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CONTENTS FOR MAY 1950

E D I T O R
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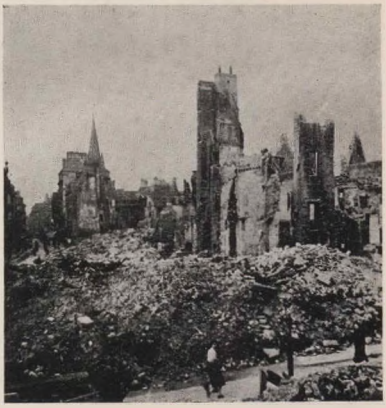
5

LE HAVRE.

DESTRUCTION

SARREGUEMINES



CAEN

RECONSTRUCTION IN FRANCE AFTER THE FIRST WORLD WAR

By H. Seymour Howard, Architect

INTRODUCTION.

As a result of German military invasion in 1940, of Nazi pillaging of French industry and the deporting of French labour during the Petain regime, and finally of the violent battles of liberation from within and without, France was in a very sick condition at the beginning of 1945. All of her raw material stocks had been seized; industrial production was at 20% of 1939; 75% of the harbour facilities were destroyed; rail and road transportation routes and equipment were ruined; 620,000 people had been killed and 5,000,000 rendered homeless; 445,000 buildings were destroyed and another 1,555,000 damaged.

These statistics give some measure of the problem which the French people faced and still face. This survey of reconstruction can discuss only a small part of the problem—the part directly concerning housing, city planning and architectural construction. The answers to two questions will be looked for :

1. What are the chief architectural characteristics of reconstruction in France?
2. What general conclusions can be drawn which are of value to an architect?

1. ARCHITECTURAL CHARACTERISTICS.

Building is one aspect of the total productive activity of a society, involving the need for shelter, the materials and skills available, and the feelings, imaginations and purposes of the classes and people constituting that society. The multiple interactions of these aspects make any analysis incomplete, though its broad features can be clearly seen in their correct relationship.

The *immediacy* of the need for shelter—for some five million people, for industries, for transportation centres and governmental agencies, for barns and silos—has been continuously the most important consideration. At the same time that architects have been drawing up new, large-scale plans for towns and cities or schemes for prefabricated units, they have had to co-operate in the design of temporary houses for homeless families and dormitories for workers brought to a construction site without housing facilities. Dreams of industrialized construction methods and modern factory produced materials have had to find their realization in traditional hand workmanship and local quarries and clay pits. The hopes (of some) for socialism and common ownership of land, with the advantages for city planning they would bring, have made no headway against the status quo of private enterprise and private land ownership.

A. BACKGROUND AND NEEDS.

Quantitatively the problem of reconstruction after the war is shown in the following tables :

DESTRUCTION

	Totally destroyed	Partially destroyed	Totals
Dwellings	256,000	1,003,300	1,259,300
Farm. bldgs.	140,700	393,000	533,700
Industrial, commercial & workshops	42,700	118,000	160,700
Public buildings	5,200	41,100	46,300
Totals	444,600	1,555,400	2,000,000

CLEAN-UP

(a) 13,000,000 mines and shells to be removed from the ground.

(b) 300,000,000 cubic yards of rubble to be removed; 340,000,000 cubic yards of fill required to level bomb holes, shell craters, etc.

TEMPORARY CONSTRUCTION

132,000,000 sq.ft. of temporary construction required, about half of which for dwellings. At the same time every effort was made to make damaged buildings watertight. The least damaged were, of course, the first to be repaired.

NEW CONSTRUCTION

This requires more elaboration. The initial programme called for 19,000 dwelling units to be built by the State. The remainder are to be built directly by those who lost their homes or property (either individually or, more usually, in associations) and by nationalized industries such as the railroads and mines.

BROAD PROGRAMME (dwelling units only):

Immediate need: ("Acute" housing shortage)	Large scale repairs	300,000
	Rehousing homeless	200,000
	Slum elimination	250,000
	Elimination of overcrowding	450,000
		1,200,000

Long-term-need:	Replacing temporary	
("Chronic" housing shortage)	housing	100,000
	Elimination substandard	3,250,000
	Replacing buildings to be destroyed in city-planning operations and for reserve	450,000
		3,800,000
Grand total		5,000,000

To this total must be added at least 100,000 new dwelling units each year in order to renew the buildings which grow too old (figured on the basis of a total of 13 million units and an average life of 130 years!)

The severity of this problem cannot be overestimated in view of the poor condition of the building industry even before the Second World War and its dislocations. During the 20 years from 1919 to 1939, barely 1,500,000 dwelling units were constructed. At the present time 45% of the dwelling units in France are over 100 years old.

The government failed during the period between the two wars to build in any significant quantity. At the same time rents were held down by legislation so that only a few luxury apartments could be built with any hope of profit. In 1914 money spent for housing constituted about 16% of a worker's budget; this dropped to 5% in 1924, 7% in 1934, 4% in 1944 and about 2% in 1946! Such a policy by itself does not aid the worker. It merely means that he can be paid less and still live. The State thus legislates in favor of the industrialist at the expense of the landlord. At the beginning of 1949 rents are to be raised by about one-third; this will, of course, require an increase in wages and will still be far from assuring any investment in dwelling construction. The dilemma will remain—for French politics to resolve, or for the shortage to continue.

At the present rate of construction, in spite of the creation of a certain quantity of new dwellings to replace those destroyed in the war, the housing situation in France will continue to grow worse. People will live in buildings whose average age will continue to increase. The chronic housing shortage—the gap between the quality of the housing provided and the quality which the building industry and architectural science *could* provide—will be continuously aggravated.

B. ARCHITECTS AND CLIENTS

What has been the role of the architect in reconstruction? His position has been very similar to that of the U.S. architect in the time of the New Deal. Private firms have continued to do the designs, while the government (through the Ministère de la Reconstruction et de l'Urbanisme) has limited its scope to the establishment of standards and the approval of plans. The architect's client is usually a group of people whose homes or property were destroyed, though he may be a single individual.

Compensation to private persons for destroyed property is paid by the state. Damage up to two million francs (1946 value) is repaid in full; beyond that amount only 70%. By virtue of this principle the homeowner or landlord is able to rebuild his own property as he sees fit and to hire an architect of his choice. In the case of very severely damaged cities, such as Amiens, Orleans, le Havre, the state undertook the initial reconstruction, acting directly as client with the architects. The homeless are to be rehoused in state-owned apartments and compensation worked out in proportion to the new accommodations furnished. In most cases where large areas have been destroyed, however, the individuals concerned have formed an association to represent them as clients in hiring an architect and rebuilding the entire section of the town. This has enabled principles of large scale planning and construction to be followed.

Central control in reconstruction has been achieved largely through the building permit (required since 1902 and reinforced in 1945). For new construction costing less than one million francs, no permit is required; for a cost of between one and five million, the permit can be granted by the department concerned; for more than five million, the permission of the Ministry of Reconstruction and City Planning is required. This is one way in which materials have been conserved (in principle) for the areas most in need, and the labour time of building trades workers used most effectively.

C. PLANNING

In regard to the planning of new dwellings, minimum standards have been generally followed. All dwellings are provided, for example, with inside w.c. and a bathroom with a shower, bathtub or combination unit. The lack of electric refrigerators requires a separate, well-ventilated storage space outside of the kitchen. Within the limitations of the structural systems available, effort has been made to provide adequate fenestration and to diminish the depth and increase the width of row houses and apartments. Although perhaps not of great theoretical interest, these standards in their realizations represent an enormous advance over the majority of existing conditions. (For example, 84% of the apartments in Paris have no bathtub).

The possibilities for city-planning are of more interest than the individual dwellings themselves. The destruction of large areas of many cities has accelerated the realization of new plans. By the City Planning Act of 1919 (revised principally in 1924, 1943 and 1945), all towns or communes of over 10,000 inhabitants, all communes with buildings destroyed in the war, all classed as bath or health

resorts are required to have a master plan, and any commune of picturesque, historical or artistic importance may have such a plan. Since France has a centralized government, this law is applicable to the entire country. However, lack of funds prevented any large scale enforcement. Under the present law all costs are borne by the state instead of by the locality concerned. Considerable progress has been made, at least for the communes destroyed during the war. Of these there are some 1,850, including large cities such as le Havre, Rouen, Caen, Brest, Lorient, Saint-Nazaire, Nantes, Strassbourg, Mulhouse, Marseille and Toulon.

The basic property rights established under Roman law are still maintained. These assure the complete freedom of the landowner to do what he likes with his property and also the equal division of the land among heirs. This system of inheritance has meant in practice the division of land into an incredible multitude of long, narrow strips, tending toward the minimum on which it is possible to build or to cultivate.

As far as possible the limitations caused by this constant division of the land have been obviated in the new plans for the destroyed towns. The land has been replanned without regard to the old lots. In some cases the former owners are given new plots of similar area of more reasonable shape; in other cases the land remains the property of the town or of the local association of those whose buildings were destroyed.

The redivision of land and the reassignment of property are, as can be imagined, of enormous difficulty because of the private interests involved. Architects and city planners have had to help settle disputes between competing businesses and jealousies among householders.

In regard to the basic problem of city planning—the control of the land—France is almost as far from a solution as the United States. City planning does not exist apart from the productive and social life of the country as a whole. Although France has in the Monnet Plan the beginnings of a plan for the re-establishment and development of the national economy, this plan has never been translated into terms of geography or population. In other words, a small start has been made toward social and economic planning, but none toward physical planning on a national scale.

