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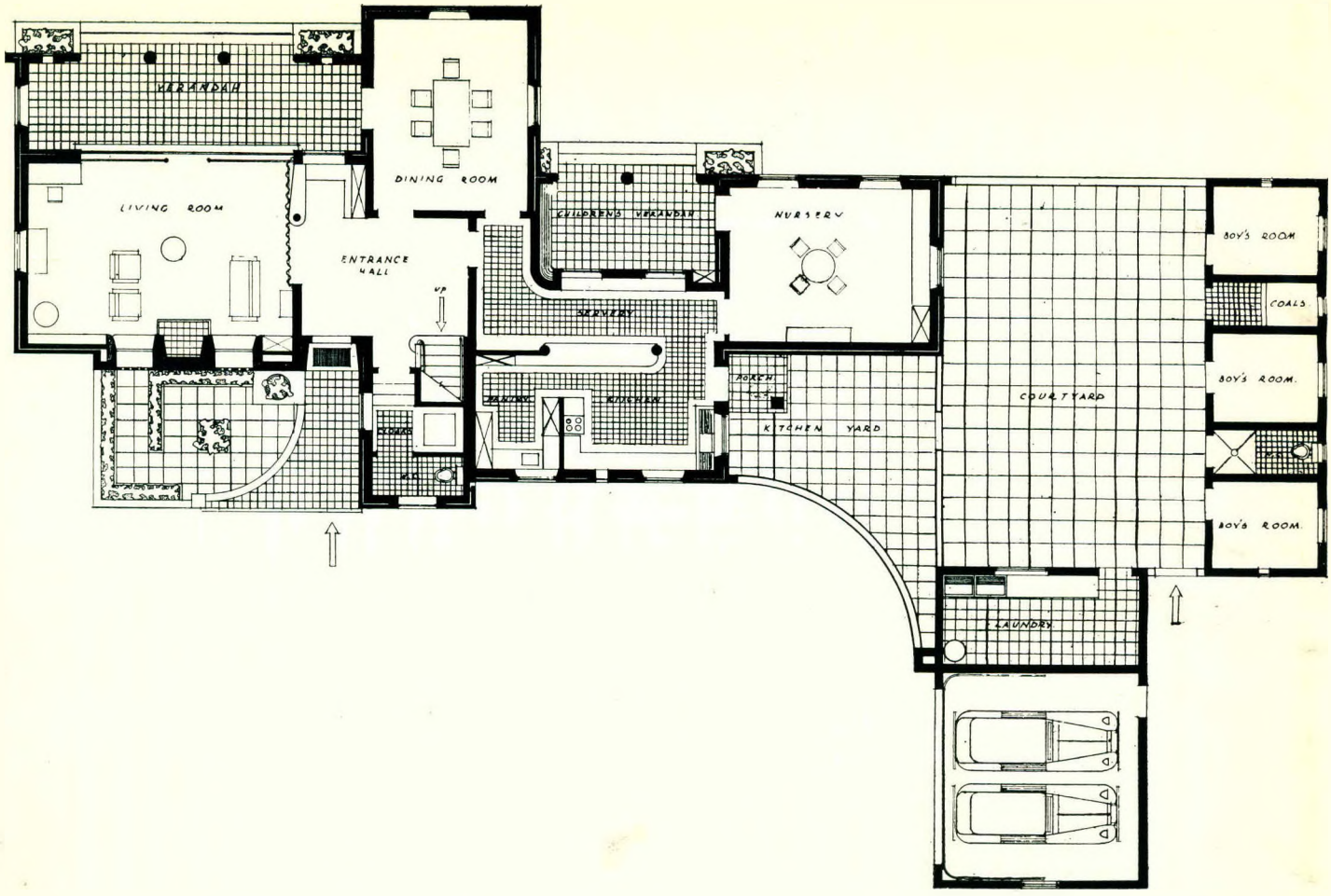
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MEADOWBROOK • JOHANNESBURG

MEADOWBROOK •

An Essay in Domestic Architecture Inspired by Italian Precedents.

A large site at Melrose, Johannesburg, was chosen by the client for his new house. The site slopes gently to the north, and on north and east are large banks of trees. Far to the south lies the Houghton Ridge. An enthusiasm for Italian art and for its richly modulated architectural forms, led him to stipulate the use of a marked Italianate idiom in the planning of the house. A study of the plans and photographs illustrated will show with what success his architects have reconciled modern requirements with this idiom.

To one who has motored on the hill roads above Florence the charm of so many of the stately but informal renaissance country houses must make a profound impression. It is apparent that examples such as Cigliano and 'L Giojello have subtly influenced the designers in their conception and handling of the constituent elements. The delight of the smaller Italian country house lies in its superb repose, its air of unaffected arrangement and in the inevitability of its growth from its setting.

In South Africa we have an atmosphere which enriches the native forms of this style. The ruthless sunlight, the harsh indigo skies and the sombre screens of trees insist on a vigorous, and understanding interpretation of the essential surfaces. The north front of Meadowbrook resolves itself into a very simple composition, of which the dominant accents are the white wall surfaces, the heavily shaded eaves capped by the Italian tiled roof, the generous arched loggias and the green-shuttered windows.

The delicately detailed wrought iron balconies lighten and give sparkle to the plane surfaces. The south and entrance front displays a more informal note. The arched entrance, with its deep-set doors of moulded teak, the scrolled and boldly modelled chimney stack and the sloping roof over the staircase wing combine in a happy demonstration of architectural virtuosity.

A transitional note between the approach and the house has been provided in a tiled and formally laid out terrace. The garage block for two cars is linked into a single entity with the house by means of a wide-swept wing wall.

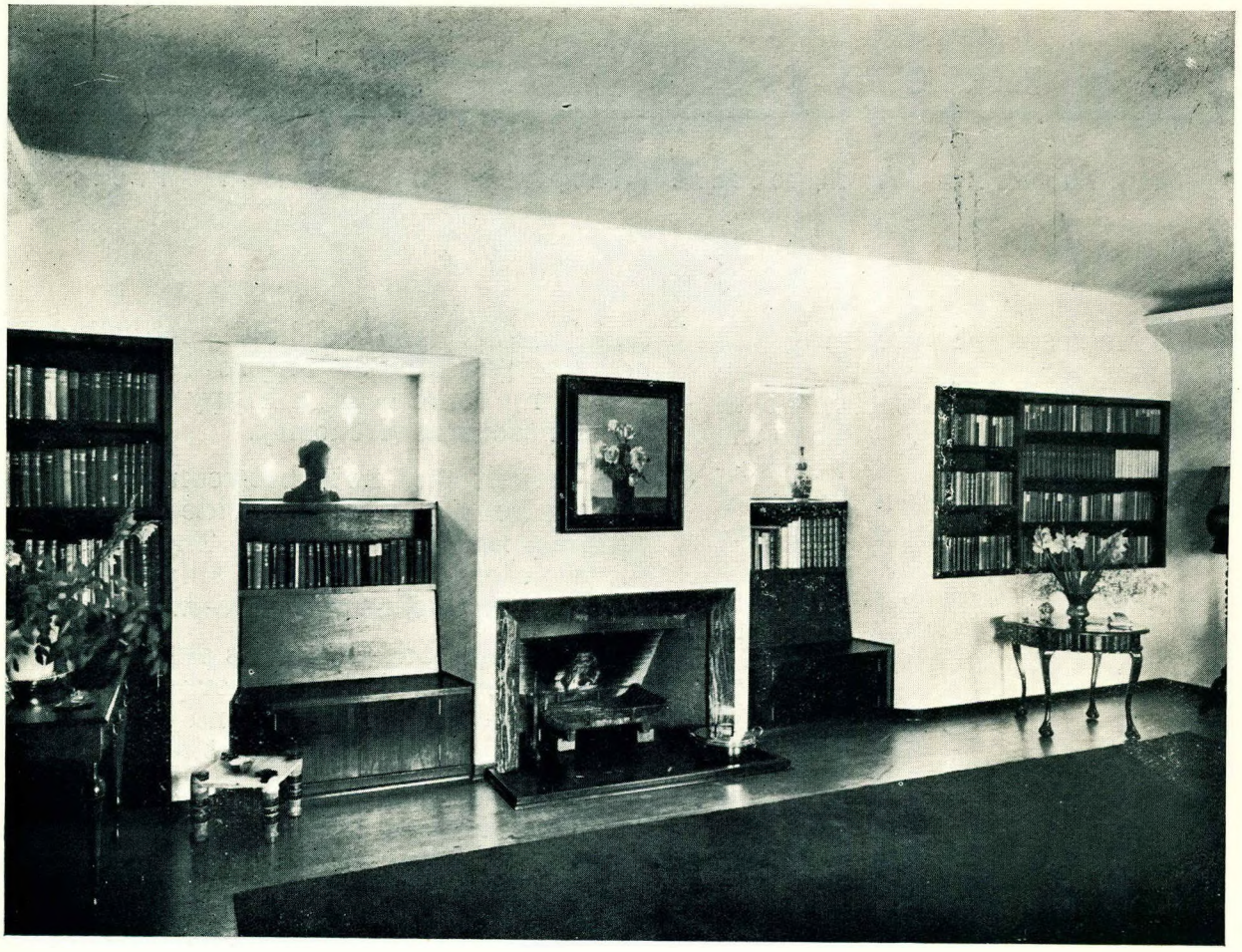
The complex as a whole is placed on an artificial plateau which is cleverly reconciled to the surrounding contours, and which provides a reposeful and spacious setting.

A consideration of the plan shows a freely arranged living-reception suite. This consists of an entrance hall of generous proportions, which is in immediate conjunction with a cocktail recess, in turn merging with the living room proper.

The south wall of the living room is composed of a central fireplace flanked by deeply recessed seats and bookshelves above which a diffused light filters through cast concrete grilles. The arrangement of the fireplace, reminiscent of Baker, defines clearly the focal point of the room, and allows for a wide placing of easy chairs. The woodwork throughout the living room group is simply treated and faced with French walnut. The floor is of waxed oregon, while the ceilings are of plaster. It is interesting to note that indirect lighting is employed in all rooms.

The north wall of the living room embodies a glass screen opening on to a brick-paved loggia which commands a magnificent view, wide-spread to the north.

To the east of the entrance hall lies the dining room, in direct contact with a fully equipped servery which adjoins the kitchen by means of sliding steel screens.

