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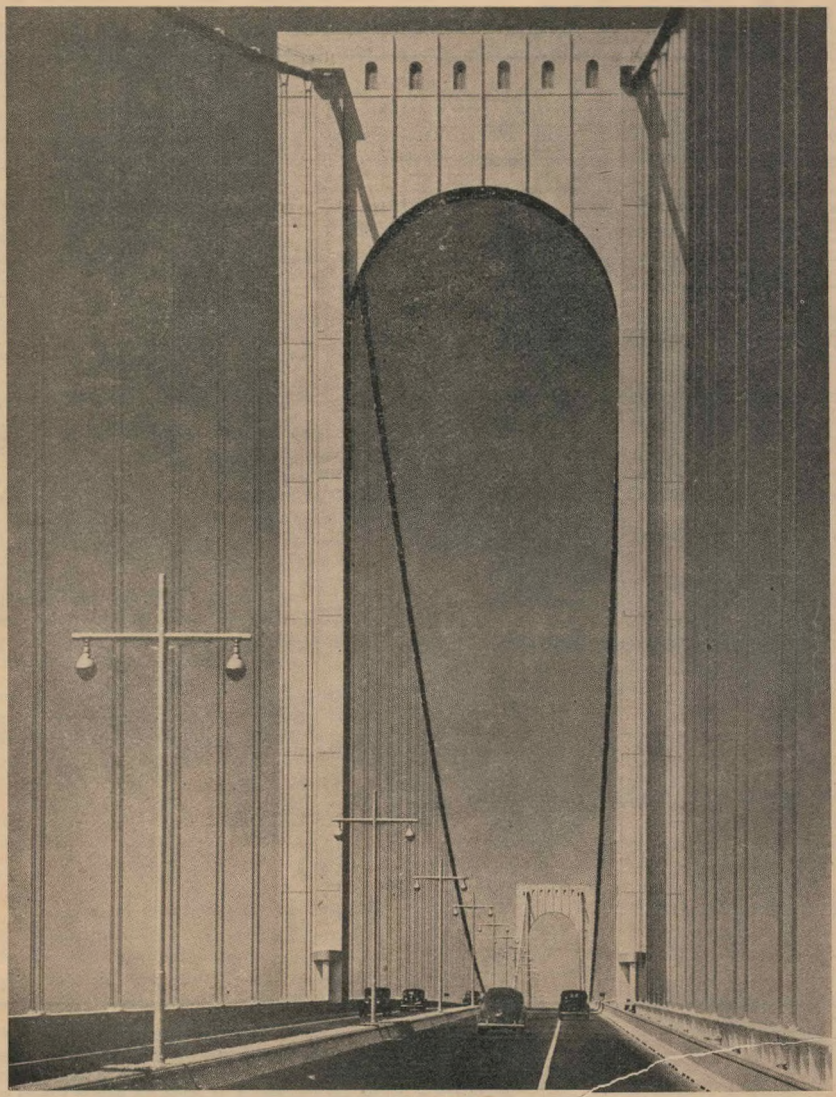
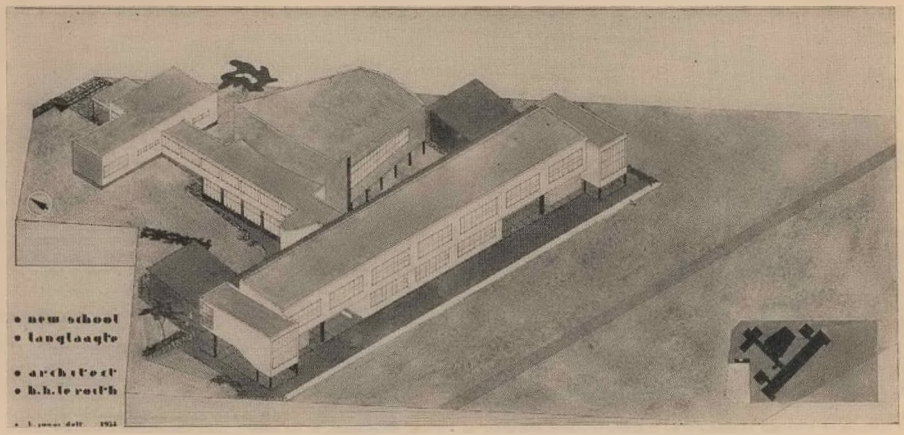


WHITESTONE BRIDGE, NEW YORK

"The architects' contribution as the engineers associate lies not in adding extraneous elements but in ordering and purifying the engineers' prose until it rises into song."



AFRIKAANS PRIMARY SCHOOL, LANGLAAGTE NORTH, JOHANNESBURG

Commentary by W. D. Howie, B.Arch.

Some years ago the Transvaal Provincial Administration adopted the commendable policy of giving out certain of its educational projects to private practitioners. The result of this policy is to be seen in the large number of recent school buildings that are characterised by a certain freshness and originality which contrasts considerably with the more conservative time-honoured character usually associated with the " government " school in this country.

In this respect the school illustrated here is no exception and it is in many ways reminiscent of the more recent developments and experiments in primary school design which took place in England and America prior to the present war.

The school serves a relatively new and expanding community situated near the industrial areas to the west of the city. This suburb is on sloping ground overlooking the broad flat expanse of the mining areas lying to the south, where the dark accents of headgear against the white dump mark the beginning of the " West Rand."

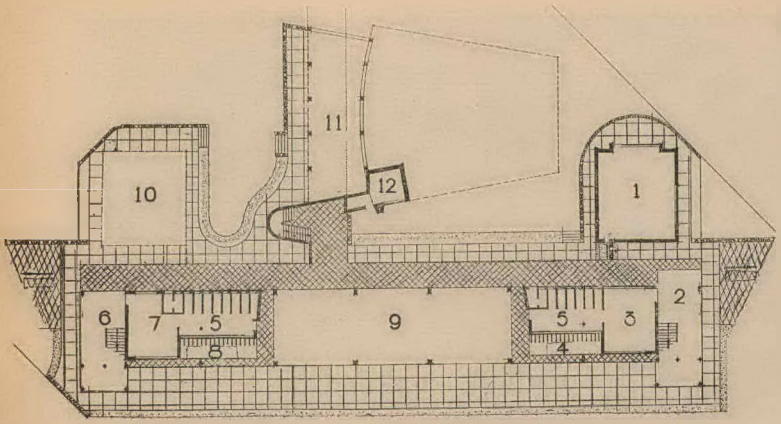
The school itself readily focusses one's attention as it is a dominating element centred in the midst of a large number of small houses, unrelieved as yet by the mellowing cloak of trees, and whose heterogeneous forms throw into strong relief the firm outlines of this white building.

The site is bounded by roads and slopes fairly rapidly towards the south, the contours running east-west diagonally across it. The plan was largely dictated by these factors, and, by means of a well-defined zoning, the architect has taken full advantage of the conformation of the ground.

The plan resolves itself into three major elements—the staff block, the assembly hall and the classroom wing. The staff block is situated on the high ground to the north of the site with the benefit of a northern aspect and providing a separate and direct access for the staff and visitors.

The assembly hall which is yet to be built, and the library which is to be built under the foyer of the assembly hall, will become the centre of the whole scheme, with the staff block conveniently located on the one side and the classroom wing on the other. The result is a well ordered system of circulation with an open articulation, well suited to the climate, giving a formal expression to the main elements of the scheme.

