N.Z. BUILDING PROGRESS.

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N.Z. BUILDING PROGRESS

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Advertising Rates will be sent on application. The value of "Progress" as an advertising medium is recognized by advertisers. Circulation considered, it is the cheapest advertising medium of its kind in the Dominion.

To Our Advertisers—All copy for advertising matter must be in our hands by the 10th of the month preceding publication, otherwise no responsibility with regard to insertion will be undertaken.

The Editor will at all times be glad to receive Illustrated Articles on subjects of interest for consideration, provided the articles are short and to the point, and the facts authentic.

Should subscribers continue to receive copies of this journal after expiry of current year, it will be accepted as an intimation that they are desirous of subscribing for a further period of twelve months.

In case of change of address, or irregularity of this paper's delivery, subscribers should send immediate notice.

Publisher's Announcements.

Our 57th Competition

We offer a prize of £1/1/-, and a second prize of 10/6 for the two designs adjudged to be the best for—

A Model Kitchen

The kitchen is to be suitable for a five or six roomed cottage. It is to have an area of about 150 square feet, exclusive of space taken up by the fireplace. The plan to show the arrangement of the scullery and the pantry in relation to the kitchen, and also the position of the door leading to the dining room. All fittings and furniture are to be shown. The drawings are to comprise one plan and four interior elevations, all to the scale of ½ inch to 1 foot.

Mr. Leslie D. Coombs, A.R.I.B.A. of Dunedin will adjudicate, and the drawings will be submitted to three different ladies for their independent decisions as to the workability of the kitchen from the point of view of convenience. The main object of this competition is to see what attention competitors give to the practical side of the arrangements of a small kitchen which has to be worked by a busy woman who has no assistant—a common experience in these times.

Designs must be sent in finished as above, under a nom-de-plume addressed to "Progress," 8 Farish Street, Wellington, and marked clearly "Fifty-seventh Competition" on outside with a covering letter giving competitor's name, and address of employer. Designs to be sent in by October 21st.

Our 58th Competition

We offer a prize of £2 2s. for the design adjudged to be the best for a

Presbyterian Church

for a small country town in New Zealand. The site is level, facing a main road, and has a depth of five chains and a width of one chain. Space is to be left for a manse in rear of church which is two miles from a wharf and has no railway connection.

Size: Total building to come under 60,000 feet cube for estimate cubing.

Accommodation: The church itself is to seat 220 persons (exclusive of choir) of which total there would be no objection to placing 20 to 25 in a gallery. A porch must be arranged for, and a vestibule or lobby as well as the pulpit or rostrum, organ and choir. A class room is required of about 300 feet super; a church vestry of about 180 feet super; and a Minister's vestry and lavatory of about 135 feet, all arranged en suite. A cleaner's room or closet of about 40 feet is necessary, and a small bell tower or fleche or turret arranged for.

General:—The church is to be designed with the view of employing (mostly for economy), materials at hand, and to withstand earthquake shocks. The materials at hand are ballast cement, wood, stone or marble, galvanized or bar iron, and imported roof coverings. The inserted features of whatever material, should be naturally applied and designed to express the true "Gothic spirit" of craftsmanship, but with local originality.

Drawings Required.—Plan, 2 elevations, 2 sections, (all to ¼in. scale), and a small sketch view (not necessarily "set up"). The ventilation to be shown.

Approximate Estimate and abridged specification or scheduled test of materials proposed.

Mr. Frank Peck, F.R.I.B.A., of Nelson has kindly set this subject.

Designs must be sent in finished as above, under a nom-de-plume, addressed to **Progress**, 8 Farish Street, Wellington, and marked clearly "Fifty-eighth Prize Competition" on outside with a covering letter giving competitor's name, and address of employer. Designs to be sent in by November 21st, 1917.

Our 59th Competition

We offer a prize of £1 1s. 0d. for the design adjudged to be the best for a

Main Entrance to an Art Gallery

The Art Gallery is proposed to be erected in one of the leading towns of New Zealand which has a population of about 12,000 people, and the whole building is estimated to cost about £12,000. It is to be a single storey building faced with white stone or white marble. The entrance is to be in the centre of a central projecting portion, and is to be reached by a short flight of steps—the floor of the building being about 3 ft. above ground level. The doorway or doorways are to be recessed a few feet, so as to form an open portico. As this is the chief feature in a building devoted to the fine arts, naturally there will be a certain amount of statuary, sculpture, etc., while the architectural treatment will be rich though restrained and refined. The style employed is to be Classic Renaissance, and the correct proportions of the Orders used with their various mouldings, etc., according to Vignola, must be carried out. The object is to enable the student to apply the knowledge he has acquired of the Classic Orders, in a practical manner.

DRAWINGS REQUIRED: Ground plan; front elevation: separate elevation of recessed doorways, side elevation, and section. Drawings to be inked in, and correctly rendered with sepia, the sectional portions filled in with Indian ink. Scale: ¼ in. to the foot.

Mr. Basil Hooper, A.R.I.B.A., of Dunedin has kindly set this subject.

Designs must be sent in finished as above, under a nom-de-plume addressed to "**Progress,**" 8 Farish Street, Wellington, and marked clearly "Fifty-ninth Competition" on outside with a covering letter giving competitor's name, and address of employer. Designs to be sent in by December 21st.

[*Note.—For conditions of entry in Progress Competitions see page 48.*]

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N.Z. BUILDING

PROGRESS

(With which is incorporated "The Scientific New Zealander")

A Journal for Progressive men interested in the development of New Zealand's Architecture, Building, Engineering and Industries

Editor: Chas. E. Wheeler.

Incorporating the Journal of the New Zealand Institute of Architects.

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WELLINGTON, AUCKLAND, CHRISTCHURCH, AND DUNEDIN, NEW ZEALAND, OCTOBER, 1917.

Contents for October

Editorial Comment

The Last Man in Industry

For over three years New Zealand has cheerfully gone ahead with its share of the war-winning effort of the Empire. We have sent more men than we were bound to send to keep up with our obligations, and sustain production of food-stuffs at a high level. Now the pace seems likely to slacken, not because of reduced enthusiasm, but for very practical reasons which cannot be ignored. Shipping has become a constant problem for the producers, and the scarcity of well trained labour is making itself severely felt. If we are to go on producing food-stuffs for the fighting men, how far can we go without prejudicing this essential work? If exports drop, the public revenue quickly shows diminution, and unfortunately the last quarter's receipts of the Consolidated Fund disclosed a substantial drop. Owing to restricted importations, the Customs revenue decreased to one-half the usual amount, while railway revenue also went down, though expenses necessarily are going up owing to the high cost of coal and other materials. Parliament sanctioned a heavy addition to the Expeditionary Force pensions and allowances expenditure, and showed a disposition to go still further until the National Government called "Halt!" There was talk of another taxing measure, and by the time this is published, we expect that Sir Joseph Ward will have asked Parliament for authority to borrow even more than the twenty-four millions which he estimated would suffice until next year. It is obvious that we cannot go on indefinitely burning the candle at both ends. In making his last Budget statement to the English Parliament, the Chancellor of the Exchequer spoke quite frankly of the financial strain, but added that our enemies

were suffering even more severely, and that we could more easily stand it. We shall now commence to feel the real strain of the war, and all resources in men and money must be carefully organised for the final effort bringing victory. The National Government has commenced to show a strongly cautious attitude in finance, and we anticipate that with the object of maintaining our exports, which are so valuable to the Mother-Country, it will also handle in the same spirit the problem of the depleted labour force of the country.

Nitrates from Air

Though the war has forced the pace of chemical manufacture and scientific development generally within the Empire, New Zealand has not gone ahead one iota in any practical respect. Millions of pounds worth of easily-harnessed water-power still run to waste, though for many years we have had in the official pigeon-holes exact data about the various sources of supply. It is reported that a few months ago a large syndicate endeavoured to secure from the Government the right to use Bowen Falls, Milford Sound, where it is said water-power can be turned to account much more cheaply than at a celebrated Norwegian hydro-electric plant which turns out large quantities of nitrates. This chemical is of the utmost value in a producing country like New Zealand, and although it can be manufactured here if there is an ample supply of cheap electrical current, we have been content to import. The Hon. Wm. Fraser, Minister of Public Works, vetoed the private syndicate's proposal, taking up the sound ground that New Zealand's water power is too valuable an asset to become locked up in private hands. He can obtain suport for this view from the history of the Parapara iron ore deposits, which have been hawked about by speculators without a single real effort to turn out manufactured iron. So many opportunities have been let slip that members of the House were recently disposed to criticise the Hon. W. Fraser for not giving the proposed nitrate syndicate an option over the Bowen Falls power, but he stuck to his guns, stating that for some time he had been in conference with Mr. Parry, Government electrical engineer, on the very subject of using that power for creating nitrates. He stated frankly to the people who desired to obtain these rights that they simply wanted to sell them to an American company. "I looked carefully through the papers I received about the proposed company, and it was full of American phrases," Mr. Fraser declared. The Minister, dryly, amid hearty laughter, continued: "If the Government is wise it will never part with its rights to any private company. I am certain that this power can be used in future in a most excellent manner for other purposes besides nitrates. (Hear, hear). In many of our mines are refractory ores that require to be electrically treated, and if the Government desires to go into this work a very big industry can be established." Opinion is Parliament is emphatic on the point that as the Lake Coleridge scheme in the South Island has been proved to be a success, the North Island should now have a turn.