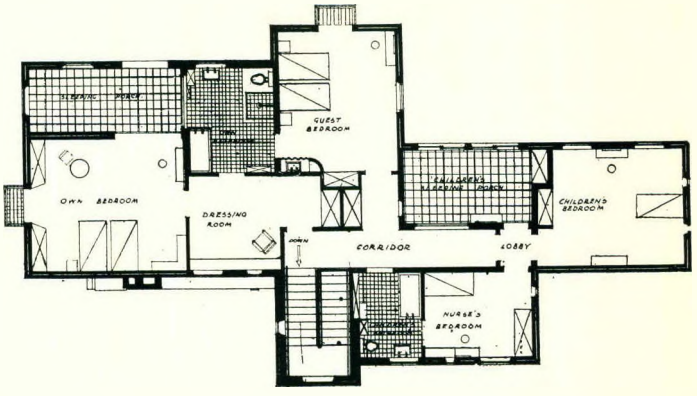


Above • The Living Room

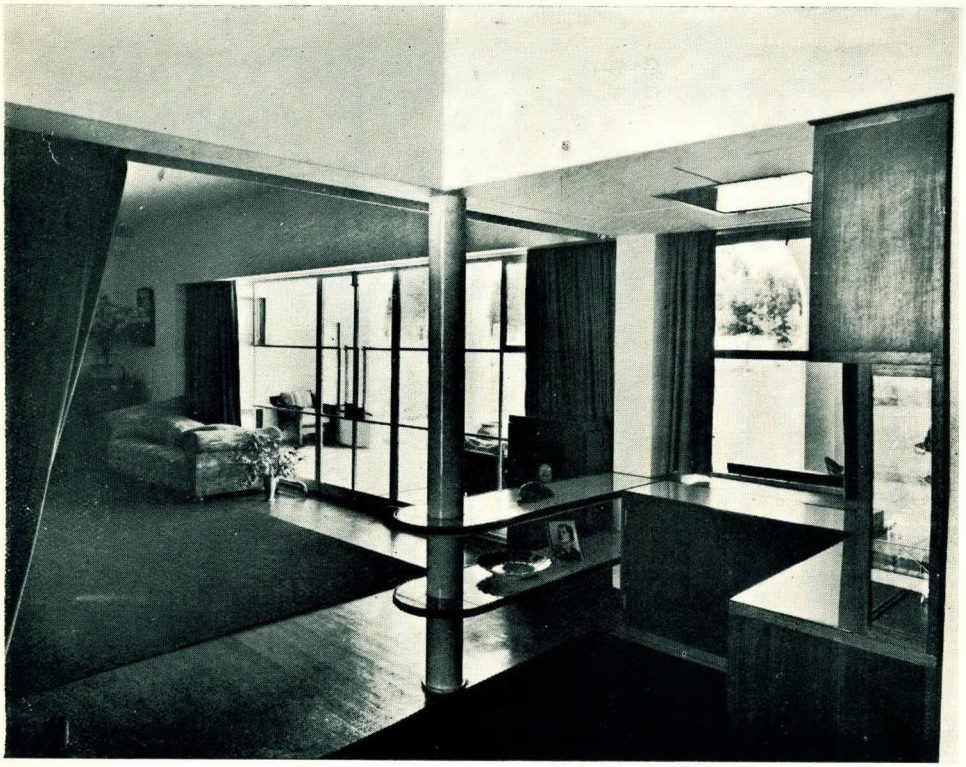
House for Harold Jeppe at Melrose Johannesburg

Architects.
Hanson. Tomkin. Finkelstein

On the opposite page the north front







The Cocktail Recess and Living Room Window



The Main Bedroom

The South Entrance



The Children's day nursery and loggia have access to this same servery, thus obviating unnecessary communications.

The upper floor is reached by a wide staircase in which teak treads and encaustic tile risers have been attractively combined. The sloping ceiling above the stair well with its great teak beams and boarded soffit, has caught the special unsophisticated quality of the Italian country house.

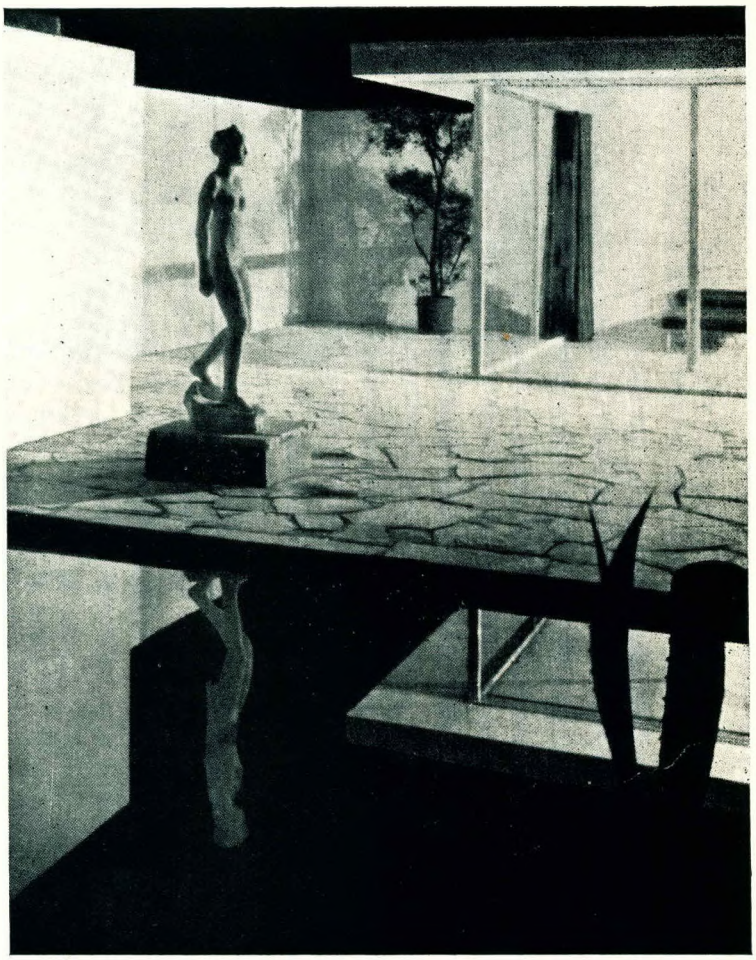
The upper floor plan falls naturally into two suites. On the north-west the owners rooms, and on the east the children's group consisting of nurses room, sleeping porch and pleasantly arranged bedrooms. Oregon is used for the main bedroom floor, marble mosaic for the bath room, and cork tiles for the children's suite. All the rooms are lavishly fitted with built in wardrobes of specially detailed design, dressing tables and electric fires.

The owner's bedroom for example is a particularly attractive room in which white-ducoed fittings, including the light trough, set off admirably the colour scheme of pale green Chinese rugs, matt gold silk curtains and polished birmabright heater surrounds.

One matter of detail finish is noteworthy. the windows of steel frames set in teak have clear sheets of glass, thus providing an uninterrupted view from all rooms, without violating the unity of the architectural treatment.

Indeed the architects have undoubtedly infused a high degree of comfort into what is essentially a traditional nucleus. Better known for work of a strictly purist nature in the contemporary field they have shown an unexpected range and sympathy of taste in what is fundamentally a literary architectural problem.

There is however some divergence from the accepted Italian prototype, achieved by the separation and due accentuation of the main elements. There is a freshness of conception both in the design and the carrying out of this important house that has breathed life and vitality into motives and materials often lightly used though seldom with true understanding or subtlety. The house for all its size and complexity is singularly free from any striving for effect, and relies in the final analysis purely on its richness of finish and breadth of handling.



MIES VAN DER ROHE

TOWARDS A PHILOSOPHY OF ARCHITECTURE

KURT JONAS

In his last article "Revelation at Venice" Mr. Jonas demonstrated with a practical example some of the theorems which he develops more fully in the present paper. A third article will correlate the theoretical discussion with the psychological aspect.

To be an architect is to serve two masters. Hence it is seemingly impossible, and therefore, like everything else which is seemingly impossible, a task to be accomplished at all costs.

Modern architecture, that is to say the architecture as represented by Le Corbusier, Gropius, Mies van der Rohe, is the realisation of a contradiction in itself. By virtue of this fact it lies in that realm where good architecture can grow. Much of the architecture of the past attempted not to be self contradicting, but logical, hence it was bound to be bad architecture. For logic is only a limited truth and a limited truth is always the source of innumerable lies and general error.

This is an attempt to give a philosophy of architecture. Philosophy lives on definitions. Therefore it should be defined. Philosophy is the endeavour to explain the world of phenomena, starting with general statements which cannot be proved, but ought to be self-evident. By means of definitions it comes to the single phenomenon, thus explaining the essence of the single phenomenon and its relation to both the other phenomena and the general statement it was derived from. Should the result of the deduction as applied to every day things be in accordance with every day experience, this may be regarded as an a posteriori proof of the general statement.

So all philosophy is deductive. The so-called inductive philosophy, flourishing mainly in England, is hypocritic natural science. All philosophy, too, is in a sense dogmatic. For it starts with unproved statements. But its touch-stone is reality—and the proof of the pudding is in the eating.

Yet to start from the same point would not ensure a common ending point, should there not be a common method of deduction. The commonest method of deduction among philosophers is the logical method. This is taken from mathematics. Its correctness is proved by the fact that it works with mathematics. The correctness of mathematics is proved by the fact that it is logical. A vicious circle.

Logic, as a philosophical term and method, is strictly defined. It consists of two laws. First Law : A equals A and never equals B. Second Law : Things which contradict each other can not be co-ordinated by thought. Anybody, attempting to think without violating these laws would end in madness. For they apply to statics only. A state where no alterations take place, no movement, is logical. Such a state does not exist, except in the abstract created by the human mind. Hence logic is applicable to mathematics only. It is unable to explain the phenomena of life. For life is movement, unresting change, flow.

The river which you see to-day is not the same river which you saw yesterday.

With the flowing river as symbol of the world starts the dialectic philosophy in the sixth century B.C. The philosopher was Heraclitus, a Greek. Because of the lucidity of his thought and style he was called the dark, and forgotten for more than two thousand years. Up to the nineteenth century he was dead for the philosophers. But he lived in all the great artists, though they did not know him.

The dialectic method states that the essence of movement, of change, is just that at a certain moment A equals both A and B. It states

that there cannot be a thing which does not by means of its inherent contradiction create its opposite and unites with it again on a higher basis, only to bring forth the opposite again of the higher form and so on. A state of tension, struggle, and dynamic equilibrium. Dialectics therefore state that thesis and anti-thesis can be co-ordinated on a higher level, which is called the synthesis. The claim of logic not to coordinate, things or thoughts contradicting each other, means giving up thinking all together. For there exist only contradictions. What we by a fictitious abstraction call static or logic is only dynamic or dialectic. That implies : full of contradictions, but in that state of balance which is given in every time unit.