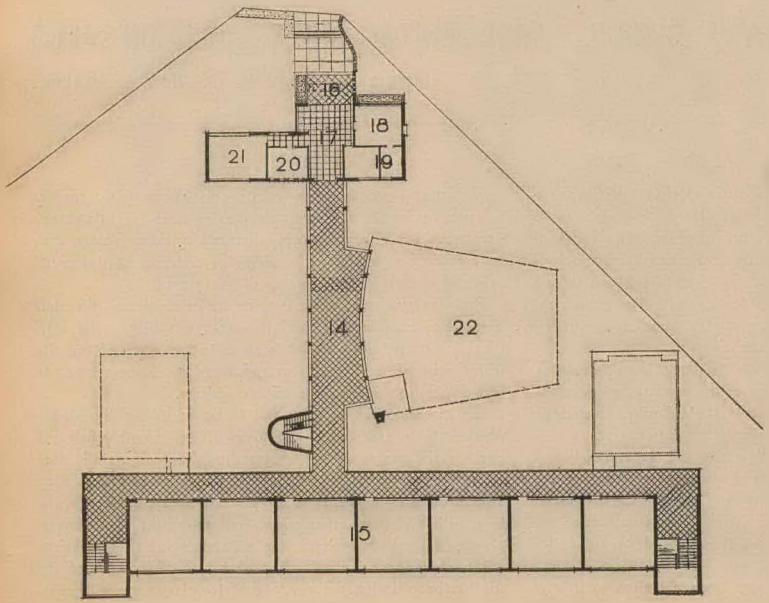
The classroom wing extending almost the full width of the site has been designed for a total of ten classrooms with coatrooms and lavatories for boys and girls, and with two ancillary kindergarten rooms for infants. For the present the coatrooms and lavatories, the seven upper classrooms and one kindergarten have been built. The neat arrangement of the



LOWER GROUND FLOOR PLAN

LEGEND.

1. KINDERGARTEN.
2. BOYS' ENTRANCE.
3. BOYS' COATROOM.
4. BOYS' BICYCLES.
5. LAVATORIES.
6. GIRLS' ENTRANCE.
7. GIRLS' COATROOM.
8. GIRLS' BICYCLES.
9. FUTURE CLASSROOMS.
10. FUTURE KINDERGARTEN.
11. FUTURE LIBRARY.
12. BOILER ROOM.



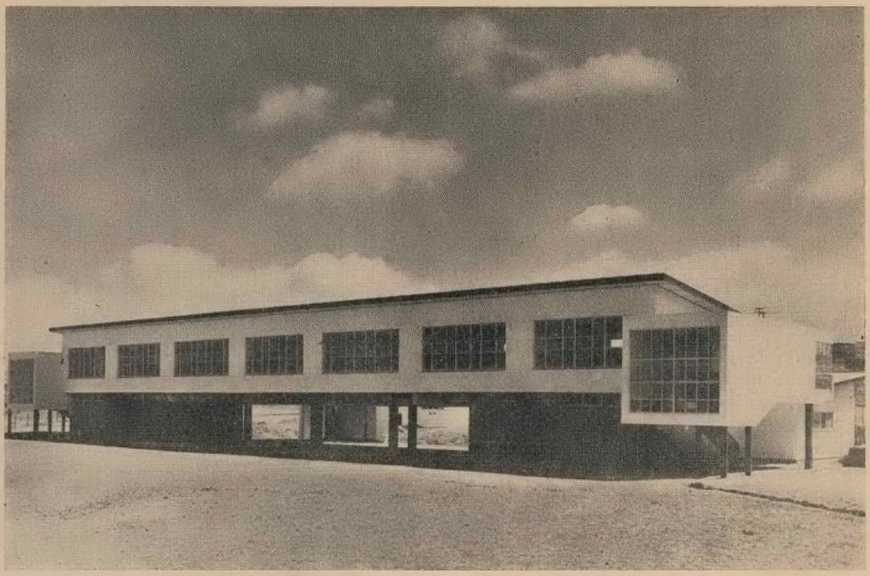
GROUND FLOOR PLAN

LEGEND.

14. FOYER.
15. CLASSROOMS.
16. ENTRANCE PORCH.
17. ENTRANCE HALL.
18. PRINCIPAL.
19. STOCK ROOMS.
20. SICK ROOM.
20. TEACHERS' ROOM.
22. FUTURE ASSEMBLY HALL.

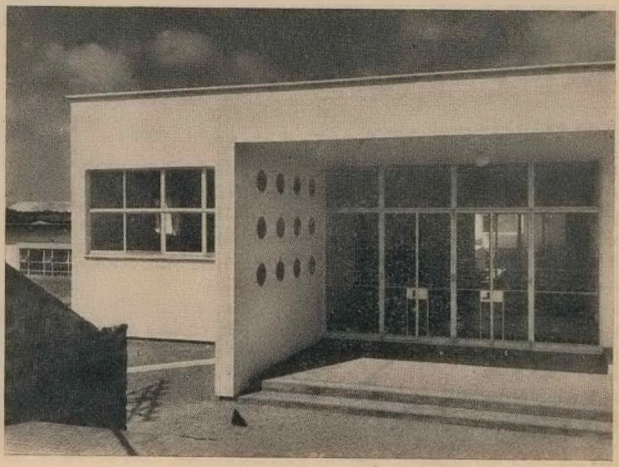
AFRIKAANS PRIMARY SCHOOL, LANGLAAGTE NORTH, JOHANNESBURG

ARCHITECT: H. H. Le ROITH, A.R.I.B.A.



CENTRAL VIEW OF THE CLASS ROOM WING

This shows the main staircases at either end, the generous classroom windows and the lean-to type asbestos roof. The walls and windows of this wing are finished in white, those of the coatrooms and lavatories are in blue, and the columns and facia are maroon. The Kindergarten room which is just visible is finished externally in ochre.



THE MAIN ENTRANCE

This wing houses the Principal's Office, Teachers' Common Room, Sick Room and Stock Rooms. The Principal's Office appears on the left. The walls are painted cream and the "portholes" are picked out in tangerine.

various elements in this wing permits of a separation of both the boys from the girls and the infants from the rest, without cross-circulations, for, when the children arrive they pass through the coatrooms before proceeding up their separate stairs, which like the corridors, are finished in non-slip alundum chippings, to the classrooms above, while at the same time the infants go direct to the kindergarten.

At the instance of the Provincial Administration the classrooms have been given a southern orientation thus precluding any possibility of direct sunlight entering them, and, incidentally, giving them fine views of the distant landscape to be seen over the neighbouring roof tops. The interiors are finished in soft green for the greater part of their height and are fitted with wallboards also coloured green.

The placing of the kindergarten on ground level obviates the dangerous necessity for infants having to negotiate steps and stairs, and its position permits of the required separation, while at the same time it is closely related to the lavatories. The dictates of economy obviously ruled out the inclusion of special coatroom and lavatory accommodation for the kindergarten, which, to-day, is recognised as an integral feature of the nursery school overseas.

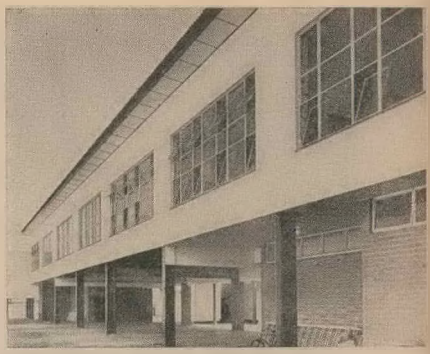
This room has the ideal northern aspect and is provided with individual lockers, storage cupboards and a sand pit, while a low wallboard runs the full length of one of the sides of the room. The interior decoration is for the most part pale green and ochre has been used on the wall externally.

The walls of the coatrooms and lavatories which appear as unplastered brickwork on the illustrations are interesting in that they are built of integrally coloured pressed bricks, in this case, deep blue, in place of the usual burnt bricks with their limited range of colours. This method of providing colour, which is available in a fair variety, should do much to obviate the difficulties normally associated with the maintenance of external surfaces where wash or paint has been used.

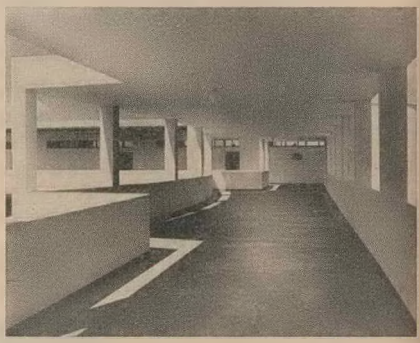
This blue, in conjunction with the maroon of the supporting columns and the facia-boarding and the ochre of the kindergarten, introduces a pleasing note of colour, which, set against the broad expanse of white, gives the elevations a bright and attractive appearance so desirable in such a building.

The general construction of the building is of reinforced concrete with external walls of cavity brickwork. The classroom wing and kindergarten have asbestos ceilings and corrugated asbestos roofs of the lean-to type. The whole building is equipped with central heating.