Water Power

It is significant of the tendency of public thought that nearly every member who discussed the Public Works Statement recently in Parliament supported the development of the water-power resources of the North Island at the earliest possible moment, and that no stronger advocate of this policy was to be found than the Hon. Wm. Fraser, Minister of Public Works. The Minister believes that it will not be economical to establish a large central generating station, because the long distribution lines would involve a good deal of waste, and would be difficult to maintain. The principal sources favoured are the Waikato River at the Arapuni Gorge, where 120,000 horse power can be obtained on the basis of a 50 per cent. load factor based upon the minimum observed flow of the river during the phenomenally dry summer of 1915. It would cost £1,200,000 to develop this source and provide the initial power plant of 30,000 horse power, with trunk lines to Auckland, Te Kuiti, and Rotorua, serving all the towns within range. Wellington's best source of power is the Mangahoe River. This river rises on the slopes of Mount Dundas on the Tararua Ranges, and flows into the Manawatu near Woodville, and it is found that by diverting through the hills for a total distance of three miles there is made available the fall of 1,040ft. in the sixty-five miles of river between the Mangahao and the loop of the Manawatu near Shannon. It is proposed to develop this source by tunnelling through the range from the Mangahao into the Tokomaru Valley, there diverting a part of the Tokomaru, and then from the Tokomaru Valley through into the valley of the Mangaore, with a power-station situated within three miles of the railway at Shannon. Observations of the flow were made during last season, which was exceptionally dry, and are also being made during the present season, and based upon the dry-season flow it is possible to obtain 25,000 horse-power on a 50-per cent. load-factor basis by impounding the waters and taking advantage of the natural features of the country for the purpose. The Wellington City Council's steam plants would be valuable stand-by installations for this scheme in case of breakdown. The scheme would supply Wellington and the whole West Coast as far as Wanganui. Lake Waikaremoana is the most suitable source of supply for the East Coast district, including Napier and Gisborne, but the rough nature of the country will keep this scheme back until settlement has developed, and good roads are available to enable the transmission lines to be easily patrolled, and breaks quickly located. It is expected that the Lake Coleridge scheme will pay all charges, including interest and sinking fund during the current year, but the Government has been obliged to stop pushing for new customers owing to the absolute impossibility of getting machinery actually on order. Thus the chance of developing the North Island, power sources until the war ends is nil, though this will not prevent the capable and businesslike Chief Electrical Engineer, Mr. Evan Parry, completing his preparations for brisk work when the time arrives.

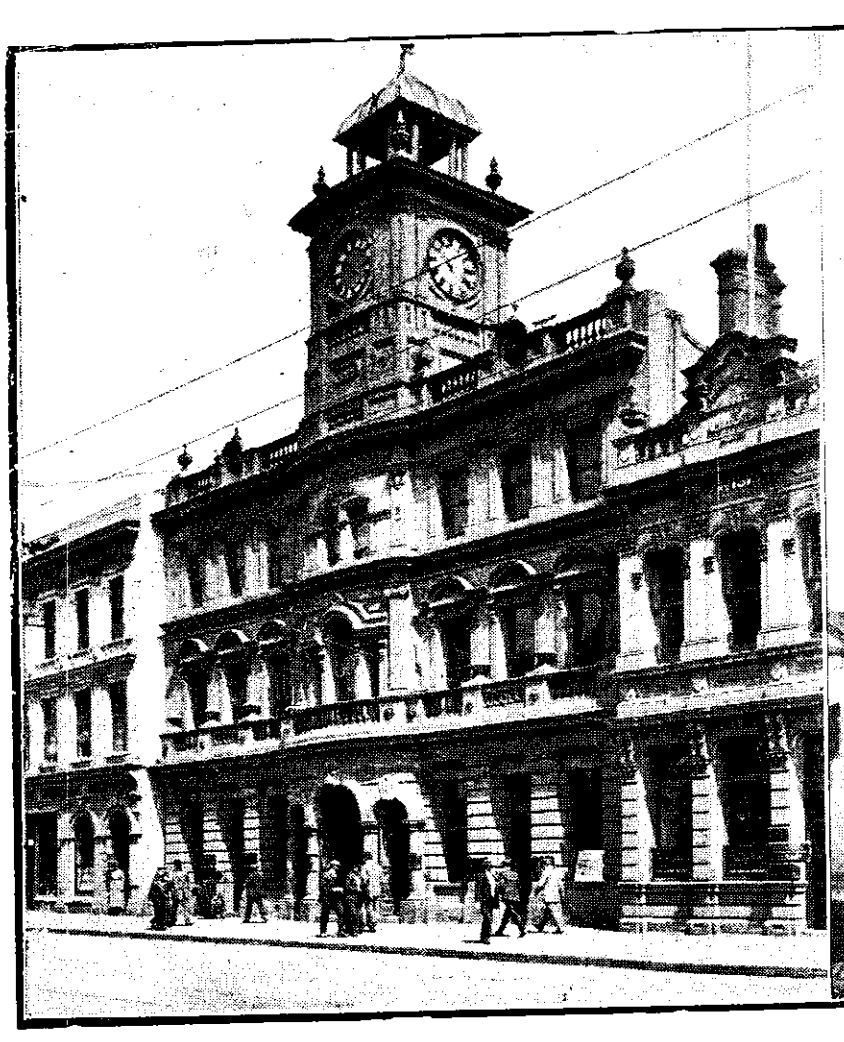
Some Recently Completed Buildings in Auckland.

New Zealand Insurance Co.

This building is now almost completed, there being only some stone work required to finish the exterior. We are unable to publish a photo of the completed building owing to this, and are therefore reproducing a perspective drawing. Illustrations are also shown of the old building which was demolished to make way for the new structure, and the clock which has been re-erected on a new tower in Featherston Camp.

The Company is now installed in the premises, and occupies four floors to the west of the building. The remainder of the structure is sub-divided into numerous offices for letting purposes, which are accessible from three separate street entrances, viz: Queen Street, Hill Lane and Exchange Lane. The main entrance is on Queen Street, and is twelve feet

The N.Z. Insurance Building, Auckland.
Messrs. Hargreaves and Prouse, and W. H. Gummer, A.R.I.B.A., Architects



The Old N.Z. Insurance Building, which has been demolished to make way for the new structure illustrated in this issue.

The old Clock, which has been removed from Auckland and now does duty in the Salvation Army Institute at Featherston Camp.

wide and lined with marble. It opens out into a hall with the elevators on the left and main stairs on the right, which lead to the upper floors.

Two of the three elevators are placed in this, the third being near the entrance at Hill Lane, where there is another stairway. The lifts will be worked automatically at night, but will be in charge of an attendant during the day.

The facade is faced with marble from the Kairaru quarries, Nelson district, the same stone that is being used in the upper stories of the new Parliament buildings, the principal feature being a lofty entrance portico with columns 35 feet apart to the height of the first two floors. The possibility of fire has been carefully provided against, the building being of steel frame construction with concrete floors throughout, so that should a fire start in any one floor, there is a very remote chance of its spreading any further. Steel frame windows and other fire proof devices are provided. The roof is flat and asphalted. The contractors for the building are Messrs. Grevatt and Sons, while the steel was supplied by Messrs. Wingate and Co. The electric lighting contract was let to Messrs. Tolly and Son, of Wellington, and the roofing and damp-proofing to Messrs. Mainland and Barr, of Wellington, while Messrs. Hansford and Mills supplied the marble work. Three lifts have been installed by the Electric Construction Co. of N.Z., two dual control, and one automatic control, each having a carrying capacity of 15 cwt., and travelling at a speed of 144 and 288 feet per minute, and serving ten floors.

New Premises for Messrs. Whitcombe and Tombs, Ltd., Auckland

Chilwell and Trevithick, A.R.I.B.A., Architects

The illustration shows a view of Messrs. Whitcombe and Tombs Ltd's. new premises, from Queen Street and Durham Street corner. It is a five storey building in reinforced concrete, flanking the south side of Durham Street from Queen Street to High Street, a distance of 187 feet 4 inches, with a 33 feet frontage to Queen Street. The rise from Queen Street to High Street, following the line of Durham Street, is about 20 feet, which entailed a considerable amount of excavation for the shop, which runs through on Queen Street level to High Street wall, practically giving free access to the public from one end to the other, as shown in our illustration. It is well lighted for its whole length, that portion nearest High Street receiving top light from a side arcade for a distance of 60 feet.