Logic produces a snapshot, dialectics a movie. It is natural to the human mind to see in the same way as the movies see. Therefore its thinking should follow the dialectic method.

It is followed in this philosophy of architecture. The first general statement we start with is : Architecture is an art.

We define art. Art, as everything else, is essentially self-contradicting. That means that it has qualities which are logically irreconcilable. It is creature and creator, made and making, brought forth and bringing forth. We define : As a thing made a work of art is the true, abstract, and comprehensible realisation of the particular laws inherent in its creator and the material used, that is to say their character, which thus, by definition, must show originality. As an active thing a work of art forces its laws on to the onlookers, bringing forth in them sensations of pleasure which are due to the perception of a hidden law. Both sides are combined in a formula which uses the word expression in both its passive and its active sense, designating "expressed" and "expressive" in one. Hence our first definition : "Art is the true, abstract, and comprehensible expression of the essence (original character) of its creator and material."

The second general statement : The sphere of architecture is space. We must define space. But we cannot. For space is defined by movement. And movement presupposes time. Therefore we should speak more correctly of space-time. In the following the term space will always be used in the sense of space-time, thus designating four dimensionality. The line stands for one-dimensionality, the plane for two-dimensionality, the solid for three-dimensionality, space for four-dimensionality. The second statement therefore in its modified form, is : Architecture is a four-dimensional art.

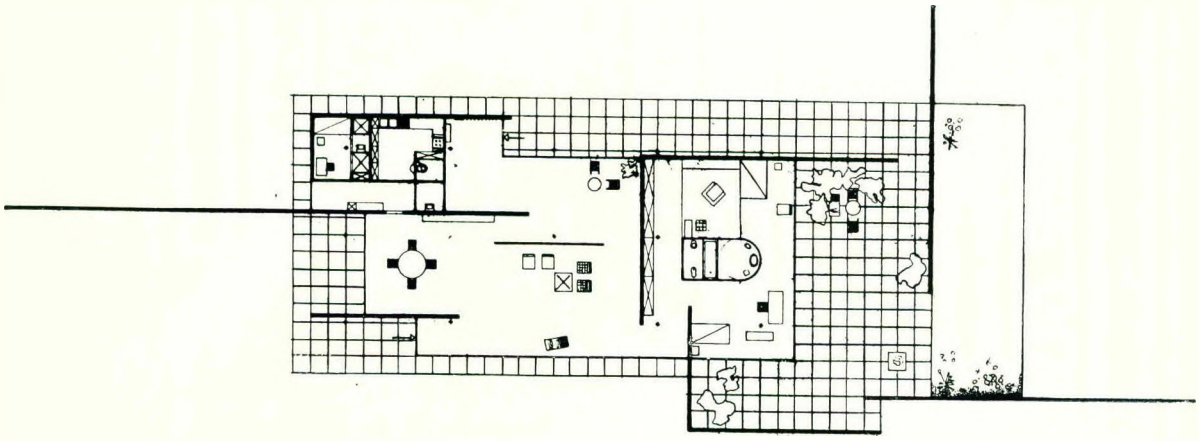
The importance of this statement cannot be overrated. The main fallacy of most theories of architecture is that they regard it as three-dimensional. Then, of course, it is impossible to see the essential difference between sculpture and architecture. For sculpture indeed is three-dimensional. It has to do with solids. Architecture has to do with hollows, with perforated hollows, with space, therefore with movement, therefore with time

To define architecture and art as we have done it, implies that architecture, as an art, must express the laws of four-dimensionality. Of these laws there are quite a number, but the most important one is, in its three consecutive stages, the law of immobility, movement and balance. Space is defined by the movement that is going on in it, but movement is only perceptible and definable against a background of immobility. (Everything, we stated, brings forth its opposite, and is only perceptible through it. If one states white, one thereby states black, or only by stating black can one state white . .) Therefore we take the entirety of space, its body, as immobility. And its pulsing life as movement.

The synthesis, in which immobility, and movement are suspended, preserved and transformed, is balance. We define balance as that state in which the manifold movements are of such a relationship that their sum total equals the weight of the immobile body. The balance therefore is not static, as it would be if immobility should dominate. It is dialectic-dynamic, although movement does not dominate either. But from our definition of balance it is clear that it is the synthesis of two logically and statically irreconcilable forces and accordingly an essentially dialectic state.



Le Corbusier



It is on the higher basis of the synthesis that the conflicting forces can be co-ordinated. Therefore architecture, in order to express fully the laws of space, must strive at balance. Buildings, expressing immobility only (as do many Renaissance buildings) or movement only (as does much Gothic work) fall short of what according to our definition is the essence of architecture. They are three-dimensional instead of four-dimensional. In the one case movement (time) is missing, in the other case immobility (body, solidity).

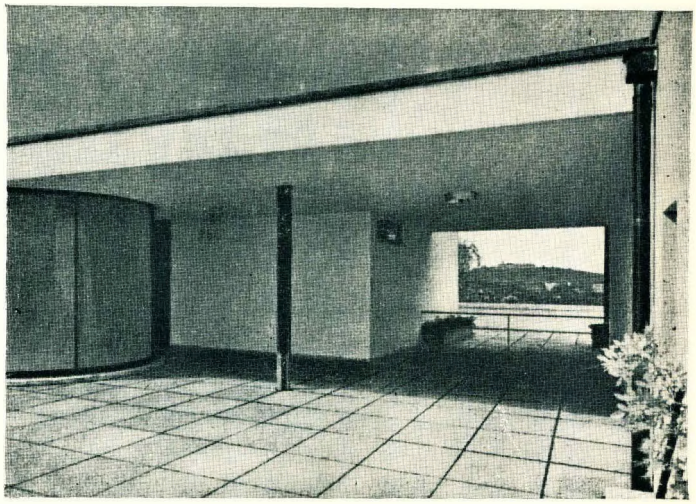
All this is not so much derived from the fundamental statements and definitions as it is shown to be their "function."

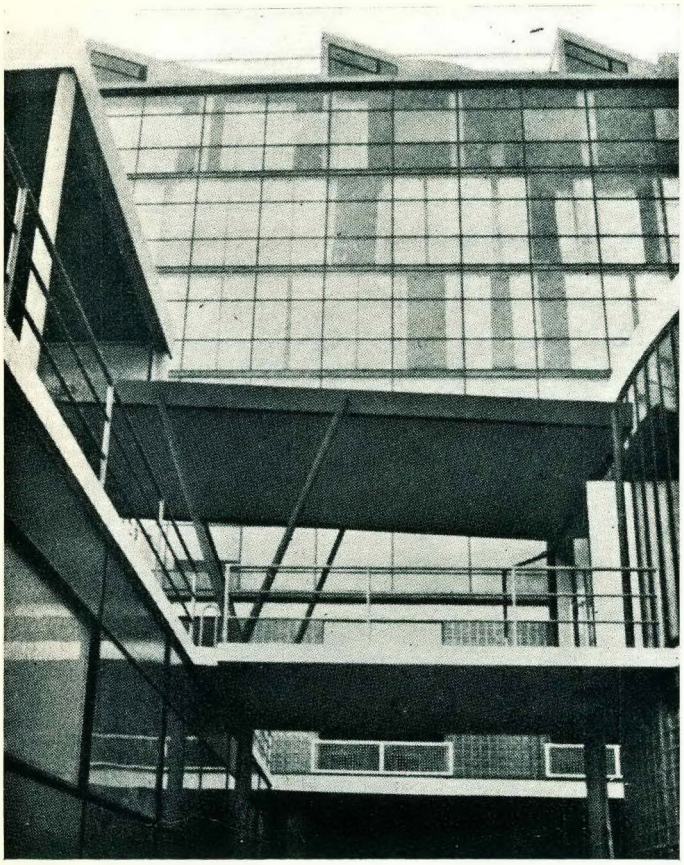
In the "Revelation at Venice" we have remarked that logic stands for derivation ; dialectics for functional relationship. To the formula $X = Y^2$ there corresponds a curve. This curve is neither derived from nor caused by the formula. It is its function. From the point of view of dialectics this is one of the two basic relationships, the other being the spiral of thesis–antithesis–synthesis and so on. The importance of this functional relationship will be noticed later. For the moment, it may show that the law of balance is an inherent function of our definition, which we repeat in the richer meaning it has acquired now. It states "Architecture is a four-dimensional art."

B E R L I N

Mies van der Rohe

B R N O





Le Corbusier

Everything that has been said about the meaning of art and four-dimensionality should be recollected, when one hears or sees this statement again. For we now proceed to our third statement : The material of architecture consists of solids. The function of solids in space is to produce divisions in space. A space (and as we now take into account the existence of solids, we have to speak about spaces as a plural) is defined by the solids which partly or wholly enclose it.

This statement may seem surprising as it is generally assumed that space is defined by planes enclosing it. This, of course, is wrong. For a plane is only two-dimensional, that implies : not substantial. Therefore, it does not really exist, but is a fictitious abstraction.

Nonetheless, architecture has to do with planes, too, in so far as solids, and especially such architectural solids as floors, ceilings and walls, may appear to be planes because their third dimension is in many cases not visible. But that is appearance only, reflection in the human mind, and must be dealt with in the psychology of architecture.

For the philosophy facts only count, not appearance. Hence the statement that solids are the material of architecture.

A solid is defined not only as being three-dimensional, but also as being to a greater or lesser extent impenetrable.