As a result the city planners can only guess at the probable growth and change to be expected in the life of a given city, and their master plans can be easily disrupted by the future. In the case of destroyed towns, they can, however, provide an improved arrangement for the functions already existing.

Who are the city planners? The Ministry of Reconstruction and City Planning, faced with the problem of finding many trained planners where few existed, has come to this conclusion:

> "As a general rule, it is the *architect* who has the background and the training necessary for a sense of composition and an understanding in three dimensions of a projected plan."

D. MATERIALS AND TECHNIQUES

What have been some of the technical aspects of reconstruction?

All technical and construction difficulties arise from this fact: The greatest need for new building came at the moment of maximum impoverishment in materials, in trained workers and in organization of the building industry.

During the period between the first and second world wars new construction was at a very low level—perhaps an average of 75,000 new dwellings per year. And the developments themselves were small in size. The single dwelling or apartment house was the unit, not the project. Over 200,000 construction firms existed, with a total of 650,000 to 700,000 workers. The small scale of the work undertaken naturally led to no extensive use of machinery on the job, nor to the need for an exact scheduling of the workers' time and material deliveries.

Similarly, the Building materials industries were not highly developed, nor was there a market for a large number of building trades workers.

On top of this general lack of materials, men and organization came the destructions of the war and the pillaging of stockpiles. It is altogether natural, therefore, to find the architects and builders in France since the war obliged to use local materials wherever possible, to make the maximum use of all facilities. On the national level it was necessary to start training schools for all building trades, and to build construction camps to house workers brought to destroyed areas. Mobile camps were set up by the National Railways.

Reconstruction of dwellings was forced to wait on the partial restoration of roads, bridges, mines and factories. But at the same time work had to be started—the partially damaged dwellings made watertight, temporary buildings erected. Local materials, often produced in the same way as in the 18th century, had to be used—brick, stone, wood, plaster, tiles. Steel and concrete were necessary for the larger apartment houses, which have on this account been often delayed. Metals such as copper, zinc, lead, have been difficult to obtain. Plumbing fixtures and piping have had to be installed later.

An interesting example of the type of difficulty encountered is the cement industry. Although in general cement factories are spread favourably throughout France, the northwest section is notably lacking. Unfortunately this is one of the worst damaged areas (Brest, Lorient, St. Nazaire, etc.). Cement has to be transported. The lack of paper bags, which have to be imported from Scandinavia, makes transportation difficult, because finished cement in the holds

of ships or in railway bins is in constant danger of attracting water. Attempts are now being made to transport cement made from the waste products of the iron foundries and steel mills in clinker form and to establish new factories in the northwest to grind the cement near where it is to be used. (However, this requires the importation of machinery for the new factories—a delay of three years!)

This type of cement is being used as much as possible because of the much smaller quantity of coal required for its production (between 100 and 200 lbs. of coal per ton of cement against 600 lbs. of coal for ordinary Portland cement.) At the same time other metallurgical cements have been developed, using the clinkers from blast furnaces. One of these has a strength of 7000 lbs./sq.in. at 28 days.

The lack of coal not only affects cement production but also that of brick and all types of clay products. The return of the Ruhr to the Germans plus the abandonment of reparations from the Germans to the French will not help this situation.

Hand in hand with coal goes steel. Here again ingenuity has been used to overcome shortages. Prestressed reinforced concrete is used in the fabrication of elements such as concrete joists, as well as in important engineering structures such as bridges. Freyssinet was one of the originators of this system. Many methods have been developed to stress the steel (and the concrete.) High tensile steels are being used to reduce the tonnage of steel required structurally.

At the same time that some advances are being made in the use of the modern materials, steel and concrete, a considerable effort is under way to modernize the production of the older, conventional materials. Freestone is found throughout France and a masonry tradition was the backbone of French construction. However, prouction of stone had diminished greatly (from 1,500,000 tons in 1895 to 250,000 tons in 1934.) Today mechanical methods of quarrying, handling and sawing are being introduced. This will reduce the load on the coal supply, since only 15 kwh. of energy are required per ton of stone. In order to achieve maximum economy standard block sizes are being agreed on.

Plaster, also traditional in French construction, is being modernized in production and use. The first plasterboard factory has just been opened. One of the houses in the experimental village of Noisy-le-Sec is surfaced entirely with plaster, including all of the doors!

In addition to improved production methods, the establishment of standard dimensions and standard units is being encouraged. In 1942 a module of 10cm. (approx. 4 inch) was adopted by various professional societies, but its general use in industry and building has not yet been achieved. Stone is to be cut to standard block sizes; windows and subframes are being produced to standard sizes in wood, steel and concrete. These standards can easily be set up by the architect in charge for single projects; the establishment of nationwide standards comes much more slowly. Factory production of various elements—windows, doors, panels, bathroom-kitchen blocks—is one aspect of the industrialization of building. The other is the mechanization of the construction work itself—cranes, mechanical shovels, ditch-diggers, etc.

The possibility of constructing projects of several hundred units at one time has permitted a greater rationalization and mechanization of the job. Scheduling is being adopted more widely than before the war. However, shortages and administrative red tape often destroy the schedules completely.

As far as structural systems are concerned, both bearing wall and frame construction have been employed. Walls of rammed earth or of lean mixtures of cement and large stones, poured and vibrated between removable forms, are used in an effort to build where brick or stone are not available. The latter materials, however, are much more usually used in bearing walls. Prefabricated panel bearing walls are being tried, of concrete or asbestos cement.

For frame construction, reinforced concrete is the most usual material. In some cases the framework is poured first and the skin placed afterward; in others the panel walls are erected with spaces for the columns, and then the columns are poured, using the panels as part of the formwork.

E. AESTHETICS

The designs of the new buildings reflect the influences of the available materials and techniques, of local traditions, prejudices and preferences, and of the varied training of the architects responsible. All types can be found, with houses and apartments of conventional appearance predominating. The standards are improved, however, and the methods of construction, which remain old-fashioned, force in general the continuation of old forms.

Many architects, however, have managed to bring a fresh approach to the use of old materials and techniques. . . for example Creutzwald, Maubeuge, Tergnier. Others have deliberately tried to copy the old buildings traditional in the locality, as at Sigolsheim. Others have continued in the reinforced concrete frame tradition of apartment house construction of the past 30 years, as at Amiens and le Havre. There is also the multi-storey apartment house in Marseille, designed by le Corbusier with Bodiansky as engineer, which is totally new.

In the replanning of cities and towns the exigencies of economy and the need for a rapid re-establishment of normal life have encouraged the maintenance of old road-beds and the maximum re-use of existing facilities and foundations. In general, buildings of architectural or historical interest have been preserved where possible and their

settings enhanced. Space is provided around a cathedral, for example, so that it stands free from the jumble of houses and shops which formerly surrounded it.

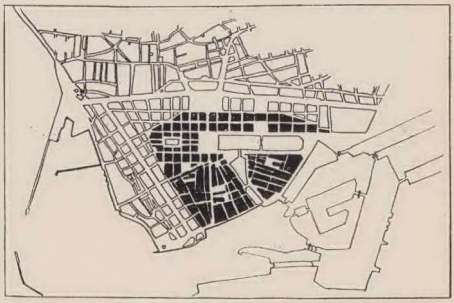
Spaciousness, moderate scale and rational separation of industrial, commercial and residential areas will be the chief characteristics of the best of the new towns.

F. SOME EXAMPLES

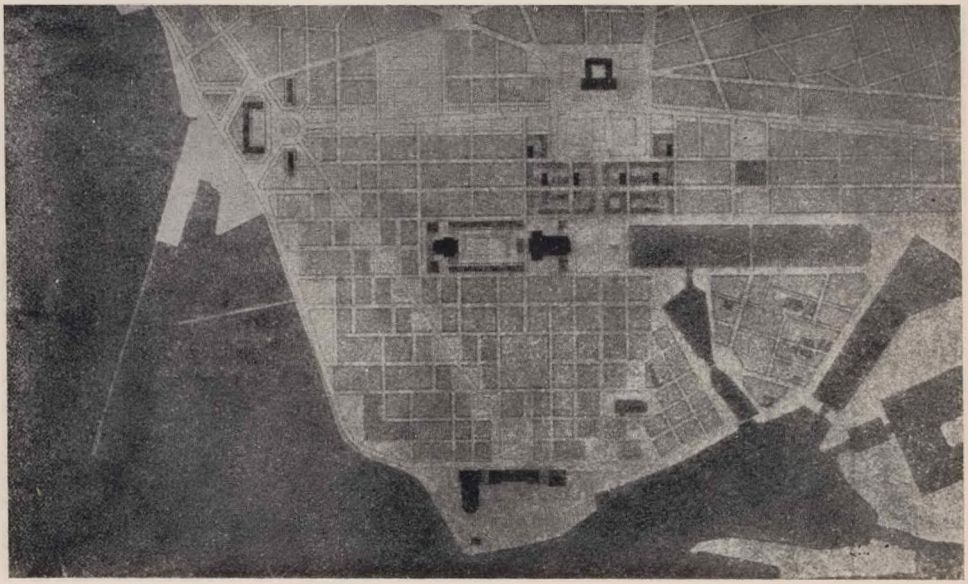
1. *Le Havre.*

Destroyed in the invasion of northern France in 1944, le Havre was initially replanned by Auguste Perret, whose composition for the harbour front has much in common with the formalism of the great Renaissance palaces, though conceived in terms of the reinforced concrete systems which Perret has personally developed. The lack of trees and green spaces gives his scheme a bare and forbidding character which is out of keeping with the generally accepted principles of modern planning.