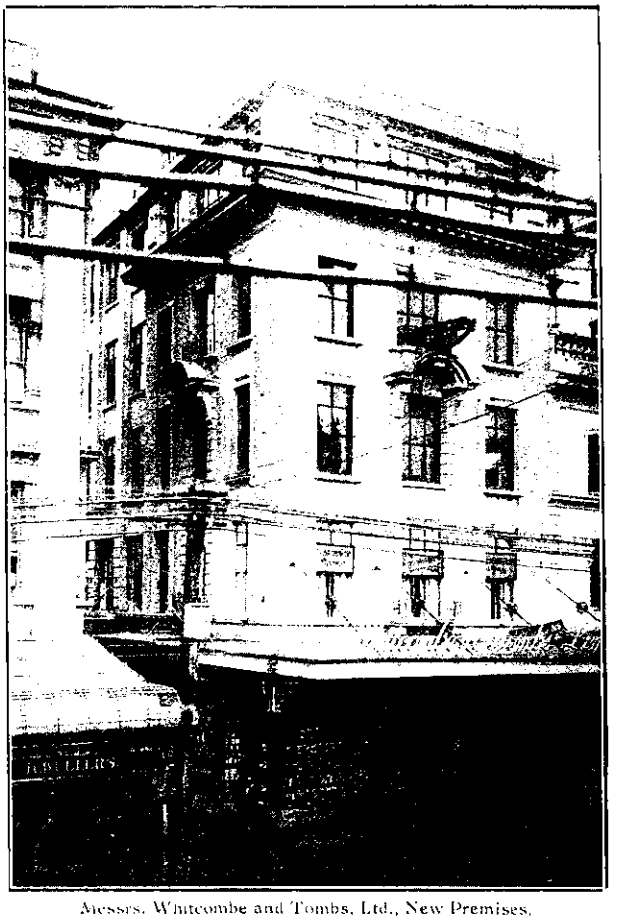
A staircase in addition to the goods and passenger lifts leads up from shop to offices and packing room on first floor, the remainder of the first floor being allotted to tearoom, with a separate public and kitchen entrance from Durham Street to same.

The factory entrance is from High Street, also cart dock and service to and from goods' lift, with parcel delivery from packing room, also strong room and lavatory mezzanine floors between cart dock and second floor.

The second and third floors are devoted to factory needs, such as folding, binding, litho., and machine work, with space for reserve stocks.

The fourth floor is designed with subsidery beams and floor slabs reinforced in both directions to take heaviest floor load, for paper and bulk store with Queen Street end, top lighted for linotype and composing room, and High Street end devoted to dining rooms for the firm's operatives.

The factory is served with two enclosed staircases well lighted, and two lifts, one of each being continued to roof of building, which is flat, and designed to carry full working load equal to second or third floor.



Messrs. Whitcombe and Tombs, Ltd., New Premises, Queen Street, Auckland.

Messrs. Fletcher Bros., Ltd., were the contractors, and associated with them are the following subcontractors:—A. and T. Burt, Ltd. (plumbing and electric lighting); L. Bater (plastering); Briscoe and Co., Ltd. (steel windows); Phillips and Impey, Ltd. (glazing); M. J. Bennett and Co., Ltd. (painting); Wilson and Kelly, Ltd. (ironwork); Carrara Ceiling Co., Ltd. (fibrous plaster); Neuchatel Asphalt Co., Ltd. (asphalt work); J. Bouskill (marble work); Fama Flooring Co. (floor covering); Redpath and Sons, Ltd. ("Rubline" floor covering); E. Bourne (tiling); C. and W. Hayward, Ltd. (fittings); Lamson Despatch Co., Ltd. (pneumatic cash tubes). The Electrical Construc-

tion Coy. supplied the two lifts installed, viz: One for passenger use, which has full automatic control, a carrying capacity of 10 cwt., and a speed of 145 feet per minute, the other is a goods lift, with switch-in-car control, and carries 40 cwt. at a speed of 100 feet per minute. Both lifts serve the five floors. Messrs. Chilwell and Trevithick, A.R.I.B.A., were the architects.

being fitted with book shelves for part of its length, to height of plaque rail.

On first floor there are five bedrooms, dressing room and bathroom, and sleeping balcony with direct access to the two principal bedrooms.

The walls, as seen from photograph, are rough cast picked out with a few eneautic tiles, and stained kauri trim, and roof covered with slates,

Interior of Shop of New Premises for Messrs. Whitcombe and Tombs, Ltd., Queen Street, Auckland. Chilwell and Trevithick, A.R.I.B.A., Architects.

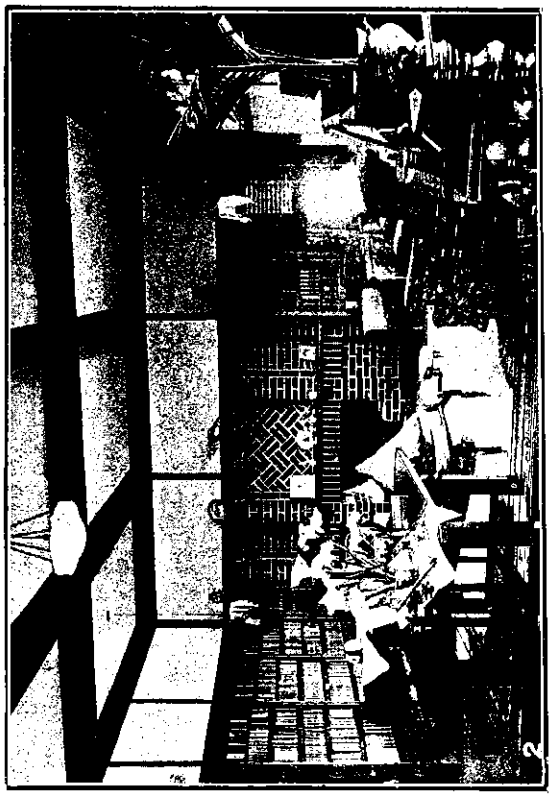
Residences.

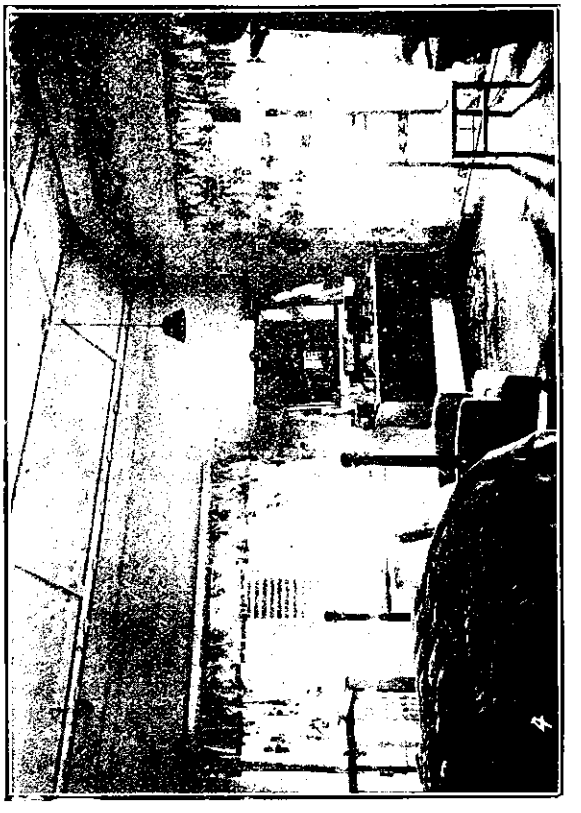
The house shown on page 36 is the home of T. A. Longuet, Esq., Kelvin Avenue, Epsom, and is sufficiently elevated to command ideal views of the harbour and surrounding district. The house is of the usual wood frame construction on brick foundations and sleeper walls, parts springing straightway from the surface rock, as seen in the near corner of the illustration, for this reason the brick base was not exposed to view.

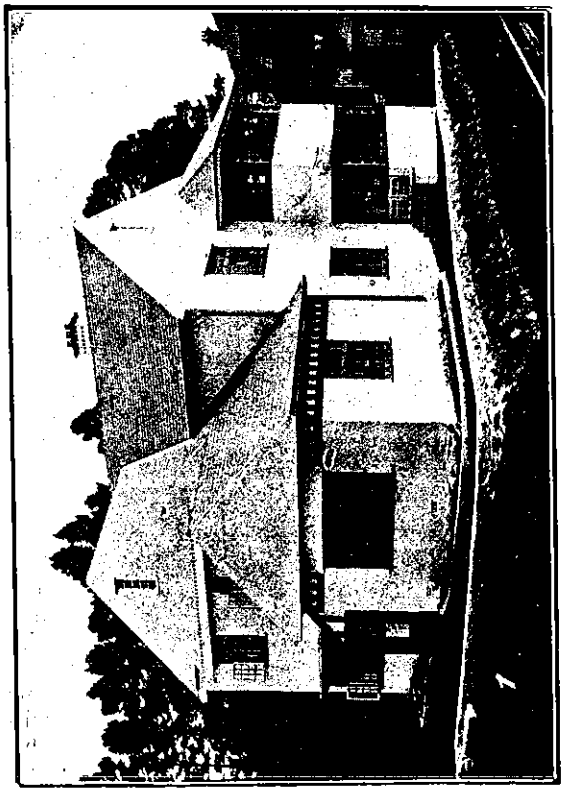
The main floor, comprising kitchen, servery and dining room, living and billiard rooms, is of wood, the remaining portion being the projecting wing, comprising bathroom, fuel and wash-house, etc., is of concrete, level with ground.