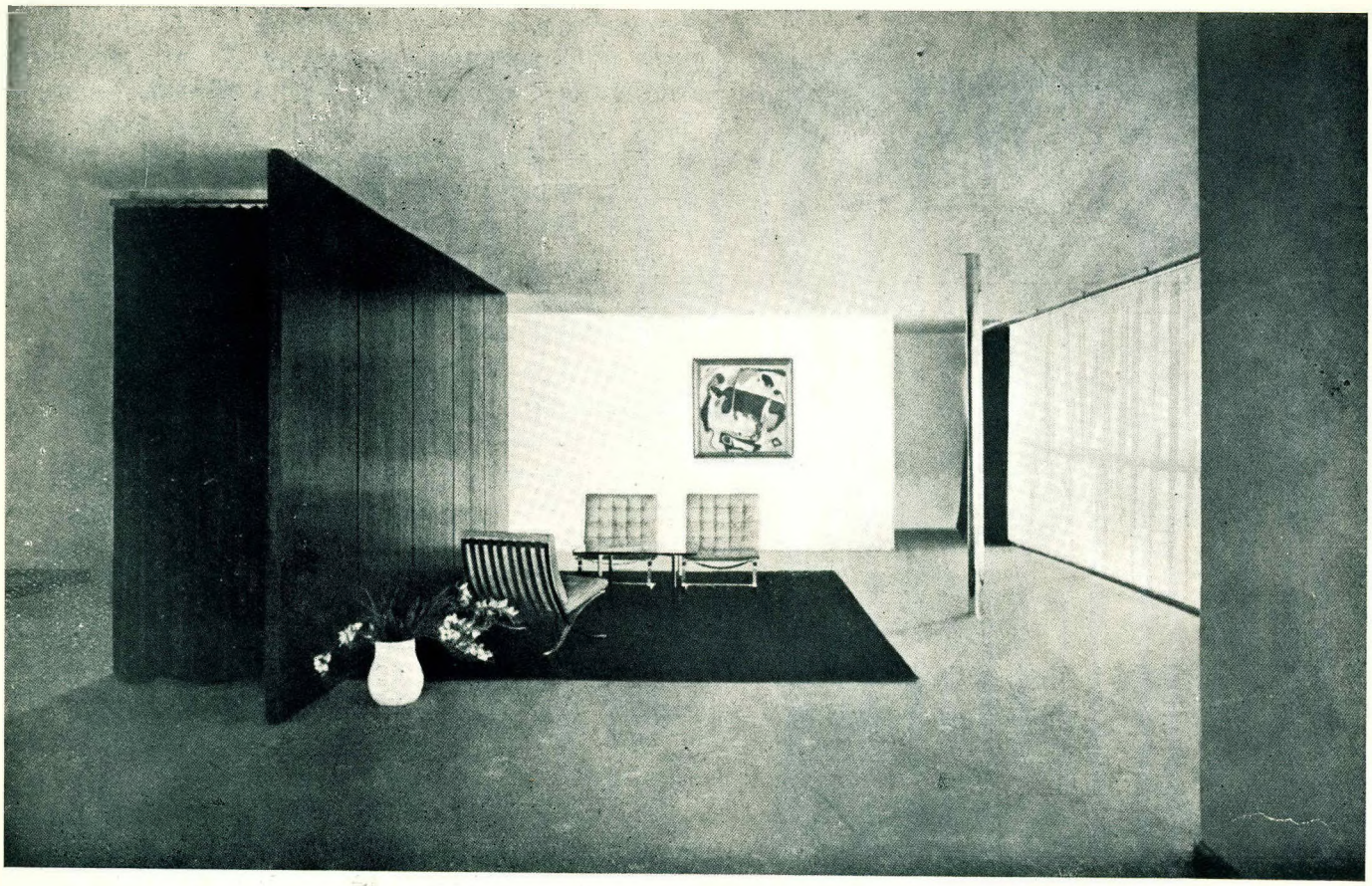
But movement, given different spaces, is identical with interpenetration of spaces. So once again we are faced with a self-contradiction inherent in our dialectic definitions. The solids which are the material of architecture and the space defining character of which must be truly and comprehensibly expressed render impossible that interpenetration of spaces which is the architectural expression of movement.

The synthesis is the perforated solid in which solidity and fluctuation are kept in balance. For a modern building in which practical restrictions make other solutions impossible, glass is the only means of achieving this end. That explains the paramount importance of glass for the aesthetics and language of modern architecture.

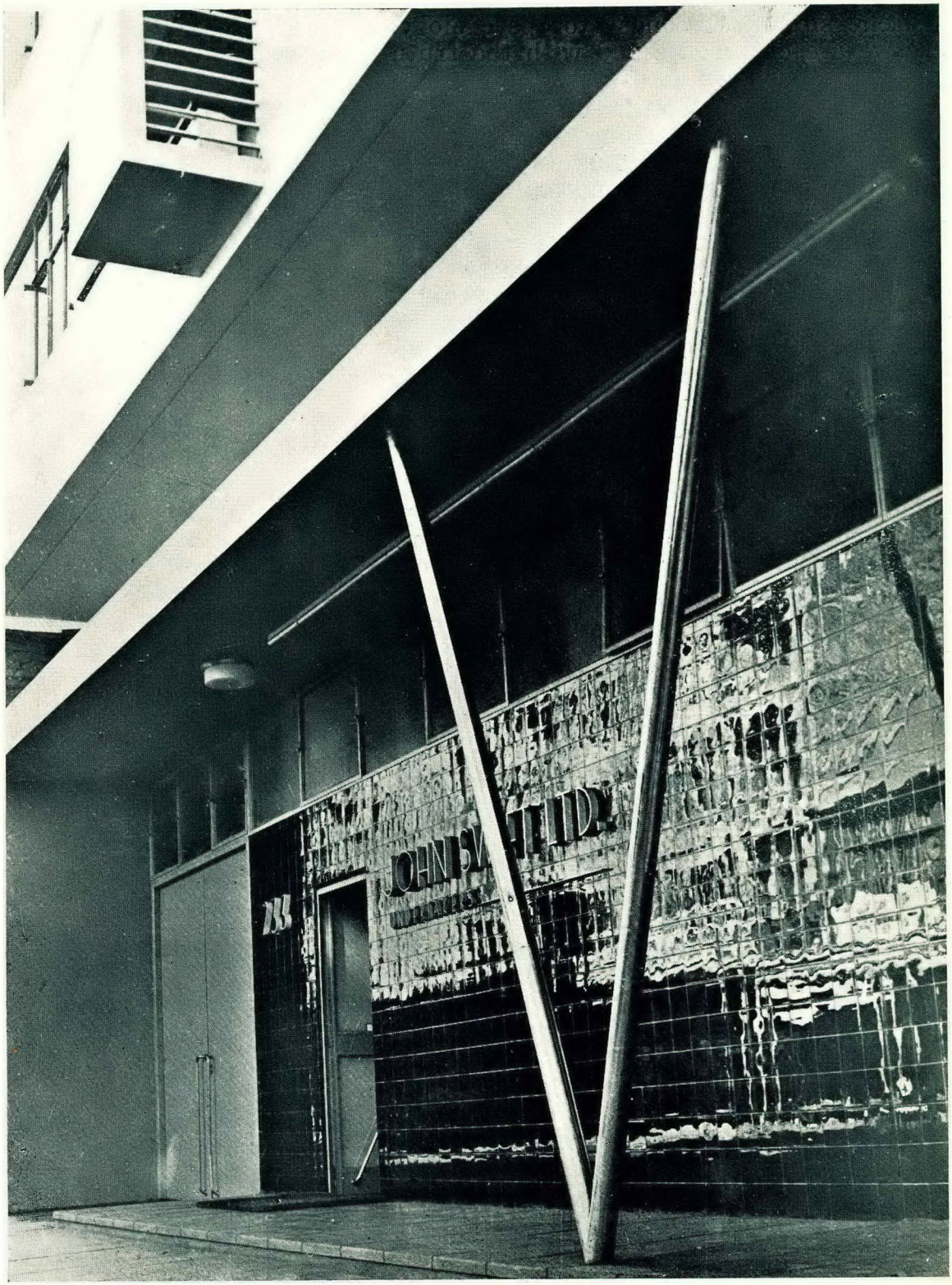
We now combine our statements : Architecture is a four-dimensional art, enclosing a space by means of solids and at the same time allowing for a free interpretation of spaces.

If we interpret this last statement with regard to what has been said already, we might state : Architecture is firstly the true, abstract and comprehensible expression of the essential character of its creator. It is self evident, that nothing can be generally said about this quality of architecture as it is entirely dependent upon the individuality of the architect. Accordingly it cannot be the object of a detailed consideration in a philosophy of architure.

Secondly, architecture is the true, abstract and comprehensible expression of the material. The abstractness has to be dealt



Mies van der Rohe



Johannesburg

Dynamic Balance

with in the aesthetics of architecture, the comprehensibility belongs to psychology. Here we are only concerned with the truth of the expression.

By material we understand both the sphere to which architecture belongs and the substances of which it is made up. Hence our definition says that architecture must express the character of four-dimensionality, namely to establish a spatial relationship in which the two qualities of four-dimensionality, immobility and movement, are clearly expressed and balancing each other. Our definition says furthermore that the material of architecture consists of solids and that their character of solidity and space-definition must be truly expressed. It says in the end, that the law of solidity is in the the same way supplemented by its opposite, the interpenetration of spaces, as the law of immobility is supplemented by the law of movement. Dynamic balance is in both cases the dialectic solution. To have realised this contradiction in itself and to have realised it, is the great achievement of Le Corbusier and Mies van der Rohe.

But though our definition is completed, we are not yet at an end. The architect has to serve two masters. The first master is architecture as we have defined it. One serves him by fulfilling the conditions of this definition.

Only the work that is up to that standard of dynamically uniting and balancing the self-contradicting qualities of spatial art is architecture. And all work that is up to that standard is architecture.

The other master, whom the architect must serve, is practical life. It has nothing to do with the essence of architecture. Therefore the definition is theoretically complete without it.

The Greek temple had practically no function except to stand there. A monument. And yet no sculpture, but architecture. Fulfilling all the conditions of our definitions, but no others, practical ones, which are so frequently and wrongly mixed up with the definition of architecture. The Greek temple, the Parthenon, a pure piece of architecture: Columns, side by side, against the sky and against the cella. Verticals, horizontals, solids, voids :–Spatial relationships, dynamic, balanced !

P A R T H E N O N



But what is the role of the second master ? We stated that art is an expression. The essential limitations are given by the character of material and creator. But it may happen that an expression is not self-sufficient. A piece of music once written, is a complete work of art. Yet to come to life it must be reproduced on an instrument. If now the composer, though strictly following the inherent laws of music, did not take into account the further limitations of musical instruments, it may be impossible to play his music (as was for a long time the case with some Hornist passages in a Beethoven Symphony). It will still be a work of art, but it will be dead.

The same applies to architecture. If an architect has to build a hospital, then the necessities and functions of a hospital are the instrument on which his work must be played. And not be played by artists ! So it must be as easy as possible to play, otherwise the actors will strike. Then it will not be built, it will not be lived in and experienced. If the design fulfilled the conditions of the definition, it will be architectural. But it will be dead.

It is important to demonstrate by this way of deduction that the functioning does not belong to the essence of architecture. Many a work of art in architecture has not been created or has been ruined because the architect thought that a design that functioned well was good architecture. It may have been. But it perhaps was not architecture at all.

A work of architecture, in the meaning we have given to this term, may not function and yet be art. Tragic and pitiful. A design may function perfectly and yet be dead. And no art. Boring and indifferent.

The architect does not want to create dead things. Therefore he has to follow the laws of the instrument—life—on which his works are to be produced.

But there is no synthesis between spatial art and the practical necessities. For these two elements are not anti-thetic. The one is not the source of the other, nor is the other the opposite of the first. They come from different sources and exist side by side, without connection.

