Hon. Editors G. E. Pearse

Rex Martienssen

Secretary A. S. Pearse

The editors will be glad to consider any mss. photographs or sketches submitted to them, but they should be accompanied by stamped addressed envelopes for return if unsuitable. In case of loss or injury they cannot hold themselves responsible for mss. photographs or sketches, and publication in the journal can alone be taken as evidence of acceptance. The name and address of the owner should be placed on the back of all pictures and mss. The Institute does not hold itself responsible for the opinions expressed by contributors.

Annual subscription per post £1 – 1 – 0 direct from the Secretary.

THE SOUTH AFRICAN ARCHITECTURAL RECORD

The Journal of the Transvaal, Natal and Orange Free State Provincial Institutes of South African Architects and the Chapter of South African Quantity Surveyors.

202, Kelvin House, 75 Marshall Street, Johannesburg. Telephone 33—1936.

Volume Twenty Two Number One, January Nineteen Hundred and Thirty Eight

Three

THE NEW FORESHORE ● CAPE TOWN

This air view is reproduced by kind permission of Neville Clayton, photographer, and The Cape Argus

CAPETOWN'S NEW FORESHORE SCHEME

Capetown, at the end of the eighteenth century, was described by travellers as a beautiful town, with wide streets, oak avenues, fine and handsome houses.

By the end of the nineteenth century, the engineer, the city councillor, the merchant and the speculator had converted it into a glorious muddle. The fine open spaces, laid out by the early Dutch governors, had been reduced in size and built upon; the broad streets had been narrowed down, and haphazard developments had taken place.

Of recent years conditions have become steadily worse, and eminent visitors and town planners have criticised its development in no uncertain terms.

The city, as it is to-day, is a standing blot on the Union of South Africa, and one of the most beautiful sites in the world has been almost irretrievably ruined. And now, we are informed, what appears to be another blunder is being made.

A great new basin is to be constructed at the foot of Adderley Street. In this the mail steamers will be berthed and one can visualise the resultant confusion of railway lines, sheds, travelling cranes, etc., at the end of the city's main thoroughfare. Some attempt is to be made to screen it from the city by a strip of trees and gardens. The railway station is to be moved a little further to the north, but this will only make the existing railway muddle considerably worse.

The reclaimed area between the railway station and the new docks is to be laid out in a most primitive manner for business purposes, the blocks being T shaped and L shaped, with all external angles splayed or curved. One can imagine the result when city merchants, world famed for their bad taste, get busy on such sites.

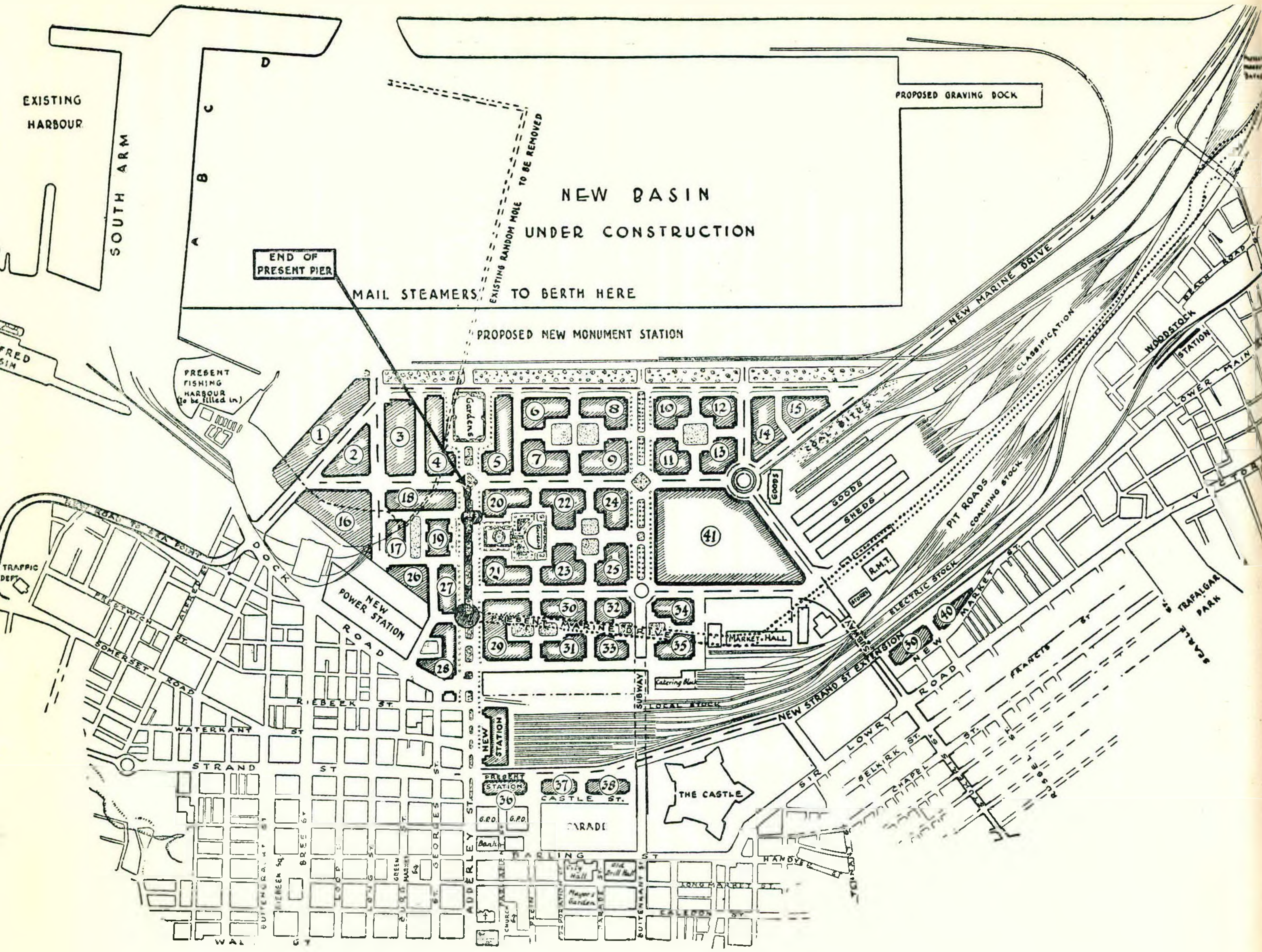
The small squares shown as gardens are presumably intended to denote a knowledge of town planning. They will no doubt become parking areas in the future.

There is little or no attempt to solve the traffic problem. Adderley Street runs through to the new Monument station, but all other streets to the west are blocked by the new power station or new building sites, whilst those to the east are terminated by the railway. Two subways are provided in spite of the fact that such death traps are usually avoided in modern town planning.

How much better if the railway station could be moved back to Stukeris Street and underground railways continued to the docks and to a suburban station. Better still if the new basin could be placed further east and thus open up a vista to the Bay.

It is encouraging to see that the Cape Argus is taking up the matter strongly, and we hope that other leading South African newspapers will support it.

This is a great opportunity for achieving something and making Capetown a world-renowned city. Only comparatively recently has London realised what a mess has been made by engineers who have been allowed to run riot. It is one of the only cities in Europe in which railways have been allowed to penetrate the central area, and now, at great cost, a cleaning-up process is slowly taking place. The appointment of a Fine Arts Commission by the British Government was found to be necessary. France for centuries has had its Ministry of Fine Arts, and Government control has long been exercised in Germany, Sweden, Austria and Italy.



CAPE TOWN OF THE FUTURE

A Sketch Plan showing the proposals of the City Engineer for the planning of the reclaimed area on the New Foreshore Reproduced by kind permission of the Cape Argus

Every effort should be made to establish a Committee of Architects, Engineers and Town Planners to discuss the problem as fully as possible and look at it from a broad national point of view. Mr. Francis Lorne, a distinguished London architect, in a recent interview with the Cape Argus, emphasised this point when he said:

" You have in Capetown the Institute of Architects, comprising the best brains in the profession in the city. Does it not seem a little illogical not to take the advice of this Institute? I am quite certain that their interest in their city is considerable and, if approached, I am certain they would be willing to give whatever help they could. They know much more about city planning and general aesthetic effect than any engineer could ever know."

Mr. Lorne also urged that great care should be taken in the design of the buildings that were to be put up on the new sea wall, and at the proposed new Monument station. If that were done the sympathy and good impressions of visitors would be enlisted at once. New York was a good example of what could be done in this regard. The wharves and buildings there were well planned and well designed. Mr. Lorne is to be congratulated on his outspoken criticism.

Copenhagen might be quoted as another instance of careful planning. Buenos Aires has often been instanced as the most beautiful harbour in the world. This is due to co-operation between engineers and architects. Why shouldn't we endeavour to achieve the same results ?

We publish a memorandum on the subject prepared by the Cape Institute of Architects, and we hope sincerely that their views will be strongly supported by the Government, the City Council and the public.

G.E.P.

MEMORANDUM OF THE CAPE PROVINCIAL INSTITUTE

Planning the New Docks and Reclaimed Area

● Architects' Views.

Tenders for the first portion of Capetown's new harbour scheme have been received, and the decision of the Tender Board should be made known before the end of the month. It is anticipated that the works will start early in 1938. The commencement of the new harbour scheme and the planning of the reclaimed area is bound to arouse some curiosity in all but the most apathetic ratepayers. In recent addresses to both the senior and junior branches of the Chamber of Commerce, the Harbour Engineer, Mr. J. F. Craig, explained some of the chief features of the harbour scheme. The discussions which followed were a clear indication of the lively concern the business community were taking in the development of the Mother City of the Union.

● Capetown of the Future.

Now that the preparation of essential technical details between the Municipality and the Railway and Harbour authorities has reached some measure of finality, the time has surely arrived for the imagination of the trained designer to consider the numerous conditions, conflicting interests and requirements, and with a vision of city life as a guide, to collaborate with those who have made themselves familiar with the practical aspects of the problems involved. The architect, by his special training in planning and design, is competent to study the proposed sites, picture their opportunities for new buildings in relation to streets, vistas and open spaces.

● Team Work.

Attention has already been drawn to the fact that the problem of planning the reclaimed area, in relation to the new harbour and the existing town, has been confined to the City Engineer and his staff. A plea has been made by the Cape Institute of Architects that before the final plan is approved by the Municipality, some consideration should be given to the views of the profession which will later on be called upon to design the buildings on the new sites. It should not be necessary to remind the Municipality that in the past architects have been consulted and entrusted with town planning schemes all over the world.

In bringing this important subject once again to the notice of the public, the Cape Institute of Architects would like to focus attention on the following matters:—

● Scale Model of Harbour and Reclaimed Area.

