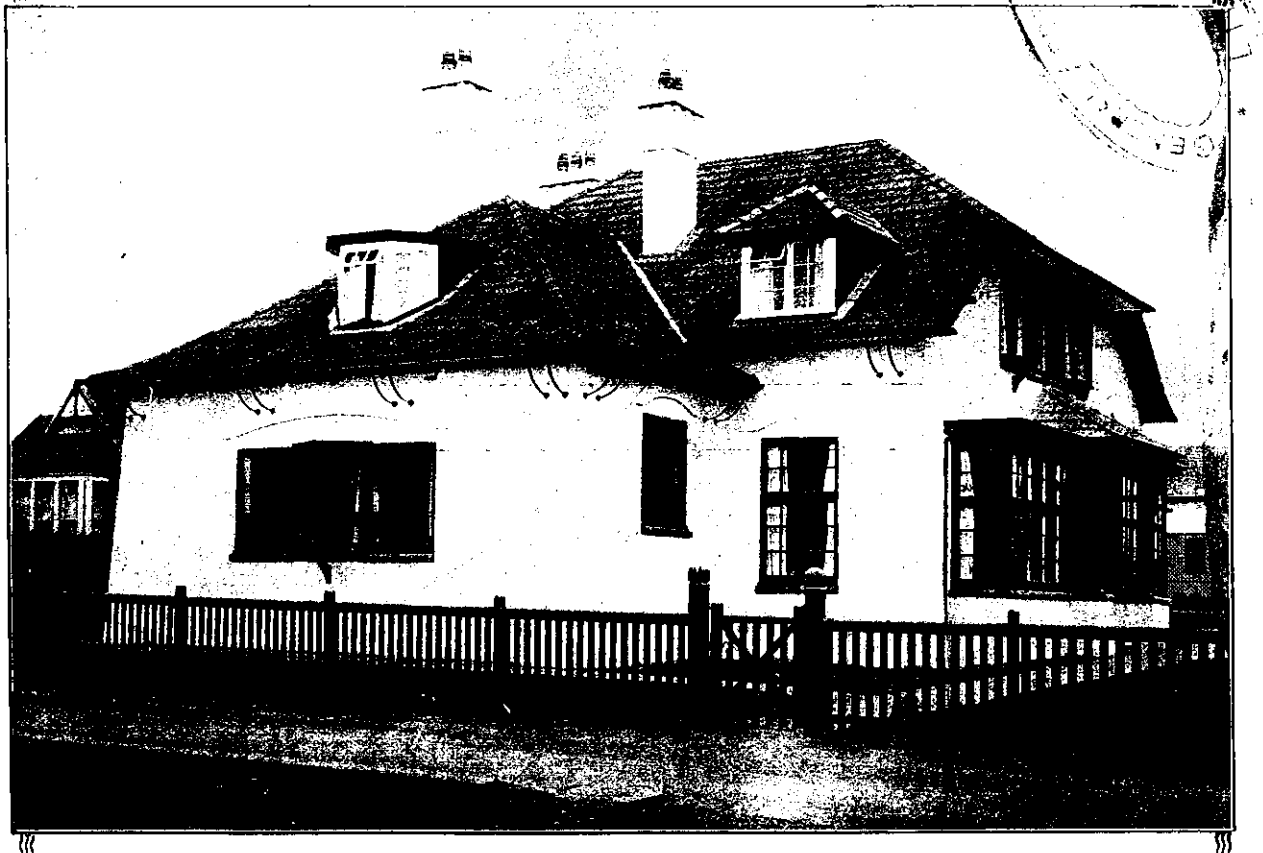
NEW ZEALAND MARBLE

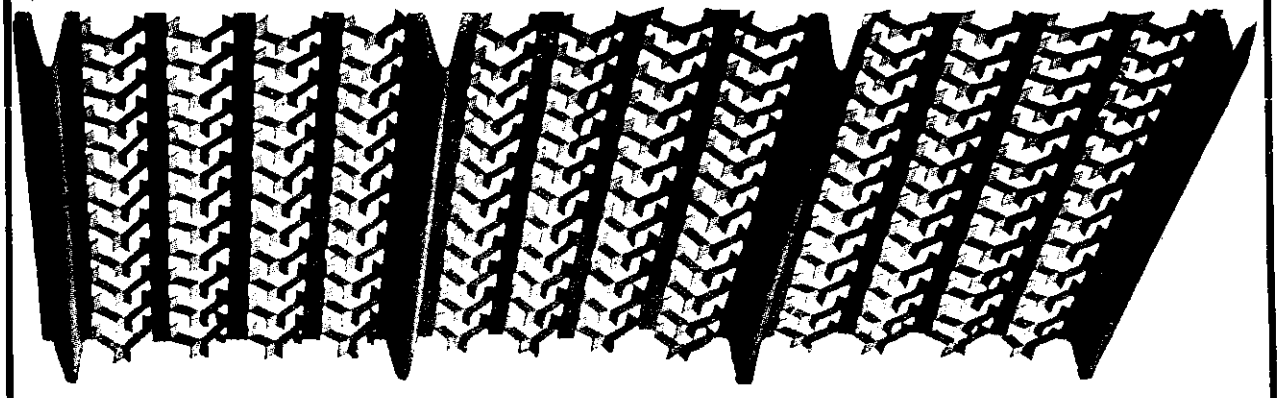
N.Z. BUILDING PROGRESS



Residence in Oamaru, built of Oamaru Stone, rough cast, tiled roof.
Basil B. Hooper, A.R.I.B.A., Reg. Arch., Dunedin.

MARCH, 1916. | Price 6d.

Printed by the Proprietors, HARRY H. TOMBS, Ltd., at their registered Printing Works, 8 Farish Street, Wellington, March 1916.



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N.Z. BUILDING PROGRESS.

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N.Z. BUILDING PROGRESS

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To Our Advertisers—All copy for advertising matter must be in our hands by the 1st 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.

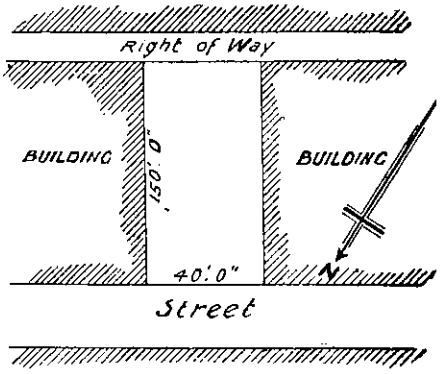
Our 41st Competition

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

Suburban Bank

situated on a 40ft frontage with a depth of 150ft. Level site with right of way at back as per diagram. Building to contain the following accommodation:—

Ground floor: Banking chambers for six clerks including accountant; Manager's room, Book and stationery room, Strong room,



Drawings required: to ⅛" scale. Plan above ground level showing dressing rooms, pools, etc., and linking up the buildings with the surrounding grounds. Plan through main water tank, one cross section, three elevations and any other sections and plans necessary to properly explain the design.

Cloak room, Lavatory and W. C's. Ample space must be provided for the Public for writing cheques etc.

Separate entrance to first floor.

First floor: To be arranged for Manager's residence and to comprise the following:—Drawing room, dining room, four bedrooms, bath, kitchen, and offices, and to have a back way down to yard.

The building to be of brick construction with a stone, or brick and stone front elevation.

Drawings to be to a scale of 8ft to an inch and to consist of plans of each floor, section, and two elevations, also ½in drawings of fittings in Banking chambers. Provision in these to be made for two tellers.