They must be connected. Yet they have no point of contact. Therefore an equation must be found, containing a third element which is related to both the others. (One remembers the "point of correlation" from "Revelation at Venice"). Thus it will be possible to establish a functional relationship in the sense indicated above. It will be possible to express truly that not the one is the cause of the other, but that they are forced, by a superior force, into parallel lines. The spatial relationship will emphasise and even express the practical processes of life that are going on in it, and these practical processes will emphasise and even express the spatial relationships of their architectural shell.

For between the two elements, orginally without connection, there will have been established, by means of an equation, a mutual functional relationship in the mathematical sense. Once the equation is given, that will imply : that if one states a certain practical process, one automatically states the spatial relationship that corresponds to it, and that if one states a certain spatial creation thereby states the practical processes which are determined to correspond to it.

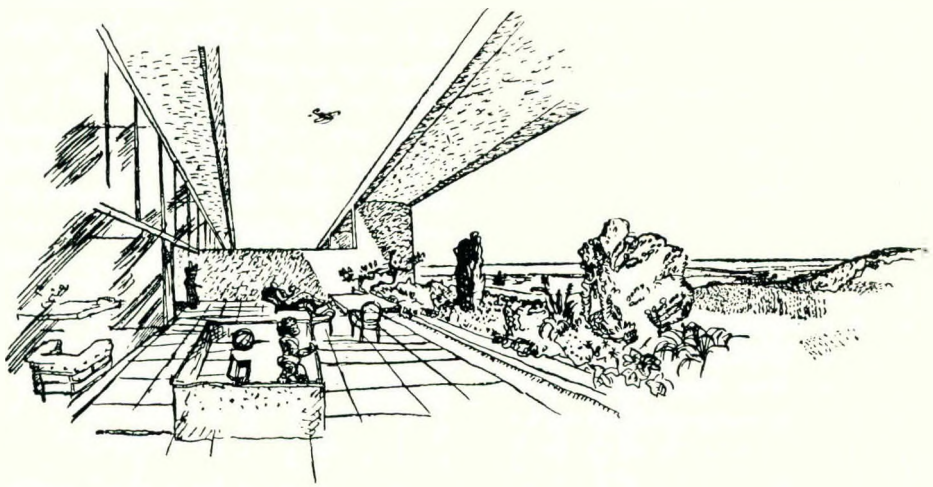
If we have the equation $X = Y^2$, then to state $Y^2 = 4$ will imply the statement of X, and to state $X = 2$ will imply the statement of Y. Yet no law of causality is at work here. It is the law of functionality.

It is by this law, that architecture comes to life. It is this law, which Le Corbusier has in mind when he says. "The plan is the generator," for Le Corbusier, who is an architect, plans in four dimensions. Practical and philosophical aspects are in his brain connected by the law of mathematical functionality.

So we conclude this attempt at a philosophy of architecture by giving our completed definition : Architecture is a four-dimensional art, enclosing spaces by means of solid and at the same time allowing for a free interpenetration of spaces. The aspects of spatial art and practical efficiency are co-ordinated by an equation, which results in a functional relationship so that the two aspects mutually state and express each other.

Let us emphasise as a result that architecture is an art. It is not a science, nothing of the essentials of architecture can be scientifically achieved. But no work of architecture to-day could be created without the help of science. Science is one of the servants, not one of the masters of architecture.

As to the equation, it is the one unknown in our definition. It exists only in the human mind, which will, by reacting on a spatial and on a practical arrangement in a similar way, supply us with the material for the co-ordination of the claims of the two masters, whom one seemingly cannot and yet must serve at the same time. To analyse these actions and reactions of the human mind on the philosophical and practical aspects of architecture, will be the task of our third part; "Psychology and Architecture."



Le Corbusier

MISE EN SCENE ● WILLEM HENDRIKZ

PART III

Stage Lighting.

Before the theatre moved indoors (in England in the late sixteenth century) the problem of illumination solved itself, since the play was produced out of doors in the daylight. Light was then generally unknown except for the utilitarian purpose of illumination. The introduction and rapid development of the incandescent electric lamp as a light source which lends itself easily to modification of colour and control, has given producers a new means of visual expression on the stage.

Lighting and stage design should complement each other and together complement the transitory art of the actor.

The use of light on the stage has developed from a mere means of illumination to a state when it becomes the most important factor in the interpretation of a play, and has become the complete expression of the art of the theatre.

Light on the stage has five distinct functions: Illumination; Production of realistic effects; A means of producing the stage picture; An aid to plastic expression; and a means of psychological expression.

When a playhouse became a completely enclosed building, the problem of visibility presented itself. At first no effect was made to differentiate the illumination of the auditorium and the stage. Then it was discovered that the players could more easily be discerned if the stage alone was illuminated, and the auditorium was darkened. The producer was, as far as light was concerned, wholly occupied with the problem of visibliity.

When the problem of illumination was solved an attempt was made to produce realistic effects. The movements of realism completely submerged the theatre in lighting and scenic design, and it has only recently discarded the systems of forced realism—the Fortuny system, by means of which a close approach to diffused natural light is obtained, and the Grosse-wolken apparatus.

Electric light made possible a careful and accurate control of light intensity (by means of the variable resistance dimmer) as well as the production of coloured light by means of conveniently applied colour media. The realistic effect became heightened by the use of amber for a sunny scene, red for a sunset and blue-green for moonlight.

As a result of this effort to achieve realism, the stage worker of the future has at his disposal two exceptionally valuable mechanical devices—the dimmer and the colour producing equipment.

Light has recently been used as the component of the paint with which scenery is decorated. A stage picture can be built up of areas of light and shade, in some carefully blended, in others deliberately harsh and contrasting—some of definite shape, others fleeting and formless. In these uses lie unfathomed possibilities in the technique of design and composition.

The painted skydrop has been abolished and the faintly coloured cyclorama substituted. The conceptions of scenic designers assume the lifelike quality, the texture, the vibrancy and the rich colouring upon which their effectiveness depend.

In the introduction of the plastic setting, light plays an all important part. The painted shadow is no more. The plastic nature of three-dimensional or solid subjects must be strengthened by light. In a like manner has the actor himself to be shown. The relief to the plastic elements of the settings is accomplished by means of high lights and shadows. These plastic elements are the setting, the properties, the costumes and most important of all, the actors.

Light is now used to symbolise the meanings of the play and to provide the atmosphere required. Direction, form, quality, movement and colour—particularly colour—must contribute in harmonious union to achieve the desired psychological effect on the mind of the spectator.

Irving Pichel, in his "Modern Theatres" summarises most conclusively the functions of stage lighting.

"It has been frequently pointed out that, in outdoor theatres of the Greeks and the Elizabethan period, the light of the sun, far from accentuating the mood of the play, actually detracted from it. The baleful gloomy tragedies of the Greeks, the bloody tragedies of the Elizabethans, must have seemed far less terrible with the actors bathed in bright sunlight, than they do today, when virtually every change in mood is a cue for the electrician to play upon the emotional sensibilities of the audience by means of subtle, skilfully applied lighting."

Lighting equipment, even for the purpose of creating realism, was crude and unwieldly, and for the most part unsatisfactory. Only recently has scientific knowledge evolved a general improvement in equipment.

In many modern theatres the equipment is generally antiquated and useless, in others there is a certain amount of usefulness, though the arrangements may be comparatively out of date. For the most part the lighting system in the average legitimate theatre serves well enough the purpose of not too discriminating producers, and still fall far short of perfection. Only recently have equipments been installed which are entirely satisfactory, notably in the Yale University Theatre at New Haven and the Guild Theatre in New York.

The average architect, knowing but little about stage equipment, and still less of the demands made upon it by active and serious play production, follows the path of least resistance and turns over to his stenographer a set of sampled stereotyped specifications (furnished by the manufacturer, featuring his individual products and having their sale as its primary purpose) to be written into the general building specifications without further thought or effort on his part. This is evidenced in the great number of impossible stages in existence, and by inconvenient features on many professional stages.

The organisation is to be sympathised with, that must cope with many of the diverse problems of play production on a stage designed by some architect who, though prompted undoubtedly by the best of intentions, succeeded only in providing an expressive outfit that is the cause of much hardship and discouragement.

A thorough knowledge of the possibilities and limitations of equipment and of how these possibilities may be fully realised is most essential to those stage workers who essay lighting design and application, and the switchboard manipulation should be vested in an artist who thoroughly understands his media.

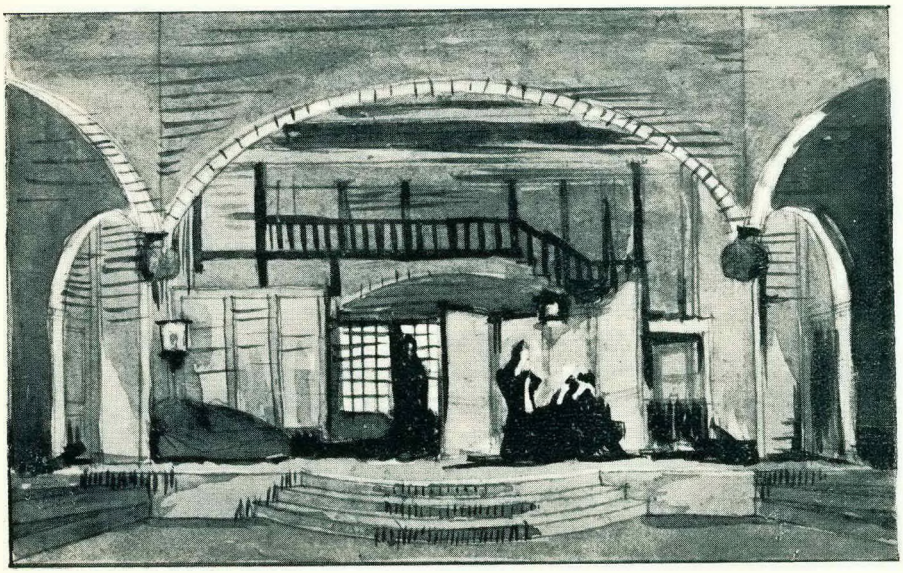
The light source should receive particular attention. As excellent as the modern incandescent lamp is, it is still far from being ideal. It converts only a small amount of the electrical energy it consumes into light ; the remainder in the form of heat being wasted. The proportions of the colour constituents of the light units are very unbalanced, the red and yellow components far exceeding the blue and green.

For greater optical efficiency in projection a nearer approach to the technically desirable point source should be achieved. And, finally, the light source should be much more powerful (and still be in a convenient form) than those now available.

The desirable luminant would be more powerful, more efficient, highly concentrated, capable of being dimmed, contain equal quantities of light of all wave lengths and retain this proportion constant on being dimmed.