A scheme which eventually will involve the expenditure of many millions of public and private funds should not be embarked upon without first preparing a model of the new harbour, showing the proposed lay-out of reclaimed land in relation to the city. The Municipality of Durban have made a model of their harbour, which shows not only the foreshore but also the industrial and residential areas surrounding the town. A model prepared on similar lines for Capetown would be of great assistance to those engaged upon the town planning scheme and traffic control problems; it would also be of interest and guidance to visitors, and those looking for industrial opportunities in this centre. In passing, it should be noted that the proposal to erect new elevated dock buildings on the quay side, which will run at right angles to streets parallel to Adderley Street, may seriously block the vistas to the new basin. A model would draw attention at once to undesirable features of this nature.

It is hoped that the section of the suburban line from the vicinity of the Castle to the new railway station will be sunk below street level to avoid cutting off a portion of the old part of the town from the new.

● Harbour Buildings.

Travellers to South Africa entering the harbour will first view the outer sea walls, look-out stations and promenades. From the new basin other essential dock buildings will be seen along the inner wharfs. The erection of these structures will be under the control of the harbour engineers, but it should be remembered that while suitability to purpose is of paramount importance in their design, the successful treatment and planning of the dock buildings will greatly enhance the appearance of the harbour.

The Battersea Power Station on the Thames and many other contemporary dock buildings fronting this famous river could be cited as examples of successful collaboration between the architect and the engineer. In his striking design for the Battersea Power Station, the architect, Sir Giles Gilbert Scott, R.A., F.R.I.B.A., has shown how a building of this class can be aesthetically satisfying when treated architecturally. It is hoped that the question of collaboration between the harbour engineers and the architectectural profession will receive due consideration from the authorities.

● Fine Arts Committee.

Future sites for sale on the reclaimed area should not be spoilt by the uncontrolled initiative of private persons acting without consideration for the public good. To combat this evil the Cape Institute of Architects urge the appointment of a Fine Arts Committee, who would act together with the

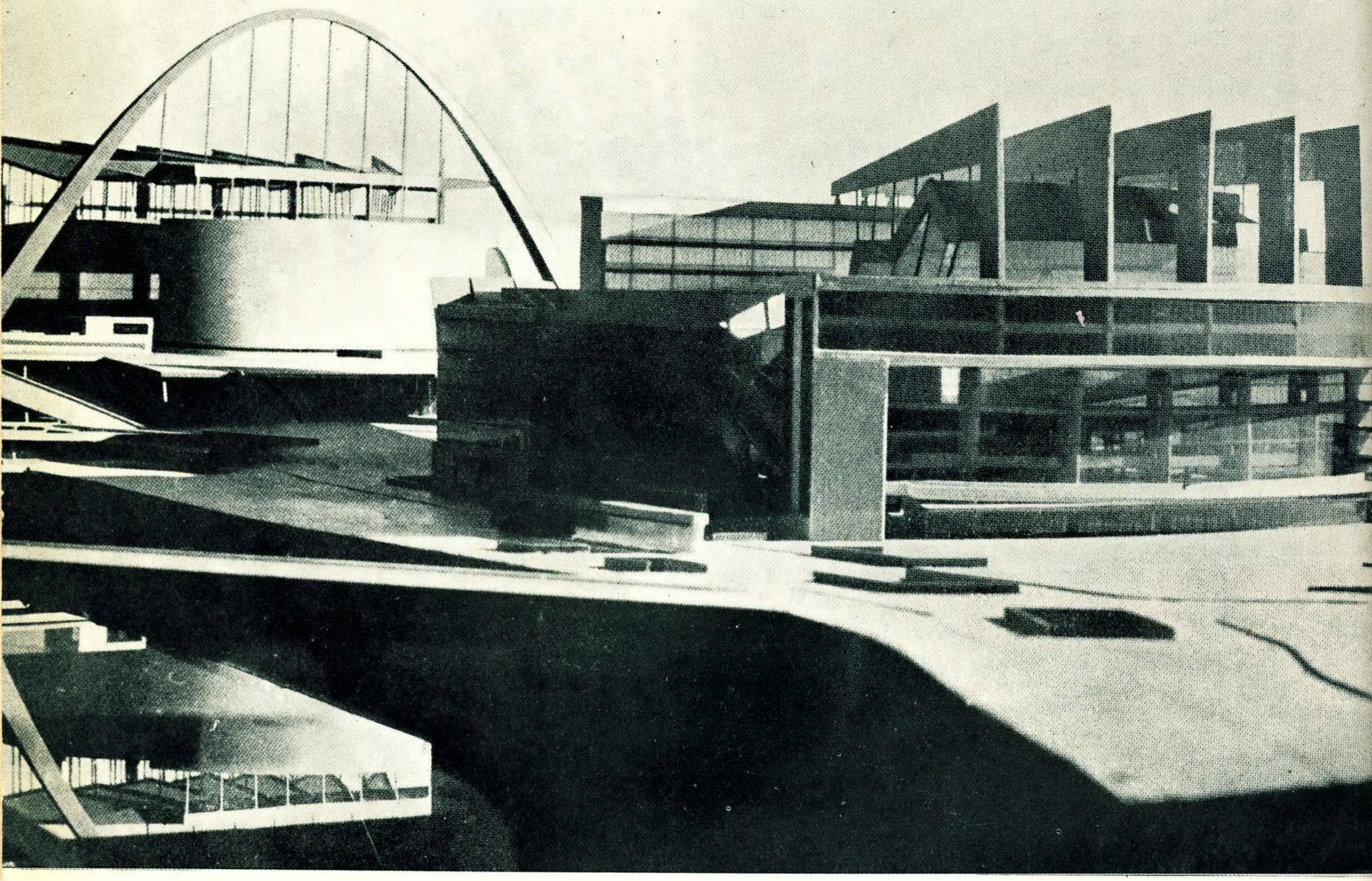
Government and Municipality. This Committee would have the power to control the design, facades and cornice lines of all new buildings. Such a committee is already functioning in London, and gives advice upon the architectural development of historic squares and important street facades. The first designs of South Africa House, in Trafalgar Square, by Sir Herbert Baker, had to be modified to meet the wishes of this Committee. Without some measure of control, future buildings on the reclaimed area are likely to develop a medley of architectural styles, devoid of civic beauty and dignity. As the sale of land on the reclaimed area is to be under the control of the Government and the Municipality, a unique opportunity exists to safeguard not only the uniformity of architectural development on the new sites, but also to prohibit unsightly advertising.

● Underground Tunnel.

Critics of the City Council have frequently called attention to the waste of time and public money involved in digging up existing streets and pavements to repair or lay new pipe lines and electric cables. It is urged that all essential services to new buildings on the reclaimed area should be taken in a tunnel below street level. The need for adequate public conveniences for all sections of the community, which is most evident in Capetown to-day, is another important matter which will require the attention of the City Council.

● Treatment of Open Spaces.

In conclusion, the Cape Institute of Architects suggests that the design and lay-out of gardens in the reclaimed area should include space for fountains, positions for future sculpture and other features of this type.



THE PALACE OF THE SOVIETS

Architect LE CORBUSIER

Acoustic Design GUSTAVE LYON

With Acknowledgments to GESAMTWERK II.

It is only when one has dabbled in architecture for a short while that one realises the full tragedy of the old woman who lived in the shoe. Here was a noble woman who had to deal with and reconcile such an enormous number of diverse and conflicting characters, that she did not know what to do. The architect (we might call him the old man who lives in a glass house and has stones thrown at him) has to bear a lot which, although I could not say it was more burdensome than that of the character of the nursery rhyme, must rank as a very good second.

His job, like the old woman's, is one of reconciling diverse functions. Problems of engineering, electricity, planning, psychology, economics, religion —and heaven knows what else—have to be attended to. The solution of these problems is never achieved without some influence being remarked in the final form of the design.

It can thus be stated with considerable justification that an architect's role is that of co-ordinating and correlating all these numerous functions into a homogeneous whole, for without the architect's ordering ability, chaos would result.

How the solution is to be made possible is of course the difficulty. The policy of " slapping them soundly and sending them to bed " certainly does not help. Just as one would advise the old woman to study the individual characteristics and psychology of each one of her family if she is to achieve order at all, so must the architect attempt to grasp the implications of the various subjects that affect his design.

The purpose of this paper is to throw some light on to one of these subjects, one that is usually surrounded by a cloak of almost superstitious ignorance. Acoustical considerations have an importance in practically every building that an architect may design. In fact, in the design of auditoria, they are of practically first importance in the generation of the aesthetics.

My intention is not to deliver an elaborate treatise on the subject of acoustics, but I would like to point out the broad considerations that are necessary in the tackling of an acoustic problem, and give examples of how these considerations find their expression, both practical and aesthetic, in the final arrangement.

I must make it understood at the outset that acoustics to-day is an exact science. Most people, including several so-called acoustical engineers, have the idea that the acoustical success of a hall lies largely in the lap of the gods; that whether or not one hits on exactly the right number of flags to hang up is so much chance. The science of acoustics has developed considerably since the date when these beliefs were in fashion. One is able now to determine within extremely close limits what the result of a particular arrangement will be.

It is first necessary to understand the medium with which we are dealing; we must find out how sound is generated, how distributed and how ultimately lost or dispersed. We can then alter or bend the natural movement of the sound wave in order that we can achieve the desired acoustical results.

Sound, as you all most probably know, is a wave motion set up by a vibrating body. When a body vibrates in a medium, air for instance, the forward motion of the body will cause a compression on the adjacent air, and the backward motion a corresponding rarefaction. This sets up a wave motion which moves outwards owing to the fact that the compressing force is handed on from the compressed portion of air to its adjacent, still portion. In this manner sound spreads outwards in every direction from the point of origin.

A sound wave can be likened to a bubble continually increasing in size, but contrary to the common soap bubble, a sound wave always attempts to complete its spherical wave front. For instance, should a sound wave be temporarily interrupted in its progress outwards through space by some interposed surface or solid, the wave will later complete itself as before and a tapering and decreasing sound shadow will be found behind the intruding object. A common illustration of this is that of the tapering sound shadow cast by the human head. If one were to stand three inches in front of a speaker's mouth and then three inches behind a speaker's head, one would notice a considerable difference in sound received. However, if one were to walk round the speaker at a radius of some five feet, one could hear equally well in any position. This is due to the fact that the interruption caused by the head on the nearer waves did not affect the further waves which rejoined into their spherical form. This phenomenon is of tremendous importance in acoustical design, for it enables us to use reflecting surfaces both in front of and behind the point of sound origin.

Sound once generated can be increased by either of two methods. The first is resonance, which does not affect hall design to any extent. The principle is, however, used in most musical instruments of the wind type. The sound wave, after having been generated at the vibrating source, passes through a tube which vibrates in sympathy with the original vibration and thus increases the eventual sound energy emerging.