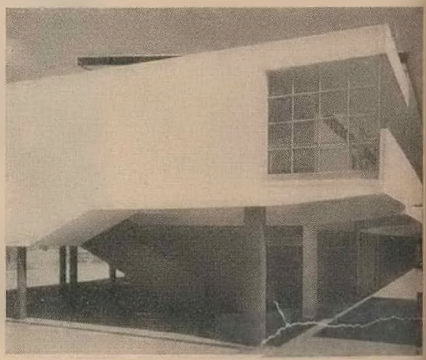
Although it is doubtful whether white walls which are so readily disfigured are the best finish for a building of this nature, yet this scheme with its pleasing character and its straightforward planning must rank as a valuable and interesting contribution to the immense problem of school planning and design, which is of such vital importance when considered in relation to this highly formative period of a child's development.



DETAILS OF THE CLASSROOM WING. Provision for three further classrooms has been made in the centre bays at the lower level.



DETAILS OF THE CORRIDOR. This view shows the outline of the future assembly hall. When this is built the corridor will be filled in with windows to become the Foyer.



DETAILS OF THE EAST STAIRCASE

ARCHITECTURE IN RELATION TO SCIENCE AND INDUSTRY

by G. E. Pearse

The Presidential Address of Professor G. E. Pearse, A.R.I.B.A., read at Kelvin House, Johannesburg, on 17th February, 1943, to the Association of Scientific and Technical Societies of South Africa, by whose kind permission the paper is published in this Journal.

One of the greatest problems facing us to-day is that of post-war reconstruction, and there is little doubt that the developing industrial era in South Africa will call for social changes and adjustments.

Industrial development is largely a technical matter, in that technical training, knowledge, and experience, are fundamentals of action, the machinery by which ideas and theories are put into practice.

In South Africa we have a certain inheritance of our own, and we have the precedents which overseas experience has established. The industrial epoch can be observed in its historical development in the larger western states of Europe —its blunders, errors, and drawbacks, as well as its civilising properties and its promise of fuller life for humanity.

It is possible now to see what is needed for raising the productivity of a nation, and what is needed to supplement, to give effect to, that urgent task.

In the first stage we need the planners to devise, correlate, and initiate, and in the second, the executive machinery to carry out the plans.

The war has thrown us on our mettle in both spheres, and it cannot be said that we have been unsuccessful in either. How is it, one may ask, that we have managed this transformation not only from a peace time economy to a war economy, but have also struck along entirely new paths of development?

It is not too much to say that our achievements to date are attributable to the Government's wisdom in calling in our leading technicians.

This in war-time! There are signs, moreover, that in the change back to a peace-time economy the technicians' work will once more be of vital significance.

The Social and Economic Planning Council is the planning head which is already functioning, and whose activities will no doubt be widely extended.

In this situation it is only natural that the technician, the engineer, the scientist, the architect, should revaluate and reassess his place and usefulness in a changing society. He will question not only his training and general qualifications, his relationship with developing industrial process, but also the inter-connection with the co-workers and collaborators drawn from other technical sciences.

It is a healthy sign that this inner examination be done. Decisive changes in the world's social and economic structure, or at least in our attitude towards our own institutions, are admitted to be necessary, and it is wise for the technician to establish his usefulness, indeed indispensability, in relation to these changes.

What an architect may say on this subject may perhaps apply with equal force to other professions and sciences. To cover the field adequately it is necessary to consider at least four aspects:

1. What Architecture means.
2. The Architect's training.
3. Architecture in relation to Science.
4. Architecture in relation to Industry.

1. WHAT ARCHITECTURE MEANS

Definitions of Architecture are themselves conditioned by the social framework and production methods of the historic periods in which they were conceived. The aesthetic of each period was developed according to the resources available to the architect; the resources determined the limits within which the creative faculties could be exercised.

These limits were always the natural resources of the land plus the technique evolved to develop and utilise these resources.

Thus we can trace the relationships subsisting not only between the architect and the natural and human resources of his age, but also the relationships between the architect and the other technicians who represented the extent of scientific experiment and theoretical research.

One of the earliest definitions of Architecture is laid down by Vitruvius, who published a treatise entitled "De Architectura" in the first century B.C., and whose manual became a standard work. He mentions that buildings "should be so carried out that account is taken of strength, utility, and grace."

Sir Francis Bacon, writing on building in 1625, says, "Houses are built to live in, and not to look on; therefore let use be preferred to uniformity; except where both may be had."

In his "Seven Lamps of Architecture," John Ruskin, writing in the nineteenth century, when architecture was at its lowest ebb, states, "Architecture is the art which so disposes and adorns the edifices raised by man for whatsoever uses, that the sight of them may contribute to his mental health, power, and pleasure," but in this work, he stresses adornment as being the first essential in architecture. For example he says, "Thus, I suppose, no one would call the laws architectural which determine the height of a breastwork or the position of a bastion. But if to the stone facing of that bastion be added an unnecessary feature as a cable moulding, that is architecture."

He qualifies the statement at the end of the book by saying, "The founding of all beautiful design on natural form was the principle I had during the arrangement of this volume most prominently in mind . . . . there is too much stress laid throughout the volume on probity in picturesque treatment, and not enough on probity in material construction."

In periods of great architectural achievement a high level of organisation in building method and procedure was frequently attained, and this is attributable to the close liaison which undoubtedly existed in the sphere of technics. There was often, in fact, no clear cut dividing line between architect, engineer, builder, inventor, and manufacturer. It is just this synthesis translated into contemporary terms, which is so necessary to-day.

The term architecture therefore has a very different meaning to-day. It is not merely the art and science of building, as defined in the Oxford dictionary, but the science of organising human environment. It embraces not only buildings, but whole towns, regions, and continents, and the life, activities, and needs of every human being in them.

"In building for the welfare of the common man," says the late Dr. Martienssen, "will be found the answer to the question, 'What is the characteristic architecture of our age?'"

2. THE ARCHITECT'S TRAINING

The architect, in common with other technicians, is striving to establish his proper place in an emerging society. His case is strong only if he can lay claim to qualities which conform in essence and degree to the basic requirements of an exacting age. His training, in the first instance, is open to the closest scrutiny.

There are, of course, many types of architects. Training will give a common starting point, from which personal attributes and preferences will indicate various directions for development. But it should be possible on the basis of training to integrate the totality of our architectural resources within the varied activities and demands of our national life.

This training must be of a specific nature. The trend of our age is towards the scientific use of available resources. This does not exclude a corresponding cultural and aesthetic development, but technique is almost decisive as a determinant.

The term architect, which means, literally, chief builder, is often misunderstood, and for this the architect is largely to blame. Until comparatively recently, he has been looked upon as a mere artist, an unnecessary expense in building, or an individual who is employed to add the frills to the structure.

This has been due to a large extent to his training as a draughtsman, with some knowledge of historical architecture, without understanding its significance, an elementary knowledge of construction, and with very little knowledge of the fundamentals of planning and science in relation to building.

To-day the position is very different, and since University facilities have existed for architectural training, a great advance has been made in the training of the architectural graduate. I should like to outline, very briefly, the training given to our graduates to-day.

Firstly, the basic subjects taken are Mathematics, Chemistry and Physics.

Secondly, the technical subjects, Building Construction and Building Materials, Theory of Structures, and Sanitation and Hygiene.

Courses are also given in the Electrical Illumination of Buildings, Acoustics, Quantity Surveying and Land Surveying, the latter being followed by a course in Regional and Town Planning, for which lectures on the sociological aspect are given.