The usual procedure of play production is roughly as follows : the producer appoints a director who directs the actors only. A specialist is commissioned to design the settings, which are constructed by one company and painted by another ; properties are furnished by a third company, and costumes designed by a second specialist and furnished by still another company. Everything lacks a unifying element. The lighting is usually left to the dress rehearsal for the stage electrician, who sees the production for the first time, to work out as best he can. In many productions lighting is therefore utterly inadequate, meaningless and ugly.

David Belasco bestows on his lighting efforts an attention which has become proverbial. Experimental work is continually being carried out in a fully equipped work-



A Setting by Jacques Copeau for his permanent stage

shop and the result of these extensive light rehearsals have made his productions what they are.

Light is a compensatory medium for many drawbacks and inconveniences and will render distinctive and beautiful the labours of many productions if properly used.

Irving might be called a pioneer of stage lighting. He was the first to use transparent lacquers, to-day known as "colour dips," for colour effects ; he was the first to break up the footlights into several circuits ; and he was the first producer to make organised light rehearsals a regular part of his production activities.

Adolphe Appia and Gordon Craig were among the first to recognise the immense possibilities of light to achieve visibility, realism and psychological expression. The work of both these men has proved most effective and their theories are adopted by the most prominent stage designers of to-day.

Fortuny, in 1900, through his experiments to devise a system of indirect lighting to simulate natural lighting by means of reflection of projected light from silk, has evolved the now indispensable cyclorama, although his original system was too cumbersome to use.

With Belasco, Pevear is another outstanding figure in stage lighting activities. His investigations in colour have made possible the manufacture of colour media of unusually high spectral purity. He was one of the first to advocate the application of colour synthesis to stage lighting—the employment of the light primary colours (red, green and blue) in combination with clear tinting, to obtain any possible colour of light.

His application of scientific optical principles to special problems has resulted in the development of stage lighting equipment that is truly unique in its effectiveness, optical efficiency and mechanical construction combined with conveniences of operation. The "soft edge" spotlight, a footlight unit for indirect as well as direct illumination, the "tormenter" and "teaser" lens units, and the special close operating colour mixing cyclorama lighting units are several of his developments.

Among the many important contributions to stage design is the dioramic use of gauze for special effects—a system devised by Hewlett and Bassett Jones.

Cycloramas are made in various shapes—flats, curved and quarter spherical (dome

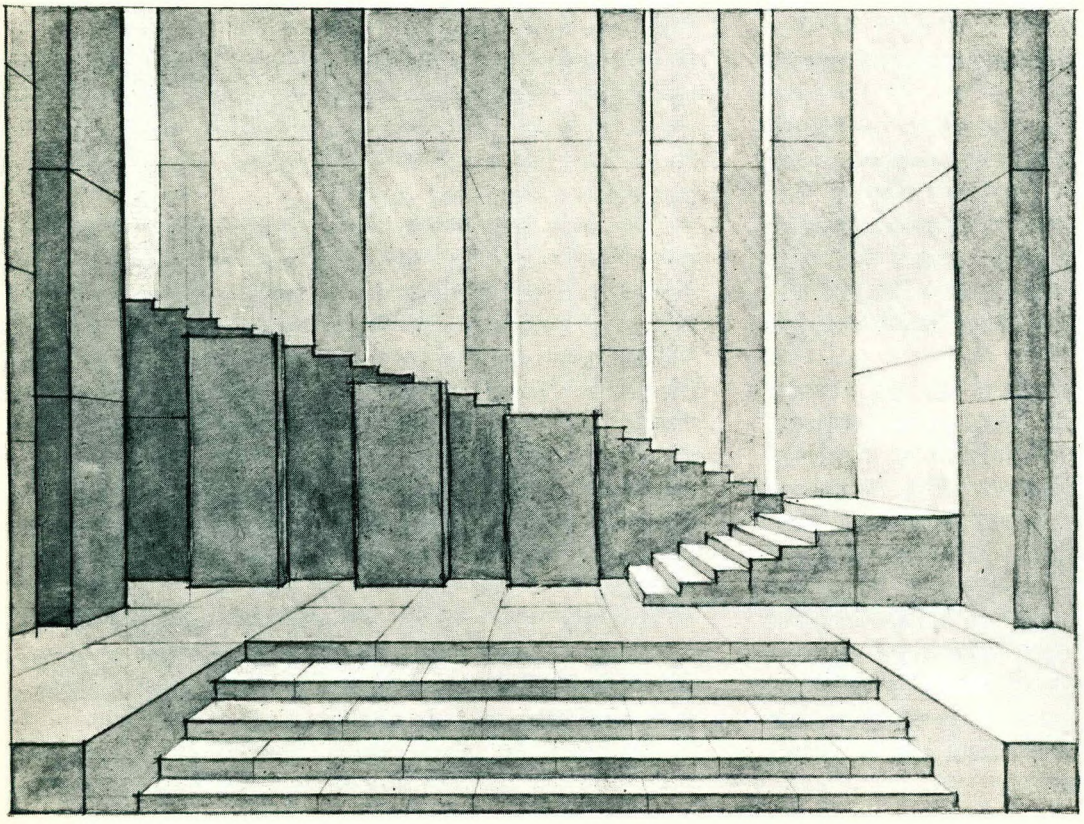
shaped). When permanently installed they may be constructed of concrete and plaster ; when they must be raised and lowered or otherwise disposed of, a heavy quality of linen can be used, or a light reinforced framework of wood may be constructed to which may be applied a smooth cyclorama surface of compo board or three-ply veneer. Plaster cycloramas should never be given a smooth surface. A rough finish is best for diffused light reflection. Canvas possesses a suitable surface after it has been painted, but folds should be carefully eliminated as these cause undesirable and illusion destroying shadows. The effect is heightened and the degree of illusion strengthened if the surface is water sprayed a flat tint of light blue (a clear noon sky in midsummer viewed at an angle of forty-five degrees to the horizon).

While plaster or canvas may be satisfactorily lighted with a blue tint.

On no account should a cyclorama be coloured yellow or buff as it will take a muddy appearance when flooded with blue lights.

Footlights.

In the older stagecraft, footlights, with borderlights and proscenium striplights, helped to furnish the blast of raw light indiscriminately applied, and as a result of the appalling effects they have become much abused and many theatres have wrongly abandoned their use. Because of their location footlights provide light in an upward direction that often brightly illuminates the undersides of tables, the chins and nostrils of the actors, the ceilings of box sets as well as the proscenium frame and auditorium ceiling, casting huge shadows on the back walls and cycloramas.



A Setting for Orphee by Adolphe Appia.

Unless face level lighting from the auditorium is used footlights are necessary to balance the plastic distortion particularly on the faces of the actors, and to overcome the expressionless silhouette formed by the actors playing far downstage, caused by the overhead lighting of borderlights.

The footlights must be diffusive in quality and give an unbroken strip of light to form a very faint, if any, shadow on the cyclorama or back wall rather than huge shadows which the misuse of such lights invariably causes.

For this reason low wattage lamps spaced closely in a well designed trough, with a white painted diffusely reflecting lining, are better than high wattage lamps spaced at larger intervals.

Footlights are of three principal types.

The Open Through Type

Consisting of a simply constructed sheet metal trough, sunk at the outer edge of the stage floor, and protruding four or five inches above its level, extending almost the full width of the proscenium opening. Porcelain sockets of medium base are mounted in the trough spaced three to five inches apart, depending on the sizes of the lamps to be used. The lamps are inclined to direct the light at an angle of ten to twenty degrees above the horizontal. For large stages a double row of lamps is sometimes used. The surface of the trough is utilised as a diffusive reflecting medium and is therefore painted flat white, using a special magnesia paint which lasts well and remains clean. The trough incline, leading from the stage floor to the lamps is painted a flat black to prevent the diffusion of light back onto the auditorium ceiling or proscenium frame. Colour modification is the weak point in the open trough type. The lamps must be colour dipped which causes uneven light owing to the reflecting qualities of some colours ; colour caps mechanically fitted or natural coloured glass bulbs, which are expensive and difficult to obtain, may also be used. But whichever method is used the various colours are mingled together, and some light is lost by the reflection from and transmission through the adjacent lamps or colour caps and strict purity of colour cannot be obtained. Five circuits should be provided so that red, green, blue, white and amber may be obtained and the footlights wired accordingly.

The Compartment Type.

Very much like the former type except that each lamp is partitioned off by a separate compartment of sheet iron with the open side facing the stage. The lamps are spaced six inches apart when the standard seventy-five, one hundred and one hundred and fifty watt type C lamps are used. A coat of white paint on the inside surface of each compartment acts as reflecting medium, and the more elaborate types have specially designed reflectors for each lamp, mounted in the compartment. The white painted metal is least expensive and gives good diffusion, but is not as efficient or permanent as the costly silvered reflectors. Colour modification is effected by inserting small sheets of natural coloured glass or gelatine colour plates into the grooves before the openings in the compartments. Because the lamps are enclosed ventilation must be provided by holes so shielded that while air may find an easy passage no light should escape. The wiring is similar to the open trough type.

An elaboration of the compartment type is the removable unit footlight, which consists of a sheet iron wiring channel in the face of which are mounted a row of flush plug receptacles and a series of deep-bowl long stemmed aluminium reflectors equipped with prong connectors which fit into these receptacles. Each reflector is an independent unit and can accommodate a seventy-five, one hundred or one hundred and fifty watt lamp. To the mouth of each reflector a standard convex colour lens is fitted. These footlights provide space for footlight baby spotlights which can be plugged to any one of the footlight circuits or into a separate circuit, individual receptacles for which may be placed at intervals along the wiring channel.

Both these types are available in a form known as the disappearing or flush type, which is particularly suitable for stages in assembly rooms or auditoriums of schools and buildings where productions are not carried on continuously. The footlights are only exposed when they are in use, and otherwise are hidden and may be locked if necessary.

The Indirect Type.

This provides the correct quality, direction and intensity of light necessary to reveal most successfully the plastic nature of objects on the stage and chiefly the features of the actors. It also permits a more thorough blending and mixing of colours than does the direct type and minimises the shadows on the rear wall and cycloramas ; it is more subdued and pleasant in quality and less trying on the eyes of actors. There are two forms of indirect footlights, one employing low wattage lamps and the other high wattage lamps in compartments.

The former consists of what is practically an open trough footlight mounted on the stage floor emitting its light flux in a direction slightly upward and toward the auditorium, directed on to a curved white painted metal diffusively reflecting shield which is placed lengthwise before the row of lamps in the trough. This reflecting shield is partly below and partly above the stage floor level and projects through a long slot in the floor near the front edge of the stage—in a position usually occupied by the regular type of direct footlights. Although this light is diffused it may be adjusted slightly by changing the angle of the shield which is hinged. Colour circuits are arranged as in the direct type.