The final plan for the redevelopment of le Havre has not yet been finished. The task of designing it was ultimately given to M. Marrast. It is likely, however, that if financial conditions permit, some of the features of Perret's harbour front design will be kept.



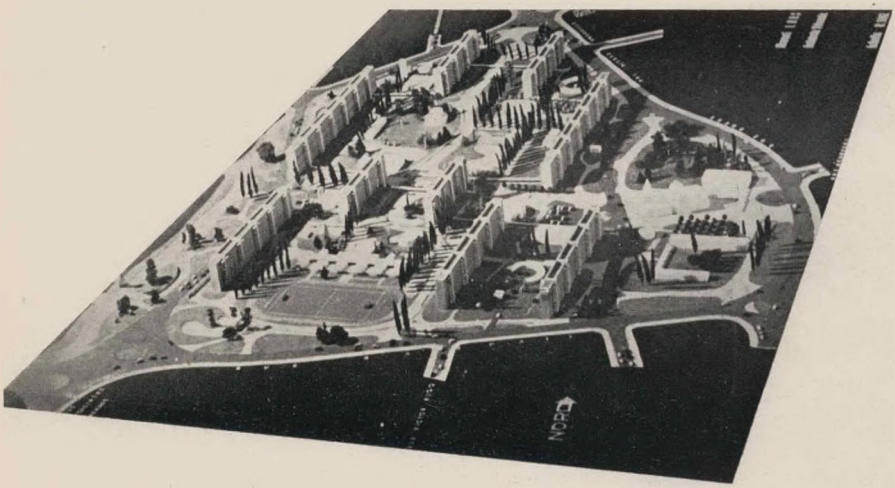
ABOVE: PLAN OF LE HAVRE IN 1939. In black is shown the old town within the ancient fortifications. *BELOW*. STUDY FOP THE RECONSTRUCTION OF LE HAVRE *by Auguste Perret, Chief Architect.*



THE FUTURE SEA FRONT OF LE HAVRE, *by Auguste Perret.*

2. *Sotteville-les-Rouen*

Another casualty of the second front, Rouen was, however, less damaged than le Havre. In his plans for rebuilding the destroyed sections of the town, M. Marcel Lods based his analysis strongly on the English neighbourhood unit theory, envisaging super-blocks containing several well-designed 10 storey buildings together with accessory schools, stores and community centres. Because of difficulties in getting the local population to accept this plan, it seems probable that very little of it will be built. Sotteville-les-Rouen will join le Havre, St. Dié, St. Nozaire-Nantes in the company of excellent theoretical studies which failed for one reason or another to get the popular support necessary for realization.



MODEL OF A TYPICAL NEIGHBOURHOOD UNIT, SOTTEVILLE-LES, — ROUEN.

3. *Orléans*

An industrial and transportation center, Orléans was twice damaged. At first the centre of the town, a bridge-head across the Loire, was destroyed in the initial invasion by the Germans in 1940. And then later, in 1944, the railway yards and surrounding dwellings in the northern part of the city were destroyed by allied bombing raids.

The main feature of the new plan, developed by M. Jean Royer, is the removal of the railway station from the centre to the edge of the city, and its transformation from a terminal to a through station. A new layout has been made for the centre of the city and much of this actually realized in a series of apartment houses which were among the first to be built in France since the war. Two other residential sections, one still urban and one much more suburban in character are also envisaged.

RIGHT: THE NEW QUARTER WITH THE THROUGH STATION.
BELOW: PORTION OF ORLEANS, SHOWING THE NEW PLAN.

4. Maubeuge

Apart from the technical aspect of the new plan of Maubeuge, which is sufficiently explained by the annotated plan and photos, the most interesting phase of this development is the manner in which the architect and his team worked together with the local population. When he was appointed chief city-planner at the end of January, 1945, M. Lurcat started by asking for the formation of a City-Planning Committee, representative of the entire population. This was done. The mayor was president of a 14-man committee, consisting of himself, two representatives from the local businessmen, two from those who had lost their homes, three from labour organizations, one from the factory-owners, one from the local engineers and architects, one from the town government, one from the teachers, one from the doctors and one from the local sports clubs.

LOOKING NORTH-WEST FROM THE CENTRAL BRIDGE.

MAUBEUGE
The dark blacks represent new construction.

EXAMPLES OF BUILDINGS BEING ERECTED IN MAUBEUGE IN ACCORDANCE WITH THE RECONSTRUCTION PLAN.

The members of this committee, by working back through the organizations and groups which they represented, were able to draw up very quickly a programme of needs which the city planner could use as a guide to the development of a realistic master plan. At the same time, with the help of the committee, the city planner established a priority schedule, putting off until the future those parts of the programme which were less essential or too expensive.

Working alone with the committee was not enough. In order to gain a wider acceptance and understanding of his plan by the whole population and in order to deepen his own understanding of their problems, M. Lurcat encouraged individual citizens to visit him and to present their private points of view. The local and regional press interviewed him and his staff regularly and gave the plan widespread publicity. And finally a mass meeting was organized in April, at which M. Lurcat explained his plans and the reasons behind them. Many questions were asked and answered and a close bond established between the people of Maubeuge and the city planner. This meeting was so successful that others were held periodically.

By July the master plan was completed. Because of its acceptance by the local committee, the municipal council felt justified in approving it and sending it to the higher authorities. By November it was approved by the Ministry of Reconstruction and City Planning, and work could go ahead as fast as material scarcities and other difficulties permitted.

5. St. Denis

An important industrial suburb to the north of Paris, St. Denis is in great need of housing, although not seriously damaged by the war. Its old, worn-out houses are greatly overcrowded and in such ill-repair that the collapse of buildings is not uncommon. It is an example of the type of new building which is going on in a small way to replace old slums. Two new projects are under construction, which will, together with the rehabilitation and remodeling of an existing structure, provide about 750 new apartments.

The same standard sizes of windows and concrete subframes are being used by M. Lurcat in this project as in the apartments at Maubeuge. Space standards are similar to those in public housing projects in the U.S., with the addition of small balconies for all apartments. Fireplaces are also provided.

REBUILDING AT ST. DENIS (CITE PAUL LANGERIN) 1948.

6. Dunkerque

One of the cities most damaged by the war, Dunkerque has a new plan which shows the type of openness and the combination of relatively low apartment houses with private dwellings typical of much of modern French planning. It is not dissimilar from American projects, with the difference that the garaging and circulation of the private automobile is not a problem.

TYPICAL OF THE NEW PLAN OF DUNKERQUE THE LAYOUT BELOW SHOWS IN DETAIL THE AREA RINGED IN THE KEY PLAN, WITH TYPICAL HOUSING UNITS. *RIGHT*: GENERAL VIEW OF AREA OF RECONSTRUCTION.

MYASSARD, Architecte
SCHNEIDER, Architecte
MOREL

PLAN REZ-DE-CHAUSSEE

PLAN ÉTAGE

FACADE

COLLECTIFS

INDIVIDUELS

DUNKERQUE

PLAN DE SITUATION

PLAN ÉTAGE

BOCAGE, Architecte
FAVIER, Architecte
SCHMITT, Architecte
TROUBERT, Architecte

7. Noisy-le-Sec

A suburb to the north-east of Paris which was considerably damaged during the war, Noisy-le-Sec was chosen for the site of a government organized experimental village. In addition to some conventional apartment houses in the town, the State planned and built this village of prefabricated houses. Some were bought from abroad—U.S., Canada, England, Switzerland, Finland, Sweden. Most, however, are of French design and construction.

The plan is of interest. For the typical division of the land into an enormous number of narrow, poorly shaped lots, the architects have substituted a garden city layout with detached houses and private gardens.

As far as the French houses are concerned, minimum space standards were established, and a certain sum guaranteed in payment to all builders and architects for their houses. This sum in most cases did not cover the actual cost of these prototypes, and there is an enormous difference in the quality of the buildings. As a result fair comparison between them is impossible. None of them is prefabricated in the true sense of the word (as are, for example, the Canadian "Fairchild" and the English "Airoh" houses in the same project.) They are assemblies of precut or prefabricated building units of relatively small size. All involve considerable foundation work and an excessive time in erection and finishing. They can be classed as attempts at a more rational house construction through the use of larger-than-normal structural and equipment units.

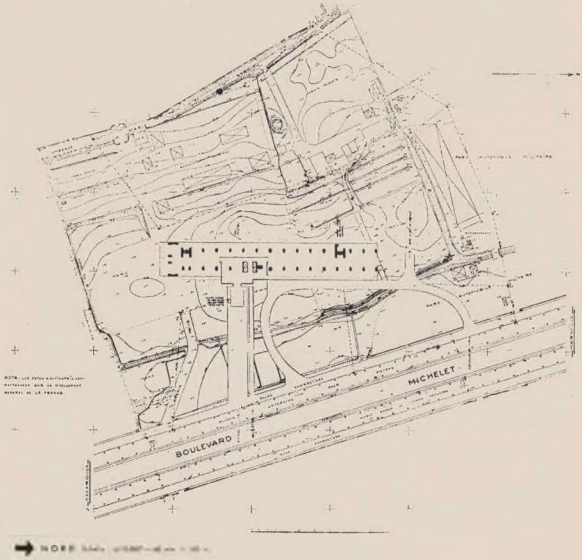
From the study of these prototype houses the government hopes to find some worthy of further development and production on a scale which will produce the economies theoretically inherent in mass production.

PLAN OF THE NEW EXPERIMENTAL VILLAGE.

EXPERIMENTAL HOUSING TYPES.