Drawings to be finished in black and white without shading of any kind, except in the case of elevations, where a flat tint of pale Indian ink may be used on the door and window openings.

Cost to be stated and to be as economical as possible.

Mr. Wm. H. Dunning 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, "Forty-first Prize Competition" on outside with a covering letter giving competitor's name, and address of employer. Designs to be sent in by April 21st.

Our 42nd Competition.

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

A Holiday Cottage

The cottage is to have three rooms only, a living room (about 16 ft. x 13ft.), and two bedrooms (each 13ft. x 9ft.) The bedrooms are to have bunks. It is to be constructed of wood in a simple and cheap manner. A tank is to be shown to collect rain water from roof.

Each set of drawings is to be on one small sheet, to be drawn to a scale ½in. to a foot, and to consist of plan, elevation, and section. Drawings are to be inked in, and shaded with diluted Indian ink. Any notes competitors wish to make are to be made on the drawings.

Mr. Leslie Coombs 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 "Forty-second Prize Competition" on outside with a covering letter giving competitor's name, and address of employer. Designs to be sent in by May 10th.

Our 43rd Competition

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

Small Club.

Accommodation required:—Dining room about 1,200 feet super with necessary kitchen accommodation; card rooms each about 400 feet super; secretary or committee room about 300 feet super, with strong room; reading room about 800 feet super; billiard and smoking rooms; porter's room; cloak room and lavatories, also stores and room for cleaners, etc.

The building to have spacious vestibule and entrance hall, also good staircases and lifts.

The building is to be placed at or near the street line and the frontage is restricted to 40 feet.

Drawings required:—Plan of each floor, one or more sections and front elevation all to be drawn to a scale of 1 inch. A detail of some prominent portion drawn to a scale of 2 feet to 1 inch.

Perspective drawings optional. Drawings may be in any medium.

Mr. G. A. J. Hart, (Lic., R.I.B.A.,) 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 "Forty-third Prize Competition" on outside with a covering letter giving competitor's name, and address of employer. Designs to be sent in by June 10th.

Vol. XI. No. 7. Monthly

REGISTERED AS A NEWSPAPER

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

Official Organ of the Institute of Local Government Engineers of N.Z.

Editor: Chas. E. Wheeler. Editor of Engineering and Motoring Section: Robt. Whitson

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WELLINGTON, AUCKLAND, CHRISTCHURCH, AND DUNEDIN, NEW ZEALAND, MARCH, 1916

Contents for March

Editorial Comment

New Zealand Marble.

The appearance on the market of a good quality of New Zealand Marble will be welcomed by our architects, who will be glad of the additional scope thus given to them in planning good architectural and decorative effects. The Dominion is fairly well off for building materials, but marble has hitherto been a scarce commodity, imported from a distance. Now it is quite certain that all the marble required for building purposes in this country can be obtained from the Kairuru district at the head of Golden Bay. The timely help of the Government in constructing a long tramway through difficult country will enable a splendid deposit of this fine stone to be easily shipped. Sufficient experience of its working qualities has already been obtained, and the testimony is altogether satisfactory. Of course, the important element will be the cost. Marble is such a superior stone that we must always expect to pay more for it in New Zealand than for other building stones. The Kairuru quarry, which we describe in this issue, starts with a great advantage, inasmuch as many tons of good stone, capable of passing a rigid Government inspection, are to be got out simply for the trimming and trucking. When it becomes necessary to quarry, the work will be comparatively easy. Kindly nature has "opened out" a spacious quarrying face at the head of the new tramway, and marble lies there in five-feet layers, only requiring to be split into practicable weights for handling. The stone cuts well into thin slabs, so that our architect readers who specify marble stairs or tilings in future need have little anxiety as to excessive cost. Until the tramway gets into thorough working order, the cost of production will be higher than normal, but once the whole concern is well under weigh, we should be able to get a first-class new building material at a reasonable price.

British Goods First

Energetic steps are being taken to organise the after-the-war commercial policy, which is to be of such importance in securing permanent benefits for all our sacrifices. Already New Zealand has started definite work along these lines, and a very successful exhibition in the Wellington Town Hall last month demonstrated to the general public how British manufacturers can give them a wide variety of attractive lines in which German firms specialised, greatly to their profit in the colonial market. It is difficult to say how fiscal arrangements will be settled after the war, but the Imperial sentiment is now so real that English manufacturers will gladly get the most effective preference in this market, while the splendid reorganisation of British industry to meet the demands of the Army and Navy must have good results when peace arrives, and the new factories and men who have triumphantly faced great industrial problems during stress of war conditions will turn their energy and new equipment on to the strengthening of Britain's hold upon the world's markets. We are fortunate in having in New Zealand, as the English Board of Trade's commercial representative, a gentleman who took a prominent part in organising a series of exhibitions of enemy goods in London, to show our kinsmen what their competitors had been doing; followed by a number of encouraging displays of what British manufacturers can turn out. Mr. Dalton, the British Trade Commissioner to New Zealand, tells an inspiring story of the adaptability of English business men, and, best of all, their readiness to sacrifice foreign orders so as to give preference to the wants of the fighting men. They have lost high profits in so doing, but they mean to use Britain's factories to help win the vital struggle, though their trade may fall into neutral hands meanwhile. We in New Zealand should keep alive this recognition of the English manufacturers' splendid loyalty. When we are inconvenienced by slow deliveries of English goods, we should put up with trouble as our small part of the commercial sacrifice in the Empire's cause. And when peace enables Britishers to trade at normal output, we must strain every nerve to ensure that English manufacturers shall win back promptly the business they have let go for the sake of the Empire.

The Otira Tunnel.

"Half-speed ahead" has evidently been ordered by the Minister of Public Works in connection with the Otira Tunnel, the progress of which we dealt with in our February issue. Apparently the Government has definitely abandoned any idea of again letting this big national work to a private contractor. Messrs. McLean & Co. having failed to do the work, mainly, we think owing to the labour difficulties piling up the cost enormously beyond the estimated figures, the Public Works Department's Engineers have since carried on the enterprise with success. Possibly we will not need to enquire too closely into the cost as compared with the original estimate, but when the cost is balanced against the advantage to the community, it will be reckoned well worth while. The work would under normal conditions have been finished in two years. Other railways of political rather than public importance are not to be allowed to bleed the two million public works loan, and it is hoped to keep up the construction policy out of this money till the war ends. New Zealand will have to wait many years before the South Island Main Trunk line is completed from Bluff to the farthest northern point, but this national undertaking ought to rank at least in importance with the Otira Tunnel. A State ferry between the Islands must also come—but this is sufficient peering into the future for one paragraph.

A Remarkable Record.