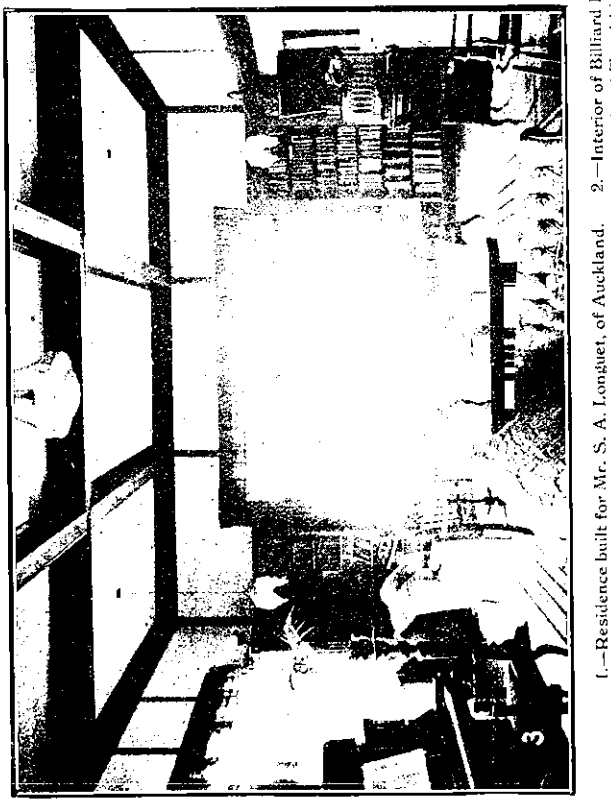
The billiard room is larger than usual, also serving the purpose of reception room and library, without eaves to main portion. G. H. Edwards, Grey Lynn, was the contractor, and L. Bater, Ponsonby, sub-contractor for the plasterer's work, Messrs. Chilwell and Trevithick, A.R.I.B.A., being the architects.

"Vital thing though ventilation be, it is seldom or never satisfactorily practised. Both natural and artificial ventilation are hampered by fears of draughts; and anxious experiments are made to discover exactly how many feet of air may be permitted to move per second and how much cubic space is necessary to allow change of air without draught. Fear of perflation, which is the best form of ventilation, renders perfect ventilation quite impossible, and makes the state of the air in many private houses and public places a disgrace to civilisation."—Dr. Macfie in "Air and Health."

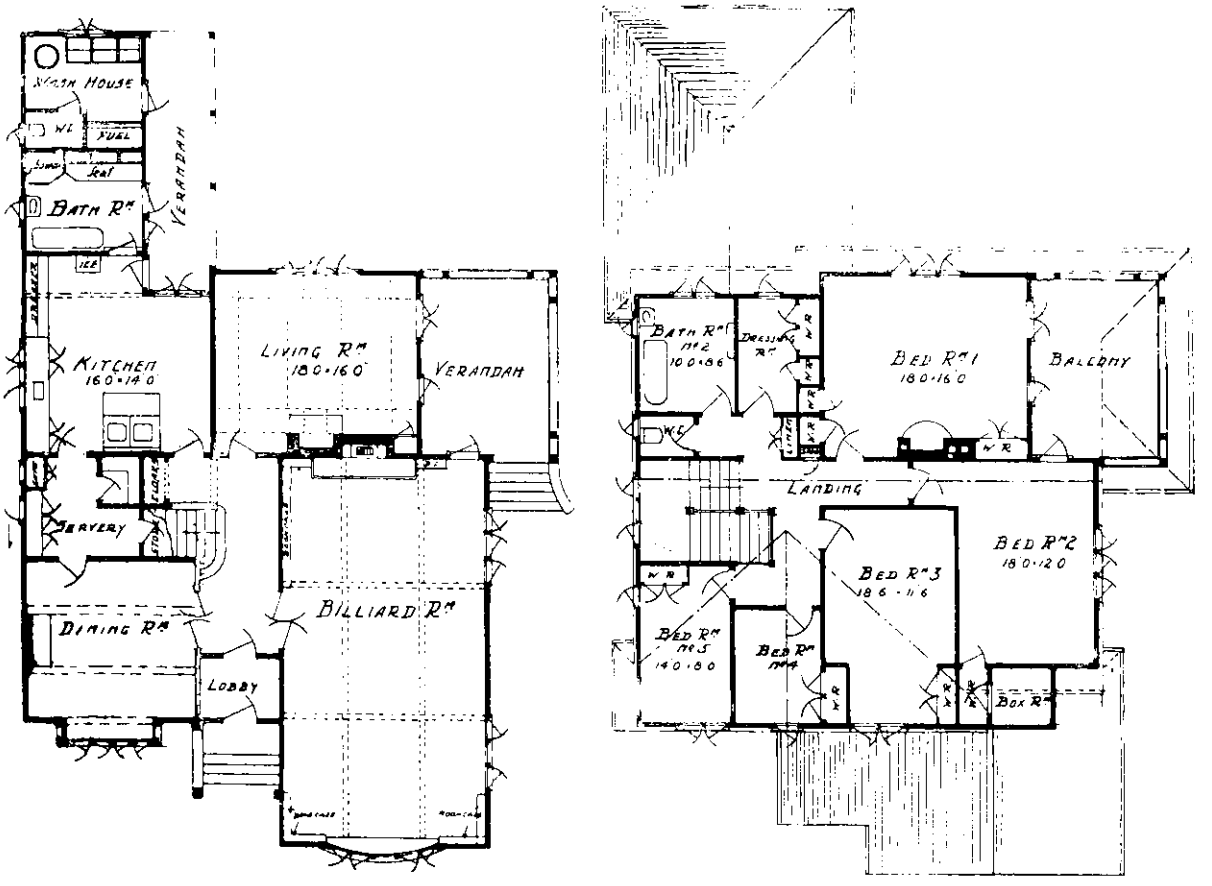








1.—Residence built for Mr. S. A. Longuet, of Auckland. 2.—Interior of Billiard Room looking west. 3.—Billiard Room looking east. 4.—Bedroom Interior
Messrs. Chilwell and Trevithick, A.R.I.B.A., Architects, Auckland.



Ground Floor Plan and First Floor Plan of House for Mr. Longuet, of Epsom, Auckland (illustrated on opposite page).
Architects: Messrs. Chilwell and Trevithick, A.R.I.B.A., Auckland

Auckland's New Market Buildings

The scheme for Market buildings now being carried out by the Auckland City Council comprises buildings Nos. 1 and 2, a third building having been planned, but its erection has been postponed until the close of the war.

A tenant has been secured for No. 1 building, which has been erected to his requirements: and for No. 2 building various tenants have been secured, so that from the outset the City Council are covered on the financial side. More detailed particulars of buildings No. 1 and 2 are as follows, but it may be noted that No. 3 building will, when erected, cover a ground space of 20,525 super feet:—

No. 1 building has a frontage of 113ft. 7in. to Customs Street extension, by a depth of 127ft. 2in., and has a total floor area of 38,625 super feet. The construction of the building is entirely of reinforced concrete, piers, beams, floors, staircases, etc., with cavity brick curtain walls to fill in externally, all on pile foundation.

The main building comprises three stories and a basement. It has one cart dock at front, and two at back of building, with shoots running from top floor right through to each cart dock. There is also a large electric goods lift and a sack lift, and a weighing machine on ground floor.

There is a large and up-to-date suite of offices on the ground floor, comprising six large private offices, and a general office 37ft. x 22ft., all thoroughly well lighted, the dividing screens being of obscure glass to height of door heads, above which is clear glass. Generally the offices and fittings, counter, panellings, skirtings, 'phone box, etc., are beautifully finished in heart of rimu.

There is a Fruit store (single storey) 125ft. x 45ft., specially designed for the storage of fruit, each one being enclosed only with ornamental wrought iron grids and gates, in lieu of doors and windows, so as to ensure a current of fresh air continually from end to end of the fruit store. There is a lunch-room, with a sunny aspect, on the first floor, also the usual separate lavatory and cloak room accommodation for women and men, and the building is lit throughout with electric light. There are over 80 large three-light windows to this building.

No. 2 building has a frontage to Nelson Street of 460ft. by a depth of 129ft., and is divided into eight separate premises. It has a total floor space of 120,000 super feet (making a total of 158,625 super feet of floor space for the two buildings.) The building is constructed generally of reinforced concrete piers, beams, staircases, etc., with cavity brick curtain walls externally, as for No. 1 building, but the

flooring is of wood, with the exception of a strip of 30 feet wide at front and back of building on ground floor running full length from end to end, which is of reinforced concrete, this being the portion where most of the trucking will take place. There will be the usual office accommodation, finished generally as for No. 1.

A lift well is provided to each premises, also cart docks at the back, and a concrete loading platform, running full length of building (460ft.) in front, six feet wide. It is three feet high supported on cantilever brackets, and sheltered overhead by a suspended awning.

In the centre of each roof there is a large area of roof lights (about 28ft. x. 22ft.) comprised of glazing bars and plate glass, with a light well of similar size in floor under, so as to efficiently light the centre of building. Two ventilators are placed on each ridge for ventilation. All the cart docks and openings to platform will be provided with steel roller shutters. There will be the usual separate lavatory and cloak room accommodation to each premises, and the building is lit throughout with electric light. Over 200 large three-light windows light this building. There are 113 reinforced concrete piles in No. 1, and 264 piles in No. 2 building, making a total of 377 piles for the two buildings.