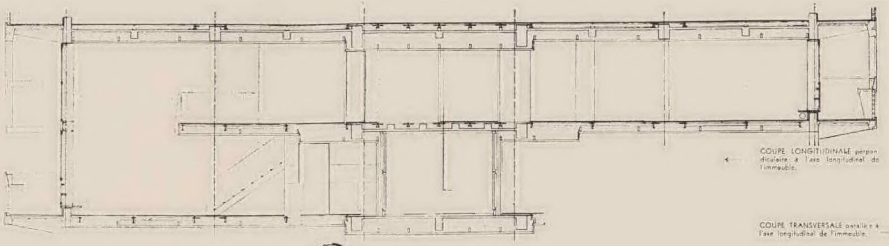
APARTMENT HOUSE AT MARSEILLES

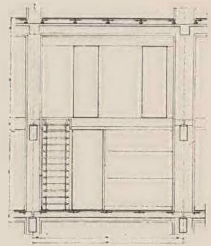
by Le Corbusier

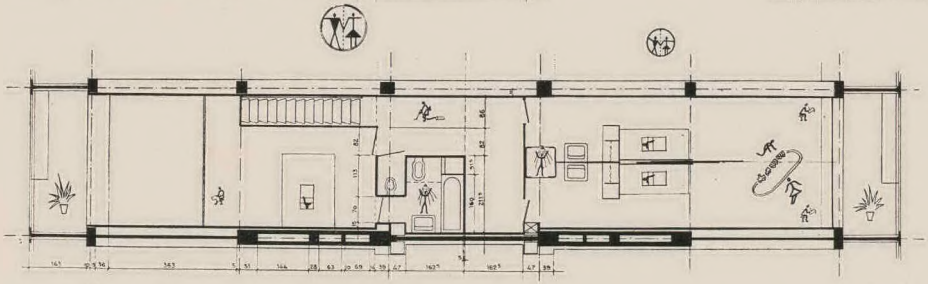


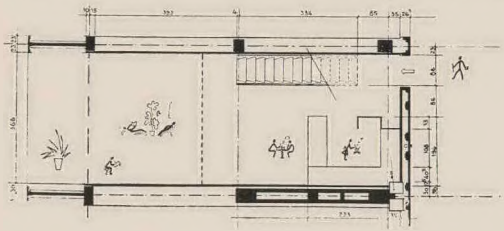
ABOVE: Perspective from North-East.

RIGHT: Site Plan. The building has been placed on a North-South axis as a result of sun-lighting studies.



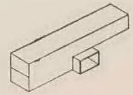






APPARTEMENT **TYPE E2**

Famille de 3 à 4 enfants.
4 à 6 habitants.
Superficie de plancher : 96 m2.
Volume : 253 m3.
Superficie par habitant : 16 à 24 m2.



DETAILS OF THE TYPE E2 APARTMENT UNIT.

8. *Marseille.* Apartment house by le Corbusier.

The apartment house, now under construction in Marseille, designed by le Corbusier, is technically the most interesting and novel building now being built in France. Whether it is the most important building or one which really answers the present day needs will be discussed in the last section.

M. Bodiansky is the engineer. It is, like many of le Corbusier's designs, in the form of a prism raised above the ground, resting on widely spaced, freestanding piers. Structurally it is an open cage framework of reinforced concrete slabs only at every third floor. Each apartment has its own, independent light framing, which is supported on the heavy girders of the basic cage. The interlocking apartments are ingeniously designed and usually have two-storey high living rooms. A central corridor serves each group of three floors. Two entire floors are devoted to community services such as stores and restaurants, and extensive recreational facilities are to be provided on the roof as well as in the free area on the ground. By means of a concrete slab lattice and balconies, M. le Corbusier hopes to control solar heat.

2. SOME GENERAL CONCLUSIONS

There are two main advantages to studying the architectural side of French reconstruction. In the first place it is a different country, with different building traditions and materials. In the second, the general economy and the building industry which is included within it have been severely dislocated by the war and occupation.

One fact stands out most clearly—that "architecture" is only one part of the whole building industry. The totality of all construction is what counts in judging the architectural quality of a period. There is still an enormous gap between what a few initiates, calling themselves modern architects, consider good architecture and the great mass of work accomplished. This state of affairs cannot be dismissed by laying the fault on a public which is too "stupid" or "insensitive" to understand good architecture, nor on building traditions which are too "old-fashioned".

Building traditions mean the habits of all building trades workers, the type of mechanical equipment available, the materials which they have been used to work with and the general organization of all of these on the building site. These traditions cannot be changed overnight. And the cost must continually be kept in mind. The cost implies not merely dollars or francs, but rather the proportion of the total production of the nation which can be devoted to all construction and ultimately to any single building. A violent change in building methods usually increases costs until new habits are established. When every architect establishes his own construction methods and details, the cost of design, of construction and of supervision is greater than when the architect can design in accordance with the building practices general in his locality.

These building practices can be enormously improved; of that there is no doubt. But the time required for such improvement and the capital investments for industrialization on the site and for the development of building materials industries (including all degrees of prefabrication) must also be considered. In France today the need for dwellings is so great that all existing facilities, men, machines and materials, must be used to build as rapidly as possible. At the same time some building labour and money must be put into the development of improved methods and materials. These in turn can be introduced into the general field of construction.

In the United States a great need for dwellings exists. There is no panacea to solve the problem. Prefabrication is not the only answer, but the investment by the government of a relatively small amount of money in a few good prefabricating companies would help enormously to reduce the deficit of homes. The highly developed level of American industry as a whole and of its transportation facilities would ensure the success of this effort. In France on the other hand the prospect of an early establishment of a prefabricating industry is non-existent. The general level of production and transportation must first be improved.

The main lines along which the French construction industry will probably proceed are those of standardization of sizes and quality of building elements (standard stone blocks, windows, doors, stairs, plumbing fixtures, modular system for dimensioning, etc.), the increased production of sheet and synthetic building materials, and increased rationalization and mechanization on the site. These have been the broad lines of development of the U.S. building industry also.

The architect can help this development. For example in France there is no set of standard window sizes such as exists in the U.S. But now some architects are adopting standard sizes for all of their projects. Not a very spectacular advance, perhaps, but one which will achieve significance by ultimately establishing standards for the whole country. The costs of construction will be reduced. At the same time the scale of buildings can be improved by the common module of size, and rhythms established by the repetition of similar elements.

The French architect, like his American counterpart, has to consider his clients as well as the building industry in a more realistic fashion than in the past. The modern movement in architecture has partially succeeded in breaking down the formalistic traditions of the Beaux-Arts, but only too often modern architects re-erect new formalistic patterns of their own which have no basis in the function

nor in the construction of their buildings, and which bewilder the layman. The architect has not yet achieved the integration with the building industry of his time which did exist before the industrial revolution. He is still often isolated and misunderstood.

The experience of le Corbusier with his schemes for the replanning of St. Dié and St. Nazaire-Nantes is a case in point. The principles of city planning developed by the C.I.A.M. in the Athens Charter (published in the U.S. in "Can Our Cities Survive" by Sert) were carefully followed in these plans. The inhabitants, their present way of life, their particular feelings and the availability of materials and labour were neglected. As a result the plan for St. Dié, the only one which was carried to a point of possibility, was rejected by the Department.

The great changes in living and working habits, many of which are of course desirable, which are implied in such schemes as that for St. Dié, must, however, come from within, from the inhabitants themselves, not merely from outside. Also these changes can be based in reality only on similarly great changes in productive relationships. In other words, until real economic and social plans are established or at least started, large-scale physical plans remain isolated and purely intellectual. They are architectural blueprints of Utopia, like those of Robert Owen and Fourier.

Just after the liberation it appeared likely that there might be some real economic planning in France. This has not occurred.

Because of the lack of social planning, some architects assume erroneously that they can solve social problems merely by architectural analysis and composition. Their projects and buildings often have serious shortcomings and are therefore discredited.

The apartment house in Marseille designed by le Corbusier is the crowning achievement of his architectural thought and practice during the past 30 years. It is supposed to be a typical unit in the ideal plan of the "Radiant City". Unfortunately it has many weaknesses. The apartments are planned back to back, each about 30 feet deep, usually two storeys high, with some of the bedrooms opening, not to the outer air, but only to the double height living room. The entire organization is therefore dependant on artificial ventilation. Results: increased construction and maintenance costs, reduced livability, and a great sensitivity to present day social upheavals and the resultant shortages of heat, light and electricity. The same effects are caused by the multi-storey construction, the dependance on elevators and on a highly organized internal life of the entire apartment house. The standards of construction—for example, double walls and floors between all apartments—could be afforded in America only by millionaires. The workmanship will, therefore, have to be of poor quality or the proportion of the total effort of the French building industry which will be devoted to this one apartment house will be out of all proportion to the benefits to be obtained. M. le Corbusier's delight at the wonderful mechanical system of a modern ship makes a virtue of a very expensive and not very comfortable necessity. Whether the workers of Marseille will want to live in this building remains to be seen. The change in living habits required is very great, and if it were not for the absolute housing shortage, it might turn out that only military discipline could force people to live there. This was the experience at Drancy, where the local ill-housed would not live in the 14 storey towers provided in M. Lods's scheme, and where the government took over the project as living quarters for the families of the Garde Républicaine. As military units, they could not refuse.

The experience of other architects, M. Lurcat at Maubeuge, for example, proves that it is possible, by working closely and realistically with the local population in terms of their own specific needs and possibilities, to get new, radical schemes adopted and built. In the course of time this scheme will probably become outmoded and a new one will have to be developed; but the circumstances at that time cannot be foreseen now. Architectural effort must be expended for the reality of today, not for an "ideal" utopia which has no counterpart in reality, now or later.