The second method is of considerable interest to us as it is the principle of the microphone and amplifier. The microphone collects the sound and converts its energy into electrical energy which is magnified by methods analogous to a system of mechanical levers and then converted in the increased form into sound energy again, which is ejected through the loud-speaker. It is a curious fact that a loud-speaker has a much greater directional quality than the human voice, particularly as designed reflectors of parabolic or similar shape are usually placed behind the point of emission.

The distribution of sound is the next consideration. This occurs in several different ways, and although the particular case of sound travelling through air is the one that we are most used to, sound can be transmitted through practically any material. Each material carries the sound at a different speed, and it is because of this fact that the sound engineer has the phenomenon of reflection at his disposal. When sound is travelling through a given medium and reaches the interface between that medium and some other medium, in order that it may continue in the same direction as before, it has to make a very rapid adjustment to the new rate of travel that it must have in order to pass through the other medium. This is possible if the rates of travel through the two media are nearly the same, and the sound wave will thus be refracted through the interface. However, if the rates of travel differ considerably, then it will not be possible for the adjustment to be made, and the sound will be reflected off the interface and the wave will return through the original medium, only in a different direction. The law for the change in direction of a sound wave after it has struck a reflecting surface (for that is what an unpierceable interface becomes) is the same as the law which governs the reflection of light off a light-reflecting surface. The angle that the incident wave makes with the surface equals that of the reflected wave.

The rate at which sound travels depends on another factor, namely, temperature. In air, for instance, sound will travel faster if the air is hotter, and slower if the air is colder than normal. This brings about some curious effects when, in the air, a hot belt comes adjacent to a much cooler belt of gas. The rates of travel through the differently heated portions of gas differ sometimes to such an extent that the interface between the two belts acts as a reflecting surface. An illustration of this phenomenon is the fact that explosions have been heard at distances of greater than eight miles from the scene of the occurrence, whereas they have been inaudible only two or three miles away. The reason for this is that sound travelling parallel to the earth's surface is soon absorbed by intermediate vegetation, but the sound that travels straight upwards into the air proceeds uninterrupted until a hotter layer in the atmosphere is reached, when the sound is reflected back to earth, often reaching the surface again at quite remarkable distances from the source.

Reflection has, of all properties of sound, the most far-reaching effects on acoustical design, for, if sound were not reflected, it is doubtful if we could hear anything of a speech delivered in a hall more than thirty feet in length. The limited scope of unreinforced direct sound and the value of reflected sound were proved by M. Gustave Lyon by some neat experiments.

The first set of experiments was conducted on the lake at Geneva. Two boats containing the experimenters set out on a day when the water was dead calm. They put out to the middle of the lake and carried on the experiments there, so as to be free from interference from the shore. It was found that the normal human voice could carry a distance of 1,750 metres—something like a mile. A little later a slight wind blew up, just sufficient to disturb the mirror-like surface of the lake into innumerable little ripples. The voice in this case was only audible over approximately eight metres. The tremendous difference can be attributed to the fact that in the first case the reflections off the water surface were sent along the surface of the water, and reinforced the direct sound being received at the other boat; and in the second case the reflections were dispersed in all directions, and very little of the reflected sound consequently reached the receiving station.

A further set of experiments were conducted in a pair of balloons floating high above Paris. In this case very careful measurements were made to find exactly how far the ordinary direct waves of the human voice could carry without any assistance from reflected waves. This was where the balloons came in so usefully, as, by covering the sides of the balloons with sound-absorbent material, the experimenters could be sure that no reflected sound would enter into the calculations. It was found that the direct throw of the human voice did not exceed eleven metres.

These two experiments dictated the particular factors that would influence an engineer's design most—on the one hand, the extremely short distance over which an unreinforced wave can carry, and on the other, the tremendous step-up in efficiency when reflected sound is used.

Now to consider how sound is dispersed. For this the bubble of analogy is again useful. Imagine a soap bubble with a fixed amount of soap on its surface. This is in any case usual. Now, if the bubble is blown up so that its diameter is doubled, then it is a simple mathematical law that the surface area is increased four times. This means that the original quantity of soap is spread over four times the area, and consequently the intensity on any given unit of area must be quartered. In sound, exactly the same thing occurs. The unit of area in this case is the area of our ear drums, and the quantity of sound that strikes them at a particular distance from the source of origin is the intensity. It is useful in any acoustical design to assume a unit of intensity, and this can be taken to be that quantity of sound that will strike an area of one square centimetre (the approximate area of the ear) at a distance of one metre from the source. Thus, at a distance of two metres the sound will be spread over an area of four square centimetres and the intensity will be only a quarter. In mathematical terms, the intensity decreases proportionally to the square of the distance.

In the open air, sound will travel tremendous distances before becoming finally dispersed, but the intensity decreases to such an extent that it would take an extremely sensitive instrument to record the presence of the sound at all. Finally, friction between the sound wave and the air itself converts the last remaining traces of the vibration into heat energy. This is a cheering thought, as we can be certain that, in ages to come, hypercritical men will not be able to listen into converations that we are having to-day.

Many materials have been experimented with in order to find out which would be most absorbent. Gustave Lyon had an interesting piece of apparatus. He found that a mirrored glass surface would reflect sound and light equally well, so he designed a shaped mirror that would reflect to a single remote point all the light or sound waves that struck it. Here a very sensitive sound-registering apparatus was placed, the exact position being determined visually by finding the point to which light rays emanating from the common source of origin would be reflected off the mirror. Thus the experimenters would be sure that all sound reflected off the mirror would fall on the recording instrument. The material to be tested would then be thrown over the mirror and a noise be made, most probably with a violin string, and the percentage absorption calculated. Most of the trade materials gave anything but satisfactory results, and it was found that the melton cloth covering over the piano gave as good results as any other material tested. Until quite recently, no better material was discovered, but now sprayed asbestos and swan-skin are claimed to be even more efficient.

In the make-up of a satisfactory solution to an acoustic problem, the skilful use of absorbent materials plays an important part. It provides, amongst other things, the possibility of adjustment for reverberation.

Echoes and reverberations are very much alike and are rather a confusing pair of conditions to separate from each other. The best distinction that I have come across is that echoes are a concentrated quantity of reflected sound arriving considerably after the direct impulse is received. Reverebera-tions, on the other hand, are not concentrated and have no definite form. One cannot distinguish the notes in a reverberation, but is unfortunately able to do so in an echo.

Echoes are heard because of the sensitivity of our ears, which will distinguish two similar sounds from each other should they arrive within anything more than a twentieth of a second of one another. Since sound travels at the rate of about sixty feet in a twenieth of a second, it follows that where we are using reflected sound waves to reinforce the direct sound, we must take care that the path of the reflected wave does not exceed the direct path by more than sixty feet. If a hall is scientifically designed, there will, of course, be no echoes. However, most halls are not designed at all, either scientifically or aesthetically, with the usual calamitous effects on the audience's comfort.

This completes the brief review of the general properties of sound, and with this background it is possible to understand some of the principles which govern acoustical design. The problem of designing a hall acoustically resolves itself into three main considerations. Firstly, there must be sufficient sound so that every member of the audience can hear distinctly and comfortably; (the importance of this consideration cannot be over-stressed when it is remembered that direct sound can carry a distance of only eleven metres); the second consideration is that all surplus sound must be absorbed, otherwise one runs the risk of having undesirable echoes in the hall; the third and last consideration, both in order of tackling and also in order of importance, is the question of reverberation—making the sound warm and mellow to the musical ear.

This method of approach outlined is not the one generally adopted in the English-speaking countries. To verify this, it is only necessary to take up any text book on sound and find what is contained therein on the subject of acoustics in buildings. There will be endless debates on the validity of Sabine's reverberation theory; its merits compared with those of the more recent Eyring and Millington formulae. There will be reams on the absorption of sound and the trouble in the Albert Hall; however, it is unlikely if there is any mention of the quantity of sound necessary for distinct hearing. This portion of the discussion is confined to some anecdotical remarks on what distance Christopher Wren thought sound could carry.

The French School of Acoustics, under the direction and inspiration of M. Gustave Lyon, worked from a more materialist angle than that which governed research in the other countries. The approach was that it was of most importance that each person could hear what was going on and rather of lesser importance that the considered opinion of seven different musicians gave seven different reverberation times as ideal. The remarkable solutions found in the Salle Pleyel, the theatre on board the Normandie, the concert hall at Helsingborg, are sufficient proof of the validity of the approach. In addition, the magnificent designs prepared for the great Le Corbusier projects have shown what enormous scope there is for acoustics in modern architectural problems.

I will here attempt to sketch the procedure adopted by Lyon and his followers in order to obtain ideal acoustical conditions. It is impossible for me to do more than broadly indicate the method as applied to the very simplest of cases, but I hope this will demonstrate the tremendous possibilities that await the wide-awake designer of halls.

It has been established earlier that the human voice will not carry more than about eleven metres. This means that for seats in a hall more than three or four metres from the speaker, it is essential to reinforce the direct sound considerably by reflected sound. In other words, in every auditorium that is to contain more than 50-100 people it is necessary to design acoustically. The acoustical design will take the form of reflecting as much sound back from suitable surfaces to the audience in such a manner that an equal intensity of sound will be experienced at any seat in the auditorium.

The first step, therefore, will be to look for suitable surfaces from which the sound can be reflected. These surfaces will have to be of appreciable size so as to be able to reflect back the sound waves which are sometimes of considerable amplitude (several feet in some cases). This means that the main defining surfaces of the room are those that must be considered. Those that might be used are:—

1. The back wall.
2. The side walls.
3. The ceiling.
4. The floor.
5. The wall behind the speaker, which will be referred to as the stage wall.

The floor can be ruled out, as it is usually covered with carpets and people, both of these materials having a high coefficient of absorption.

The back wall is also useless, as by the time sound has travelled to it, been reflected, and reached the desired destination, so much time would have elapsed that an echoe rather than a reinforcement of the sound will be experienced.

The side walls are not of considerable importance or value in the normal run of cases, as very little of the surface would be able to reflect sound back to the audience. Above a height of three or four feet, sound reflected off the walls would rise, passing high over the heads of listeners, striking the ceiling at the opposite side of the room, and eventually returning to the seating zone as an unwanted echo. In extreme cases, where the maximum number of reflecting surfaces are needed, the side walls are incorporated in the design by battering them inwards.

We are left with the stage wall and the ceiling; and it is here, particularly in the stage wall, that the greatest scope for acoustical design lies. The stage wall is usually designed as a reflecting shell or " concha " which distributes the sound over the hall. This is usually for medium-sized halls, and the ceiling is not in those cases included in the reflecting portion of the design (e.g., Concert Hall at Helsingborg). The stage wall is primarily preferred as, owing to its nearness to the speaker, there will be less loss in the intensity of the sound available for reflection than if the ceiling were to be used. When the latter is used, as in the Salle Pleyel, it is merely as an extension of the concha.