Messrs. Fletcher Bros. have the contract for the erection of the buildings.

The Borer Again.

An interesting paper on the subject of the susceptibility of New Zealand timbers to the attacks of the borer was read by Mr. R. Speight at the Philosophical Institute, Christchurch, last month. Mr. Speight stated, says the "Press," that his observations had been made from a fairly complete series of New Zealand timbers, which were collected principally in the early days by Dr. von Haast, but added to by Captain Hutton. The timbers were in the Canterbury Museum and most of them had come from the forests that once grew in the province of Canterbury, notably those on Banks Peninsula; but representatives had been obtained from other parts of New Zealand, the total number exceeding 150. The museum had been exposed to the ravages of the borer, and the timbers were in a part in close contact with the wood which was seriously affected, and all were equally exposed to attack. Some of the timbers, said the lecturer, were immune, while others showed a varying proportion of affected specimens. It was frequently found that the sap was attacked while the heart wood was unaffected. This was especially the case with regard to the matai, commonly known as black pine. A considerable quantity of this timber had been used in the construction of the Museum, and the sap was almost universally affected, while the heart had invariably escaped, and was now so hard that it was difficult to drill it. It was somewhat remarkable that specimens of kahikatea or white pine, which was always looked on as one of the most susceptible of timbers, had been but slightly affected, although it had been badly attacked where used in the construction of the Museum building. The only reason the lecturer could assign for this was the experience of builders, who stated that timber from trees grown on hillsides or river terraces had more resistent properties than that grown on swamp lands, and that timber cut in the winter had superior lasting power over that cut in summer.

Continuing, the lecturer said, in view of the threatened shortage of local supplies of timber it was of importance that the utmost should be made of what we now had. A great source of waste was due to the ravages of the borer, which necessitated a considerable amount of timber being used in replacements. There was no doubt that this waste could be minimised by the adoption of methods of sterilisation in connection with building timbers. Some of these processes would not only prevent entirely the attacks of the borer, but would prolong the life of the timber as well, and have no deleterious effect on human life. A thoroughly satisfactory method of treatment had been found to be the soaking of timber in petrol in which carbolic acid and camphor had been dissolved. This specific had been effective as far as the petrol penetrated into the wood, and would therefore protect new timbers entirely. Both these substances would no doubt disappear from the wood in time, the former as a result of the action of water, since carbolic acid was slightly soluble in it, and the latter owing to its gradually passing off as a vapour. It was possible that the substitution of naphthalene for the carbolic acid would to some extent obviate these slight objections.

Housing Conditions and the Child

We note with pleasure that the Hon. J. A. Hanan, Minister of Education, has brought the matter of the care of the health of our children up before Parliament in his Report. In dealing with the Industrial School system in N.Z., he says that the question of the eradication of the slum areas of our towns and cities is one which demands the most careful consideration. It is a crime to place children in conditions that almost defy them to become healthy, decent, citizens. More care is taken over the rearing of stock than the rearing of children. The free kindergarten associations, however, are doing splendid work towards brightening the lives of city children, and in many cases stimulating parents to do more for the welfare of their children, and the Minister has, as far as possible, recognised the value of this work by arranging for an increased capitation and an improved status for the free kindergarten schools.

The report goes on to state that owing to the overcrowding of institutions under the control of the Department it seemed as if it would be necessary to provide: A fourth institution, at a cost of not less than £21,000, with a recurring annual charge of about £6000. A subsidiary institution on the Burnham school estate for the detention of incorrigible boys, at a capital cost of at least £8000 and an annual maintenance charge of £2500. The rebuilding on a much extended scale of the first division

building at Te Oranga Home, Christchurch, destroyed by fire some time ago. The cost of building was estimated at about £6000 and the increased annual cost at about £1400. Additional buildings at the Auckland Industrial School at a cost of £1500, carrying with it an increase of £650 in annual maintenance.

Workers' Dwellings

Although the cost of erecting the workers' dwellings seems to have been complained of a good deal, Mr. Massey seems to be inclined to go on building. He said he would like to erect a great many more this year than last. The Labour Department erected only 65 last year, and have 11 under construction now. Some mistakes had been made, he said, but in most cases the tenants were thoroughly satisfied. He hoped that when the war was over and building materials had fallen to normal prices, the Government would be able to build very many homes for workers. He said that he was taking quite a large sum for workers' homes this year. But it was not desirable to undertake a big scheme of building, owing to the high price of materials. If houses were built at present prices, the tenants would have to pay high rents for very many years to come. During the last five years, workers' homes had been built at the rate of about ninety a year.

Two Kinds of Unionism

Militant political trades unionism in Australia has had a fall, and its dreams of dominating the body politic by the use of extreme measures have turned out to be disturbing nightmares, with a bad effect upon the dreamers. The great Australian strike is practically all over and the strikers go back to work with lessened privileges. In New Zealand we frequently hear of the success of militancy, and a comparison of the pay and conditions made by the sword, so to speak, will sometimes make more constitutional trade union leaders wonder if the quiet policy is really best in the long run. When labour is scarce, the militant worker probably scores increases more quickly than the less aggressive man, but under normal conditions the latter is better off, for the industry in which he is employed is less disturbed and is consequently better able to develop and provide permanent employment. Though it is the custom in extreme unionistic circles to scoff at the Arbitration Court, it must not be forgotten that its minimum wage gives the worker some protection from the worst class of exploiting employer when times are bad. Public opinion, too, is a great factor in favour of the trades union which takes the constitutional course in securing redress of grievances. When the horse drivers of New Zealand secured an inadequate wage from the Arbitration Court a few months ago, they made their case public, applied reasonable means to impress their employers with their grievance, and although the latter were obdurate for a time, public opinion showed itself on the men's side, the pressure of public opinion was applied through the Government, and the men won. The industrial situation in New Zealand to-day is not altogether clear of clouds, but trades unionism on the whole is disposed to trust its case to sound argument rather than the big strike, therefore it deserves well of the community.

The Model City of the World

A proposal emanating from America in connection with the Tercentenary of the landing of the Pilgrim Fathers in Massachusetts Bay, has been under consideration for some time past to found in 1920 a model city which is to be the last word in city building. A site, it is said, has already been chosen—an area of about 50,000 acres south of Boston with a present population of 75,000 people. The population is to be 100,000 in 1920, and 500,000 in 1930, but apparently the date for the million has not been fixed. An attractive booklet has been issued by the promoters, and the following is of interest:—

"THE MODEL CITY OF THE WORLD."

"The World City of 1920 is epitomized by its projectors in the following terms:—

"A concourse for the Nations of the World, where Universal Peace shall be fathered and cherished."

"A Permanent Exposition where Art, Industry, Literature, the Achievements of nations shall be exploited in a Permanent Educational Festival."

"A Centre to which tremendous business enterprises will be compelled because of matchless facilities."

"A City of Homes fashioned after the last scientific word in twentieth century home building."

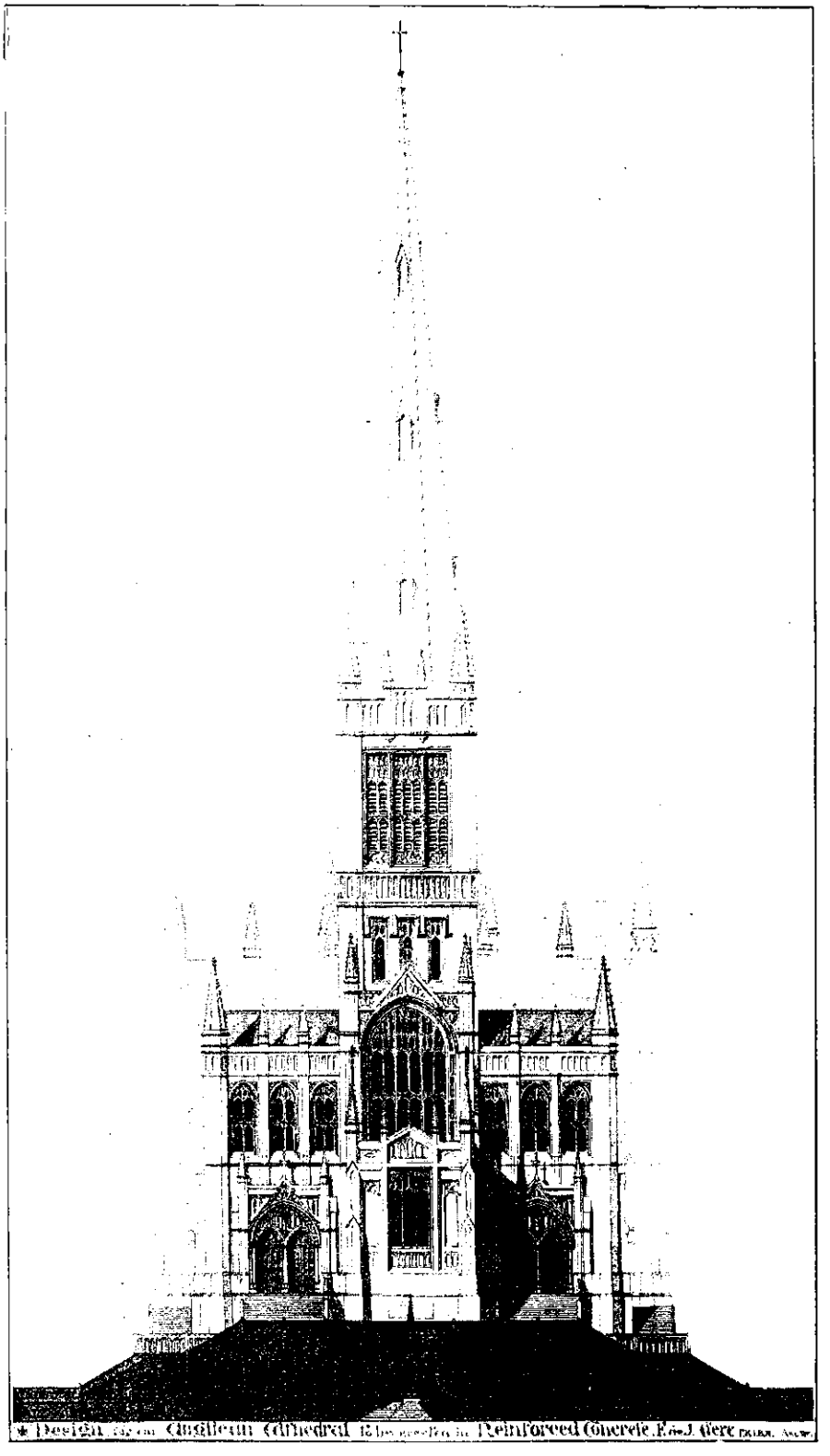
"An Ultimate Quarter to which the travellers of the world will make their pilgrimages."