For this reality the architect must work continuously with the living people who are to inhabit his buildings and his cities. Where there are contradictions within this population he must help to develop and strengthen the forces which will aid a progressive, popular architecture, designed to meet the needs of the mass of the people. In this direction lies real progress, expressed in real buildings. Paper architecture remains paper architecture, whether designed by Vitruvius, Palladio, John Webb, Viollet-le-Duc or le Corbusier. Architecture exists for society, not the contrary. And the architect of today must play his part in creating a new democratic architecture not merely by making ideal schemes but by working with his clients, the people.

ACKNOWLEDGEMENTS :

Illustrations on pages 96, 103, 104, 105, 107 from The Ministere de la Reconstruction.
Illustrations on page 106 from Direction Generale de l'Urbanisme et de l'Habitation.
Illustrations on page 101 from " l'Architecture d'Aujourd'hui," September, 1946.
Illustrations on pages 108 and 109 from " l'Homme et l'Architecture " 11-12-13-14, 1947.

NEW OFFICES IN JOHANNESBURG

FOR THE SHELL CHEMICAL DISTRIBUTING COMPANY OF S.A. LTD.

JOHN M. SHUNN, ARCHITECT

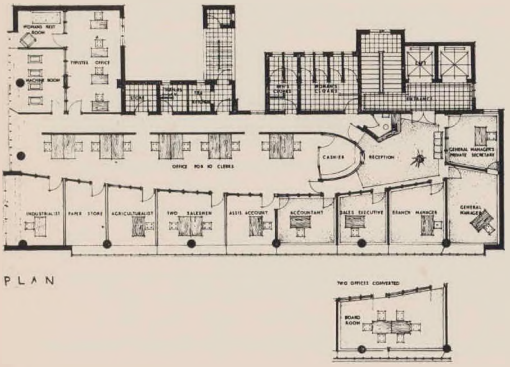
The construction of these offices consisted of partitioning and finishing a floor in an existing building. Inevitably, numerous problems arise out of this type of work, as no knowledge of the final sub-division of the floor space was available when the original building was erected.

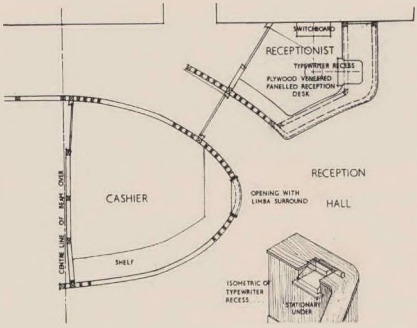
The uninterrupted window space on the North and West made it necessary, in the case of offices requiring complete enclosure by partitioning, that the partitions be arranged in positions to strike the normal window mullion. It was found, also, that the spacing of these mullions bore no relationship to the spacing of columns and beams in the reinforced concrete structure. A further difficulty, was the lack of natural lighting and ventilation on the East and South walls of the space allowed, and that the light points were already fixed. Added to these problems, were the complex requirements imposed by the intricate office organisation of Messrs. Shell Chemicals Ltd. The problem was eased somewhat by a division of the required accommodation into a confidential office space and a non-confidential office space. The confidential office space required enclosure by partitions to ceiling height. The non-confidential office space required enclosure by partitions seven feet high.

It was seen from the outset that there would be internal office spaces requiring indirect lighting and ventilation from the large windows on the West. These West windows would have to be screened during the afternoon by venetian blinds, which have the effect of throwing the light onto the ceiling, and so allowing the light to penetrate more deeply into the interior of the building.

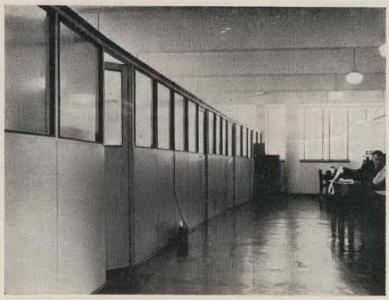
PLANNING

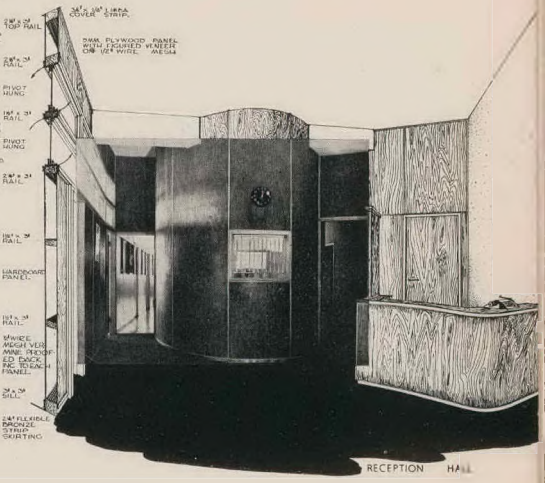
The offices provided for the chief executives for South Africa and the Johannesburg Branch, are grouped about the entrance hall with easy access from one to the other. A reception desk has been provided in the entrance hall. In this desk is a dropped panel to accommodate a typewriter at the correct height. A swivel chair allows the receptionist to move freely between the typewriter and the telephone switch board. Adjoining the West windows along the remainder of the length of the building are the offices for the junior branch officials. The accommodation for clerks is placed down the internal length of the office space adjacent to the minor branch executives' offices. To eliminate noise from the central office space which has only door-height partitioning, the central typing office and machine-operating room have been placed in the East wing and separated by ceiling-height partitioning. The rest-room for women opens off the central typing office. The accommodation for clerks down the centre of the office space is screened from the cloak-rooms by means of 7-ft. partitioning with openings suitably placed to allow access to record store room, tea kitchen, etc. The only structural alterations to the building consist of the re-organisation of one of





Photography : Derrick A. Bridge.





LEFT : Clerks' Office, also shown above. Partitioning is painted pale cream with beads and toprail in maroon, to match the floor. Narrow reeded glass is used in the partition in the upper panels. ABOVE : Detail of the Cashier's cubicle and Receptionist's desk in the Reception Hall.

the ablution spaces to form a small tea kitchen and private cloak-room for the General Manager.

A difficulty arose in that a space was required for occasional conferences and Board Meetings. This requirement was met by the construction of a removable panel between the offices of the Sales Executive and the Branch Manager. When this partition is removed, the two desks may be placed together to form a conference table.

DETAILS OF CONSTRUCTION AND FINISHES

The construction of the partitions was simplified in the interests of economy. They consist of a 3in. by 3in. bottom rail bolted to the floor, with 3in. by 3in. posts at approximately 3ft. centres with 2½in. by 3in. top and intermediate rails. The panels are of hardboard backed with chicken wire as vermin-proofing. Glazing is narrow reeded glass with the reeding placed vertically and fixed by means of ⅜in. by 1½in. planted bolection beads. The 3in. by 3in. verticals and 3in. by 2½in. top rail form the door frame at openings, with ½in. by 1in. planted stops all round. There is a continuous 4½in. by 1½in. capping along the top.

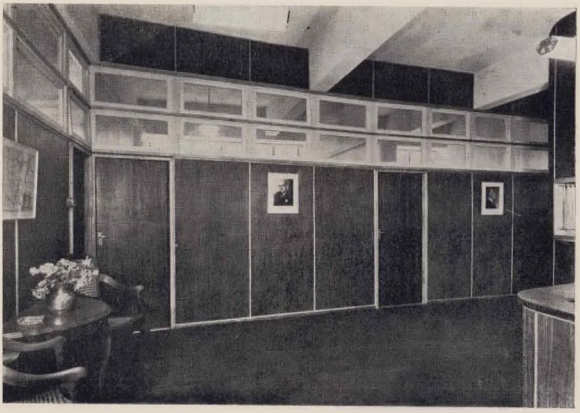
In the entrance hall, a 9 millimetre plywood with Kiaat veneer was used as panelling instead of the hardboard. In order to provide ventilation to the entrance hall, two series of horizontal pivot-hung fan-lights are provided. Cover strips, horizontal rails, door frames and beading, are in Limber. The exposed vertical between the fan-lights is painted in dove gray, the fan lights being picked out in ivory white. The curved partition of the cashier's box is an interesting detail. The partition was constructed by means of a sill and top rail made up of two laminations of 1½in. by 3in. timbers in short lengths with lapped joints. Spanning between the sill and top rail are 1½in. by 3in. studs at 4½in. centres with two horizontal lines of spacing blocks of 3in. by 1½in. timber. These rails are clothed internally and externally with four millimetre flexible plywood;

the external ply having a Kiaat veneer. Vertical cover strips of $\frac{3}{4}$in. by $\frac{1}{4}$in. Limber were used. The cashier's hatch has a Limber surround and bronze grill. A 3in. flexible bronze skirting was used without a quadrant in order to take up the curve of the partition at floor level. A similar construction was used for the curved face of the Receptionist's desk. A wine red Axminister carpet with a heavy pile and underfelting was used in the entrance hall and more important offices. The rest of the office spaces has a linoleum type floor finish.

Partitioning not faced with Kiaat veneered plywood, is painted in a pale cream with the glazing beads and top rail picked out in maroon which matches the colour of the floor finish. The General Manager's office and that of his confidential secretary, are finished in dove gray.

THE RECEPTION HALL

Two views of the Reception Hall looking towards the senior executives' offices. Close carpeting to floor. Partitions in Kiaat veneer with Limber beads. Frames of ventilators in cream, divisions dove gray. Walls painted cream and ceiling white.