While the building trade has been troubled with short supplies, scarce labour, and high prices, our farmers have been making millions of extra profit without any extra effort. The Government Statistician, who simply gives figures without regard to their controversial possibilities, cannot avoid pointing out, in an introduction to the details of the exports for 1915, that most of the increase in values is due to higher prices compared with the previous year. His table of values of our main lines of exports last year is particularly pleasing, and explains why capital is piling up in the Dominion in spite of the international convulsions. Our wool exports last year amounted to 196,570,114 lbs, compared with a weight of 220,472,898 in the previous year, yet the value of the 1915 wool exports was £2,079,994 in excess of those of 1914. Frozen meat shows almost as good a record. Last year our meat exports increased, compared with 1914, to the extent of 361,287 cwts, but in value—the really vital test—the difference in favour of 1915 was £1,275,523. We sent away 14,000 cwts more butter in 1914 than last year, but our prosperous producers raked in £437,060 more money for the smaller quantity notwithstanding. Cheese shows the same position. War has been a tremendous cash advantage to New Zealand, but we have a dreadful item of death and injury to our best and bravest to set against the money which piles up so readily. The export total for 1914 was 14¼ per cent. above that for 1913, which itself was a record, and the total value of exports in 1915 is 20.90 per cent. ahead of 1914. The absolute increase amounts to £5,487,465 from £26,261,447 to the extraordinary total of £31,748,912, equivalent to approximately £27 6s. 5d. (provisional figures) per head of population, by far the highest export trade per head in the world. The careful comparison of values and quantities by the Government Statistician leads him to the conclusion that, coming to increased prices, our producers last year won a bounty of no less than four millions sterling. Of course, there is always a reverse side to the prettiest picture. One section of the community piles up money faster than it cares to invest it; another section—unfortunately a much larger one—suffers from the high prices which bring so much prosperity to primary producers. The Government statistician, who has gone into this reverse side of the position, shows that the necessaries which could have been bought for a sovereign in 1906, now costs 22/7½—in other words, the value of the sovereign has declined to that extent. Wages, under our arbitration awards, have gone up substantially in ten years, but recent events show that large sections of workers consider the cost of living has advanced faster than the cost of labour. The Government Statistician would be doing good service to the community if he produced authoritative figures bearing on increases in wages during the last decade. Unless the "living wage" is really a living wage, adjustments will have to be made, otherwise labour, a scarce commodity, will make itself scarcer.

Architecture & Building

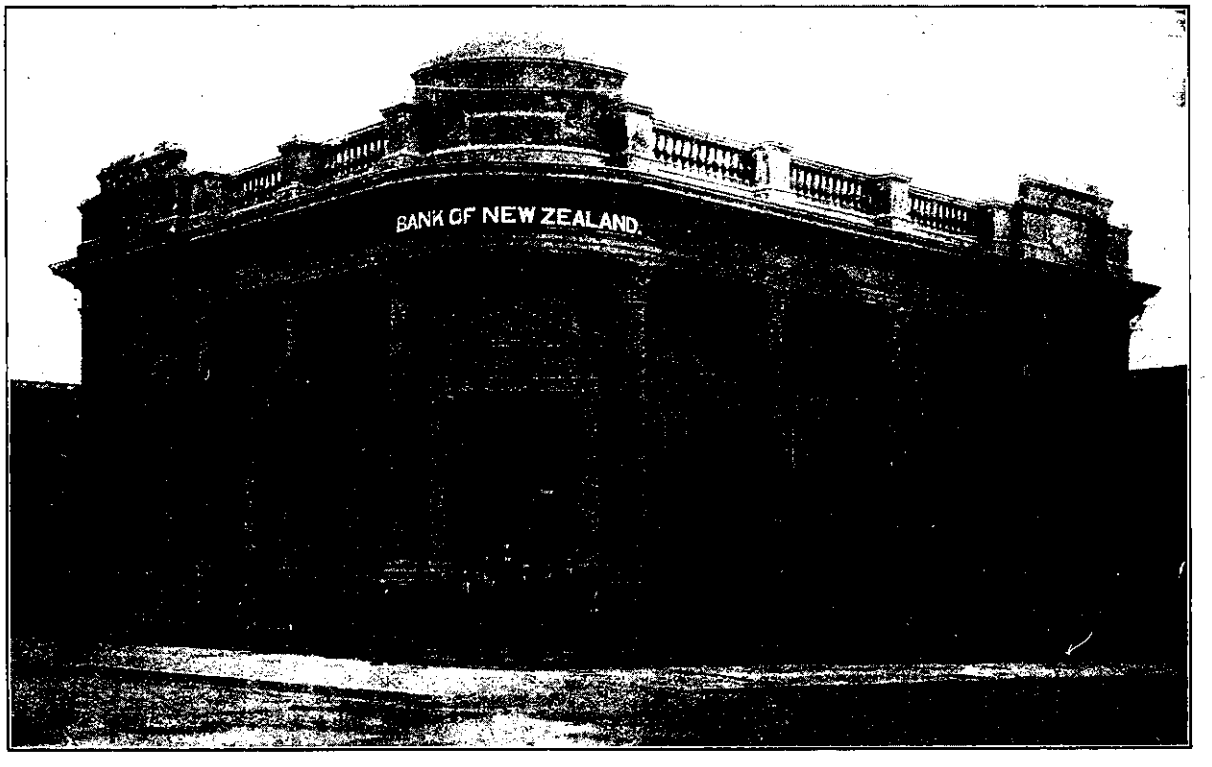
New Building in Dannevirke

BANK OF NEW ZEALAND

The Bank of New Zealand is certainly endorsing the advice given by its chairman of directors at the last annual meeting. In his speech the chairman pointed out the necessity of keeping employment and supplies as near normal as possible under the existing war conditions, with a special reference to building and its contingent trades.

We reproduce a photograph of the latest edition to the banking establishments controlled by the Bank of New Zealand. This typical building has been erected at Dannevirke, and while the exterior is indicative of solidity, no pains have been spared in arranging the interior for the convenience of the public and the working staff. The erection of this building is ample evidence of the growing importance of Dannevirke as a business centre.

The building which was erected at a cost of £5,000 was completed just before 'Xmas, and the time occupied in building was about eight months. The contractors were Messrs Duncan and Abbott of Hastings. As already pointed out the exterior bears out the business character of the building, and the effect is heightened by the massive Corinthian pillars well shown in the photograph. In the interior the lighting is well cared for by three large windows in each outside wall, these being of embossed glass diffusing an effective and restful light. A central dome of coloured lead light work assists materially in the general lighting. Outside of Auckland and Wellington the main banking chamber is the largest in the North Island, the measurements being fifty feet by fifty feet, with a clear height under the dome of twenty-four feet.



New Premises for the Bank of New Zealand, Dannevirke.—*Architect: J. C. Charlesworth, Wellington.*

The interior appointments of the banking chamber are imposing, special attention having been paid to the woodwork finishings. These are completed in figured and panelled rimu, and great care has been exercised in the selection of the best examples. The ceilings are of embossed steel, painted, and blend easily and well with the white plastered walls. In the centre and desk appointments, which are designed to conserve labour in every possible way, ample provision has been made for future increase of business, and such faith have the bank officers in the

present and future of Dannevirke, that it is anticipated that such spare room as there is will very shortly be called into requisition.

Two private offices are provided, one for the manager and one for the accountant, and while the prevailing tone of the interior decoration of these rooms is severe, the excellent finish of detail is well maintained, in fact the whole of the woodwork finishings which show extreme care, and beautiful figure work, reflect great credit on the local company responsible for this section. A cloak room is provided for the staff fitted with every essential convenience, and easily accessible from the entrance lobby. The top story of the building, towards the rear is fitted out for the use of clerks sleeping on the premises and comprises two well-built bedrooms and a comfortable sitting room, all these rooms being fitted with artistically set-in fire places.

In this portion of the building are fitted lead light windows similar to the construction of the dome, which add appreciably to the attractiveness of the back story.

Situated as the building is at the corner of High Street and Gordon Street, it presents an imposing aspect to the main thoroughfare and the architect Mr. J. C. Charlesworth of Wellington is to be congratulated on having given such able expression to the class of building required for a Banking House. Mr. Charlesworth has just let a contract to the same builders Messrs Duncan and Abbott of Hastings for another building for the Bank of New Zealand at Featherston.