Locally Made Roofing Shingles

The prohibitive price now ruling for corrugated iron is (says the "Tuatapere Guardian") causing a demand to be made at the local sawmills for roofing shingles. Quantities of shingles have already gone forward to Dunedin from the Longwood mills, and it is fair to assume that their adoption for roofing purposes will become general in the near future, thus giving back to sawmillers a branch of their business that has lain dormant for close on 40 years.

Local Marseilles Tiles.

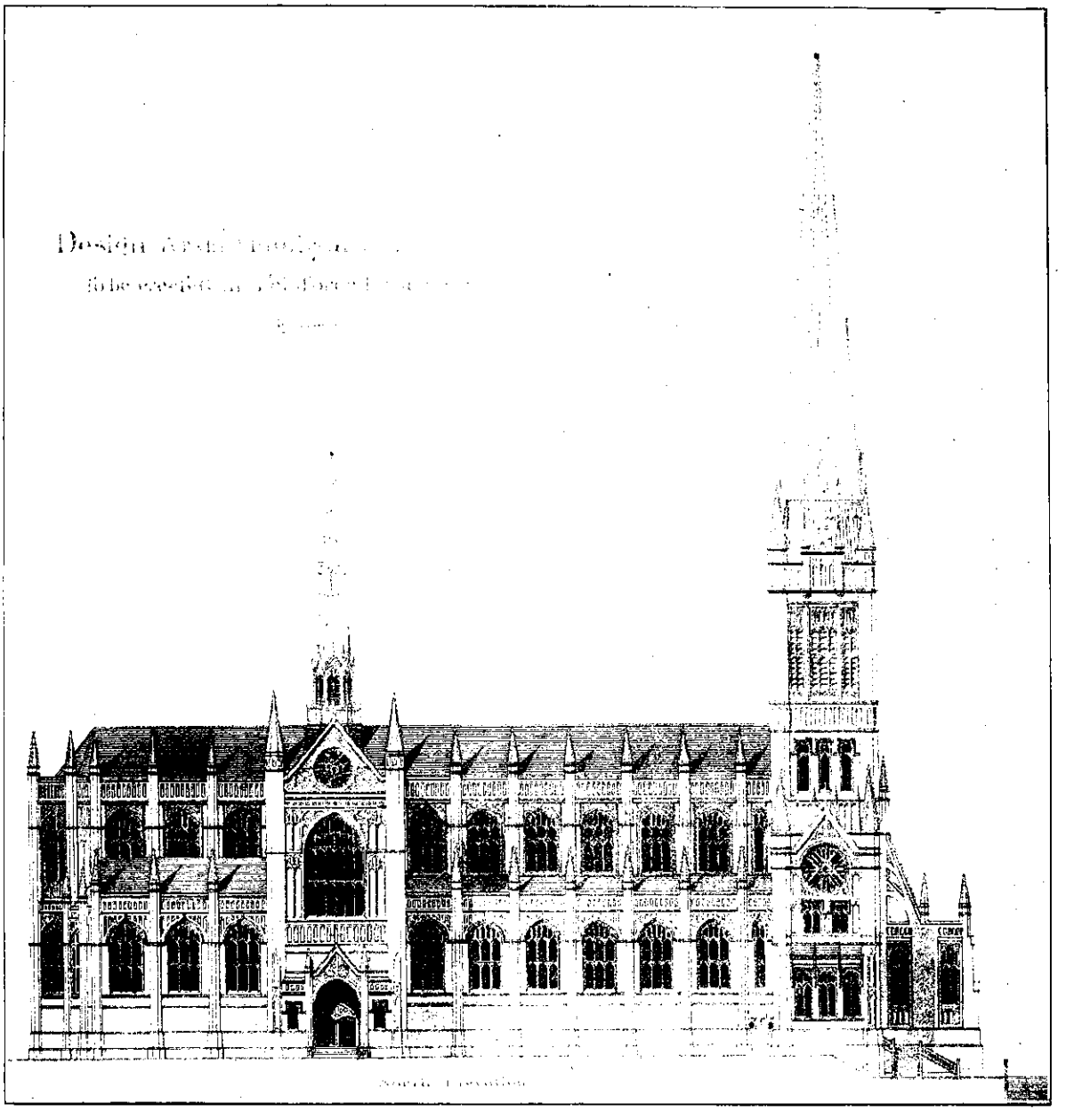
Persons who think about building, and are pondering over the war price of materials (says Otago Daily Times), will be pleased to learn that Otago is about to manufacture roofing tiles of the Marseilles type, and also of the much-desired shingle type. Architects have been wanting to use the shingle tile, but the expense has been prohibitive except in the few cases where money is no object. Relief is in sight in the formation of a company to take over the Abbotsford pottery works, which are to be extended and developed on big commercial lines.



West Elevation

Design for an Anglican Cathedral to be Erected in Reinforced Concrete.
F. de J. Clere, F.R.I.B.A., Wellington Diocesan Architect.

(Note.—A perspective drawing together with descriptive matter were published in our September issue.)



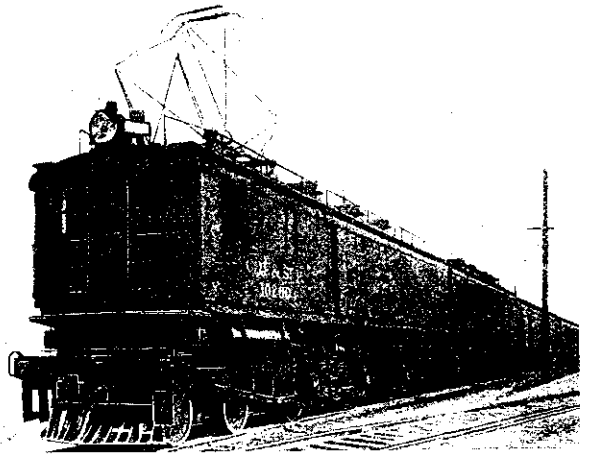
North Elevation

Design for an Anglican Cathedral to be Erected in Reinforced Concrete.
F. de J. Clere, F.R.I.B.A., Wellington Diocesan Architect.

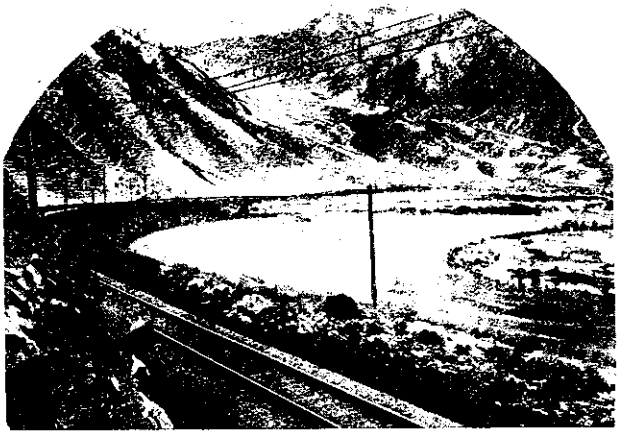
Electrified Railways—
An American Example

By WILL LAWSON.

Among the dreams which New Zealanders permit themselves is that which embraces an electrically driven railway system, for which the power will be provided by harnessing the rivers and falls which are conveniently situated for that purpose. Some day, no doubt, this dream will materialize; and the Auckland–Wellington trunk line, among others, will be operated by electric trains. To the steady-going people—and politicians of this country, such a change appears to be something almost unattainable and only to be achieved after years of waiting. But in America they do these things quickly; and the manner in which 440 miles of line of the Chicago, Milwaukee and St. Paul railway, was converted from steam to electricity should interest those of us who hope for the ultimate electrification of the 425 miles which link Wellington and Auckland and the 369 miles of track between Christchurch and Invercargill.



