.		SQ. FEET.
NEW OUTSIDE WOODWORK																		
Priming coat.	112.	79.	5.	3·5.	17.	14.	..	..	..	..	5.	3·5.	..	..	4.	1.	5¼.	4,500.
Second.	112.	83·5	..	..	10.	8·5.	..	..	..	..	10.	8·0.	..	..	4.	1.	5.	5,000.
Third.	112.	85·5.	..	..	14.	12·5.	..	..	..	..	2½.	2·0.	..	..	4½.	1.	4¾.	5,500.
STRIPPED OUTSIDE WOODWORK (Previously painted.)																		
First.	112.	82·4	..	..	14.	12.	..	..	..	..	7.	5·6.	..	..	4.	1.	5⅛.	4,800.
Second.	112.	83·5.	..	..	10.	8·5.	..	..	..	..	10.	8·0.	..	..	4.	1.	5.	5,000
Third.	112.	85·5.	..	..	14.	12·5.	..	..	..	..	2½.	2·0.	..	..	4½.	1.	4¾.	5,500.
GOOD CONDITIONED OUTSIDE WOODWORK (Previously painted.).																		
First.	112.	80·6.	..	..	12.	10.	..	..	..	..	12.	9·4.	..	..	4.	1.	5½.	5,000.
Second.	112.	85·5.	..	..	14.	12·5.	..	..	..	..	2½.	2·0.	..	..	4½.	1.	4¾.	5,500.
NEW INSIDE WOODWORK																		
Priming.	112.	78·8.	5.	3·5.	17.	13·9.	..	..	..	..	5.	3·8.	..	..	4.	1.	5¼.	4,500.
Second.	112.	83·5.	..	..	10.	8·5.	..	..	..	..	10.	8·0.	..	..	4.	1.	5.	5,000.
Finish, Flat.	112.	85·3.	..	..	..	..	..	..	..	..	16.	13·2.	1½.	1·5.	3¼.	½.	4¾.	5,000.
Eggshell.	112.	84·5.	..	..	..	..	..	..	..	..	14.	11·5.	4½.	4·0.	3½.	½.	4¾.	5,000.
Oil gloss.	112.	85·5	..	..	14.	12·5.	..	..	..	..	2½.	2·0	..	..	4½.	1.	4¾.	5,500.
NEW INSIDE WOODWORK, ENAMEL FINISH																		
Priming.	112.	78·8.	5.	3·5.	17.	13·9.	..	..	..	..	5.	3·8.	..	..	4.	1.	5¼.	4,500.
Second & Third.	112.	83·5.	..	..	10.	8·5.	..	..	..	..	10.	8·0.	..	..	4.	1.	5.	5,000.
Final undercoat.	Flatted zinc oxide, or one of the special "Undercoats" sold by reputable manufacturers.																	
Enamel coat.	One of the special Enamel finishes applied as directed by the Manufacturer.																	
NEW PLASTER, INTERIOR.																		
Priming.	112.	75·0.	..	..	..	..	28.	22·0.	..	..	4.	3·0.	..	..	..	..	6½.	5,400.
Second.	112.	83·5.	..	..	10.	8·5.	..	..	..	..	10.	8·0.	..	..	4.	1.	5.	5,000.
Finish, Flat.	112.	85·3.	..	..	..	..	..	..	..	..	16.	13·2.	1½.	1·5.	3¼.	½.	4¾.	5,000.
Eggshell.	112.	84·5.	..	..	..	..	..	..	..	..	14.	11·5.	4½.	4.	3½.	½.	4¾.	5,000.
Oil gloss.	112.	85·5.	..	..	14.	12·5.	..	..	..	..	2½.	2·0.	..	..	4½.	1.	4¾.	5,500.
EXTERNAL WALLS, STUCCO OR BRICK.																		
Priming.	112.	75·0.	..	..	..	..	28.	22·0.	..	..	4.	3·0.	..	..	..	..	6½.	5,400.
Second.	112.	78·5.	..	..	..	..	..	..	18.	14·5.	9.	7·0.	..	..	..	..	5¾.	5,500.
Third.	112.	85·5.	..	..	14.	12·5.	..	..	..	..	2½.	2·0.	..	..	4½.	1.	4¾.	5,500.
EXTERNAL WALLS, CONCRETE OR STONE.																		
Priming.	112.	80·0.	..	..	..	..	20.	17·0.	..	..	4.	3·0.	..	..	..	..	5½.	4,800.
Second.	112.	80·5.	..	..	..	..	..	..	16.	13·5.	8.	6·0.	..	..	..	..	5½.	5,200.
Third.	112.	85·5.	..	..	14.	12·5.	..	..	..	..	2½.	2·0.	..	..	4½.	1.	4¾.	5,500.
IRONWORK, INTERIOR & EXTERIOR.																		
Priming.	..	..	112.	83·5	..	..	..	..	19.	16·5.	..	..	..	..	..	..	4⅜	3,100.
Second.	112.	83·3.	..	..	10.	8·7.	..	..	..	..	10.	8·0.	..	..	4.	1.	5	5,000.
Third.	112.	85·5.	..	..	14.	12·5.	..	..	..	..	2½.	2·0.	..	..	4½.	1.	4¾.	4,500.

Information from the White Lead Publicity Bureau.

INFORMATION SHEET: THE COMPOSITION OF LEAD PAINTS FOR VARIOUS PURPOSES.

SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE BEDFORD SQUARE LONDON W. C. 1. Oscar A. Bayne.