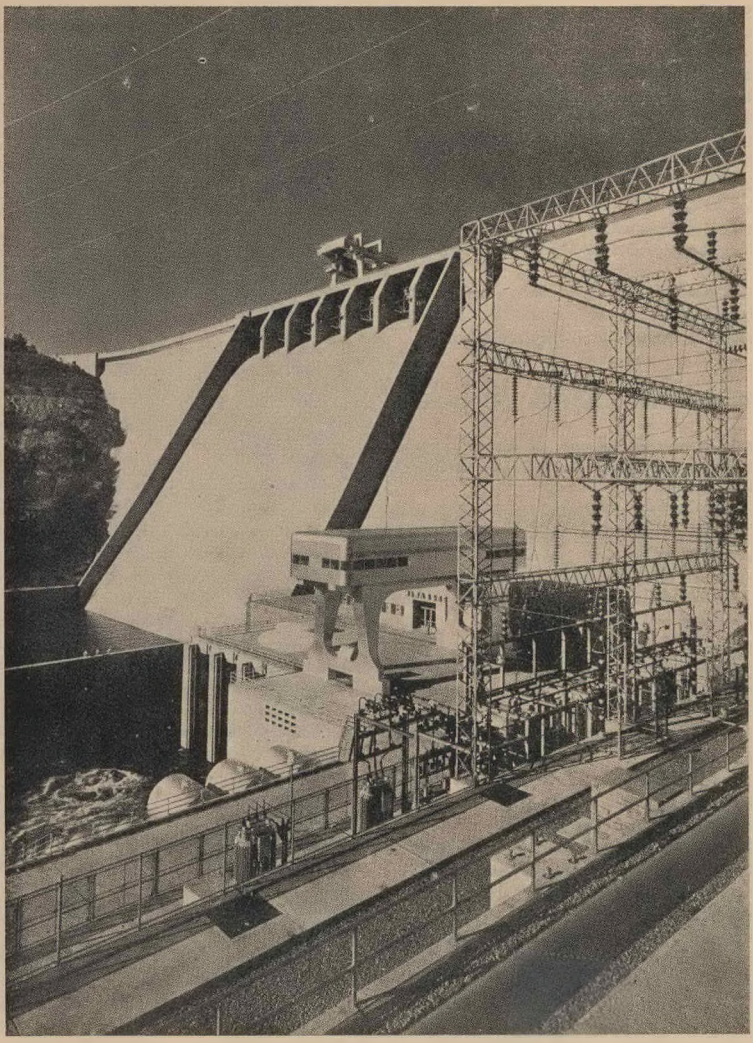
Thirdly, the professional subjects, the History of Architecture, Planning, and Design. The former includes an historical analysis of architecture, studied in terms of productive capacity and social structure, in order to appreciate fully why and how the buildings in each period were erected.

The legal side of an architect's work is dealt with in the study of the law relating to contracts, arbitration, and building by-laws, and the responsibilities and liabilities of the architect as agent of the employer.

Throughout the course, Planning, which calls for a great deal of imagination, one of the most essential attributes of a good architect, plays an important part, and to appreciate this an analysis of the functions of every type of building is considered. Planning is the all important function of the architect, and all the courses mentioned are directed towards equipping him for this end.

The innumerable and variable services to each type of building have to be considered in relation to the plan. Electricity, gas, steam, water supply and drainage, play an important part in the equipment of the modern building, and such subjects as air conditioning must be thoroughly understood. All this involves considerable research on the part of the student and calls for the greatest amount of ingenuity. The structure of the building, especially in these days of steel and reinforced concrete, influences the plan to a very great extent, and affects the sections.

The design or elevational treatment of the building, which some consider to be the first thought of the architect, comes last. This is governed by the plan and a thorough knowledge of building materials, their aesthetic values and durability, a



HIWASSEE DAM, TENNESSEE VALLEY AUTHORITY Photo: T.V.A.—Charles Krutch.

THEODORE B. PARKER, CHIEF ENGINEER.
ROLAND A. WANK, HEAD ARCHITECT.
HARRY D. TOUR, SENIOR ARCHITECT.

Hiwassee is the second of the two great storage dams which help to control floods and maintain water levels on the Tennessee River. This dam is indicative of the high standard of design that has been maintained in the work of the T.V.A. and in particular it shows the close attention that has been paid to the finish of the cranes, outdoor power unit and other details.

sound knowledge of scale and proportion, and not, as many think, by trappings of the past, each of which was developed logically, but applied, particularly in the nineteenth and early twentieth centuries, in a meaningless way.

To equip the student aesthetically, a close study of the arts of painting and sculpture, interior decoration and furniture, is required, the two latter being affected by the great advance in synthetic materials to-day.

To appreciate site planning, a knowledge of town planning and landscape design, and, in addition, a knowledge of indigenous and exotic trees and shrubs, which are part and parcel of the surroundings and setting for the building, are necessary.

These then are the essential requirements of an architect's training, and, as carried out at a University, are mainly designed to equip the student for practice and research.

3. ARCHITECTURE IN RELATION TO SCIENCE

The architect, to play his full part in modern economic development, needs a close and detailed knowelge of technique in many spheres.

He cannot, in the nature of things, become expert in all, but his basic training should be sufficient to permit of subsequent concentration on at least one related science. By bringing up the level of understanding and knowledge of architectural planning in the parallel scientific organisations, a working integration is envisaged.

What is needed is a common approach and particularly a method of approach: this may best be achieved on the firm basis of scientific investigation and scientific methods, the value of which architect and engineer will readily concede.

The term science hardly requires any definition, but, briefly, it means to investigate. In architecture it has much the same meaning as in civil engineering, for at one time the two professions were one and the same. In Europe they still are in many of the leading technical institutions.

The scientifically trained architect has been quick to master the forces released by science, and apply them in his work. Moreover, many of the most notable advances in materials, methods, and processes in construction in recent times, are due to his own experiments in workshop and laboratory, for example, the work done by Walter Gropius and his colleagues at Dessau, between 1920 and 1930.

This had a considerable influence on industrial development in Germany at that time, more particularly in the design of furniture, textiles and electrical equipment.

The great developments that have taken place in steel and reinforced concrete construction have revolutionised the planning of buildings of to-day. Much greater spans are possible, the use of the cantilever gives greater possibility in design, and in the planning of industrial buildings in particular, uninterrupted floor spaces are most essential. To appreciate this, laboratory experiments are therefore necessary, and the architect's training in this respect is developed as fully as possible.

The removal of heat, gases, and varying effluents from buildings, particularly scientific and industrial buildings is given more attention by the architect than heretofore and requires a sound knowledge of ventilation, drainage and sewage disposal.

In buildings such as cinemas, the question of eye-strain often caused by the angle of vision and the flutter of light, is being investigated by the modern architect.

The science of colour and the effects of colour on the eyesight in certain factories, workshops and laboratories, as well as in our everyday environment, is all-important and has to be given careful consideration.

The lighting of museums and art galleries to prevent reflection and the electrical illumination of buildings to counteract eye-strain are also essential in planning to-day.

Acoustics, since the introduction of the talkie film, has revolutionised the planning of auditoriums, theatres, and lecture rooms, which in the past were mainly designed for architectural effect. The scientific knowledge demanded from architects in this respect, makes it possible to produce new forms in planning and sectional treatment.

In addition to these applications of scientific knowledge to design there is the further question of the collaboration of scientists in the design of laboratories whether physical, chemical, medical, etc.

It is the architect's duty to keep abreast of modern scientific research more particularly in the planning and equipment of laboratories, and it is up to the scientist to employ only those men whose training and qualifications fit them for the purpose. The extraordinary development of hospital planning in the past twenty five years is a case in point. The planning and equipment of the wards and their services, of operating theatres, of X-ray and therapeutic rooms, have changed out of recognition and the graduate equipped with the latest knowledge of the subject, is better qualified to plan these buildings than the surgeon who uses them.

Planning, as I have said, is the foundation of an architect's training, and this does not concern merely the plan of a building but the planning of the site or sites upon which the buildings are to be erected.

It is therefore most essential that there should be closer collaboration between graduates in the professions of civil engineering, land surveying and architecture, in order that the best results may be obtained in the planning of our towns and cities.

In another branch of science, civil engineering, a lack of co-operation between architect and civil engineer has led to the unfortunate results which we see around us.