An Electrified Railway in America. The Mountain district of the Chicago, Milwaukee and St. Paul Railway has been Electrified for a distance of 440 miles.

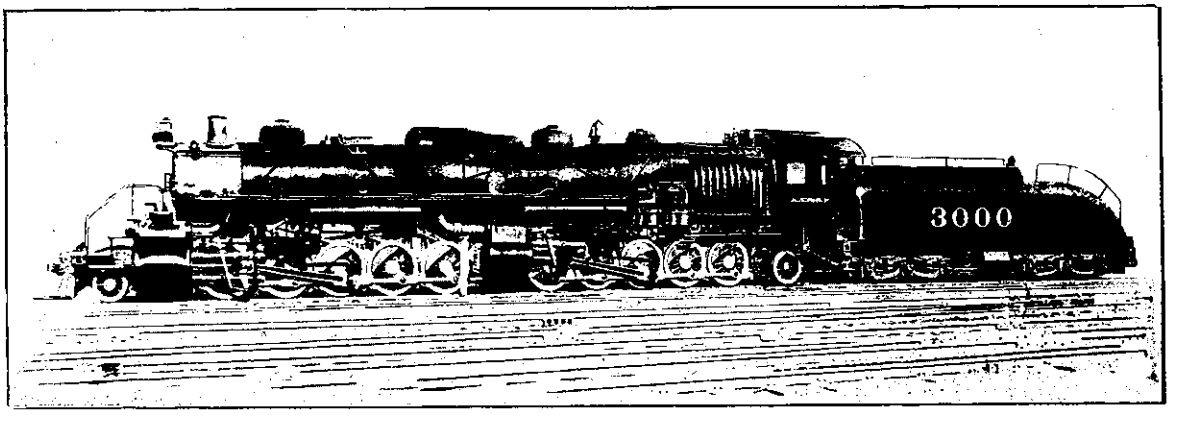


A glimpse of the Scenery the Electrified Railroad passes through. The Jefferson River Canon, Montana. Note the Cable supporting the Trolley Wire.

The length of railway to which electric power has been applied runs from Harlowton, Montana, to Avery, Idaho, and crosses the great continental linking range of mountains. It affords a smokeless, dustless and gasless main line route for 440 miles through the Rocky and Bitter Root Mountains and the line and its equipment are regarded as the last word in all those factors which conduce to the safety, comfort and pleasure of the travelling public. The total cost of the colossal work was £2,400,000 and it took three years to complete it. What the change means may, perhaps be illustrated most effectively by comparing the two types of locomotives which, respectively, were employed before and after the change was made. While not exactly the largest locomotives in the world the steam engines that formerly hauled the trains were enormous—monstrous in fact, if judged by New Zealand standards. The largest engine in the world is illustrated in these pages. It belongs to the Atchison, Topeka and Santa Fe line and its total weight is 387 tons. The engines of the Chicago, Milwaukee and St. Paul were not far short of this and their coal and oil bills were almost unbelievably huge. To-day the mountain torrents of the line supply all the power that is needed, and this power is delivered on insulated lines to 14 sub-stations, from which it is carried on the overhead wires (the dangerous third rail is not used) to the fast moving, powerful electric locomotives. There are no coal stacks, no cinder pits, no smoky engine houses. A coal stack has no terrors for the Chicago, Milwaukee line. And the cost of the power is much less than it was in the days of steam. Two sumptuous de luxe trains, the "Olympian" and the "Columbian" provide a superb service between Chicago and the Pacific North Coast, and when these trains come to the mountain section the electric locomotives are coupled on and through the tunnels and water sheds that once were dread places of smoke and sulphur fumes, the trains glide at an even speed. Grades are mounted with less effort than before. To give an idea of this immense advantage, a two per cent. grade—1 in 50, in other words—had to be surmounted for a distance of 20.9 miles on the last approach to the Divide; immediately west of the Divide, for a distance of 10.4 miles, there is a 1.66 per cent. grade; and on the western slope of the Big Belt mountains, for a distance of 40 miles, there is a 1 per cent. grade—where the line climbs 52.8

feet to the mile. These grades make steam haulage difficult for long, heavy trains, especially in winter. To-day electric locomotives not only haul heavier trains more smoothly over these grades, but travel at much greater speed than when steam was used. And weather makes little difference to them.

The electric power is delivered from the power houses to the sub-stations in 100,000 volt alternating current. At the sub-stations this is converted into a 3,000 volt direct current and in that form it goes to the locomotives. This reduction is accomplished as follows: The 100,000 volt alternating current is received through oil-switches, is conveyed to the high tension distributor, made up of three lines of copper tubings. From the current distributor the current is conducted through other oil switches to the transformers, entering at 100,000 volts and emerging at 2,300 volts—still alternating current. The next step is to convert to a direct current. The current passes through oil-switches and the motor generator sets and provides the power to operate



This is the largest Locomotive in the World, and belongs to the Atchison, Topeka & Santa Fe Railroad Co. The white line against the 3rd. Driving Wheel represents the height of an ordinary man. Length 121 feet 7 inches. Weight 587 tons. Drawbar pull 110,000. Driving Wheels 5 feet. Cost £8,800.

them. These motors are of the 60-cycle synchronous type which means that the current changes its direction sixty times each second. Each set generates a 1,500 or 2,000 volt direct current and the two generators employed, being permanently converted in series, delivers a combined direct current of 3,000 volts, which is the highest voltage direct current that has been adopted for railway work in the world. By way of comparison—the direct current used on electric tramways is only 550 volts. After passing through the control switches the 3,000 volt current is conducted to the feeder and trolley lines and, through the pantagraph—as the trolley frame is called—to the motors of the locomotive.

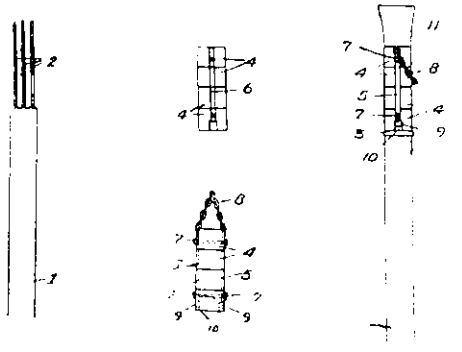
The overhead equipment presents some unusual features. To eliminate any likelihood of the trolley wire breaking and falling to the earth, a strong steel cable, called a "catenary" runs just above the trolley wire and parallel to it all the way. From this cable the trolley wire is suspended by hangers at short intervals. Single poles, each bearing a bracket support the catenary and it supports the trolley wire at curves and in station yards, "cross span" construction is used. The trolley wires of which there are two, are of 4/0 size, and are specially made for high voltage electrical power. They are the largest diameter copper wire employed for this purpose. The so-called twin conductor trolley wire has been installed after careful investigation and experiment. This form of construction permits the collection of heavy current through the twin contact of the pantagraph with the two trolley wires, and assures sparkless collection under all speeds.

Under normal conditions, 42 immense electric locomotives are required to haul freight and passenger trains over the electrified mountain districts of this railway. These locomotives cost about £22,400 each. They weigh 284 tons each and will haul 3,200 ton loads up a 1 per cent. grade at an average speed of 16 miles an hour. Similar locomotives, geared for greater speed will haul 800 ton passenger trains over the same stretch of road at a speed of 25 miles an hour and on a level run, at 60 miles an hour. To appreciate the tractive strength of these electric Goliaths, let it be said that the present day Mallet-steam locomotive has a tractive force of 76,200 pounds while these electric locomotives have a tractive power of 85,000 pounds. They measure 112ft. 8 in. in length and are driven by separate motors twin-geared to each of eight pairs of driving wheels. The cab extends over nearly the whole length of the locomotive.

There is a sermon for New Zealanders in this achievement of an American railway company. The cost of electrifying a similar stretch of line in New Zealand, moreover, would not be as expensive. Train loads are much lighter here. Where an American passenger train load runs to 800 tons, the express train in New Zealand rarely exceeds 300 tons, and freight train loads are likewise much less. This would mean that smaller locomotives, lighter lines, and lower power would be required. And the initial cost would be the heaviest. What the exact saving in running charges will be, have yet to be ascertained: the electrical operation of the Chicago, Milwaukee and St. Paul mountain section, began last year. But it is certain—was certain, in fact, before the work was undertaken, that the saving would be considerable.

Patents of Interest to Builders.

Reinforced Concrete Pile, Driving.—A patent No. 38,605 has been taken out by E. A. Clark of Waihi, Auckland. According to this invention, the pile is constructed with the concrete stopping short of the reinforcing-rods, at the upper end of the pile; and means are provided comprising a series of perforated blocks,

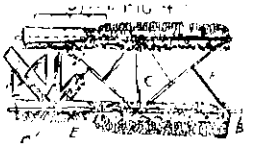


which are removably fitted over the exposed portions of the rods, and rigidly connected together, for the purpose of enabling the pile to be driven without in any way injuring or displacing the reinforcement.