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INFORMATION SHEET

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PAINTING

Product : White Lead Paint

Common Painting Defects :

The proper preparation and use of paint and the best conditions for its application have long been known to painting craftsmen, and when defects in paint work appear it is generally found that they are caused by improper application or mixing, or by application to a surface improperly prepared to receive paint. The following notes deal with the commonest types of defect found in painting work, and have been extracted from "White Lead Paints, why, when and how specified."

Crazing and Crocodiling :

These defects take the form of fine splits or ruptures in the paint, which break the surface into innumerable irregular areas, but which are in the top coats only and do not extend through to the surface underneath. When the areas formed by the hair-like splits are small, the defect is called crazing ; when the separated areas are large, it is called crocodiling. The cause is always too soft an undercoat, due either to the use of too much oil, to insufficient drying time between coats, or to the use of impure oil or other vehicles drying to a soft film.

To avoid any of these defects, each undercoat should have plenty of drying time, and should be properly formulated to ensure its being harder than the succeeding coat.

Cracking and Scaling :

These two defects are closely related, since scaling is a later stage of cracking. Cracking is a rupture of the paint film extending clear down to the bare surface. This allows moisture to enter behind the paint film, which loosens the paint and scaling results.

Blistering and Peeling :

The most common cause of blistering is moisture present in the material behind the paint film. Peeling follows blistering in most cases, since the paint which has blistered no longer grips the surface properly, and a comparatively small pressure is sufficient to force it completely from the surface.

In some cases the heat of the sun is enough to increase the vapour pressure of the moisture in the material, so that it will cause blistering. In interiors, it is usually the heat of a radiator or a hot water pipe which causes the trouble.

The best way to avoid blistering is to make sure that the surface to be painted is thoroughly dry.

On repainting a blistered surface, it is necessary to remove all the defective paint, allow the wood to dry out thoroughly, and repaint as on new work. The priming coat on such work should be permitted to dry for a considerable time, and it will be found that this, if properly designed, will permit the wood to dry out further, and yet will tend to prevent the entrance of moisture from the outside. If leaks or faults in construction are responsible for the presence of moisture, these should be properly repaired before anything else is done.

Spotting :

Spotting is characterised by loss of gloss, fading and early chalking in spots of small area, due to absorption of oil from the finishing coat by the porous surface underneath. It is likely to occur on new work that is only given two coats or old work painted with one coat. Spotting usually shows up more prominently with dark tints and colours. This defect will not occur when sufficient coats of properly formulated paint are applied and sufficient time for hardening of each coat is allowed.

Washing Off :

This condition occurs when a paint film contains pigments that are soluble in water, or when soluble compounds are formed by chemical reactions after the paint has been applied. Washing off may be noticed in the form of streaks near the lower edge of weather boards and in accumulations on column footings or building foundations. The material that is dissolved out of the paint will collect in these places, and when the water evaporates the streaks can be plainly seen.

White lead never develops water-soluble compounds, and surfaces painted with properly mixed white lead paint will never give this trouble.

Wrinkling :

The principal cause of this defect is an excessively thick coat of paint. When paint is left in too thick a film it is impossible for it to dry uniformly throughout, and after the surface skin has formed the later drying of the part underneath causes the surface to wrinkle. There are sometimes contributing factors, such as changes in temperature, or excessive humidity during the drying period, but even under unfavourable drying conditions, wrinkling can be avoided if the coat being applied is brushed out to a thin, even film.

Bleeding Over Knots :

Bleeding of this type is caused by the oil in the paint dissolving out substances in the knot, and can usually be prevented by coating knots with a thin rosin-free shellac knotting, after which one or two coats of "sharp" white lead paint should be applied.

Chalking :

Chalking of painted surfaces is generally due to the partial or complete destruction of the binder (oil), owing to physical and chemical changes. Paints containing large proportions of lithopone, titanium white, barytes, silica, etc., are very liable to chalk badly, as are those having an excess of driers. Surfaces exposed to sea air are usually more prone to chalk than others. Moderate and even chalking after prolonged exposure is not necessarily a bad defect, as it enables repainting to be more easily carried out. If new paint chalks really badly, however, it is best to rub down the surface with waterproof paper, and repaint.

Excess of Driers :

Excess of driers in a paint usually causes several defects to appear, notably cracking, wrinkling, loss of gloss and early breaking down of the film. It also causes slow drying. Ready-made paints, properly prepared by reputable firms, are generally free from this but where a defective film is due to excess of driers, it should be removed and the surface repainted.

Quick-drying Paint Troubles :

There are so many troubles which arise from very quick-drying paints that it is impossible to give adequate information for dealing with them. Each case must generally be taken on its merits, but reference to the paragraphs dealing with crazing and crocodiling, cracking and excess of driers, will be of assistance.

Discoloration of Painted Surfaces :

This is frequently found on investigation to be due to deposits of smoke, soot or fog on the film, especially with light-coloured paints. Such discolorations can usually be removed by washing, and it is essential that this should be done on old painted surfaces before repainting. Less often, staining may be due to sulphide gases having attacked the paint, but it should be noted that when white lead paints are so affected, the film is not destroyed, but remains intact, whereas many other pigments become water-soluble, and such paint films are, after a comparatively short time, easily washed off by rain.

Previous Sheets :

The previous Sheets of this series were Nos. 126, 186, 211, 219, 227 and 233.

Source of Information : The White Lead Publicity Bureau

Address : Rex House, 38 King William Street, E.C.4

Telephone: Mansion House, 2856, 2857