Photography : B.R.S. Photographers (Pty.) Ltd.

TORNADO DAMAGE AT ROODEPOORT

By Chas. A. Rigby, M.Sc.(C.E.). Principal Research Officer, Engineering Division: National Building Research Institute.

The severe storm which struck Roodepoort on the evening of the 26th November, 1948, killing three people and causing £200,000 worth of damage to buildings, has raised two questions: (1) What was the nature of the storm and (2) what steps can be taken to minimize the damage and loss of life sustained from storms in the future?

* * * * *

From a study of the damage and eye witness' accounts it is obvious that this storm was a tornado. Before we can consider whether there are any steps we can take to minimize the damage sustained by buildings and to reduce or prevent the loss of life in such storms let us briefly consider the nature of a tornado.

Briefly stated, a tornado is a very intense, progressive whirl, having a diameter of only a few hundred feet, with inflowing winds which increase tremendously in velocity as they near the centre, developing there a vorticular ascensional movement whose violence exceeds that of any other known storm. From the violently-agitated main cloud mass above there usually hangs a writhing funnel-shaped cloud, swinging to and fro, and rising and descending. The forward speed of the whirl is usually of the order of 20-40 miles per hour or more; its path of destruction usually less than a quarter of a mile wide; its total life a matter of perhaps an hour or so. In dim light, accompanied or closely followed by torrential rain, and perhaps hail, and usually with lightning and thunder, the tornado suddenly strikes with almost irresistible force.

It is one of the most remarkable things about a tornado that even the lightest objects may be wholly undisturbed a very short distance, perhaps only a few yards, from the area of complete destruction close to the vortex. The central low-pressure core of the tornado is surrounded by radially inflowing winds of moderate strength, and then closer to the centre, by spiralling and ascending winds of terrific violence. The surface winds which take part in the vorticular inflow and ascent seem to be chiefly responsible for the damage and loss of life. However, the central "core" surrounded by its whirling winds, has its pressure greatly reduced by the centrifugal force of the whirl; this causes the nearby air within buildings or other enclosed spaces which is at normal atmospheric pressure, to exhibit a powerful explosive effect which may also cause considerable damage to buildings.

Summarizing then we have three sources of damage in a tornado:—

(1) That resulting from the violence of the surface winds;

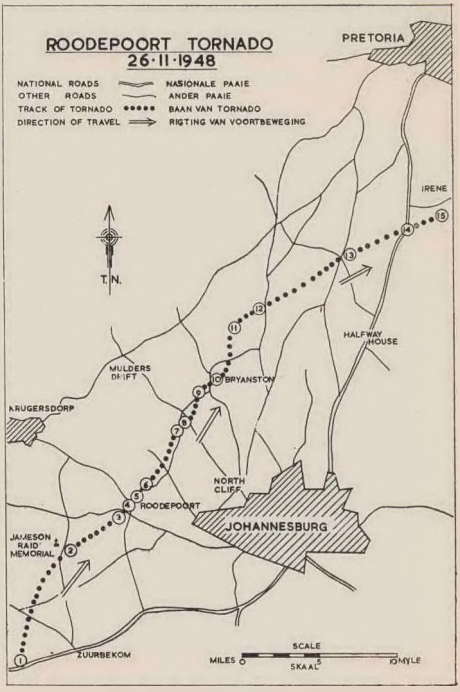
(2) that resulting from the uprushing air movement close around the central vortex;

(3) that resulting from the explosive action due to the drop of pressure in the central core.

* * * * *

The damage at Roodepoort was inspected by officers of this institution (including the writer), while the path of the storm, throughout its entire length, was surveyed by Messrs. J. A. King and A. J. Dreyer of the Meteorological Office, Pretoria. The accompanying map, showing the path followed by the storm was kindly supplied by Mr. King.

The path was first located at a point 4 miles west of Zuurbekom (Point 1) on the main Johannesburg-Potchefstroom road where it is reported to have struck at 5.15 p.m. Here hailstones 2" in diameter fell and nearby observers saw a funnel-shaped cloud well above the ground surface.



1. Houses damaged, that at right practically unscathed, and trees uprooted at Durban Deep Mine (Point 3)

Photography : Johansons Portrait Studio, Springs.

2. The greatest destruction occurred in the north-eastern residential area of Roodepoort (Point 5).

At Durban Deep Mine, Roodepoort (Point 3) a mine headgear was damaged; trees were uprooted and some houses of very sound construction were severely damaged. Illustration 1 shows the damage caused to some of these houses. Six identical houses which had been very well built stood on the street shown in the foreground. The one on the left, out of the picture, was slightly damaged, the next three were badly damaged as shown, while the two on the right were practically unscathed. The direction of travel of the storm was approximately diagonally across the picture from the lower right hand corner to the top left hand corner.

The path of the storm then passed through a residential area in the North-Eastern part of Roodepoort (Point 5) and it was here that the greatest destruction occurred (see illustration 2 and 3). At this point the path was about 300 yards wide with fairly well defined edges. Within this width the damage showed a very haphazard pattern, a house which showed no evidence of being better constructed than its neighbours would be practically unscathed while five or six houses on either side would be roofless and, in many cases, very badly damaged. This random nature of the damage was observed throughout the entire area. Evidence of the rotational effect was sought but very little was found here. However, at the Durban Deep Mine the fall of the trees suggested a clockwise rotation while on the outskirts of Roodepoort the roof of a cowshed (see illustration 4) which had been supported on stone pillars about 2 feet above the general wall level was rotated in a clockwise direction through a small angle. The sidewalls of a nearby roofless cowshed collapsed toward the centre of the storm's path. No evidence of the explosive action, caused by the drop in pressure, such as walls or windows falling outwards, could be found although it was reported that the plate-glass windows of a garage "blew-out" into the street. Ceilings which had risen were fairly common but in these cases the roof was either completely gone or was missing on the leeward side, and it might have been the uplift caused by the wind on the leeward side that was responsible for the raising of the ceiling. It was observed in practically all cases where only part of the roof was missing that the missing part was on the leeward side of the buildings showing that uplift is the predominant cause of failure of roofs.

Sheets of galvanised iron roofing and other debris were scattered over a wide area of the veld on the upward slope of the hill beyond Roodepoort. An avenue of trees (Point 6) on the brow of the hill was badly damaged and several of these trees had sheets of galvanised iron wrapped round them several feet above the ground (ill. 5). The trees in the centre had collapsed in the direction of the storm, but the ones on the left hand edge had fallen towards the centre.

The storm followed the path indicated and uprooted 40 blue-gums over a width of 200 yards at milestone 13 on the main Johannesburg-Pretoria road (Point 14). The last trace of damage was observed near Irene (Point 15), where more blue-gums were uprooted. There are conflicting reports of the time it reached here, but the most reliable put the time at about 7 p.m. The total length of the tornado path traced was about 41 miles, and the rate of travel, according to reports of the times when the tornado passed various points on the route, was 22-28 miles per hour.

* * * * *

In their report Messrs. King and Dreyer conclude that this storm was a tornado of the type commonly known in the central southern states of the U.S.A. in that :—

(1) A writhing funnel-shaped cloud was observed below the main cloud base.

(2) Damage occurred intermittently along the track of the storm and was confined to a width in no case more than 300 yards.

(3) The storm was accompanied by hail and severe thunder. Both are indications of extreme atmospheric instability.

(4) Damage occurred in valleys and on hills on both upward and downward slopes without showing any preference for locality.

(5) No damage occurred even on short distances outside the track.

(6) The evidence obtained indicates a cyclonic (clockwise) direction of rotation.

(7) The storm was short but intense in its duration where it touched the ground.

(8) There was considerable variation in intensity at the points of damage located.

* * * * *

In regard to the protection of property certain conclusions are fairly clear. Tornadoes cannot possibly be prevented, and no building, certainly none of any practical nature, can be built to withstand the violence of the wind in the vortex of a well-developed tornado.' Costly preventative construction is not recommended for two reasons: (i) it is not likely to be effective if the full force of a tornado should strike the building; and (ii) tornadoes are, fortunately, rare in South Africa and cover such a limited area that the chances of any particular house being struck are very remote indeed, and therefore any large additional expense is not justified. However, the intensity of the tornado violence and the velocity of the surface winds vary greatly and the damage done by the less violent components will depend on the type of buildings and excellence of construction. Obviously buildings of good, sound construction should be less liable to sustain damage than those less soundly constructed.

* * * * *

The records of tornadoes which have occurred in South Africa since the turn of the century are by no means complete and it is possible that a number have occurred in remote parts of the country and have not been reported. Those which have done the most damage are listed on page 119.

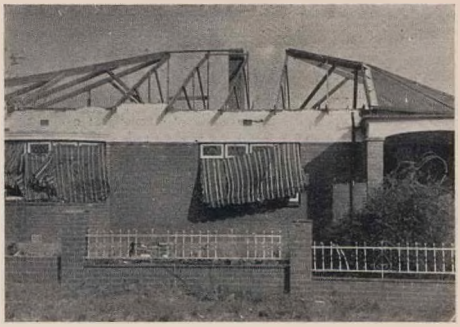
Photograph : Johansons Portrait Studio, Springs.

3. Another view of the north-eastern part of Roodepoort, where the damage was greatest (Point 5).

4. Roof of cowshed rotated through a small clockwise angle.

5. Corrugated iron roofing sheets wrapped round a tree on the brow of the hill outside Roodepoort at Point 6 on the map.

6. Wall plate anchored to wall, but trusses and roof removed.



7. Trusses anchored to wall but purlins and roofing removed.

(a) Malmesbury, C.P., 29th September, 1905; path about 300 yards wide by ½ mile long; killed 7 people and damaged 75 to 80 buildings.