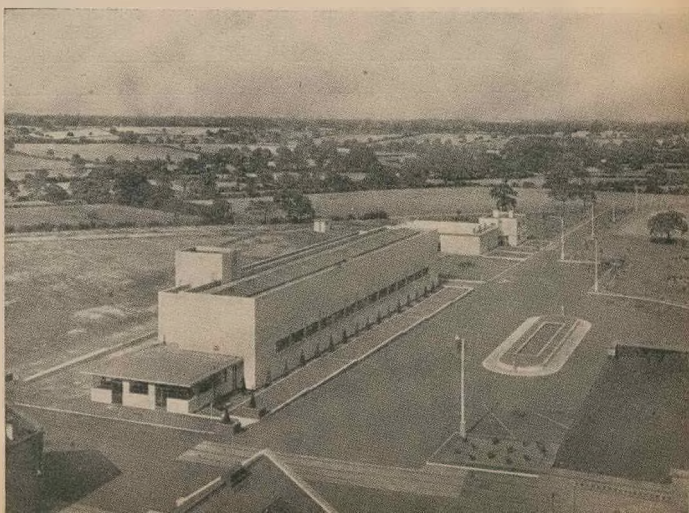
Take our railways, for example, and look first at our main railway stations. Is there one in this country to which one can point with pride when compared to those in many countries

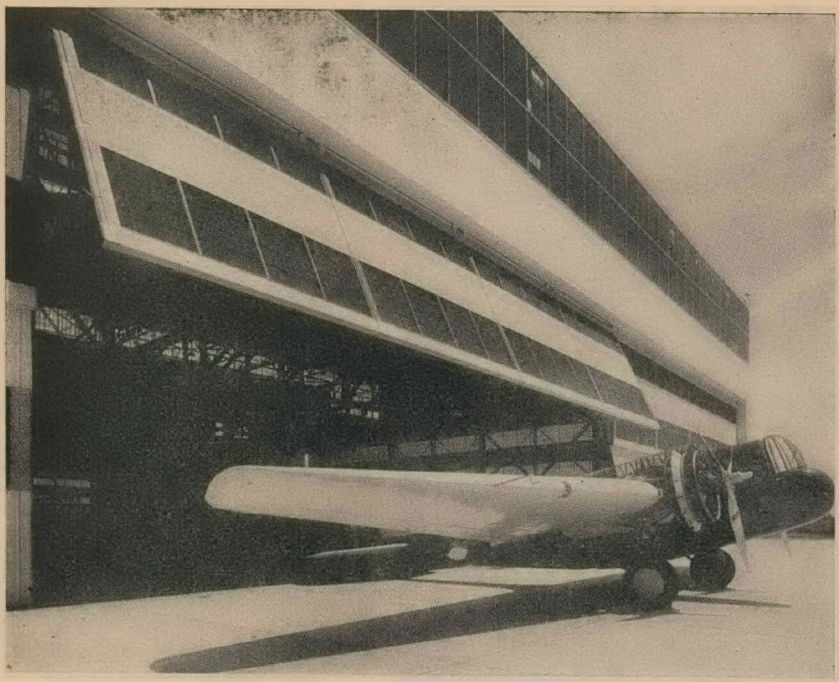
Typical Products of the Bauhaus which were adopted as models for mass-production by German manufacturers, and also influenced foreign industrial design (1922-1925). The illustration includes models of metal lamps; writing table in glass, metal and wood; china service; kitchen equipment; textiles; and first models for tubular steel furniture, designed by Marcel Breuer.

PITHEAD BATHS
COVENTRY

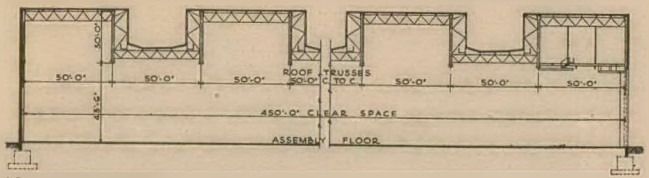
Architect: W. A. WOODLANDS.

The building houses pithead baths and canteen provided by the Miners' Welfare Fund, for the Coventry Colliery (Warwickshire Coal Company, Ltd.). It is situated in wooded and unspoilt countryside, where the amenities have been carefully preserved.





ASSEMBLY BUILDING, GLENN L. MARTIN CO., BALTIMORE, MARYLAND



LONGITUDINAL SECTION

ASSEMBLY BUILDING, GLENN L. MARTIN CO., BALTIMORE, MARYLAND

ALBERT KAHN INC., ARCHITECTS

The problem presented by this building was unique in that an uninterrupted floor space 300 x 450 feet was required, and the 300 feet trusses are the largest flat-span trusses used in a building. The doors are 294 feet wide and nearly 50 feet high, arranged to open in three sections separately or simultaneously. The reason for the great span of the building is Mr. Martin's belief that the future transoceanic flying boats, weighing 250,000 lbs., will have wing spaces of 300 feet, and be capable of carrying 150 passengers on 5,000 mile non-stop flights.

overseas? Only quite recently a responsible Cabinet Minister, himself an engineer, stated that the planning of a railway station, and in this connection he referred mainly to the offices, was essentially the work of a railway engineer, and that an architect might be employed to design the facade! This in the twentieth century. In America the great railway companies have employed architects in all their undertakings, and one need only refer to the Grand Central and Pennsylvania railway stations in New York, and the Union Station in Washington, to illusttrate this point.

In Europe, more recently, the remodelling of the great railway stations, and the building of new ones is taking place and in all these, without exception, the architect is being employed.

The rapid development in aviation has called for a new type of building and here new methods of building significant of the times are being carried out by architects. Even in shipbuilding, architects are being employed, as they were in the old days of sailing ships.

When we turn to the great dams for power and irrigation, being built in Europe and America to-day, we find the architect working in the closest collaboration with the civil engineer, a state of things unheard of in this country, unfortunately. These great national projects are landmarks in the countryside and are usually a centre of pilgrimage for visitors. This fact is not overlooked overseas and the results are as a rule very satisfactory.

It is obvious that the civil engineer in this country often feels this and introduces such innovations as a Roman triumphal arch or ornate decoration quite out of place and meaningless, as for example at Hartebeeste Poort and the Barrage at Vereeniging.

In bridge design we find that the architect has played a great part from ancient times to the present day. With the advent of the engineer and the use of steel and reinforced concrete, replacing brick and stone, larger spans were possible, and for a time a revolution took place in the design of bridges, many of which were disfigurements in the landscape. Of recent years a change has taken place, brought about by collaboration with the architect, and many fine structures are to be seen, notably in France, Switzerland, Scandinavia, and America. In this connection I should like to quote from the Presidential address delivered by Dr. Inglis before the Institution of Civil Engineers, in 1941.

In stressing the need of the Humanities in relation to Engineering education he says: "In addition to its cultural value the study of aesthetics in engineering design is particularly appropriate to present circumstances, with such a

GENERAL VIEW OF THE RAILWAY STATION IN FLORENCE

ARCHITECTS: "THE TUSCAN GROUP."

vast vista of reconstruction work looming ahead. In this particular direction education in the past has taken little or no interest. Students are taught to design structures which are reliable and economical, but it is very unlikely that they are given the faintest indication that in beauty of form and harmony with surroundings there are other problems to be solved of almost equal importance. When accused of indifference towards aesthetic considerations, engineers have been prone to take refuge behind the plausible but pernicious doctrine that if a structure is properly proportioned for the duties it has to perform it must be automatically pleasing to the eye. That doctrine is one of those half truths which can be very dangerous. For mingled with truth it contains an element of complacent self sufficiency which, if allowed to remain unchallenged, will inevitably debase the whole status of the Civil Engineering profession.

"Education will have performed a valuable service if it merely indicates to the rising generation of engineers that in their designs beauty of form as well as strength must be taken into account."

It is in large scale planning that science has its widest application and here the graduate architect must necessarily play the leading rôle. For he alone, among the various technicians whose services are required in planning, is qualified to direct this work. Against the broad background of his training he is best able to view the problems of planning in their entirety and proper perspective and by the discipline of his work, to integrate them and arrive at the most economical and effective solutions possible.

Before leaving this section of my paper I should like to quote from Dr. Waddington's book, "The Scientific Attitude." "The state of technical knowedge," he says, "and the balance of social forces, gives man his opportunity. It is up to him to make the best of it; and in this endeavour it is the writers and artists, the scientists and architects who act as scouting parties to explore the terrain in front of the main body of the advance.