The World's Greatest Concrete Viaduct

A piece of American rail-road building which is termed "more daring and original than any of the great rail road-construction works of the West," and which contains the largest concrete bridge in the world, was opened November 6th by the president of the Lackawana Railroad and public officials of New York, New Jersey, and Pennsylvania. This most impressive engineering feature of the Lackawana line is the great viaduct over the Tunkhannock Valley, shown in the accompanying picture. It is half a mile long—2,375 feet, to be exact—and is as high as a twenty-storey building. The whole cut-off from Clark's Summit to Halstead, Pa., is 39.6 miles long and cost £2,400,000. It reduces the distance between New York and Buffalo just 3.6 miles. Yet Lackawanna officials insist that it will pay for itself many times over. The President of the Railroad Coy. Mr. W. H. Truesdale says in a New York "Times" interview:

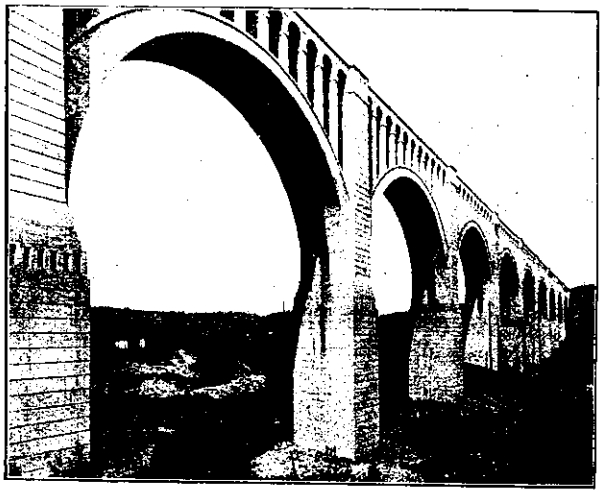
"There were other savings than the shortening of distance to be considered. The new route will give us a maximum grade of 0.68 per cent., against a previous maximum grade of 1.23 per cent., and a total curvature of 1,560 degrees, against a total curvature of 3,970 degrees.

"These, to the layman, may seem as small and unimportant results—as the slight saving in mileage may seem. But, together, these changes will cut the running time of every passenger train between New York and Buffalo by twenty minutes, and will reduce the running-time of freights by a full hour. Nor is this all. By reducing the traction, through reducing the grade, they will make it possible to move trains with two engines which, under present conditions, require five."

A few impressive facts about the viaduct are thus sketched:

"The Tunkhannock Viaduct is 240 feet high, more than a hundred feet higher than the roadway of the Brooklyn Bridge, and is half a mile long. It is by several times the largest concrete bridge in the world, with ten spans of 180 feet each and two spans of 100 feet each.

"It contains approximately 4,500,000 cubic feet of concrete and 2,280,000 pounds of re-inforcing steel, the trains which cross it being guarded



THE WORLDS GREATEST CONCRETE VIADUCT
Near the Tunkhannock Valley in Pennsylvania, built as part of the Lackawanna's £2,500,000 cut-off

between massive parapet-walls rising four feet above the level of the track and three feet thick. Each of its foundations has been carried down to the bed-rock, and this, in the case of two of its piers, meant making excavations ninety-six feet deep."

Further description of the cut-off as a whole is given to the press by the Lackawanna Railroad as follows:

"It is what railroad men know as a replace-ment line, being for the most part in sight of the old line for which it is substituted. The radical reduction of grades and curves is achieved by very heavy cutting and filling and by viaducts of enormous size, all of which was impossible in the early days of railroading. Some idea of the magnitude of the operation is seen from the fact that the amount of earth moved reached a total of 5,525,000 cubic yards, while the rock-excavation amounted to 7,647,000 cubic yards, 8,100,000 cubic feet of concrete was used, and the amount of re-inforcing steel employed in the various bridges, viaducts, and culverts aggregated 4,720,000 pounds."

New Zealand Marble

The Beginning of a Great Industry. Visit to the Kairuru Quarry and Tramline.

After ten years of failures and disappointments, New Zealand marble is being produced in ample quantities, and of splendid quality, from the Kairuru quarries, near Sandy Bay.

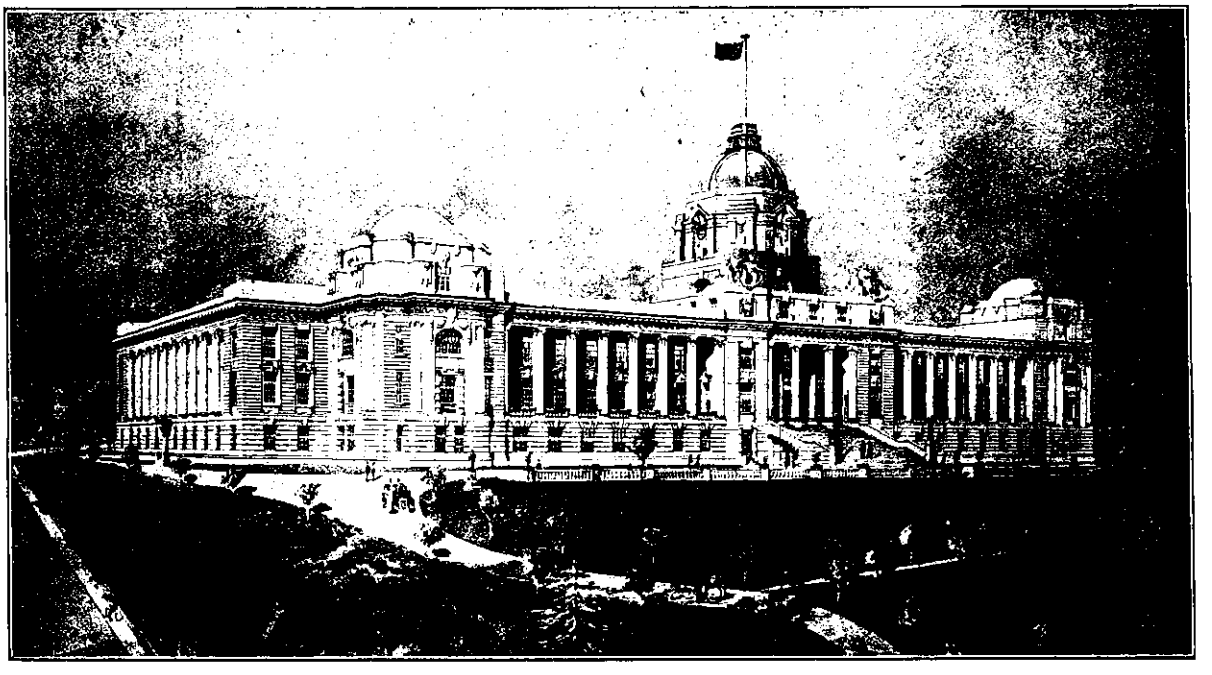
—Description and photographs by Chas. E. Wheeler.

New Zealand marble, of high quality, is just beginning to make its appearance as a building material. It exists in ample quantities, but the deposits are situated in country so difficult of access that it was only after the expenditure of £5,000 upon a tramway rising from sea level to the head of a deep ravine 1,130 feet above sea level, and six and a half miles distant, that this valuable stone could be made available for practical purposes.