(b) Turffontein, Johannesburg, 6th October, 1929; path about 300 yards wide by 7 miles long; no casualties; estimated 200 buildings damaged.

(c) Roodepoort, 26th November, 1948; path 300 yards wide; 3 people killed and 425 buildings damaged.

It is interesting to note that in each case the path is reported as being 300 yards wide.

The most complete records found were those for the period December, 1923, to December, 1929, when twelve tornadoes were reported from such widely scattered points as Pietermaritzburg, Delarey, East Griqualand, Kokstad, Newcastle, Pietersburg, Umtata, Volksrust and Turffontein.

No record of the number of buildings damaged by these storms could be found, however, but an estimate of 130 was made (omitting Turffontein) on the basis of the value of the damage done and the size of the town involved. Due to natural growth many of the smaller towns in the Union now cover a larger area and are more densely built up than during the period under review; so it may be expected that more buildings will be damaged by tornadoes in a similar period of time in the future. A 50 per cent. increase should be more than ample to allow for this factor. With this adjustment an average of 33 buildings damaged per year can be expected. Although the records do not cover a long enough period to give an accurate probability figure, those that are available show that a tornado may be expected to strike some larger centre once in 20 years. It is unlikely that the damage sustained will be more severe than that at Roodepoort as the storm passed through a thickly built-up area. Assuming the Roodepoort figure as the probable loss, another 22 buildings annually is added giving a total expectancy of 55 buildings damaged per annum. It is assumed that there are about 750,000 buildings in South Africa of the class reported as damaged in the records, which gives a probability figure of 1 in 13,600 of any building being damaged in any one year. It is believed that the actual risk is much less than this.

An example of the damage at Roodepoort has shown up certain weaknesses in roof construction which could be improved at very little additional expense. Had these details been taken care of there is no doubt that the damage sustained would have been much smaller. One of the weaknesses noted was the practice of fastening the rafters down to the walls with a single strand of galvanised wire embedded at one end in the brickwork, passed over the rafter and twisted around itself below the rafter. Where the rafters had been thus fastened down, and the roof had been lifted off by the storm, in nearly all cases the fastening had failed because the wire had straightened out or had broken where it had been twisted around itself, and not because the wire had pulled out of the brickwork. If double wires or strap-iron anchors, securely built into the brickwork and anchored to the rafters had been employed, it is very probable that some of these roofs would have remained in place.

It was also noted that in some cases a wall plate had been anchored to the top of the wall and the truss rafters nailed down to this (see illustration 6): this detail develops very little strength and it is recommended that the rafters should in all cases be anchored directly to the wall. In a number of cases where the trusses had been properly anchored they remained firm but the corrugated iron roofing was missing (see illustration 7). It was observed that in these cases the purlins had been carried away with the roofing, indicating that the fastening of the purlins to the trusses is weaker than the fastening of the iron to the purlins. In most of these cases the purlins had been fastened to the rafters by nails which developed very little resistance to lifting. If the purlins had been strapped down to the rafters with hoop iron or angle irons a much stronger joint would have resulted. Failing this a bolted joint could be employed to advantage. In general

it was considered that the members of the trusses themselves were adequate but that the method of fastening the truss down and the joint details, both of truss members to each other and to the purlins, were the weak links. Improvement of these details would not be costly and would, no doubt, materially reduce damage done by the less violent elements of a tornado.

No cases were observed where a wall had collapsed when the roof had remained in place. In cases where one or more walls of a building had collapsed, and witnesses or victims could be interviewed, they were unanimous in stating that the roof had gone before the wall or walls collapsed. Hence it is apparent that improvement in the roof details and anchorage, if it is effective, will reduce the damage to walls and danger to life, as well as reducing roof loss. It seems prudent therefore to carry out the suggested improvement in roof details.

Bibliography

(1) Tornadoes of the U.S.—Ward: Quart. J. R. Met. Soc., July, 1917.
(2) The Tornado — R. G. Veryard — Weather, July, 1946.
(3) Tornadoes — Manual of Meteorology. Vol. II Napier Shaw.
(4) The Roodepoort Tornado — J. A. King and A. J. Dreyer. A departmental report in the Met. Office Library, Pretoria.

Reprint of the Article which originally appeared in "Public Works of South Africa," Vol. X, No. 65, April, 1947.

APOLOGY

In the issue of this Journal of December, 1949, a letter from Mr. Anthony M. Chitty was published. That letter contained the following passage :—

> "I have spent a day at Vanderbijl new town with its vigorous chief engineer—an operation (it seemed to me) likely to be one of South Africa's most successful; a day in the hopeless chaos of Welkom and Odendaalsrus, whose unplanned future hitched to such flimsy hopes seemed to me capable of utmost disaster."

It has now come to the notice of Mr. Chitty and to the Editors of this Journal that these words may be calculated to reflect on the ability of the Town Planners for the Townships of Welkom and Odendaalsrus, Orange Free State.

It was at no time Mr. Chitty's intention that the passage quoted should be taken to convey this meaning, or that it was even intended to constitute a criticism of any Town Planning Scheme. Mr. Chitty's intention was to refer to the social and psychological chaos which he considered was likely to flow from urbanisation on this scale and at this speed.

In so far as the passage quoted may be regarded in any way as a reflection on the Town Planners of the two Townships mentioned, it is hereby withdrawn, and Mr. Chitty and the Editors of this Journal express their deep regret if any reader took the words to convey that meaning. Mr. Chitty and the Editors join in tendering their sincere apologies to the respective Town Planning Consultants.

ANTHONY M. CHITTY.

INCIDENTALLY . . .

A Column by GILBERT HERBERT

EXHIBITIONISM

On the walls of most London tube stations (perhaps sandwiched between the Guiness poster and some glamorous film star showing that You can be a Vision Too, if You Use a Drene Shampoo) one can usually find a list of current art exhibitions, their closing dates, the galleries in which they are housed, and the price of admission, if any: which invaluable information is compiled and published for the public good by the Art Exhibitions Bureau. The list includes all permanent exhibitions such as the National and National Portrait Galleries, which are always thronged with visitors—and perhaps genuine Londoners too, although one always suspects that they are merely filling in that odd halfhour before meeting Jane or Berty for lunch. The tourist, on the other hand, is easily identifiable by the dogged determination with which he progresses from picture to picture. But in addition to large galleries, current exhibitions and one-man shows are listed, and a good month, such as the one just past, may include such lions as Epstein and Leger: Epstein exhibiting a new work, as usual the centre of heated discussion, and Leger being handsomely covered in a comprehensive display at the Tate.

DENMARK IN PORTLAND PLACE

One noteable omission in this otherwise admirable catalogue was the "Exhibition of Danish Architecture of Today" which throughout March had been attracting architects and others to the Exhibition Hall of the R.I.B.A. It may be, of course, that the Exhibitions Bureau does not classify Architecture as an Art, which may be justifiable, especially as this exhibition does stress the aspect of Architecture as a Social Science. However this is not to imply that the examples presented were not of considerable artistic merit: the architecture on show was in fact well up to the high standard we have come to expect of Scandinavian work; and the presentation in exhibition form was direct, and most pleasingly handled. The photographs were large and clear, and told their story with a minimum of text, which is as an exhibition should be—and especially where the text is translated from the Danish, and consequently embodies phrases that are to say the least quaint, and spelling that in places is not exactly orthodox. The subject matter was categorized in seven sections, namely: Town Planning; Education; Housing; Community Life (which we would perhaps call by the less friendly term Public Buildings); Industry and Trade; Health and Recreation; and Decorative Arts. The material displayed provided no dramatic revelations, and gave no shocks, but rather demonstrated the consolidation of a National Danish school of Architecture, the natural development of the style which theorists are pleased to call the New Empiricism. It is Functionalism as seen by the humanist, carried to its logical conclusion, or rather, because the process is not finite, carried to a further stage of maturity and refinement. There is a community of thought and feeling amongst these Danish architects, and a sympathy of style that results not from the use of hackneyed cliches, which is uniformity by a levelling-down process, but from a uniform cultural and social environment. It is "not that Danish Architecture is by any means standardized or stereotyped, far from it, but there is just that something to it which stamps it a product of Denmark".

THE COLOUR QUESTION

The photographs exhibited were all in black and white. The time has apparently not yet come when sponsors of architectural exhibitions can afford to run to large Kodachrome plates: yet the disadvantages of black-and-white presentation are obvious. In an article in the beautifully prepared catalogue to the display, Helge Finsen writes: "People whose lives are closely associated with the sea often have a predeliction for the decorative and the showy, and . . . in contemplating the pictures of the exhibition this colourfulness must be kept in mind. Brick walls are deep red or light yellow in a variety of tones: roofing tiles are bright red; and the reason we are so fond of copper roofs is that the salty sea-air quickly changes them to a 'luminous verdigris,' and then adds: "Perhaps inhabitants of the British Isles will recall the Vikings (our tourist association has, at any rate, done its best not to let you forget them) and in our love of colour see a relic of their barbarism in modern Danish civilization, a reminder of the fact that Denmark joined the European cultural community at a relatively late date." This is needless humility — for a monument to Danish civilization, just look around these exhibition walls. Proof of an enviable standard of culture lies in the pictures and the models, the books on sale at the entrance, and those so exciting moulded plywood chairs, inviting rest. A civilized attitude is evident, too, in the concern shown in the exhibition for architecture as a means of improving the life of the people. The largest section of the exhibition is the Housing section, with examples ranging from private houses to large scale housing schemes involving flats and terrace houses. Primary interest is low-cost housing, and Denmark has far-reaching positive legislation in this respect, whose fundamental idea, according to Jens Mollerup, is "to improve housing for the less well-situated, including families with many children, while there is naturally no particular interest in supporting

purely speculative building": which principle should be writ large in the legislation of any country with a housing shortage.