"It is from present day culture that we can learn what sort of being modern man should be, and it is only when we know this that we can decide what political and economic system we must try and create. And if civilisation is to continue to advance, and if full use is to be made of the opportunities for a richer life which technical advances present, the scientist and technician must join with the artist and writer in thinking out what those possibilities are and bringing them to the notice of people in general . . . Of all the artists, it is perhaps the architects who have realised most fully both the scientific character of the point of view to which they have come, and the existence of an essentially poetic element in scientific thought. It is not difficult to see why; their field of activity is half scientific . . . The modern architect is presented with materials, . . . which enable him perfectly simply to roof far larger spans than any of his ancestors could do . . . and completely to abolish the problem of the larger window, by making, if he wishes, the whole wall of glass. No wonder he must become an applied scientist to discover just what are the potentialities of his new materials. Just as the architect's materials are new, so are many of his problems. Most of the large buildings which have been designed recently have been factories, hospitals, warehouses, etc., buildings whose uses are so definite that the architect must take them into consideration.

"He must know not only what will be done in the building, but how it will be done, and why, so that he can think out the most convenient form of building for that particular purpose. At every turn, the materials he handles and the purposes he handles them for, force the architect into contact with scientific knowledge and scientific ways of thinking . . .

"He emphasises the difference in attitude of the 18th century architect who would often make a lavatory as large as a bedroom for the sake of symmetry and place the kitchen along with the servants quarters and away from the dining room to express the cleavage between the upper and lower classes.

"It is not yet the generally accepted attitude; banks prefer looking respectable, disguised as Georgian houses, to experimenting to find the most convenient form, and the amount of convenience which a dweller in the new suburbs will sacrifice to look a little Tudor about the doorway or Moorish in the gables, is almost unbelievable . . .

"The man who has escaped from the mixture of rabbit warren and gin palace that we call a city, is a definite enough sort of person. It is for him that the modern architect works."

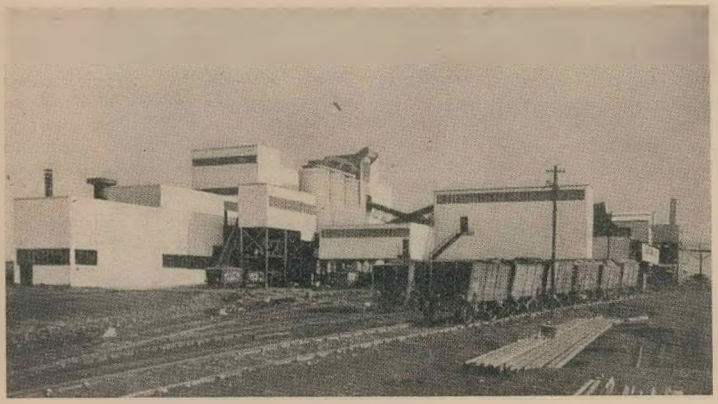
4. ARCHITECTURE IN RELATION TO INDUSTRY

I come now to the last section of my paper, namely, architecture in relation to Industry.

The historic lesson of environment, to use an embracing term, has been indicated previously. The environment which we partly inherit and partly create, determines the rôle of the architect in society. The architect has both a creative and interpretive function in the social framework. Our inheritance has deep roots, but a dominating factor to-day is the large scale industrialisation of the nineteenth and twentieth centuries.

The process has been a dynamic one, and we have not attained that state of momentary equilibrium during which the cultural arts achieved a deeply creative maturity as in the age of Pericles or during the Italian Renaissance.

The nineteenth century showed the elements of society in a state of flux, and industrial advance with the processes involved, is not reflected or expressed in architecture in other than crude terms. Towns and cities grew overnight with little or no control, land was purchased by speculators, and the speculative builder arrived on the scene. The result was chaos; the outcome, squalor, disease, and slums which spread over the countryside like a blight. The vast sums of money



CONSULTING ARCHITECT:
PROF. R. A. CORDINGLEY.

"Collaboration between engineer and architect has rarely been carried to so felicitous a conclusion as at the Rising Sun Colliery; future industrial building may well gain in seemliness and precision by following this notable precept."—J. R. Leathart in "The Architectural Review," April, 1936

COAL PREPARATION PLANT, RISING SUN COLLIERY, WALLSEND, ENGLAND

which are being spent to eradicate these evils to-day are staggering.

"The bankers, industrialists, and the mechanical inventors," says Lewis Mumford in his "Culture of Cities," "were responsible for most of what was good and almost all that was bad. In their own image they created a new type of city; that which Dickens in Hard Times, called Coketown. In a greater or lesser degree every city in the Western World was stamped with the characteristics of Coketown. The political base of this new type of urban aggregation rested on three main pillars; the abolition of the guilds and the creation of permanent insecurity for the working classes: the establishment of the open market for labour and the sale of goods: the maintenance of foreign dependencies as a source of raw materials necessary to the new industries, and as a ready market to absorb the surplus of mechanized industry. Its economic foundations were the exploitation of the coal mine, the vastly increased production of iron, and the use of a steady reliable—if highly inefficient—source of mechanical power: the steam engine . . .

"Perhaps the most gigantic fact in the whole urban transition was the displacement of population that took place over the whole planet. For this movement and resettlement was accompanied by another fact of colossal import: the astounding rise of population increase.

"In 1800 England had a population of a little over nine million, Germany some twenty-four million, France about twenty-seven million, and the United States not much over five million. By 1930 their population in round numbers had risen to respectively forty-five million, sixty-six million, forty-two million, and one hundred and twenty-three million.

"The increase in numbers was accompanied by a drawing of the surplus into cities, and an immense magnification of the bigger centres. . . . . Villages expanded into towns; towns became metropolises. . . . . Extraordinary changes of scale took place in the masses of buildings and the areas they covered: vast structures were erected almost overnight. Men built in haste, and had hardly time to repent of their mistakes, before they tore down their original structures and built again; just as heedlessly. . . . . It was a period of vast urban improvisation: makeshift piled upon makeshift . . ."

"A blight that had its origin in England's dark Satanic mills, as William Blake called them, laid its diseased fingers on the new cities and stultified the further development of the old ones. Here was a chance to build on a firm foundation and make a fresh start: such a chance as democracy had claimed for itself in political government. Almost everywhere that chance was fumbled. In an age of rapid technical progress the city, as a social unit, lay outside the circle of invention. Except for utilities such as gas mains, water pipes, and sanitary equipment, often belatedly introduced, often slipshod and inadequate, the industrial city could claim no important improvements over the seventeenth century town. Indeed the most wealthy and 'progressive' metropolises often denied themselves elementary necessities of life like light and air that even backward villages still possessed.

"Until 1838 neither Manchester nor Birmingham even functioned as incorporated boroughs: they were man heaps, machine warrens, not organs of human association . . .

"The two main elements in the new urban complex were the factory and the slum. By themselves they constituted what was called the town. . . . Such urban masses could and did expand a hundred times without acquiring more than a shadow of the institutions that characterize a city in the sociological sense . . . . that is, a place in which the social heritage is concentrated, and on which the possibilities of continuous social intercourse and interaction raise to a higher potential the activities of men . . . .

"The factory usually claimed the best sites: mainly in the cotton industry, the chemical industries, and the iron industries, the site near a waterfront: for large quantities of water were needed now in the processes of production, supplying the steam boilers, cooling hot surfaces, making the necessary chemical solutions and dyes. Above all, the river or canal had still another important function: it was the cheapest and most convenient dumping ground for all soluble and semi-soluble forms of waste. The transformation of the rivers into open sewers was a characteristic feat of the paleotechnic economy.

"This resulted in the poisoning of the aquatic life, the destruction of food, and the befouling of water so that it was unfit for bathing."

And what has happened in the older countries has been happening to a considerable extent in South Africa.

The war has once more brought home the necessity for a revaluation in social terms of our economic structure. When our planners have established the balance of forces needed for a stable society, architecture, in common with the other arts and sciences, will no doubt come into the second "Golden Age." In the meanwhile, however, architecture and architects must assume the creative rôle, which is, pre-eminently, planning in the broadest sense.

We have in South Africa a special case, for which close parallels cannot be found elsewhere.

Industrialisation here calls for measures in some respects different in essence and content from those propounded for other countries. This is certainly an acknowledged fact, and is being acted upon now.