The indirect type with high wattage lamps is similar to the open type just described, except that the lamps are in compartments and gelatine or coloured glass sheets are used for colour modification. A combination of the direct and indirect light may also be used. The lamps are mounted in a white painted metal reflecting trough of special design which is mounted so that it may revolve on its longitudinal axis. In addition there is also a white painted metal shield as used with the indirect type. The row of lamps may be locked in position either below the stage floor and facing the auditorium (in which case totally indirect lighting is produced), or above the stage floor and facing the acting area producing direct light.

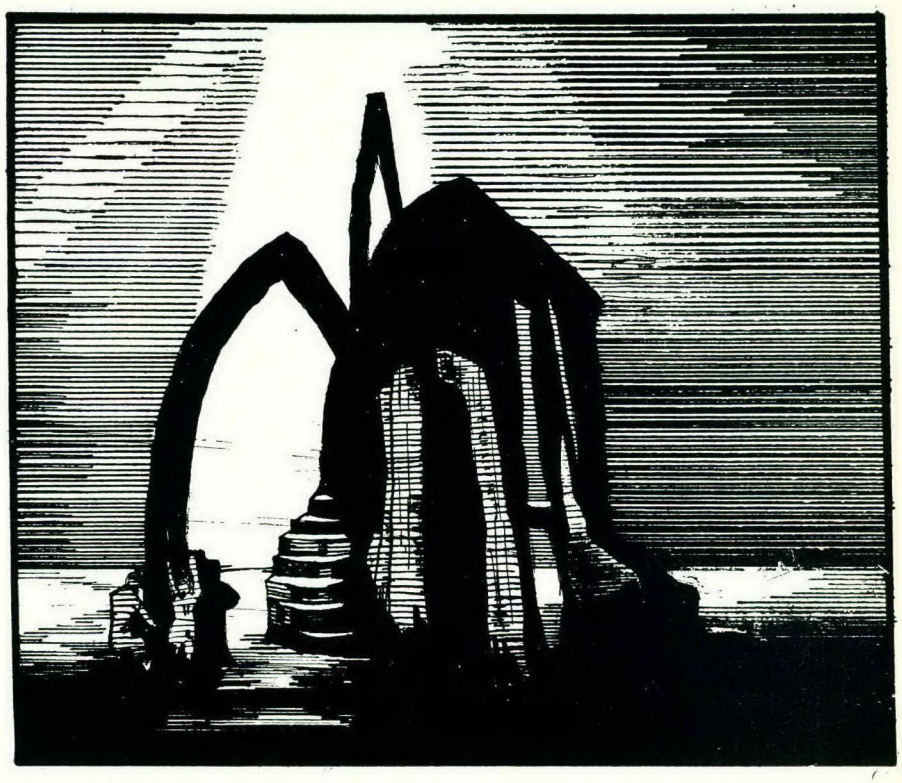
Footlights should never extend across the entire front of the stage but only to three or four feet within the proscenium opening. They should be so designed that no stray light is spilled on the frame surrounding the proscenium opening or auditorium ceiling. Trough footlights should be provided with baffles painted a dull black to minimise the side escape of light on the proscenium frame.

Borderlights.

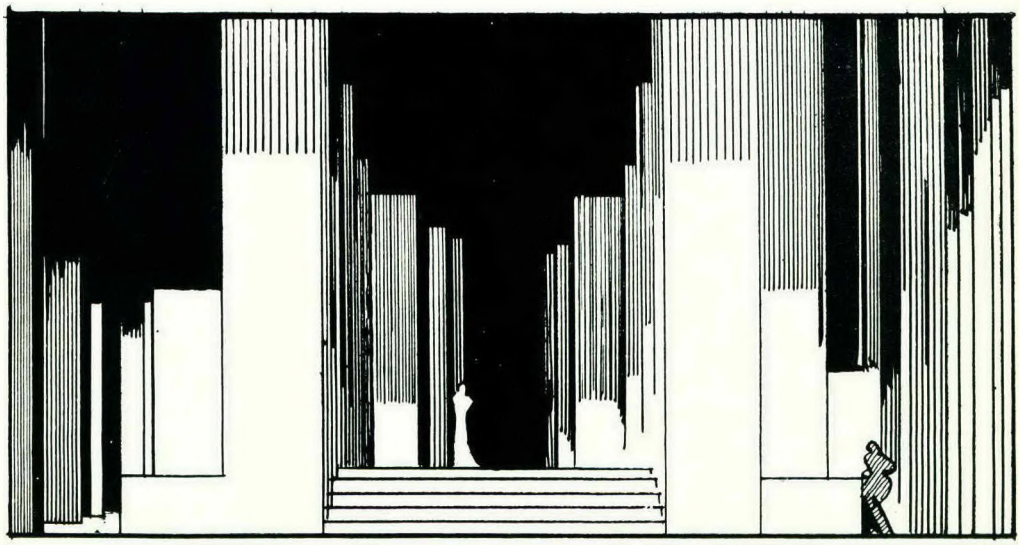
These are the companion equipment of footlights. They also provide a general illumination, but from above, and are virtually inverted footlights suspended from a gridiron at variable heights and parallel to the front of the stage. Construction is similar to footlights except with a difference in actual details owing to the inverted position and suspended mounting. They are also used in the open trough or compartment types. The lamps are invariably burned base up. The size and spacing in the open trough is the same as with footlights, but in the compartment type lamps ranging up to two hundred watts are used and spaced from six to twelve inches, depending on reflecting medium. The same types of reflecting media are used, and colour modification is similar and the same principles of ventilation prevail. Wiring is carried in channels directly above the lamps and is permanently connected in the splicing box to the mains from the switchboard. The borderlight cable is so designed as to allow for the lowering and raising of the lights and precautions taken to ensure efficient service.

For some productions borderlights are replaced by a number of spotlights or of olivettes or a combination of these from which the spotlights cradle was developed. An indirect borderlight is now commonly used. A series of individually controlled spotlights, directed downward toward the auditorium and permanently focussed upon a bowed circular disc coated with silver leaf, which provides a semi diffused reflection and, being bowed, shapes the reflected light into a strip about six times as long as it is wide. The position of the disc controls the direction, and the dimmer the intensity. Colour modification is obtained by coating the silver leaf with colour French varnish which reflects the light in colour.

The newer forms of borderlights are similar in design to the newer spotlights, but high wattage lamps are used because the light from



A Setting for Faust by Mielziner



A Unit Setting by Gordon Craig

overhead must be more intensified. In contrast to footlights the borderlights should extend beyond the limits of the stage area in a permanent installation. The number of sets of borderlights is placed directly in the back of the act curtain as closely as possible without fouling the curtain. For large stages it is customary to use one set of borderlights for every eight to twelve feet depth of stage. Always on each set of borderlights a space should be left to accommodate two hundred watt lamps with reflectors on a separate circuit for general utility purposes for construction and rehearsals or when the stage is being set or cleared. The borderlights should be protected from jarring by battens, drops and pieces of scenery when they are being raised to the fly loft.

Striplights.

These are the rows of lamps mounted in open troughs or compartments. They are usually portable and are useful for providing illumination in various places on the stage when a broad but not too powerful light is necessary. They are similar in design to footlights and borderlights.

Proscenium striplights are mounted vertially ranging in height from about eight feet to the full height of the proscenium opening. They are hinged so as to be adjustable in a horizontal plane behind the sides of the proscenium arch. These are the only striplights that are permanently installed, and they are being replaced by vertical banks of small spotlights or by banks of tormentor lens units, a form of soft edge spotlight each unit of which is operated individually for flooding or spotting certain areas.

Portable striplights, in various lengths, can be set on the floor between ground rows to illuminate them or before the cyclorama to supply tinting effects, or at the front edge of stage as temporary footlights, hung from battens or parts of the scenery ; they can light entrances, "wings," masking pieces, dioramic scenery or "transparencies" or suspended from battens they can act as temporary borderlights. They are hardly ever wired for more than two colours, so instead they are equipped with lamps of the required colour.

Footlights, borderlights and striplights supply a light that is general in character. Their light is diffusive, non-directional in planes parallel to and passing through their longitudinal axes. But in planes perpendicular to their longitudinal axes their light is predominantly directional. Hence the necessity of footlights from below and borderlights from above to counteract the vertical directionality of the light from each other.

The light from olivettes and spotlights, each of which forms a more compact source of light, is directional in all planes. Spotlights project a comparatively narrow beam of light which is highly directional. Olivettes project a wide beam or flood of light which is slightly more diffusive though still directional in nature. Thus olivettes and spotlights are exceptionally effective in expressing the plastic objects on the stage.

Olivettes.

Sometimes known as open box lights or floodlights. An open sheet iron box with a mogul socket for a high wattage lamp. The side walls converge to the back wall, the opening and the back being eighteen inches square and six inches by eighteen inches high respectively. The mogul socket is fixed at the top with a three hundred to two thousand watt lamp. The inside surfaces are painted with flat white diffusely reflecting paint which is resistant to the heat of the lamp. The modern type has a parabolic shaped reflector of spun aluminium in a sheet metal housing. The aluminium is protected from discolouration and oxidation by a coat of lacquer. This type reflects a greater proportion of the light from the lamp and provides a light that is much whiter in quality, as well as providing a better degree of diffusion. Colour modification is obtained by gelatine media usually in wooden frames covering the face of the floodlight.

There are several types of olivettes all of which are used extensively. A certain type has besides the mogul socket two medium sockets which are separately wired for effects where only a touch of light is required. The olivettes are usually mounted by means of a swivel joint which is adjustable on an adjust-

able extension standard with heavy pedestal. Banks of several olivettes mounted vertically on heavy pipe standards with bases are also available and principally used for side lighting of back drops and cycloramas and for other purposes where a large volume of light is necessary. The usual type of pedestal olivettes may be mounted on a pipe batten and the lights used singly or in groups to supplement or replace the usual borderlights. Dismounted from the pedestal olivettes may be placed on the floor to light the bottoms of back drops or cycloramas. These lights may be either subjected to switchboard control or have an enclosed switch and slide-wire dimmer on the extension standard for local control of intensity.

Bunchlights.

A square open faced sheet iron box painted white inside in which ten or twelve lights are mounted. This type of floodlight is very inefficient and cumbersome and is practically obsolete.

Spotlights.

Known as lens lamps. They employ scientific methods of light control to a greater extent than do any other lighting instruments previously mentioned. It was originally used for lighting a certain stage area to higher intensity which focussed the attention of the audience subconsciously.