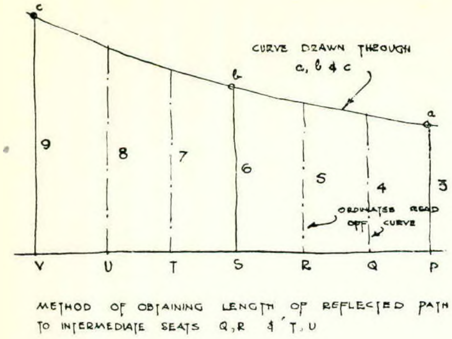


FIGURE 2.

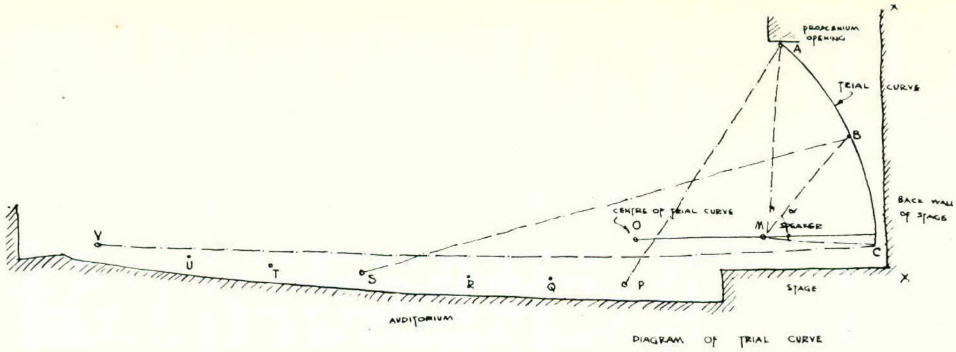


FIGURE 1.

The following is a description of the setting out of a concha for a gallery-less hall with a fixed point of sound origin (i.e., where there is only one speaker). Referring to Fig. 1, " m " is the speaker, " p," " s," " v " are members of the audience in the front, middle, and back of the hall respectively. The problem is to design a concha, " abc," to reflect all the sound thrown, through the angle " ∝" at the back wall of the stage. This angle is limited by the back wall, " xx," and the proscenium opening at "a." A rough form of the curve is obtained by tracing the arc of a circle with centre, " o," and radius equal to twice the distance from the speaker to the limiting back wall, " xx." That is, " om "=" mc." Points " a," " b " and " c," at the top, middle and bottom of the arc are taken, and joined to " m." " a," the highest point on the concha, and therefore furthest from the speaker, is joined to the point " p " in the auditorium. " b," the middle point on the concha, is joined to " s," the middle point of the hall, whereas " c," the nearest point on the concha, is joined to the farthest point, " v," in the hall. The lengths of the paths " map," " mbs," " mcv," are scaled off the drawing. Let the lengths be, for argument's sake, three, six and nine metres respectively. Erect these as vertical ordinates as in Fig 2 on a base line, " psv," representing the seating line of the hall. " ps " will, of course, equal " sv." A curve, " a-b-c," is passed through the three points; " ps " and " sv " are then sub-divided into any desired number of equal parts (three were taken in this case) and the vertical ordinates from the base line to the intersection with the curve are noted. Let them be, again for argument sake, four, five, seven and eight

Ray	Length of Reflected Path, Metres.	Square of Path.	Proportion of sum of squares.	Proportion of Angle
M A P	3	9	$^{9}/_{280}=0.032$	0.032 ∝
	4	16	$^{16}/_{280}=0.057$	0.057 ∝
	5	25	$^{25}/_{280}=0.089$	0.089 ∝
M B S	6	36	$^{36}/_{280}=0.129$	0.129 ∝
	7	49	$^{49}/_{280}=0.175$	0.175 ∝
	8	64	$^{64}/_{280}=0.228$	0.228 ∝
M C V	9	81	$^{81}/_{280}=0.289$	0.289 ∝

metres. We have now the approximate paths of the reflected sound to seven seats in the auditorium, and as we know that the intensity decreases proportionately as the square of the distance, we can find the decrease in intensity per unit of sound over the whole length of the hall by squaring the amounts that we scaled from the curve. A table is then drawn up as below and the proportions of the available angle, " ∞" that have to be devoted to reflecting to the various portions of the hall found as shown.

Having the extent of the various angles subtended by " m," it is an easy graphical process to trace the curve, beginning at " c " and extending upwards to " a," and conforming to the rule that the angle of incidence must equal the angle of reflection. Should the curve come too far over the speaker's head, it is a simple matter to step the curve back on a radial line from " m " on to another curve (Diagram 3) with only a small loss in intensity.

Thus we have a curve traced that will give a uniform intensity of reflected sound over the whole length of the hall. In any normal design, of course, many complications enter into the discussion.

No account has been taken of varying intensity of the direct sound received by the audience. There are no galleries, and the convenient choice of the unit point source of sound cuts out all the difficulties that are always met with in stage and orchestra requirements. In the more complicated cases, the graphical method outlined above would be much too unwieldy, and Gustave Lyon devised a set of formulae based on the principles of the graphical method, that would cover any conceivable type of hall, whether it had two, three or four galleries, was for political speeches or symphony concerts. This means that the most complex problems of acoustics are rattled off on a calculating machine giving the co-ordinates necessary for the setting-out of the desired curves.

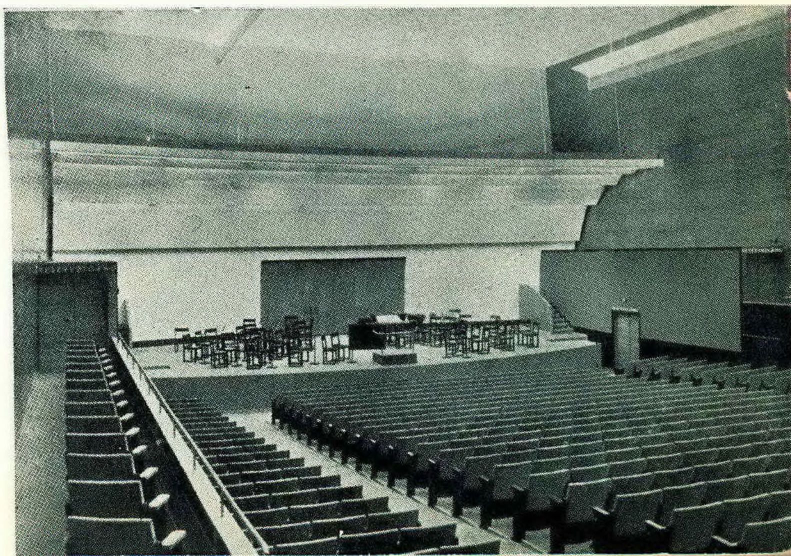
Next attention must be paid to the other requirements, absorption and reverberation. These are, however, easily dealt with, as the design of the reflecting surfaces means that the path of travel of all the sound waves has been determined. It is a simple matter, then, to place, absorbent materials where necessary (i.e., on the back and side walls and the furthest back portion of the ceiling). The side walls may be covered with semi-absorbent material of a diffusing character, and adjustments according to a chosen formula can then be made for reverberation conditions. It is not the purpose of this paper to discuss the hackneyed problems of reverberation and absorption; these are dealt with fully in any text-book on sound. It is mainly on the lines of the Lyon system of reflection that we can hope for a satisfactory solution. The system goes to the root of the problem and arrives at the solution from first and scientific principles. The following are illustrations of the application of the intensity method to big hall problems.

The Salle Pleyel.

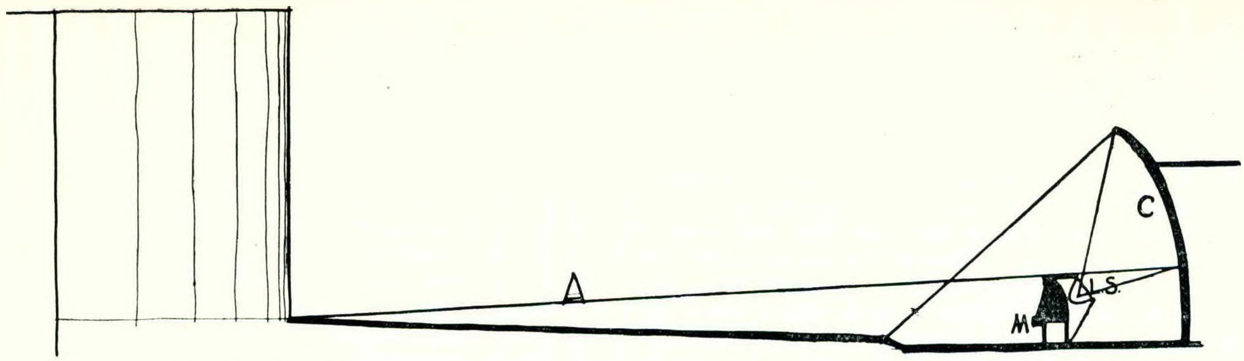
This was a reconstruction job that Lyon took on. This great hall in Paris vied with our Albert Hall for the worst acoustics known. By means of reflecting surfaces which extend over the whole ceiling, sufficient sound is directed to every listener in the Hall.

THE CONCERT HALL ● HELSINGBORG

From The Architectural Review, June, 1933

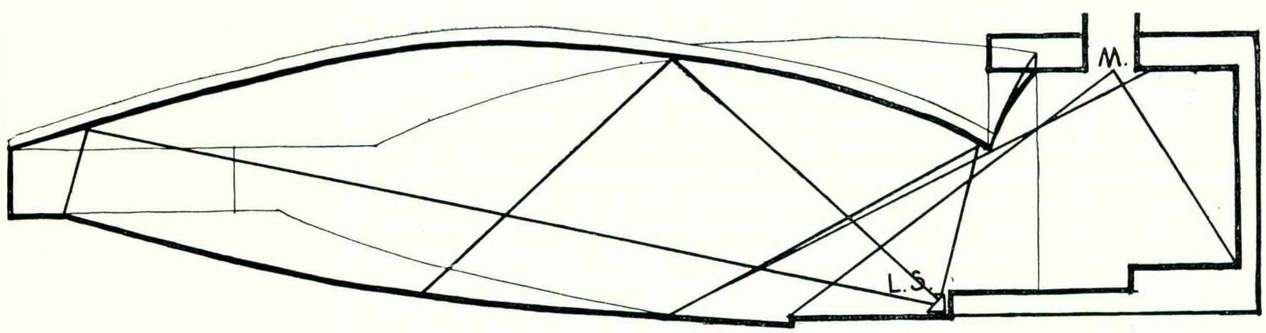


1.