Rarely does a new material enjoy an introduction of so auspicious a nature as this Kairuru marble, as it is called. The finest national building in New Zealand, the new House of Parliament is being built of it from the first floor, the base being of Coromandel grey granite. Kairuru marble is white, with grey streaks, and its general effect is grey. Thus the two New Zealand stones will harmonize nicely, and the front elevation of the building, with its dome, lofty Ionic columns and spacious loggias, will be an architectural sight of which New Zealanders should be proud—designed in their country and built of splendid materials obtained in the Dominion.

Behind the successful shipment last February of a cargo of fine sound marble lies a history of ten years of failures. Settlers in the Sandy Bay district, and the mountainous region stretching back from the bay to the main road between Motueka and Takaka have always had faith in "the marble being there"—but the problem has been, not only to get it away, but to find a deposit of stone sufficiently free from faults to warrant the heavy expense of working.

One venture was started on sufficiently substantial lines to give great hopes of success but the hillside quarry which this particular company worked with only fair results is now lying idle, and the rails are pulled up from the incline heading to the bottom of the valley. The marble-seekers have had to go another four miles inland to secure good sound stone, and they have now laid firm the foundations of a great industry.



PROPOSED NEW ZEALAND PARLIAMENT BUILDING.

Architect: John Campbell, F.R.I.B.A. *Contractors: Hansford & Mills*

The base, up to a height of 14 feet, is constructed of granite. Kairuru Marble is being used for the whole of the remainder.

UNSUCCESSFUL EFFORTS

Ten years ago, Mr. John Campbell, Government Architect, endeavoured to bring New Zealand marble into prominence by inducing the Government to order a block for an exhibition in London. A Wellington stone-mason undertook the work, and although cost was not a very important consideration, he failed to produce the block of marble. He undertook to open a face and quarry out a stone, which would be partly polished, but he never attempted the task, probably quailing before the tremendous difficulties involved in getting a heavy weight transported over country which comprises a constant series of steep valleys or ravines, most of them 500 feet deep.

The next step taken officially was in 1911, when Mr. Campbell visited the district and obtained various samples of the marble. Again there was nobody forthcoming to face the difficulties of working the splendid material. Mr. Campbell was then shown the Kairuru deposits which ultimately proved to be the most perfect, though most remote from the sea. A company was formed to take quarrying in hand on a substantial scale, and with that assured, Mr. Campbell had no hesitation about including New Zealand marble in the materials specified for Parliament Buildings. The other stones were Mount Somers limestone, Tonga Bay granite, and Coromandel granite.

EXPERTS' OPINION.

A committee of experts was set up by the Government to deal with the important question of the stone to be used in the national building, and they came to the conclusion that marble was preferable.

Many of the above blocks of marble exceed five tons in weight. They have been taken from the surface without difficulty. Most of the blocks were too long for transportation and had to be cut.

Samples of marble from Kairuru were tested, for the committee's information at Canterbury College by Professor Robert Scott, with the following result:

Crushing strength—760 to 830 tons per cubic foot.

Weight—191 pounds per cubic foot.

By way of comparison between marble and other building materials it is worth noting that Oamaru stone has a crushing strength of 40 to 90 tons per cubic foot, and Mount Somers limestone 180 tons per cubic foot. New Zealand marble is as strong as most granites.

These tests of resistance under crushing strain are regarded as most important in building materials, where the strain is mostly that of dead-weight. It is estimated by the designer of Parliament Buildings that the heaviest crushing strain will be in the twelve Ionic pillars on the front elevation. There the strain will range from 15 to 20 tons per cubic foot, so that Kairuru marble, with its crushing resistance of 760 to 830 tons, provides an enormous margin of safety beyond the usual one required by architects, that of ten times actual strain.

caps of the columns of Parliament Buildings out of four-ton blocks, and they give the marble high professional praise when they say it "cuts to a fine arris."

As to the weathering quality of New Zealand marble, this has to be proved. However, the aspect of the stone in situ provides reassuring evidence, so that there is no reason to believe that the material will disappoint remote generations of posterity who will gaze on their national building. It is well known that certain qualities of Italian mar-

A four-feet rule stands against the centre stone. This photograph shows the beautiful grey marbling of the stones, which will be greatly heightened when they are polished.

KAIRURU MARBLE DESCRIBED.

Kairuru marble is coarse-grained, highly crystalline, and bears a strong resemblance to the marble obtained by the Greeks from the famous quarries of Naxos and Paros islands in the Aegean Sea. From this material the glorious buildings of ancient Greece were constructed, and but for the ruthless hand of the spoilator, they would be standing intact to-day. Is it anything more than a coincidence that the vandals of those days were Turks, allies of our modern Huns from Prussia?

Coarse grain is a quality of value. The finer the grain, the more dead the polished surface. Kairuru marble, with its coarse crystals, gives a beautiful lustrous polish of a creamy depth. The stone works well. Carvers have already commenced to chisel the

ble have stood well in a sulphur-laden atmosphere, in fact the beautiful national memorial to Queen Victoria erected in London, contains 1,000 tons of Italian marble. It was, however, selected with the greatest care, only 25 per cent. of the quantity cut being used in the memorial.

DISAPPOINTING OUTCROPS.

Anyone who climbs the endless spurs of the mountains back of Sandy Bay would gain a general impression of boundless supplies of marble, only waiting to be quarried. But the history of Sandy Bay marble has proved that it is difficult to find a patch of the valuable material sufficiently free from shattering to warrant its use in building. I have before me in writing the photograph of one of the

celebrated Sagro quarries of Carrara marble. One-half of the picture is taken up with an enormous mass of "faulted" rock. Then it suddenly ends, giving place to a splendid "face" 50 feet square of absolutely unbroken marble which has to be sawn out by wire saws, electrically operated. The view—except for the 50 feet of marble face—is singularly like those to be seen in New Zealand's marble district. One may see the huge mass of shattered rock in the abandoned quarry of the old Sandy Bay Marble Co. Under ordinary conditions, one expects

THE FUTURE QUARRY SITE

Sufficient sound stone is visible within the limits of this photograph to construct the whole of Parliament Building.

to find solid rock beneath this overlay of faults, but the Sandy Bay venture disproved the theory, and those who are interested in developing New Zealand's marble resources will tell you with a sad shake of the head that sound rock is not to be got by merely digging deep for it. This is why the tramline from the sea penetrates six miles of rugged country before a satisfactory marble deposit is reached.

PROBABLE ORIGIN OF THE DEPOSITS.

There is more than one geological theory to account for the presence of an isolated occurrence of marble in a well-defined line, bordered on either side by granite rock. The most plausible line of explanation is that the marble overlaid the granite, and that a subsidence involved most of it in the folds of the granite, shattering it to pieces. One sees remnants of the ancient marble bed scattered in fragments on the hill-tops. Fortunately, there was one mass, extremely narrow, which was not apparently so much involved in the movement. It escaped a great deal of the shattering and crushing to which the remainder of the deposit was subjected. This lays on the western side of the line of a great ravine running from Kairuru almost to the sea. On the eastern side of this ravine, along which runs a tramline to the marble deposits, the protective granite wall is plainly visible. Cuttings made by the tramway builders are of fascinating interest to the geologist. There one may come across cliffs of granite, but the rock has decomposed, so that it could be removed by the shovelful like sand. Resting against it one finds the marble, subjected to the same decomposing elements, but hard as steel though shattered by great strains of earth movements. The tramline, running alongside one side of the deposit, might be regarded as an extensive prospecting cut in the hillside, but in spite of the fact that marble

cuttings are numerous, not one of practical commercial value was reached until the tramway came into Messrs Hugonin and Henderson's property. The owners had long known of a fine outcrop of marble within their boundary but never hoped to develop it when there were miles of marble outcrop between Kairuru and the sea. But the failure of the Sandy Bay venture gave them their opportunity; they brought the Kairuru deposit once more under the Government's notice, and as it was already favourably known to the Government Architect, the Minister of Public Works agreed to help a languishing venture of tremendous potential value by building the tramline to Kairuru. The cost will eventually be repaid by the company now working the Kairuru deposits.