The spotlight provides light that is highly directional and besides emphasising certain elements of the scenery is used to gain plastic effects and to create compositions in light, shade and shadow for aesthetic, symbolic or psychological purposes.

The term spotlight covers a very wide range of sizes and types and is usually applied to any equipment that utilises a condensing lens in combination with a concentrated light source and that projects a beam, rather than a flood of light. They vary in size from the tiny one hundred watt type used in footlights to the one hundred and fifty (carbon arc) elaborately equipped type used from the projection room of motion picture "supertheatres" weighing over four hundred pounds.

A spotlight consists principally of a concentrated light source and a lens, mounted in a sheet metal housing that restricts the escape of light to the opening occupied by the lens. The size of housing depends on the maximum size of the lamp and the maximum distance at which the lamp can be placed from the lens. The lamp socket is mounted on a plate that can slide back and forth on the bottom of the spotlight in the housing. This plate is held by a thumbscrew projecting through the bottom of the housing, the distance between the lamp and the lens thus being adjustable, and the spot of light produced can be adjusted from the outside while the spotlight is in operation. The lens is mounted permanently in the front end. An access door placed on the side or, in some cases, the back provides for lamp replacement and adjustment. The lamp is ventilated by staggered holes in double walls to prevent the escape of light, with a cowl running the length of the top for cooling.

In the better type a spherical mirror is mounted behind the lamp to utilise the greatest possible amount of the light. The position of this mirror in relation to the lamp must be fixed and is fixed on the same sliding plate as the lamp. With this mirror the spotlight beam is greatly strengthened. In order to prevent undesired reflection the entire inside surface of every housing as well as the socket and mirror mounting is painted a flat black.

The lens used is the plano-convex lens known as the "condenser" lens. The diameter depends on the size of the spotlight and its focal length depends on the range of spot sizes it has to produce. When spotlights are used for front lighting, or at some distance from the stage, they should be equipped with lenses of shorter focal length especially if small spots of light are required. Standard range spotlights can be adapted for long projection distances by the use of the extensive lens which increases the focal length of the permanent lens of the instrument. Gelatine colour media can be inserted in sheet metal frames in grooves above and below the opening before the lens.

Spotlights have two types of mounting, pedestal and suspension. Unless otherwise designated they have the same mounting as olivettes—adjustable swivel joints with adjustable extension standard with heavy circular cast iron pedestal. The suspension types are mounted on pipe battens or on a light bridge directly behind the teaser or on vertical pipe standards behind the tormentors. The control is the same as with floodlights—with enclosed switches, slide wire dimmers or direct switchboard control.

A comparatively recent development of great importance to stage lighting is "soft edge" spotlight. It has an internal sliding device which overcomes the hard sharp edge of the ordinary spotlight. This feature makes the spotlight ideal for localised illumination, as the edges of the spot fade out into darkness or blend into a low intensity of general illumination. In addition it can be dimmed uniformly over the entire lighted area without sharp shadows and without a dimmer by inserting an opaque screen in the colour frame grooves. The colour can be changed in a similar manner. This instrument can be converted into an ordinary spotlight by removing the sliding device.

The "tormentor lens unit" is similar to this, but used for short projection distances. It is provided with a yoke mounting and can be mounted on a vertical standard, used behind the tormentors at each side of the proscenium opening.

Sciopticons.

"Effect" machines which are used for simulating visual effects such as moving clouds, rain, snow or fire and flame effects. It is an adaptation of the spotlight consisting of four separate parts; a spotlight—usually large standard—a second condenser lens beside the one which is part of the spotlight, an effect head or effect casing, containing a painted or photographed transparent disc and the mechanism for revolving it, and the objective lens for magnifying and focussing the image of the painted disc and projecting it on the screen or back drop or cyclorama. The lamp of the spotlight should be focussed about two thirds of its traverse distance away from the lens for best results.

The second condenser lens serves to redirect the diverging light rays of the spotlight forming them into a narrowing beam of light. This lens is mounted in an aluminium holder which fits tightly with a thumbscrew to the colour frame grooves, a spring ring collar preventing the escape of stray light from between the spotlight and the lens holder. This lens holder is itself equipped with a set of grooves in which the effect head is fitted. (The lens, holder, ring collar and grooves form the effect holder). The function of the effect head, which varies considerably, is to pass through the beam of light from the second condensing lens at the proper speed and direction, a transparent slide or disc on which the design is painted or photographed. An adjustable speed clockwork mechanism controls the revolving of the disc or moving of slide. Where the motion must be rapid, the design is in a continuous form on the disc, which is usually made of mica, the undesired portion blacked out or opaqued photographically, and transparent colours are used. For effects such as flame or water a pressed glass plate of irregular surface is used. The plate or discs are contained in a sheet iron housing. The clockwork mechanism is in its own housing outside the plate casing. This casing is equipped with a holding plate fitting into the slide grooves of the effect holder, and fixed to the effect casing with a swivel joint which permits the moving of the effect image in any direction on the stage. Like the effect holder, the effect casing has a set of slide grooves to hold the condenser lens. The holding plate, swivel joint, effect casing, effect disc or slide, the clockwork mechanism and slide grooves form the "effect head."

For stationary effects the effect head is replaced by a slide carried holder, converting the sciopticon into a stereopticon or "magic lantern." The objective lens receives the image, magnifies it many times and projects it onto the screen, or back drop or cyclorama.

Effects may be projected from several positions. "Clouds" or rising moon, from the light bridge directly behind and above the proscenium opening onto the backdrop or cyclorama, or from behind on to a translucent drop. Some effects such as rain and snow from the balcony face or rear wall of audi-

torium on to a gauze drop that completely covers the proscenium opening ; others such as flames or flowing water from the front directly onto the stage setting itself. With several sciopticons in use the possibilities of effect are unlimited.

The Linnebach Lantern.

This "scene projector" is used to project a scene or design on the backdrop or cyclorama. It consists of a powerful concentrated light source, a large glass slide upon which is painted the design, and a suitable housing and mounting. The slide is placed before the light and the scene is placed before the light and the scene is projected greatly enlarged onto the desired surface. The design must be clear and sharp, because of the great magnification. No lenses are used in this instrument. The lamp used is the incandescent spotlight lamp of one thousand, one thousand five hundred or two thousand watts. With this lamp a spherical mirror is sometimes used to obtain best results.

The housing is simply a large sheet iron hood in the form of a truncated rectangular pyramid lying on its side. At the narrow end the lamp is mounted (with adequate ventilation) and in the front are grooves for the painted slide. The entire inside surface is painted a dead black to prevent blurring. It is mounted on a regular pedestal base with telescopic adjustment, with provision for adjustment of height and vertical and horizontal angular setting for directioning the light beam.

The contrast between a projected scene and the actors who appear before it is likely to be jarring. A special advantage of the lantern is its wide range of projection which permits its use for scenes as much as thirty feet wide at ten feet away from the drop on which it is projected. Usually a translucent drop is used, and the light projected from the rear. It may be used from the front but then shadows are likely to be cast by the actors.

To be concluded

PROFESSIONAL NOTES AND NEWS

In connection with the House for Mr. Harold Jeppe described and illustrated elsewhere in this issue the following information has been received : General contractors, J. C. Dunbar and Son (Pty.), Ltd. ; Plasterers, Plastering Industries (Pty.), Ltd. ; Electrical work, D. J. White ; Steel windows, Crittall-Hope Metal Windows (S.A.), Ltd. ; Cork floors, Linoleum House, Ltd. ; Roof tiles and general tiling, Douglas, Son and Pugh (Pty.), Ltd. ; Steel reinforcement, A. S. Joffe ; Plumbing and special fittings, F. A. Sharman (Pty.), Ltd. ; Door Furniture, Central Agencies and Import Co. (Pty.), Ltd. ; Flush pannelled walnut door, Plywoods, Ltd. ; Sanitary fittings and mosaic floors. W. R. Boustred, Ltd. ; Painting and Glazing, Herbert Evans & Co. ; Face bricks, The Brick and Potteries Co., Ltd. ; Electrical Hot Water System, A. E. Barker ; Staircase balustrade and wrot iron balconies, F. Gwilliam ; Malthoid roofing, Hunt, Leuchars and Hepburn, Ltd.

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The following have been registered as Members of the Transvaal Provincial Institute :— Miss M. S. Leitch ; Messrs. R. Bullock, D. M. Cowin, R. W. Green, A. R. Harris and W. Leers.

●

As from the 1st March, 1936, the firm of Stucke and Harrison will carry on practice at Ascog Buildings, Rissik Street, on the Second Floor. Their P.O. Box and Telephone Numbers remain unchanged.

●

Mr. W. R. Stewart has entered into partnership with his son Mr. Angus Stewart, B.Arch. (Rand), at 39, Human Street, Krugersdorp, and 505. Stuttafords Buildings, Johannesburg.

●

Mr. J. R. Burg has entered into partnership with Messrs. J. S. Burg Dip.Arch. (Rand), and C. S. Lodge, Dip.Arch. (Rand), and the firm is carrying on practices at 40/41, Koedoe Buildings, Pretorius Street, Pretoria, and 24, Evelyn Mansions, Third Street, Springs.

The following letter received from the Secretary of the Royal Institute is published for the information of Members :—

"The Annual Conference of British Architects will take place this year at Southhampton from June 24th to June 27th inclusive, when the Hampshire and Isle of Wight Architectural Association will be the hosts of the Conference.

The Conference will be largely of a social character and it is expected that many ladies will be present as the guests of members.

If any of your members happen to be in England at the time mentioned we should heartily welcome their presence at the various functions which will form part of the programme.

Copies of the Programme with full particulars and all the necessary information will be sent to any of your members who care to write to me on the subject."

●

The firm of Cowin, Powers and Ellis, is dissolved and Mr. E. M. Powers is practising at Durban with his son Mr. F. W. Powers as "Powers and Powers," and Mr. N. T. Cowin and Mr. T. G. Ellis are practising at Johannesburg and Pretoria together with Mr. J. N. Cowin and Mr. D. M. Cowin as "Cowin and Ellis."

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Mr. J. Corrigall has opened a practice at 31, Court Chambers, Second Street, Springs. Trade Catalogues and Journals will be appreciated.

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Annual Meeting.

The Annual General Meeting of Members of the Transvaal Provincial Institute will be held in the Council Chamber, Kelvin House, 100, Fox Street, Johannesburg, on Tuesday, the 10th March, commencing at 1.30 p.m.

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S.A. Academy.

The Seventeenth Annual Exhibition of pictures. etc., will be held in the Selborne Hall, Johannesburg, from Monday, the 23rd March, to Saturday, the 4th April, 1936, both dates inclusive.

Journal of the SA Architectural Institute

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