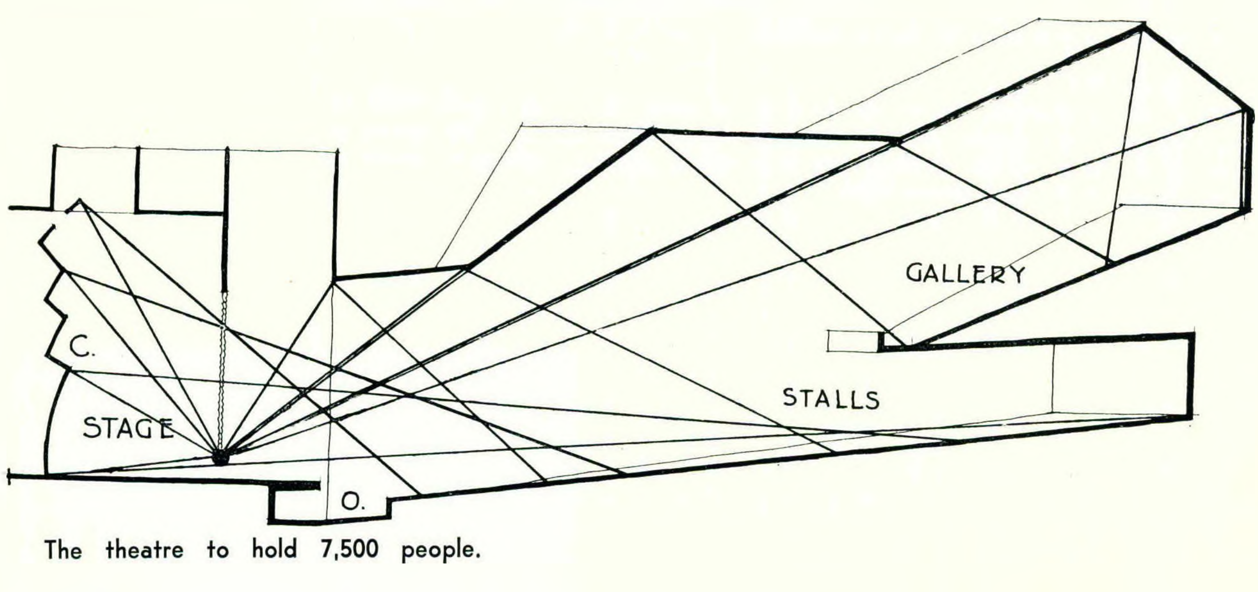
The open-air plain to hold 50,000 people.

2.



The great hall for 15,000 people.

3.



The theatre to hold 7,500 people.

● The Concert Hall, Helsingborg.

One of the last designs of Lyon. It consists of a plain, stepped concha which reflects sound down the length of the plain rectangular hall. The powerful form of the shell suspended over the point of interest forms an integral portion of the interior architectural arrangement. Owing to the relative smallness of the hall, the ceiling is not used as a reflector; the concha is sufficient for the hall's requirements.

The Acoustical Solutions in the Project for the Soviet Palace by Le Corbusier.

Le Corbusier, as usual, entrusted the acoustical design to Gustave Lyon and the brilliance of the acoustical solution is completely in keeping with the outstanding achievements in the architectural and structural spheres. There were three problems :

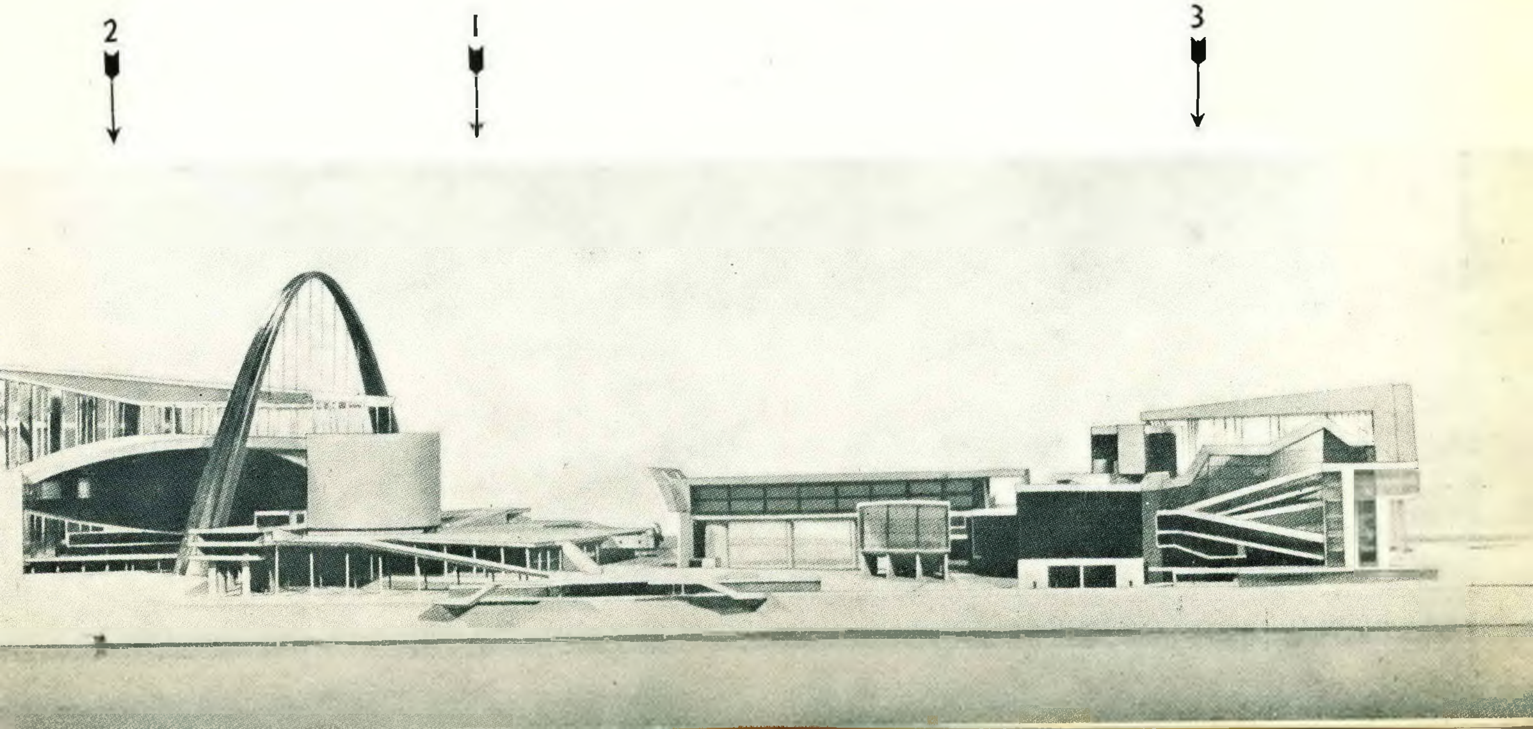
1. The open-air plain to hold 50,000 people.
2. The great hall for 15,000 people.
3. The theatre to hold 7,500 people.

● The Open-air Theatre.

Only amplified sound is used and the speaker is separated from the first member of the audience by a vacant space of eleven metres, so that no ordinary sound might interfere with the amplified sound. The speaker has a microphone at his feet, and a small concha behind him reflects as much sound as possible into the microphone. This is stepped up and re-issued through the amplifier which is situated directly behind the small concha. The sound is sprayed over a tremendous concha further back still, and this reflects the sound equally to all the people assembled on the vast plain. The curved back wall of the great hall diffuses in every direction all waste sound that strikes it.

● The Closed Hall for 15,000.

This hall is for a metting of all the Soviets. The stage is thus colossal and people from all over this area may be required to speak to the assembled audience. Again, only amplified sound is used, so once more the stage is separated from the nearest seat in the audience by a distance of eleven metres. The sound from any point of the stage is trapped by a tremendous microphone of great surface area situated thirty metres above the stage level. Thus sound from the whole stage area will reach the microphone with approximately equal intensity. The stepped-up sound is thrown from the loud-speaker on to the ceiling of the hall, which in turn reflects the sound evenly to every member of the audience. An interesting fact is that the voice of any member of the audience could not be heard through the microphone as baffles cut off the path of the sound before it can reach the microphone. In cross-section, a large lip will be discovered over the centre of the hall near the stage end. This spreads the sound that would otherwise fall on the central corridor on to the seats at the side.

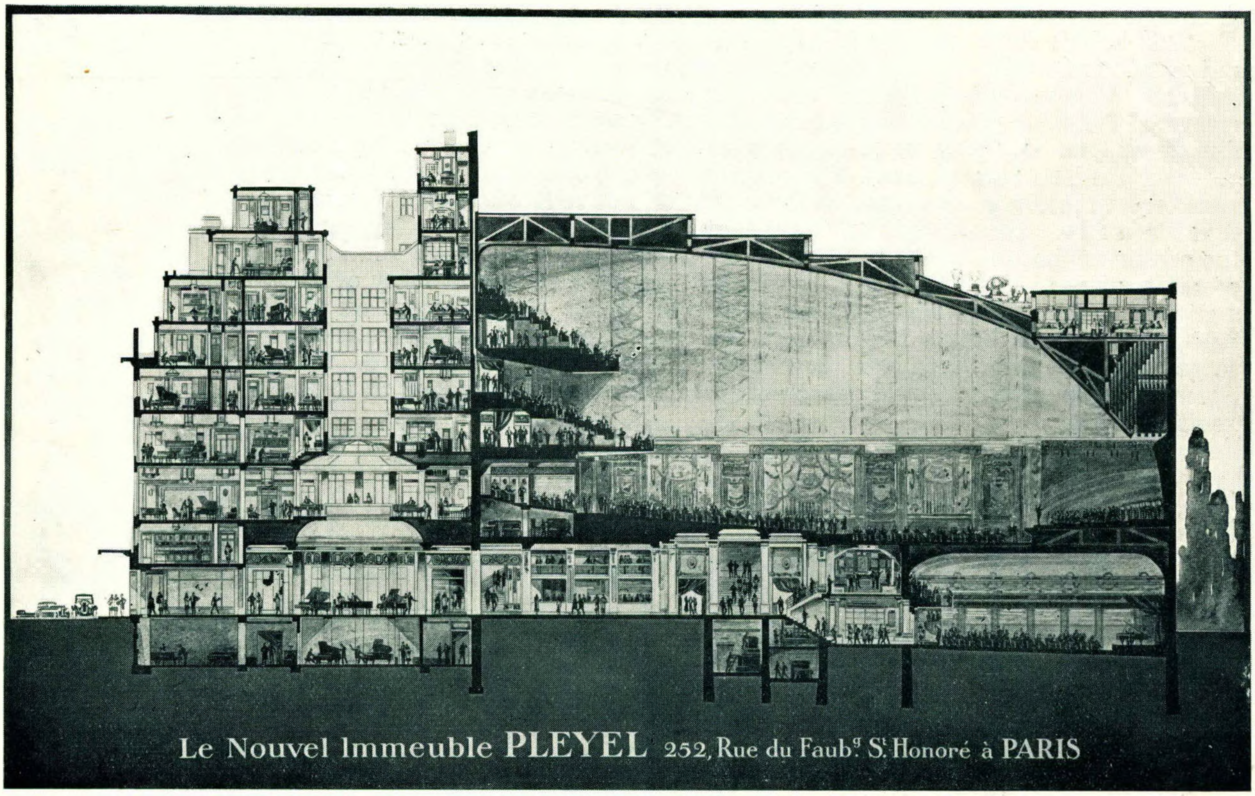


● The Theatre.