The main point is that the road of industrialisation lies ahead, and, while admitting different pre-conditions, there is no necessity for us to repeat the errors made and make-shifts adopted haphazardly, in other countries, while they were undergoing the industrial transformation.

We can avoid these errors by utilising to the full our technical personnel, including architects, not forgetting though that it is necessary to educate and integrate in the initial stages.

To what extent then can the architect be employed in industry?

1. Site planning. For this the architect is more fully trained than any other professional man. It is his duty to study the site as a whole, its configuration, its services, whether rail, road, water, or electricity, its climatic conditions, the types of building required and their orientation. He can then plan the approaches and roads to the best advantage, bearing in mind the drainage, whether surface or underground, lay out the sites for the buildings, and visualise the finished product.

2. The factory lay out. To achieve the most satisfactory results the architect must make a close study of the processes involved in manufacture, whether the raw materials arrive by road, rail or water, whether they are heavy or light, and what power is used, and arrange the different plan elements to prevent cross circulation and provide an orderly sequence from the raw to the finished product. This naturally involves close collaboration between the architect and those connected with the working of the factory, but once the sequence of the work is fully understood, the architect is capable of preparing his preliminary lay-out. His knowledge of planning is of inestimable value to the industrialist in this respect.

3. The design of the buildings. With the architect the economic factors are given first consideration, particularly in the selection of materials and the position of the supports, to ensure that the working of the plant and machinery shall not be interfered with. The necessary services, water, gas, steam, electricity, and drainage to the various parts are all laid out in the first instance so that they shall be included in the planning scheme and not introduced as an afterthought.

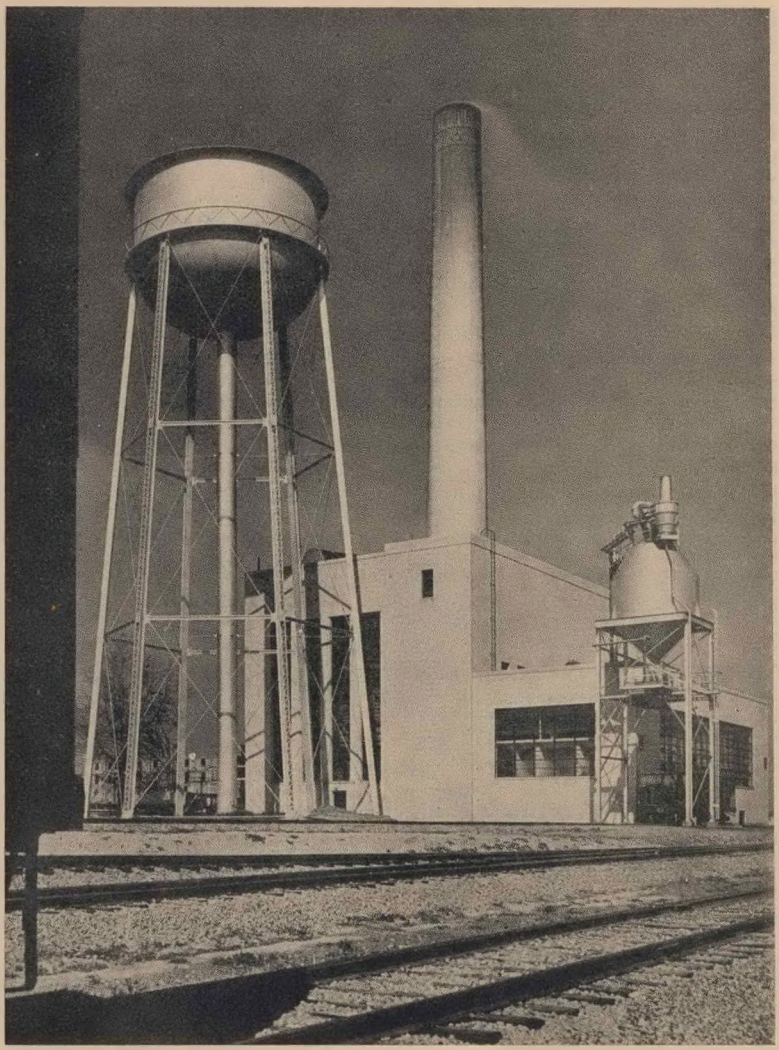
It is in this respect that many industrial schemes have proved a failure. Planning has been uneconomical and the desire to produce something ornate has led to disastrous results. What the architect has often been blamed for can be traced to an engineer's design.

Take for example a power station. Architecturally, a cooling tower, properly designed, is a thing of beauty, but the power house adjoining usually detracts from the clean lines of the towers. The lay-out of the plant itself calls for considerable ingenuity on the part of the designer working in collaboration with the engineer.

The fenestration which varies with the different types of industrial buidings, is arranged to produce the most efficient results, and finally the method of roofing depends on whether or not large spans are required.

These then are the main factors influencing the designs of the elevations which are then modelled to ensure a harmonious relationship between all the parts.

4. Housing and welfare buildings. Some consideration has been given to these questions by industrialists, but large sums of money have been wasted by consulting engineers in their attempts to plan. One need only quote mine housing in this country to illustrate what I mean.



POWER HOUSE, CHEVROLET MOTOR AND AXLE DIVISION, TONAWANDA, N.Y.

ARCHITECTS: ALBERT KAHN INC.

Many companies have sited their houses badly in the first instance with little or no regard to the prevailing wind, others have orientated the various rooms in such a way that the buildings are cheerless and depressing. I have had many opportunities of seeing these buildings, in fact have lived in them, and have frequently been asked to advise on how to make them more habitable. The architect in house planning is concerned first with the industrial parts of the plan, the kitchen, bathroom, etc., their siting and their services, the house in fact having been described as a machine to live in. The living rooms are the next concern and their furnishing and orientation even in the smallest cottage must be given the closest attention. The worker's wife is tied to her home far more than the official's wife, and every consideration should be given to the saving of labour in planning.

The argument that the mining industry is a waning industry and therefore such buildings are only of a temporary nature, may hold good, but the fact that many of these buildings are absorbed in townships after the mine has ceased to function, should make the engineer realise that a well planned, well constructed, small cottage is an asset and not a liability.

Such arguments can hardly be applied to more stablised industries and the housing schemes connected with these are disfigurements in the landscape in many instances.

Overseas, vast projects are under way by industrial companies to improve the living and working conditions and to provide clean, healthy, and efficient buildings for their employees.

Some reforms have been forced upon the industrialists by Acts of Parliament, such as rest rooms, pit head baths, clinics, social welfare, and recreation buildings, in all of which the architect has played an important part, and whose work in this respect is being more and more fully acknowledged.

5. The building industry. One aspect of the architect's work is the importance of the building industry in the change over to peace time production. It has a positive rôle in reconstruction and in the production of building materials and their use. The ramifications of the industry are immense. To initiate building materials production, though, yardsticks are needed, not only the unit of building, be it wall, roof, window, or door, but more important, the standards arising from a clear picture of objectives—in town planning, mass housing, and building types. The manufacturing process must be geared to given requirements. The architect here is the fulcrum.

Much more care should be exercised by our industrialists in this country if industry is to play the part that it should do in our national life. The aim of industrial expansion which South Africa is now undertaking must be to satisfy the needs of all her people and raise their standard of life to a higher level.

To achieve this aim, such expansion must take place according to a plan, for unless it is based upon a plan the economy of the country is such that industrial expansion cannot progress very far.

This plan must be comprehensive, national in scope, and the scientifically trained architect has a vital contribution to make in its preparation and execution.

The main task of industry is to equip South Africa with towns and countrysides which will provide a better life for all her people. The organisation and building of the towns and the countrysides—the environment of the South African people—must be directed by the architect who is especially trained for this work.

Unless he is used to his fullest capacity in the shaping and building of South Africa, now and in the future, the environment necessary to a clean, healthy, productive life for all her people, and indeed that life itself, will not and cannot be realised. The choice before us is Architecture or Chaos.

I SHOULD LIKE TO EXPRESS MY APPRECIATION OF THE ASSISTANCE RENDERED BY SOME OF MY YOUNGER PROFESSIONAL COLLEAGUES ON THE PREPARATION OF THIS PAPER.—G.E.P.