Reinforced Concreting.—A patent No. 2,385 has been taken out by W. C. Davis of Victoria. To form ornamental rustic railings, fences, bridges, parapets, &c., rough-cast concrete is built up around a skeleton framing of reinforcing tubes and rods laid in a mould formed in the ground.

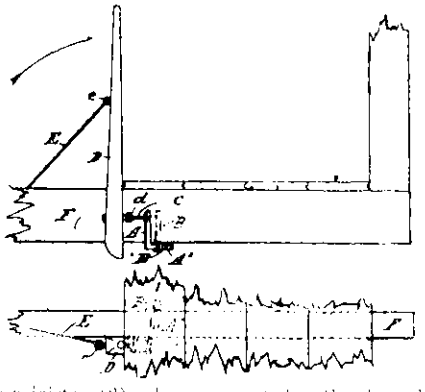
The frame of a fence panel, formed of tubes **A** and **B**, rods

C, and wires F, is placed on the ground which is scooped out to form the mould bed. The frame is then removed and the mould



is lined with concrete and the wire netting I, and the frame being replaced the concrete and netting are built up as required.

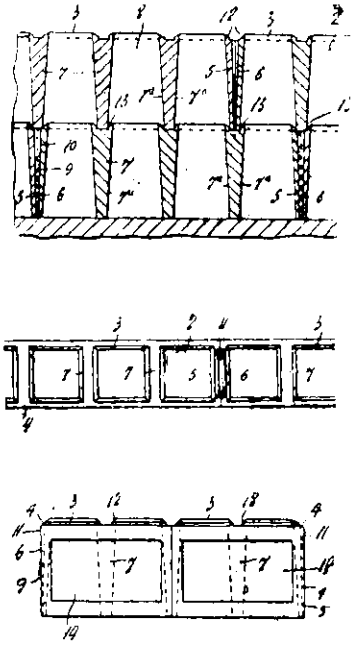
Cramp for Flooring Board.—A patent No. 38,074 has been taken out by Richard A. Tyler of Broadwater, N.S.W. carpenter, for a cramp. The improved cramp consists of a combination of three main parts, viz.: (1) A clamp having a toothed or serrated member or limb that will be temporarily secured



obliquely to a joist; (2) a lever connected to the clamp by a link. The rear side of the lever will be provided with an articulated spike, which will prevent the lever from receding from its position when it butts against the edge of the last flooring-board. In giving effect to the invention the clamp will

be laid obliquely under (or over) the joist at a point a few inches back from the edge of the last board laid, and in such a position that the lever shall be nearly upright, impinging against the edge of the last board laid. The lever will then be pushed or pulled inwards towards the section of flooring that is being laid, the eye on the lever (to which the link is articulated, connecting the lever with the clamp) being the fulcrum, thus making the lever one of the second class. The clamp will be made adjustable to the varying sizes of joists to which it may be applied. The implement may be used with flooring-boards, ceiling-board, match-boarding, and the like.

Building Block.—A patent No. 38,896 has been taken out by Wm. Lewis Packman, motor engineer, and Jas. Lewis of Pembroke Street, gasfitter, both of Carterton. The block is made with a plurality of vertical compartments or apertures, preferably four in number, and around the top of each aperture is a lip or projecting rim forming a rebate, which lip or rim fits into the bottom of the aperture of a superposed block. The partitions at each end of the block have an aggregate thickness equal to the thickness of the intermediate partitions of the block. Both sides of each partition and the inferior sides of



the block are sloped to permit the ready withdrawal of the cores whereby the apertures are formed. The outer sides of the end partitions are also sloped, forming a tapering gap for the reception of cement, which is poured therein for the purpose of uniting the ends of adjacent blocks. The lips around the top of the apertures are sloped so that, when a superposed block is in position, a channel is formed for the reception of cement, which is poured down the sides of the compartments. The exterior of the sides of the block is divided into two panels, so that when the blocks are laid with one compartment at the end of each block overlapping a compartment of another block the bond is preserved throughout the structure.

Building Notes

AUCKLAND.

During the month the foundation stone to a new annexe to the Mater Misericordiae Hospital was laid. The addition to the hospital comprises a separate block in brick, only the first section of which is to be erected at present. This section will, at a cost of about £5,000, provide 17 single bedrooms for patients, and will include an up-to-date operating-room, besides a surgeons' room, X-ray-room, chemical laboratory, and anaesthetic

chamber. At the rear of the building will be a new sanitary tower of a temporary description. Mr. D. P. Patterson is the hon. architect and Mr. C. A. Jones the builder.

The North Auckland Freezing Co. after a good deal of discussion have resolved on the motion of Mr. Vernon Reed, that the directors be authorised to erect the works on the railway line between Okaihau and Opua, and if they considered any other site to be to the advantage of the company they shall consult the shareholders before coming to a decision. The new company has been successfully floated, 37,600 shares having been applied for.

At a lecture given in the Grafton Library last month Professor Maxwell Walker said in regard to applying Continental town-planning schemes to Auckland city, that the present time was most opportune for carrying out extensive beautifying schemes, as in the near future the high price of land would prevent the consideration of such ventures. Several schemes, including the laying out of the new Auckland railway station, were outlined.

The scheme by which the Mangere Road Board should assume control of the Mangere water supply, in place of the Domain Board, was approved at a recent meeting of Mangere ratepayers. Application has been made to the Government for a loan of £3,000 for reticulation purposes, and a rating area is now being defined. Water will be drawn from the Onehunga reservoir at a cost of 10d. per 1,000 gallons. It is hoped that the system will be in working order before the dry weather sets in.

Auckland, like Wellington, badly needs a new museum building, and a movement is on foot to gather in donations for the purpose of erecting a suitable building after the war.

The creditors of a bankrupt builder named T. H. Williams passed the following resolution with one dissentient:—"That creditors are of opinion that bankrupt has been guilty of fraudulent practices, and request the official assignee to take proceedings against him."

Messrs. Wade and Wade called for tenders early this month for a house at Feilding. Tenders were called for the erection in brick of an Infant School at Newmarket for the Education Board.

CHRISTCHURCH.

During August the permits issued for buildings were as follows:—Central ward (Inner) 2 permits, value £6,320; (outer), 5 permits, value £1,430; St. Albans, 14 permits, value £8,425; Linwood, 7 permits, value £3,330; Sydenham 2 permits, value £450. Total 30 permits valued at £19,955.

Tenders were called for additions to Nurses' Home at the Christchurch Hospital by Messrs. Collins and Harman, architects, during the month, and Messrs. Panton and Sons, architects of Timaru called for tenders for additional insulated storage at the New Zealand Refrigerating Coy.'s Burnside Works (Dunedin).

Messrs. England Bros. also called for tenders for the erection of Catholic School, Ferry Road.

Some interesting statements were made in Christchurch at the recent hearing of the Plumbers' Dispute which apply generally to all allied building trades. Mr. J. S. Douglas, master plumber, in speaking on the apprentice question said that he was of opinion that every inducement should be made to get young men into the trade. He also though that apprentices should be encouraged to take advantage of technical education, though were they compelled to attend those classes in the day time it would be a serious matter for the trade. If the employers had to give such time to apprentices, Saturday morning would be the most suitable. The time for attendance at the classes might perhaps be that when an apprentice was most required at his work. The witness was also in favour of a probationary period for apprentices, and of a recognised body being authorised by the Court for the purpose of granting certificates.

J. H. Howell, director of the Technical College, said that six plumbers' apprentices were at present taking the course at the college. If the Court decided that apprentices should take their classes on Saturday mornings, witness had no doubt that the Board of Governors of the College would be pleased to make arrangements accordingly.

J. D. Colville, master plumber said with regard to the demand for time off for technical instruction—two half-days—that he opposed it at present, because of the restrictions that the Union sought to impose on employers, such as the fairly lengthly period that an apprentice must work under the supervision of a journeyman. The restrictions of the New Zealand Plumbers' Registration Board such as the provision that no certificate shall be issued to an apprentice until he has completed his sixth year, was another reason. Witness said that he would be willing to pay school fees for night classes, and increased wages on condition that the apprentice earned all possible capitation, and showed satisfactory progress by passing his examinations.

Conditions of "Progress" Competitions

The Editor reserves the right of publishing any or all the designs submitted, and while every care will be taken of drawings, no responsibility is accepted should any loss or damage be sustained. Those desiring their designs returned must send postage to cover cost of same. No award will be made unless at least three designs are sent in for any one competition. Unless otherwise stated drawings are to be in black and white only.

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"N.Z. Building Progress" is posted each month through the G.P.O. at Wellington. If any subscriber should not get his copy, another will be sent him if we are notified in good time. The paper is supplied from year to year only, and if subscribers continue to receive the paper after expiry of the current year, we shall accept it as an intimation of their desire to continue for another twelve months. We undertake to supply the paper for such further term. Notice of discontinuance must be sent to the Manager, 8 Farish Street, Wellington in writing, as no Agent has authority to receive notice of discontinuance on our behalf. The subscription is 7/6 per annum. A discount of 1/- will be allowed off this amount if subscription is paid in advance.