Although this hall holds 7,500 people, it was decided to use only the direct voice. For this reason, distances to the back of the hall were minimised by having a large gallery. The problem was to conserve for useful purposes as much of the sound that was thrown into the hall as possible. In the longitudinal section, practically the whole 180 degrees of sound are used for reflecting purposes, the concha being extended over the whole ceiling. The paths of the reflections can be traced out from the accompanying diagrams.

To assist in the general conservation of sound, the side walls are battered inwards.

The hall is a remarkable achievement, giving natural voice conditions to an audience of 7,500. In South Africa, by way of comparison, theatres holding less than half the number of people have to be equipped with a battery of some half a dozen microphones and loud-speakers. This last comparison will serve to illustrate the importance of the Lyon method and show in what particular direction an acoustical solution to a worrying hall problem may be found. The illustrations of the designs in these Corbusier halls show the immense plastic possibilities of the concha shapes in addition to their great practical value. The science of acoustics can be seen, therefore, to join the other sciences related to architecture in providing limitless possibilities of solutions of great beauty, a beauty that arises out of the elementary laws that govern all natural physical phenomena.



A NEW ARCHITECTURE FOR A CHANGED WORLD

By WILLIAM LESCAZE

Man inhabits to-day a world very different from that which encompassed even his parents and grandparents. It is a world geared to modern machinery —automobiles, airplanes, power plants; it is linked together and served by electricity. New conditions create new needs. New needs, in turn, impose a new design for living and a new pattern of education to match.

We hear a great deal about the new education—see a deal of it in action. But the school house, though prodigiously magnified in scale, is still very much the same old school house.

The modern architect—accepting the new conditions and the new design for living—believes that the school house, especially, should be adjusted to that design; that it should express, in itself, the principles, the social values, the ideals by which modern life is actuated. After all, the high school graduate has spent 13,000 hours of his—or her—life in a school house and the mere silent influence of a building, so familiar through the formative years, is a part of the mold of that graduate's mind.

At Ansonia, Conn., the writer, holding strongly to this view, undertook to apply the modern formula to a high school building which began operation this term. It thus became the first thoroughgoing example of its type in active service in the eastern region of the country.

It is a public high school for about 900 students and was dealt with as a problem in practical arrangement and organization of the required space for the purposes assigned. The nature of the site and the limitations of the budget were essential factors, of course. But no question of an imposed " style " of architecture—as Gothic, Tudor, French Provincial or Colonial—complicated the task of building a school house that would work and work smoothly, like the machine for learning and teaching it was intended to be.

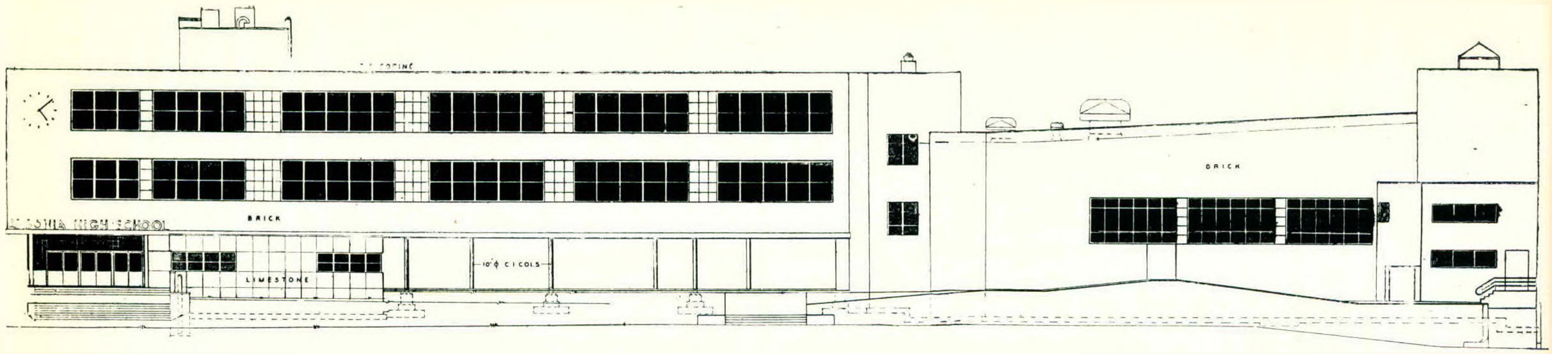
To make it that sort of building was the architect's prime concern. Accordingly, the floor plan was assembled in a general L shape along the two street fronts of the corner lot, so as to leave the maximum clear play space on the remainder of the lot, with north lights for the laboratory and east and west lights for the more important classrooms. The administration offices—as control room—were put at the main entrance, which was at the juncture of the two arms of the L for convenience of circulation. (In the conventional or monumental pattern the entrance would naturally have been in the middle of the principal or show facade, that on the avenue front, with the natural consequence of an extension backward into the middle of the lot, thus cutting up the open space.)

The auditorium was set next to the main thoroughfare to make it more convenient for outside activities without disturbing the school routine. Between the auditorium and the administration offices an open porch extends, serving as entrance to the athletic field and gymnasium beyond and, at the same time, giving the public (presumably interested in its own school), a view from the street of the outdoor sports on the school grounds.

Materials were selected for durability and low upkeep, but for feeling and taste as well.

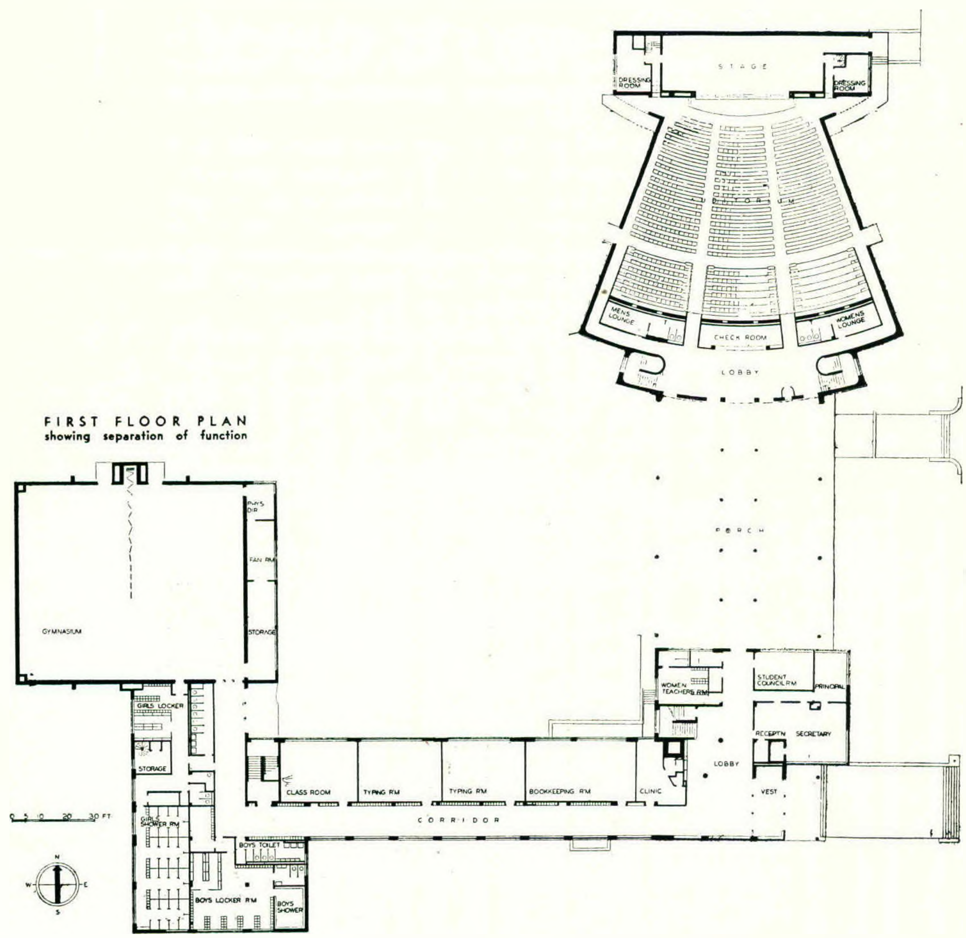
Externally, therefore, the building became a pure, undisguised, honest expression of its plan. The logical assemblage of its parts in relation to use—or function—gave it harmonious composition.

Here lies the contrast between this school house and the type that is standard educational equipment. Notwithstanding very considerable advances towards a saner and more up-to-date treatment in many schools, this standard equipment is still cribbed and confined by a traditional style which determines the outside form and thus controls the interior arrangements to greater or less extent. Or, worse still, it adopts the dull " barrack " layout, with a



ENTRANCE ELEVATION

FIRST FLOOR PLAN
showing separation of function



ANSONIA HIGH SCHOOL, ANSONIA, CONNECTICUT ● William Lescaze Architect
Veron F. Sears Associate
From "The Architectural Record," June, 1936

long corridor and rows of rooms on either side, or else a series of short passages with separate entrances cutting the whole circulatory system into little bits.

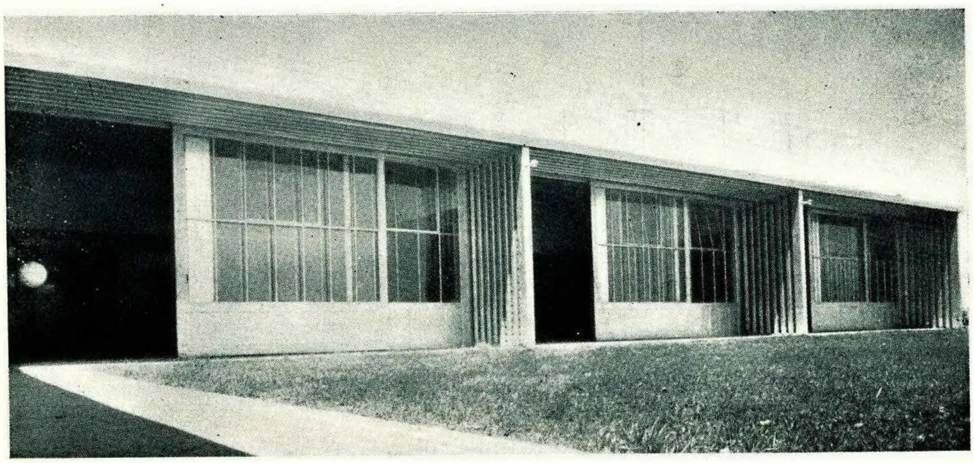
If a classic style is used there must be symmetrical wings—whether they are needed or not. If the style is Gothic, stairways twist and turn, towers pile room on room, and the windows are long and narrow. If the style is Renaissance there is less clutter, but the windows are still mere boxlike openings in the walls. More sunlight is shut out than is let in in either case and electricity does a fair share of the interior illumination even in broad day.