BREAD AND CIRCUSES

The wide range of building types on show cannot fail to arouse memories of the good old days for British architects who have had for many years now to subsist on a lean diet of utility housing. Building in Britain today is priority building, which means that homes and schools come first. And usually second, third, and all the way as well. Housing is the architect's bread and butter — but men can't live by bread alone, and so there is building on the South Bank of the Thames the British counterpart of a Circus. On these few acres where the Festival of Britain is growing the architects of England are having a well-earned fling. Here is the concrete pyramid, and the aluminium dome (the largest dome in the world, Americans please note!); the suspended administration block, and the vertical feature; all the intriguing elements that are to brighten London in 1951. This is a brave project: and boldness courts criticism. Already the pinchbeck wolves at the door howl "Needless extravagance" But to the architects of Britain this is manna from heaven.

POET'S CORNER

With manna-like unexpectedness this tailpiece to my column dropped into my lap the other day, in a letter from a Pretoria reader who signs himself "Jekyll". He writes: "One or two friends who have seen the enclosed have suggested I should send it to the Record. Whilst I would not dare to send it to the Editor, it occurred to me that it might strike you as suitable for your "Incidentally" column". It certainly does.

To a Lady Whose Son is Thinking of Becoming an Architect, and who Asks what he will Need

He'll need to have a banker, madam, and a book on Art,
Unlimited self-confidence, a car, an early start,
A hefty private income, and a 3B Koh-i-noor,
Experience of hospitals, a knowledge of the Law.

He'll need to have two pairs of hands, a scale, a welding plant,
A gross of india rubbers and an influential aunt,
A box of coloured pencils and a handicap of four,
Some midnight oil, a way with women, references galore.

He'll need to know his stuff, madam, and where to draw the line,
And when to cut his fees, his friends, his losses; Where to dine.
The current rates of interest, and the works of F. L. Wright,
A thing or two, a Minister, a man of straw on sight.

He'll need to know the meaning of the week's Neologism
And words like Impact, Idiom, and New Empiricism,
Acanthus, Bouleterion, but not of course Defeat,
And how to hold the baby, pass the buck, and make ends meet.

He'll need to be artistic, Ma'am; in high finance a giant,
Distinguished, dapper, tall enough to dominate a client,
Adept at mixing cocktails, colours, good at taking pains,
And quite au fait with bending moments, calculus and drains.

He'll need to be a leader and a good committee man,
A neat and accurate draughtsman, and as tactful as he can,
He'll need to be all this and more if he's to get ahead,
So start his training early, ma'am, he'll be a long time dead!

SPECIFICATIONS: THEIR IMPORTANCE IN GENERAL

By L. G. WARREN, M.I.A.

It appears to be common practice among some Architects to-day to consider the specification as of secondary importance. Consequently, the preparation of the document is very often left to the Quantity Surveyor, notwithstanding the fact that this is an important part of the Architect's work.

The following definitions of the word "Specification" are taken from Websters Collegiate Dictionary 5th Edition 1949.

(1) "Determination of a thing in its specific sense or particular character."

(2) "A statement containing a minute description or enumeration of particulars as of the terms of a contract, details of construction not shown in an Architect's drawings, etc., also any item of such a statement."

It must be realised that if a specification is issued, it should conform with definition (2), otherwise, from the legal point of view, the document, if not carefully and properly prepared, is likely to lead to numerous misinterpretations of the Architect's intention, or, what he had in mind, particularly in a case where no supervision by the Architect is a condition of the Commission, in which event the personnel entrusted with the supervision of the work can only rely on the drawings and specification to carry out the work.

Without a full specification it is almost impossible for the supervision of the work to be conscientiously carried out especially in cases where through Government or other policy, the lowest tender is accepted without regard to the competence of the tenderer, provided only that his sureties are financially sound.

From the foregoing facts, it will be appreciated that vital importance must be attached to the specification which will contain a minute description or enumeration of particulars that will ensure the work being carried out to the full intent and meaning of the contract.

Further, the specification should clearly define particulars of the various materials and methods of construction to assist and enable the Quantity Surveyor to enumerate and itemise to the fullest extent any specialised work which is to be provided for, especially in projects for Government, Provincial or Corporate bodies. This in turn will minimise variation orders, and omissions in the bills of quantities.

In cases of dispute or disagreement arising during construction of any item not defined on the drawings, or provided for in the bill of quantities, the specification is the document to which contractors and clerks of works must refer, and unless the specification clearly defines precisely what is required the contractor's interpretation must be accepted, and frequently an extra is claimed, which, if not agreed to, can lead to litigation.

Taking all facts into consideration it is clear that the work of framing specifications is as important a portion of the Architect's service as that of the preparation of a design and working and detail drawings, and Architects should consider it as such, and devote serious attention to this part of their service, to avoid discrepancies in contracts.

The question whether specification work should be a specialised department or section of the Architect's practice, is debatable, particularly as regards large projects. In the largest offices and in Government and Municipal departments in Britain, in the U.S.A., and in the Union Department of Public Works, it is customary for a staff of specialists to be wholly maintained on this work.

In the United States "free lance" or professional specification specialists are widely recognised by private practitioners, and their services are increasingly in demand, due to their wide experience in this specialised work, which must contribute to greater speed in getting the job out.

An article on Office Practice entitled "The Specification Specialist" by Joseph A. McGinniss, which appeared in the December 1949 issue of "Progressive Architecture", is well worth reading.

NOTES AND NEWS

LEGAL OPINION

THE STANDARD FORM OF BUILDING CONTRACT: PENALTY FOR DELAY AND LIQUIDATED DAMAGES.

Council's Opinion to the Institute of Southern Rhodesian Architects with regard to the stipulation in building contracts of a penalty for delay in completion of a building :—

"Up to 1934 there was some uncertainty concerning the law on this question, but ever since July of that year when the matter came before the Privy Council in the case of the Pearl Assurance Company versus the Union Government all hitherto existing doubts have been removed. Briefly and in common parlance the legal position is as follows :

If a contractor agreed to construct a building within a prescribed time and fails or neglects to do so, the building owner may recover any damages which he may suffer as a result of such failure or neglect. If, in the building contract, the parties agree that in the event of the contractors failing to complete the building in time a fixed penalty shall be paid — the Courts will not enforce the payment of the penalty but they will award damages if they are proved. It has not yet been decided whether the building owner may recover an amount in excess of the penalty; the probabilities are that he may not. That is to say, the building owner may not recover an amount which had been fixed as a penalty in case of default but he can, provided he proves that he has suffered damages, recover such damages up to the amount of the penalty. If the contract, instead of imposing a penalty provides for the payment of a sum as liquidated damages, the building owner may recover such liquidated damages provided the Court is satisfied that the amount provided in the contract is a bona fide and genuine pre-estimate.

In view of these decisions it appears to us that the fixing of a penalty may be contrary to the interests of the building owner assuming that the Court will not give judgment for proved damages in excess of the amount of the penalty. It should be noted, however, that the fixing of a penalty does not preclude the building owner from recovering damages if damages have been suffered and proved. If, on the other hand, the contract fixes an amount as liquidated and ascertained damages, the Court will award that amount if it is satisfied that the amount was agreed upon as a result of a genuine and bona fide pre-estimate of such damages."

TRANSVAAL PROVINCIAL INSTITUTE

TRANSFERS

Mr. G. B. Bruton has transferred from the Salaried to Practising Class; Mr. D. E. Connell from the Salaried to Absentee Salaried Class; Mr. L. A. Reeves from Practising to Salaried Class and Mr. W. Seiler from Absentee Practising to the Salaried Class.

RESIGNATION

Miss P. M. Fitt has resigned her membership of the Institute.

PARTNERSHIPS

Mr. M. Simon and Mr. G. B. Bruton have entered into partnership and are practising at 210, Arop House, Von Brandis St., Johannesburg. Messrs. A. Jonker and C. A. Poseman have dissolved partnership. Mr. Jonker is practising at 29, Erasmus Buildings, and Mr. Poseman at 317, Transvalia Buildings, Pretoria.

Mr. Douglass Cowin has resigned from the partnership of Cowin and Ellis, and is practising on his own account in the Eastern Transvaal, address, care of New Mola Industrial Farms (Pty.) Ltd., Private Bag, White River, E. Transvaal. He is prepared to undertake the preparation of architectural perspectives in water colour or other medium at a charge of 1/- per sq. inch with a minimum charge of ten guineas.

Acknowledgement : Photographs of the Duplex Flats at Craighall appearing in the April issue by Derrick A. Bridge.

PROVINCIAL WORK (TRANSVAAL)

LIST OF ACCEPTED TENDERS FOR PROVINCIAL SERVICES FOR QUARTER ENDING 31st MARCH, 1950.

SERVICE	ARCHITECTS	QUANTITY SURVEYORS	CONTRACTORS	AMOUNT
Balfour Primary School Additions	Departmental	Departmental	Messrs. G. A. Bates & Bros.	£6,289
Randgate School (now Rapportryer School) Additions	Mr. W. Leers	Mr. L. Navis	Mr. B. D. Bouwer	£7,525
Warmbaths Non-Acute Hospital Contract No. 2	Departmental	Departmental	Mr. H. F. Clark	£51,938