THE KAIRURU QUARRY.

The new tramline is hardly in full working order, but by dint of great care in trucking—and much exertion in replacing derailed loads!—it was possible to make the first shipment of marble to Wellington on February 19th last. The undertaking being thus in working order, the time seemed favourable for a visit, and thanks to the kindly hospitality of Messrs Hugonin and Henderson of the Kairuru station, one important difficulty associated with the trip was happily overcome. The daily motor-car service between Nelson and Takaka serves Kairuru, which is about six miles up the high hill leading out of Riwaka. The Kairuru homestead is scarcely a quarter of a mile from the main road, and the marble quarry only another quarter of a mile, as the crow flies. But this quarter mile gives one a speedy introduction to the character of the country. The hillside drops at a steep angle, sometimes more than 45 degrees, and the quarry though so close to Kairuru, might be three miles away in a practical sense, when the difficulties of the rugged hillside are taken into account. On the way down, we pass the marble outcropping with granite. An illustration of a prominent rock is reproduced on page 568. This is not a true marble, as it has become schistose in structure. It was photographed as a typical outcrop on the edge of the true marble.

GREAT MASSES OF MARBLE.

There is no real quarry face at the head of the tramway, but the great mass of splendid marble blocks awaiting trucking shows that at least the uncertainties of supply are over. In the pile of stone near the crane, illustrated on page 566 are blocks of sound marble, passed by the Government Inspector, totalling 12,000 cubic feet. These have been taken practically from the surface. The real quarry face to be opened up is behind this pile of stones, a few score yards up a narrow gully, where giant marble rocks, stand up like rugged castles, defying Time itself. They measure out at 200 tons of sound visible marble, and how far they go beneath the surface, quarrying operations must be awaited to prove.

A block measuring 30 feet in length, 30 feet in width and 7 feet in thickness was taken out of the face at the tramway head. It weighed 520 tons. So enormous a mass was, of course, impossible to move from the quarry. It was cut into fifteen stones averaging 5 feet by 5 feet by 2 feet 6 inches thick, without a fault. Rarely does a quarrying enterprise start with such remarkable ease. There is usually a great overlay of shattered rock and soil to remove, but in this case the great problem was not how to get sound stone, but how to transport it. And that difficulty has now been overcome.

SOME OF THE STONES.

At the stage of quarrying when rubbish has to be cleared, the quarrymen have put out fine square blocks suitable for the caps of the front columns of Parliament Building. Here are the sizes and approximate weights of some of the stones illustrated on page 566-7.

6 feet by 6 feet by 3 feet: weight over 9 tons.

6 feet by 5 feet by 2 feet: weight 5 tons.

6 feet by 3 feet by 2 feet: weight 3 tons.

This stone will be identified in the photographs as the one against which a quarryman's rule, four feet in length, has been placed.

5 feet by 5 feet by 3 feet: weight 6 tons.

8 feet by 4 feet by 4 feet: weight 10 tons.

15 feet by 2 feet 6 inches by 2 feet 6 inches: weight 7 tons.

At the proposed quarry face, sound stones 15 feet in thickness are showing over a large area. One rock has been measured up to a length of 25 feet, and another is 45 feet long. The stones lie in stratas, a joint occurring at about 5 feet intervals, so that all the quarrymen have to do is to drive a series of holes along the top of a rock, and split it vertically by means of steel wedges—the operation known as "plugs and feathers." Explosives will be rarely needed at the Kairuru quarry. The operation of plugging is at present done with long iron bars —jumpers—but a compressed air drilling plant, to be driven by steam, is awaiting erection. The Kairuru Marble Company has also under consideration various types of power crane, with a view to installing one capable of dealing with the heavy lifts required. Ten tons is the present limit of weight which can be transported over the tramline, but the quarry furnishes sound stones greatly exceeding this weight. When transit facilities improve, larger blocks of marble can be delivered, if they are required. The splendid surface rocks available have given the quarry a great start, more stone being ready for trucking than can be taken over the tramline for many months to come. The quarry foreman, Mr. Thomas Cooper, has had lengthy quarrying experience at Mount Somers and Timaru, and more recently as foreman at the greenstone quarry on the West Coast.

EXTENT OF VISIBLE DEPOSITS.

The present limit of visible stone goes 200 feet above the face of the new quarry, and it evidently runs into the hill a considerable distance.

The marble can be traced down the valley to a point 300 feet below the face, the intervening dis-

GENERAL VIEWS IN THE MARBLE COUNTRY.

1—At the top of the tramway incline. Trucks ready for the decent.

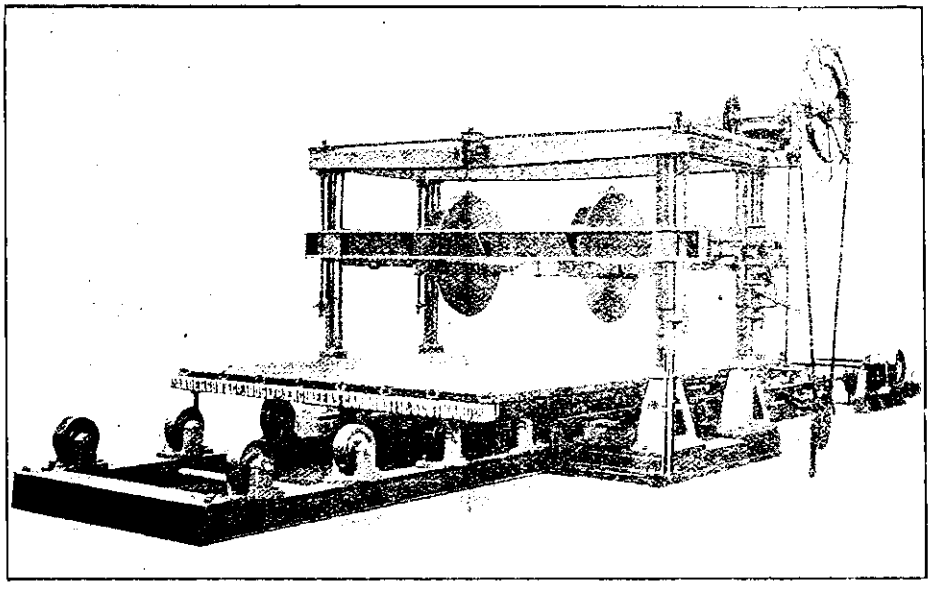
2—Typical rock outcrop on the eastern side of the valley.

3—The head of the Tramway. Debris in the gully is pure marble. The temporary quarry is shown at the head of the cutting.

4—On the incline. A five-ton marble block passing the upward tram.

tance being covered with debris. However, it is assumed that with such large masses of sound stone at both ends, it will only be necessary to remove the debris to expose further extensive deposits. This will be a task for future generations, because there is more than sufficient for the present uncovered. The sound rock exposed on the west side of the gully, pictured on page 568 is sufficient to provide all the marble needed for Parliament Building.