The modern architect in such situations takes advantage of modern construction, independent of solid walls for support, to use broad expanses of glass. Thus he gets maximum daylight and much better control of the circulation of air by openings for that purpose. A still further lightening and brightening comes from the use of gay sun-reflecting colours instead of the traditional browns and olive greens.

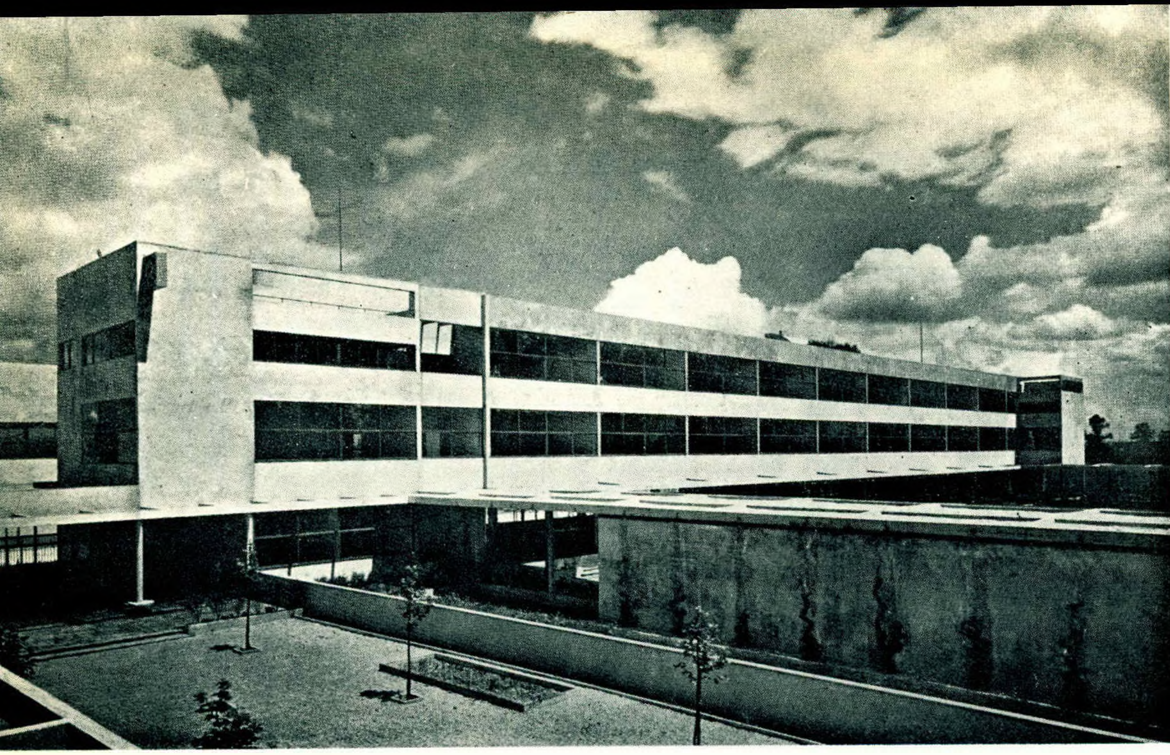
Aside from mere physical inadequacies as a frame for modern schoolboys' or schoolgirls' activities, there intrudes the outmoded idea of the age to which the traditional architecture belongs. That architecture is the logical expression of the age which created it—an age which is not ours. It puts a sham frame around school life for our young people which modernists think should not be there because insensibly it affects the honesty of the approach to modern problems. Everybody, of course, does not agree that this is so. But, surely, the modernist is entitled to take a point of view which has so much of logic in its favor.

The position is that a pupil in such a school—a school with a false front —is not free to be himself. The effect is suppressive and confining, which should not be the effect of the school of to-day. On the contrary, with nothing to conceal and no reason for pretending to be anything but what it is, the school building itself should encourage the student to be true to himself and his time. And this it will do when it is a truthful expression of the materials, the technique and the spirit of the age which makes possible its flexibility, cleanliness, light and forthright simplicity.

It is not as if there were anything revolutionary about the new way of building. There isn't. Rather what we are doing is to get back to the very first principle of architecture. This principle, out of which the architecture of each successive age has been evolved, is building what we need out of what we have that best serves the purpose, using the best tools available. It just happens that the new age has given the architect a wealth of new materials and tools to work with that the old builders never had or only dreamed of.

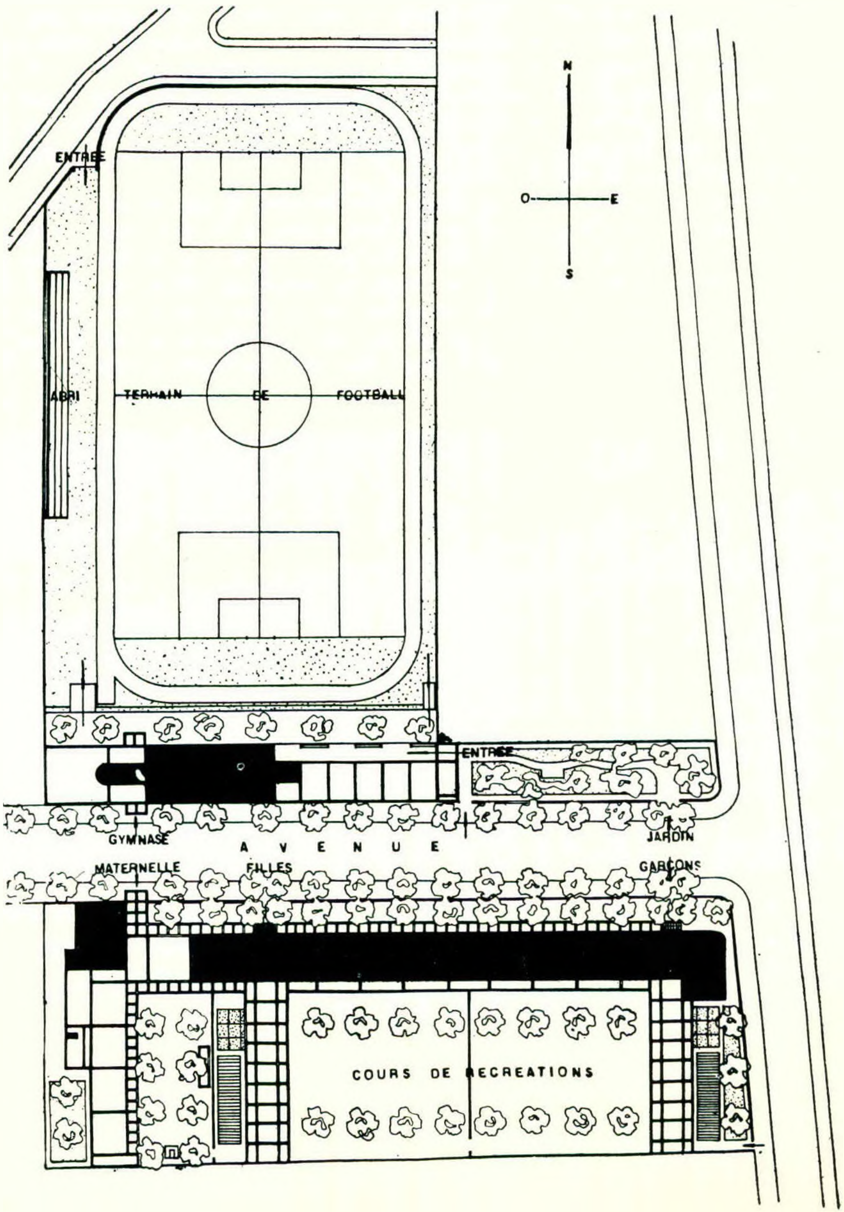


CALIFORNIA MILITARY ACADEMY ● RICHARD NEUTRA, ARCHITECT
Large sliding doors open the classrooms onto the outdoor teaching space.
From "The Architectural Record," September, 1935



SOUTH ELEVATION
Photo: M. SaLaun

SCHOOL GROUP AT VILLEJUIF
ANDRE LURCAT, Architect
From "GROUPE SCOLAIRE de VILLEJUIF"



LAYOUT PLAN

Modern architecture prides itself on its direct approach. Technical and engineering progress has given it new resources, liberated it from restrictions, such as self-supporting walls, and immensely enlarged its capacity to "create space." (Architecture has been called "the art of creating space.") In addition, examples in purely utilitarian structures—bridges, power dams, steamships, automobiles, airplanes—have shown what effects of sheer beauty can be achieved by logical and efficient structure with modern materials. These are not the products of designers trained in aesthetics but forms arrived at by engineers unhampered by a pre-existing pattern, since many of them are things which never were before. They are the results of organization of elements for a purpose. The form is the logical result. They look like what they are because they are what they are.

The modern architect applies the same principles to building for modern conditions of living and working which never existed before. Reduced to two words, his formula is to be "functional" and "organic," though, as a matter of fact, the use of one word implies the other, and the whole thing is summed up in "working order"—the smoothest possible working order and one that will stay put. What is going to be done in the building determines the character of the building, controls both interior arrangement of the parts and outward form.

But the architect is not merely an engineer concerned with use. He is now, as he always has been, concerned with beauty as well. It is not beauty applied as architecture over the engineer's job of building—that is reducing architecture to a menial and contemptible level. True architectural form is derived from the conditions of construction and the materials. The architecture of wood, stone, brick, cement, steel or glass has in each its own form. Given the materials, and the technique, every architectural problem contains the answer within itself. The solution is not "designed" but actually "discovered," when the needs and conditions are accurately defined. Thus every genuine work of modern architecture is a building from within—the form a pure expression of the content.

Since architecture is functional and organic, it should seek the perfect correlation which is the first principle of growth and be indigenous to the soil and the life which produces it. Nothing is admitted to the building, whether in structure or decoration, unless it is related to and functions in the purpose of the building itself.

This is the crux of the battle that "modern architecture" has had to wage with so-called traditional styles which were equally functional and vital in the times which produced them and brought them to flower. In our times they have become applied decoration where they are not archaeological reconstructions.