ACKNOWLEDGMENTS FOR ILLUSTRATIONS.

FRONTISPIECE, Whitestone Bridge, from " ARCHITECTURAL RECORD," New York, March, 1941: page 53, Hiwassee Dam, T.V.A., from " THE ARCHITECTURAL FORUM," New York, September, 1941: page 55, Products of the Bauhaus, from " THE NEW ARCHITECTURE AND THE BAUHAUS," by Walter Gropius, published by Faber and Faber, Ltd., London: Pithead Baths, from " THE ARCHITECTS' JOURNAL," June 25th, 1936: page 56, Assembly Building, Glen L. Martin Co., and page 61, Power House, Chevrolet Motor and Axle Division, from " INDUSTRIAL ARCHITECTURE OF ALBERT KAHN INC.," by George Nelson, published by Architectural Book Publishing Company Inc., New York: page 57, Florence Railway Station, from "L'ARCHITECTURE D'AUJOURD 'HUI," August, 1936: page 59, Coal Preparation Plant, from " THE ARCHITECTURAL REVIEW," April, 1936.

THE TASK OF POST-WAR ARCHITECTS

by S. A. Abromowitch

Since the war started, architects have indulged, to excess perhaps, in talk of the amount of work that will have to be done when the war is over. In some cases this talk has even been backed up by a little thought.

Somehow, when speculating on the post-war period, the architect seems only to visualize a rosy future wherein there will be enough work for all architects. In other words the average architect foresees in the future a change from the normal pre-war state of things.

Not only architects, however, but almost everybody foresees, or tries to foresee vast social changes. How exactly these are to come about or what is to happen they are not very sure. It is true that the war has yet to be won, but nevertheless the time for hazy, nebulous ideas is passed—especially for the right minded architect.

The time has come when architects must cast aside the cloak of moth-eaten conservatism, cast aside the hindering bonds of tradition and prejudice to grapple with their problems the right way. Everybody, as I have written before, hopes for a better world, but this better world cannot develop if, as in South Africa, out of a population of eight millions three and half millions live in slum conditions. No! a better world can only come about through better living conditions and better homes.

Better homes in the broadest sense of the words should be the focal point in the work of all architects worthy of the name. Unto this end, all the resources, scientific and aesthetic, of the modern building technique must be employed. Decadent and tragically conservative planning councils must go, to be replaced by men imbued with modern ideas and capable of bearing the load of rehousing humanity; especially South African humanity. The architect should work hand in glove with the medical man, and more important still, the sociologist, who should guide and advise the architect when dealing with health and social problems.

When actual rebuilding in built up areas of a city is being undertaken, it should be remembered that if the formation of slums is to be avoided, the construction of large blocks of flats is the one and only solution. If single cottages are to be built, they must be well designed and placed in grounds which should not be less than 10,000 square feet in area. This, of course, will lead to an unjustifiable increase in the size of the city, and a disproportionate increase in costs of essential social utilities.

I know some people are bound to disagree, thereby unearthing that age old controversy, popularly known as flat versus house. Time and time again in articles, in debates, in speeches, the greatest men of contemporary architecture have decided the question in favour of flats—flats not as we know them, thanks to speculators—but flats conceived on an entirely different basis. Yet because of that terrible disease, the inconsiderate lust for private gain, horrible apartment buildings have spread their ugly masses like a cancer, across the faces of our large cities. I stress again that which has been stressed by men greater than I can ever hope to be; that in rebuilding of congested areas only the efficiently designed flat block can solve the sinister housing problem facing the architects of to-day.

In many cases the planning councils hope to abolish slums and rehouse their inhabitants in so-called sub-economic dwellings. The general idea is that, to do away with slum conditions and slum dwellings, a new structure of four walls, subdivided and crowned with a roof must be built. This so-called future home is placed on a ridiculously small plot of 75 feet by 50 feet thereby only succeeding in renewing the slum conditions. Tradition and conservatism seems to dictate age old, out-of-date cottage dwellings should be erected on congested sites of large cities. These ideas must be abandoned as the ideas of serfdom were abandoned some six hundred years ago.

Instead of the obsolete, single unit dwelling, we must rehouse the population of congested areas in great blocks of flats in park-land—if they are to be rehoused in healthy, happy conditions. A comparatively small number of tall flat blocks, rising up to the blue sky, to light and air, spaced well apart, properly served with communications, away from arterial roads is the obvious solution.

It is the duty of the architect to see the population of South Africa satisfactorily rehoused.

Housing schemes should be planned with all the resources of modern architecture and town planning. It is the duty of the architect to break down the conservatism, lack of imagination and prejudice that animates the ideas of local housing authorities. Better understanding of human needs and desires should govern projects of the future and only with this better understanding can we achieve a better world.

A COMMENTARY BY A FIRST YEAR STUDENT OF ARCHITECTURE

● TO ALL MEMBERS OF THE INSTITUTE AND CHAPTER.

An open invitation is extended to all members of the Institute and Chapter to attend the opening session of the Central Council's 1943 Annual Meeting, which is to be held at Kelvin House, Johannesburg, on the morning of Tuesday, 13th April, from 10 a.m., to 11.30 a.m. The Press has been invited to be present.

ASSISTANCE TO EX-VOLUNTEERS IN CONNECTION WITH UNIVERSITY STUDIES.

The following scheme has been approved in connection with the assistance to be granted to volunteers who wish to proceed to Universities on discharge from military service:

1. Regional Committees, consisting of not more than three members, will be set up by the Universities' Advisory Committee to the Civil Re-employment Board and will be selected from the personnel of the University institutions in the area for which the Committee is designated. The functions of the Committees will be to decide :

(a) In the case of non-matriculated students, whether an applicant's qualifications and past scholastic record justify his admission as a student ; and

(b) In the case of every applicant for assistance, whether non-matriculated, a matriculated new entrant or a student desiring to resume a broken course, whether his qualifications and past record justify the grant of State assistance.

2. An Awarding Committee consisting of three members representative of the Universities' Advisory Committee, the Department of Union Education and the Civil Re-employment Board, will be constituted for the purpose of deciding what assistance by way of grant and loan (within the maxima authorised) may be given to an applicant.

3. Applications for assistance should be addressed to the Secretary for Education.

4. The latter will supply the applicant with questionnaires for completion, viz., an "academic" questionnaire and a "financial" questionnaire. In each the applicant will state in order of preference the three University institutions at which he or she desires to attend.

5. On receipt of the completed questionnaires, the Secretary for Education will send the "academic" one to the Regional Committee for the area in which is situated the University institution to which the applicant has given first preference. The "financial" questionnaire will simultaneously be sent to the Awarding Committee. The two Committees mentioned will report their decisions directly to the Secretary for Education.

6. Thereafter the application will be sent by the Department of Education to the University institutions in order of preference indicating the decisions of the Committees.

7. On receipt of advice from an institution that it is prepared to accept an applicant as a student, the Secretary for Education will advise the applicant accordingly and inform him of the grant and loan that will be made available to him.

8. The continuance of any grant and loan beyond the conclusion of the first academic year will depend on a satisfactory report from the University institution concerned.

9. The maxima for grants and loans has been fixed at £50 per annum for grants and £150 per annum for loans.

10. Loans will be repayable over a period of 15 years commencing two years after the completion of the course at the University institution and will be free of interest.

11. Universities which are not entitled to subsidies on the £1 for £1 basis in respect of fees received from ex-volunteers, will receive special grants to meet extra expenditure in connection with additional accommodation and equipment if and when such additions are rendered necessary by the influx of ex-volunteer students.

RECORD OF EVIDENCE GIVEN BY INSTITUTE-AND-CHAPTER BEFORE "COST-PLUS" INQUIRY COMMITTEE.

The executive Committee of the Central Council is now in a position to make available, for the use of Members of the Institute and Chapter, a copy of the Record of Evidence given by the Institute-and-Chapter before the "Cost-plus" Inquiry Committee.

Any Member wishing to peruse this Record may borrow it on application to the Registrar, 85, Walter Wise Building, Joubert Street, Johannesburg.

(A resume of this evidence will be published in the following issue of the Journal.)