It is difficult to define the full range of colour in the Kairuru marble. What has been opened up ranges from dark blue-grey to pure white. A few stones show beautiful tintings of pink, and occasionally there are small blocks obtained of such dark blue colour that they could well be used with the white stone for tiling contrasts, when the effect would be black and white.



THE DIAMOND SAW.

Used by Messrs. Hansford and Mills for cutting the marble in their masonry yard at Parliament Building.

PERFECT QUALITY.

The Government overseer at the quarry, Mr. Angus Ross, subjects every stone to close and critical inspection, exceeding in severity that imposed in the case of material for ordinary buildings. So far, he has rejected stones only on account of surface faults due to heavy bush fires.

Mr. Ross had practical experience in the Iona marble quarries in Scotland, and when he was asked how the New Zealand marble compares with the Scottish stone replied: "It is far superior, both for quality and colour."

THE TRAMLINE.

What has made Kairuru marble of practical value is the tramline, six and a half miles long, which enables heavy blocks of stone to be shipped at Sandy Bay. The quarry is 1,130 feet above sea level, in extremely broken country, and it was found difficult to devise an easily worked line. The scheme finally adopted involves a gigantic ziz-zag down one spur, ending in an incline 777 feet long with a grade of 1 in 2.

Starting from the marble deposit, the line which is of 3 feet 6 inch gauge skirts the left, or eastern side of the deep valley, and runs on a slightly rising grade for the first mile. The descent then commences, the grade limit being 1 in 10. Huge swallow-holes, or pot-holes, are passed and one as large as a crater is circled by the line, which gains grade with a horse-shoe bend. At 1 mile 36 chains, stiff grades begin. The line is maintained within a grade limit of 1 in 10, but to do this involves two back shunts, so as to work diagonally down the hillside. The first back-shunt is at 1 mile 64 chains, and the next at 2 miles 5 chains. The top of the incline is reached 2 miles 34 chains from the quarry. As the load is with the grade, one horse can manage the haulage of a tram to this point, its services being needed mostly during the first mile, and at the back-shunts. The important item of equipment is the brake, which has to stand very severe wear, the four-wheeled trams frequently carrying a three-ton axle load. At the incline top, the height is 621 feet above sea level. A loaded tram is attached to the wire rope running over a large pulley provided with two powerful hand brakes. Its weight easily draws up an empty tram, and any supplies required at the quarry. The bottom of the incline is 270 feet above sea level. Thence the line runs by a slight down grade over two bridges, and past the foot of the incline formerly serving the unsuccessful Sandy Bay quarry. The last mile skirts one side of a lagoon, and at the end of the line is a temporary wharf for loading stone upon the scows. The present method is the primitive one of dumping big

blocks of marble into shallow water, leaving them to be hoisted on board by the ship's tackle, but a crane is almost ready for use, and timber is being cut for constructing a wharf, where there will be 4 feet of water at low tide, and 15 feet at high water spring tides. A bar at the entrance to the Bay limits the draught of vessels which can use the wharf, but the port is easily worked by scows, which can economically handle the heavy blocks of marble. To cope with the demands of the Parliament Building masons, a daily out put of 140 cubic feet is required. This can easily be maintained even under the present primitive conditions.

UP-TO-DATE METHODS.

When the line consolidates, and the shipping facilities are improved, Kairuru marble can be placed on the market at a very reasonable price. The quarry is being managed on behalf of the Kairuru Marble Company by Messrs Hansford and Mills of Wellington, contractors for Parliament Buildings. They possess the most up-to-date stone-working plant in the Dominion, their machinery including a diamond saw, which does remarkable cutting work, greatly exceeding the speed of the gang saw method. The rough blocks are cut into slabs by bar and shot machines, and then squared with the diamond saws.

To bring Kairuru marble into the market as a commercially practicable building material has involved many disappointments, some of an extremely expensive sort, but it is pleasing to end this description of the whole business, from a remote hillside quarry to the busy masons at Parliament Building in the capital city, with a confident prediction that here is the sure beginning of a great industry.

Practical Town Planning

The South Australian Parliament is considering a Town Planning Bill this session, and the Government have purchased a 300-acre block of land, so that a scheme for the formation of a model settlement may be carried out as an example to those concerned. The area secured is about four miles from Adelaide, and can be served by an extension of the existing railway. It is at present being used by the Commonwealth Defence Department.

The Attorney-General (the Hon. J. H. Vaughan), who is also Minister for Pleasure Resorts, states that careful consideration will be given to the basis of allotment, and the Government will endeavour to adopt the system of tenants' co-partnership, which has proved so successful in England. In the past it has been the practice to throw a reserve into the centre of a community, and say that a town has been planned. Thus, only those whose residences abut on the reserve enjoy its benefits. That will not be done in the case of the new model. Areas will be set apart in different localities, so that the number who will derive pleasure from having their homes on the borders of reserves will be greatly increased.

Notes

A good many of our architects have felt the pinch of the war and its interference with the normal course of building enterprise. They have weathered the worst part of the storm now, and it will interest them to know that similar trouble in England had to be dealt with by organisation.

It was felt by the Institute of British Architects' that owing to the war there would be architects more in need of advice regarding their professional affairs than of any other form of assistance. To meet such cases, the Professional Employment Committee constituted a small advisory committee, the members of which are prepared to give applicants the benefit of their personal experience and advice, with a view to finding some solution to the applicants' difficulties. The idea is that of personal service, and the Professional Employment Committee has been fortunate in securing the co-operation of Messrs. Henry T. Hare, F.R.I.B.A., Gerald C. Horsley, F.R.I.B.A., and Paul Waterhouse, F.R.I.B.A., who form the advisory committee, and to whom will be referred any applications received by the Professional Employment Committee, of the kind indicated. The Professional Employment Committee of the Architects' War Committee loses no opportunity of turning to good account any circumstances which may assist it in providing paid work for architects who are in distress owing to the War.

The Dominion Government will continue the construction of all public works under contract in Canada. Apart from the war, the total expenditure of the Canadian Dominion will reach 200,000,000 dollars for the year, while the war expenditure will mean an addition of 100,000,000 dollars. The programme for the current year includes an expenditure upon public works of 25,000,000 dol., on railways and canals of 27,000,000 dol., and on capital account and works of harbour commissioners of over three and a-half millions. Since the outbreak of the war the Dominion has made every effort to minimise unemployment in Canada by maintaining its programme of public works.

The Manitoba Government has appointed a Royal Commission to investigate the charges made to the Lieutenant-Governor by the Opposition in connection with the contracts for the new Parliament Buildings at Winnipeg. It is alleged that a sum of £160,000 was charged over the contract price.