As has already been said, modern architecture has as yet no defined style or styles by which it may be recognized. It is still more an approach than a form, but the approach is positive and in that approach lie fruitful seeds of greatness. Society has changed while architecture, repeating accepted styles, stood still. Modern architecture recognizes the social change—recognizes no less the rapidity with which that change is still proceeding. It builds for to-day—as it must—but with an eye on to-morrow as well. It takes into account not merely the confusion of the transition in which society finds itself at the moment of its birth but the ideal toward which society is moving out of that confusion. All new great architectures arose out of similar periods and were portents of the future. Style became stabilized only when the social scene found stability.

Historically architecture, as Ruskin observed, is a record of the community's life, interests, tastes, economic advancement, religious attitude and general social order. Only the Catholic mind could have built Chartres. A style is not the product of one individual mind but of a common creative process, the ideas and directive force of which arise from the human stirrings and aspirations which make the period what it is.

Since architecture is a social product, modern architecture must be a product of modern social conditions and relations. It will be valid architecture just in proportion as it satisfies those conditions and relaions. But architecture is not merely an expression of the culture that produces it. Having been produced, it becomes an active force affecting the further development of that culture. A building does not only take care of existing activities. It invites other activities by offering facilities which promote them, and so establishes customs, habits and modes of behaviour which do their part toward changing the pattern of life as time goes on.

We look upon modern architecture as not merely a new design in buildings but an expression of the new concept and attitude toward life that mark the modern world as indelibly as our industrialism. Architecture idealizes the directions of thought which composes our minds, and so becomes a great educative and cultural influence. This influence could nowhere be more persuasive than in schools, where impressionable youth spends its years.

In the words of Dr. William Burnlee Curry, headmaster of the school at Dartington Hall, South Devon, England, "We are mostly timid creatures, terrified of wandering far from the beaten track. In modern architecture courage, simplicity and sensitiveness are applied to the solution of human problems, and nowhere are these qualities more needed than in the field of education."

Reprinted from "The New York Times Magazine," October 3, 1937.

"TECHNICS AND CIVILISATION," by Lewis Mumford. Publishers: George Routledge, London, 1934.

To-day any philosophy of architecture must identify itself with the various aspects of our social system, a system which technical, cultural and economic factors have produced as the residue of centuries of interaction between themselves and the changing patterns of society. The present era is briefly dismissed as the machine age, something unique in the history of man and the direct product of four generations of illustrious inventors.

This new age, this liberation from mediaevalism, it is alleged, commenced with the industrial revolution. New horizons, infinite vistas holding the promise of life in all the richness of its experiences, a freedom of the spirit. These were the potentialities of the machine. The tragedy of its stark fulfilment, over-production, economic crises, the decay of capitalism, inadequate housing and a decline in the art of living. And projected across this unstable society there is the shadow of war. A technique of organised destruction which threatens the continued existence of civilisation itself.

These are the problems which Mr. Mumford relates to the development of the machine. His thesis "Technics and Civilisation" analyses the relation between man and the machine. It divides the development of the machine between the 10th and 20th centuries into three stages—the eotechnic, paleotechnic and neotechnic phases. The ages of wind and water, coal and iron and electricity and steel. He discusses the repercussions and unexpected results of their application and out of these "attempts to define the specific properties of a technics directed towards the service of life." For, as he says, to understand the machine is not merely a step towards reorientating our civilisation: It is also a means towards understanding society and towards knowing ourselves.

Mr. Mumford evaluates the results of the application of the machine in the three phases which he demarcates. I shall quote one of his conclusions as an example of his clear thinking. He says of the paleotechnic phase:—
"The truly significant part of the paleotechnic phase lay not in what it produced but what it led to: it was a period of transition, a busy, congested, rubbish-strewn avenue between the eotechnic and the neotechnic economies. Institutions do not affect human life only directly: they also affect it by reason of the contrary reactions they produce. While humanly speaking the paleotechnic phase was a disastrous interlude, it helped by its very disorder to intensify the search for order, and by its special forms of brutality to clarify the goals of humane living. Action and reaction were equal—and in opposite directions."

The grand sweep of this thesis cannot confine it to technics alone. Religion, art, economics and architecture sometimes opposed and at others interlocking take their places in a confused jigsaw which we to-day are attempting to reduce to some form of order. Already the corners are beginning to take shape. In architecture this is apparent. But perhaps the most gratifying aspect of this book to the architect is the manner in which Gothic revivals, Neo-Greek revivals and muddled conceptions of the meaning of architecture during the last century are ruthlessly dealt with. It establishes once and for all that our contemporary architectural idiom is not a stunt, an attempt to be different, but is an organic part of a development which will continue parallel to that of the machine.

J.F.

" **ART AND SOCIETY**," Herbert Read. (William Heinemann, Ltd., London.)

Herbert Read is unquestionably one of the few writers on the subject of art in its relation to the present, who is worthy of the name. In " Art Now " he gave us one of those rare works—a sincere and sensitive approach to the conflicting tendencies of contemporary art. Now the student, as well as the historian, is indebted to him to a further extent for this new and invaluable book, " Art and Society."

His clear insight to all the problems of art illuminates the darkest and most complex corners in the aesthetic structure. On reading the book the student will find to his delighted amazement that he can relate the spirit underlying palaeolithic painting to the spirit of the Florentine humanists, the hieratic art of ancient Egypt to the art of the early Christians, the sublime resignation of the Buddhist to the despairing idealism of a modern communistic consciousness. In this book Herbert Read turns his attention, with characteristic courage, to the " social genesis of art "—an important issue which art historians are inclined to evade—and leads the reader confidently and convincingly to a deeper understanding of every phase of the development of art.

The book itself, when detached from the disappointing dust cover (designed, astonishingly, by Paul Nash), has a dignity in keeping with its precious contents. The format is delightful, and the freedom of the significant illustrations contributes to the production of a fine book.

W.H.

" **CIRCLE**," Edited by J. L. Martin, Ben Nicholson, N. Gabo. (Faber & Faber, Ltd., London.)

" An International Survey of Constructive Art." This is an interesting and comprehensive survey of the works of the contemporary " constructive " artists and architects.

It does not prove the establishment of a new philosophy of artistic unity, but it reflects a spirit of fundamental objectivity and relationship. This spirit underlies the pictorial and plastic phenomena of the present cycle of experimentalism and reintegration, upon which we are entering. Two stimulating articles by the architects Le Corbusier, who is also a painter, and Walter Gropius point the way to this new cultural unity.

The section devoted to painting and sculpture is a well illustrated and useful reference collection of the works of a number of contemporary artists, although it is surprising that Fernand Léger is given only one illustration. The architectural section illustrates the work of many well-known architects, including Gropius, Le Corbusier and Jeanneret, Lubetkin and Tecton, Breuer, Neutra, Roth and others.

Breuer and Neutra contribute well presented articles of architectural interest.

" Circle," on account of its wide range, is a difficult book to assimilate, and it is not aided by the confused and misleading contributions of Mumford and Richards. It is well printed on art paper, which does justice to the many illustrations; it is backed with linen and has an attractive dust cover.

W.D.H.

OBITUARY

J. S. DONALDSON.

We regret to announce the death of Mr. J. S. Donaldson, a much loved and respected member of the profession. Quiet and unassuming, he was a tower of strength in the early and struggling days of the profession in the Transvaal. Year after year he has looked after the fitting up of the Selborne Hall for the Academy exhibitions, and could always be relied upon to help when assistance was needed.

The late Mr. Donaldson was born in Bloemfontein on February 15th, 1862, and was educated at St. Andrew's Grammar School and St. Andrew's College, Bloemfontein. He commenced his architectural training in Kimberley in 1885, and came to Johannesburg in 1887. He was a burgher of the Orange Free State Republic. He was a Past President of the Association of Transvaal Architects and of the Society of Architects, London, South African Branch; a Fellow of the Royal Institute of British Architects, and a member of the Chapter of Quantity Surveyors.

The late Mr. Donaldson was consulting architect to the Real Estate Corporation Union Estates for Sir William Gwynne Evans, Bart. He designed the first Roman Catholic Convent in Kimberley and the first Roman Catholic Church in Johannesburg, also the first shop in Johannesburg. He was also responsible for the design of many early Johannesburg buildings, including Palace Buildings, in Pritchard Street, which still stands as an old Johannesburg landmark to-day. He died on January 2nd, 1938. Our deepest sympathy is extended to his widow and children.

WILLIAM HAWKE.

It is with deep regret we have to record the passing of William Hawke, F.R.I.B.A., who died at Capetown on January 4th. The deceased took a leading part in professional matters in South Africa, having occupied the position of President of the Cape Provincial Institute in 1930/31 and again in 1934/5; and of President-in-Chief of the Institute of South African Architects in 1930/31.

Mr. Hawke was born in France of English parentage. He was educated in England and gained his professional experience chiefly in the offices of Goldie, Child and Goldie, Sir Aston Webb and Ingress Bell. He met Mr. W. N. McKinlay (who subsequently became his partner) whilst in the office of Sir Aston Webb, and together they collaborated in competition work. They were successful in winning the competition for the Cape of Good Hope University Buildings, and this work brought the partners to South Africa in 1905.

The principal works subsequently carried out by them were the Law Courts in Capetown and Bloemfontein, the University Buildings, Groote Schuur (in association with Mr. C. P. Walgate), the Johannesburg Town Hall (extensive additions to which are now in progress), the Atlas building, Capetown, the Dutch Reformed Churches at Bethlehem, Aliwal North and Trompsburg, and schools at various centres.

In the passing of Mr. Hawke the Institute of Architects has lost a loyal member and a zealous worker for the betterment of the profession; and those of us who knew him intimately are bereft of a highly esteemed colleague and a staunch friend.

Mr. Harold H. Le Roith's business address, as from 1st April, will be 7th Floor, Washington House, 68a, Commissioner Street, Johannesburg.

●

The following letter from the City Engineer is published for the information of members:—

" TEMPORARY CLOSETS DURING BUILDING OPERATIONS.

" I have to inform you that this Department has been giving consideration to the question of the use of pails in builders' temporary closets, and it has been decided that in future all such closets which are in the sewered area must be connected to the sewer."

●

At a Council meeting of the Royal Institute of British Architects held in London on February 7th, the following were among those elected as members: Mr. Arthur Stanley Furner, Johannesburg (as a Fellow); Mr. Philip Berold, Johannesburg (as an Associate); Mr. Harold David Margo, Johannesburg (as an Associate).

●

Mr. L. W. Livingstone has been appointed a Director of the Lewis Construction Co., Ltd., as from the 31st January, 1938. Mr. Livingstone came from Australia when the Company commenced operations in this country on the Colonial Mutual Building, Durban, 1932.