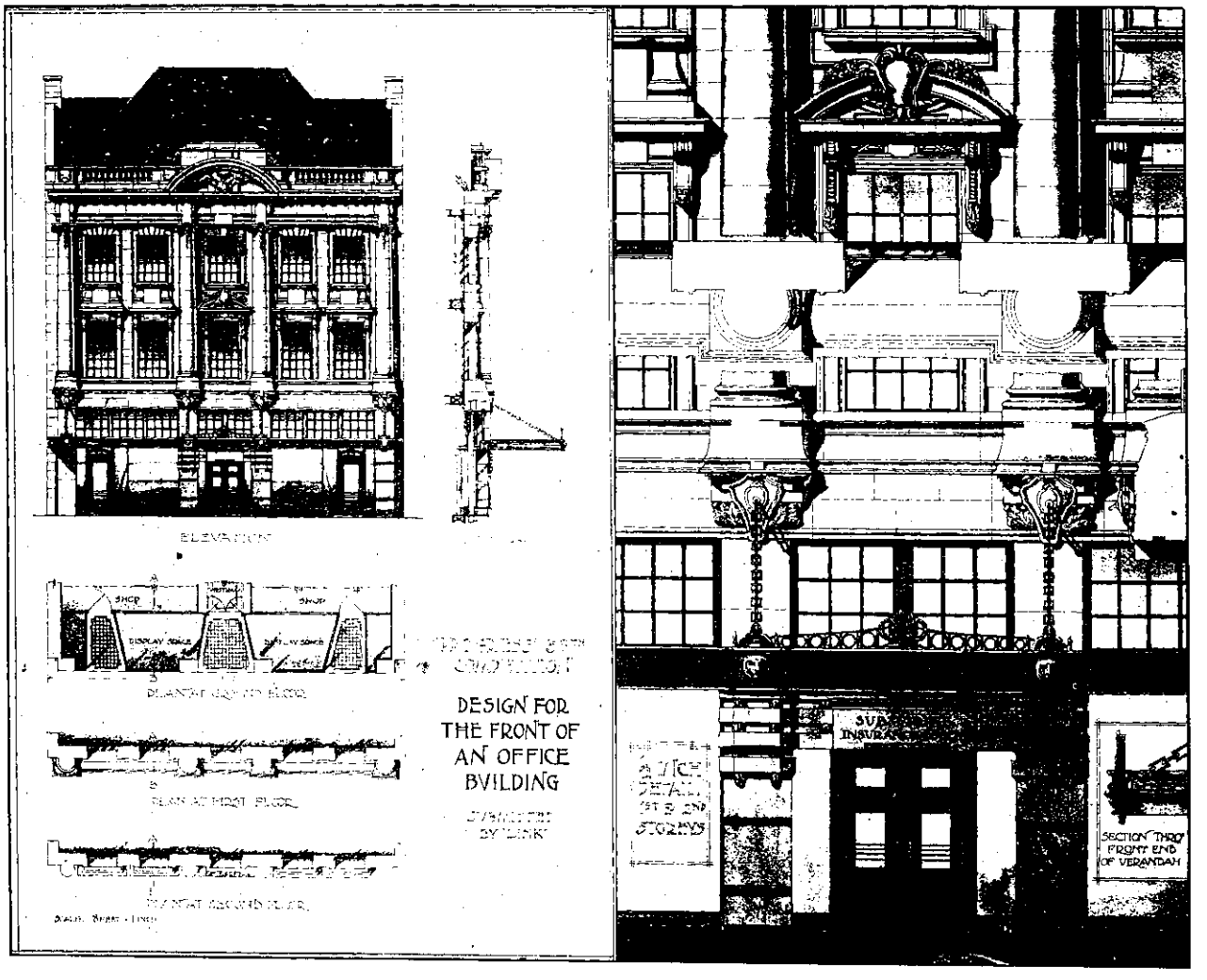
Truly, extremes meet. It is not enough that a building be fireproof. It should also be waterproof, so that in case the contents of the upper floors are aflame, the water thrown on the fire will not drip down and spoil everything on the floors below. Without doorsills raised a little above the floor level and surbs around other openings on the floor, any water in a reinforced concrete building is drained off the impervious floors by scuppers.

Our 38th Competition

Front of a Block of Offices

WON BY ERIC MILLER OF DUNEDIN

Only two designs were sent in for this competition, viz.:—"Ionic" by Gordon S. Reid, with Mr. E. W. Walden, Dunedin, and "Link" by Eric Miller with Messrs. Salmond & Vanes, A.R.I.B.A., Dunedin.



Winning Design in our 38th Competition by Eric Miller, ("Link") with Messrs. Salmond & Vanes A.R.I.B.A. of Dunedin.

As only two designs were sent in there is no prize payable under the conditions of these competitions, three being the minimum. In this case however the judge, Mr. Basil Hooper, A.R.I.B.A., of Dunedin, states that both the designs are so good, and show such an amount of diligent study, that he recommends the payment of the prize to "Link." The judge's report runs as follows:—

"It is disappointing that only two competitors have sent in designs for this subject, as it is one which affords students an opportunity of indulging in work rather higher in plane than the ordinary five-roomed cottage or seaside villa, that we are all so necessarily familiar with, but possibly the season of the year was not propitious to hard work of this sort.

"LINK." This design shows a certain amount of original treatment although the details are, I suspect, to a certain extent at least, borrowed. But they have been put together fairly well, and that is greatly to the favour of the designer. Broadly speaking the elevation suffers somewhat from being rather overdone in the way of detail, and a rather simpler treatment would have been an advantage. The steep slate roof rather takes away from the restful classic feeling that was desired, and having no dormers, is an unwarranted waste of money that would not be appreciated by the owners. If one or more floors had been asked for, it would have been quite allowable to have worked them into the roof, but a costly feature of this sort, serving no useful purpose is not to be encouraged.

The Verandah treatment is very pleasing, and quite a good feature in the design, though there are one or two points of construction which do not seem quite

right. The chain hanging would not be sufficient by itself and a secondary and shorter stay would be necessary to give it stiffness. The idea of putting plate glass as a covering is not to be recommended, as it would not do in actual practice; the dirt and dust would collect quickly and unless washed thoroughly daily would be most objectionable. Also shopkeepers usually want the shade that an opaque verandah roof gives. The width of the entire frontage certainly does not admit of very much being done with the shop fronts, but still I was disappointed in not seeing a little more originality displayed in their design, as there is great room for more variety in the treatment of shop fronts, both in their lay-out and ornamentation.

A detail of the shop doors would have been desirable as the eighth scale does not show up the portion above the transome to advantage.

A few notes on the drawing indicating the materials proposed to be use, would have been an advantage.

"Links" draughtsmanship is very good, and shows great care, though the cast shadows on plan are rather unnecessary, also the cast shadows on the plate glass windows are unfortunate.

"IONIC." The design by "Ionic" is very pleasing in mass, and with a little alteration of detail should look well in execution. He however makes the fatal mistake of not noticing the clause in the conditions which mentions "three-story buildings on each side," and so has carried his main cornice past the boundary, right on into his neighbours' fronts, which is a liberty not likely to be allowed by any self respecting building. The consequence is that the ends of the cornice would have to be chopped off. The only way is to return the cornice on itself and allow sufficient plain wall at the sides for the purpose. In this important matter "Ionic" falls behind "Link" who has carefully carried out this point. Coming to details, the sills of the second floor windows seem rather clumsy, and it would have been more graceful to have mitred the architrave round, or some other lighter treatment of the sort. A detail of the verandah was very necessary, as the eighth scale does not show it at all plainly. The same fault that "Link" makes is noticeable, in that there is no stay to give the stiffness that the chain hanging lacks. The solid stone frame round the fanlights over the shop windows certainly gives solidity, but I am afraid it is not allowable in a case like this where every ray of light is necessary for the lighting of the shops. The stone-cased piers also, would most likely have to be cut down in execution, in fact the two outer ones might have to be omitted altogether. My note in the conditions as to "vertical lines being brought right down to the ground as far as possible, and not stopped *anyhow* by the shop girder" was meant to apply to the haphazard spacing one so often sees of the vertical lines of the upper portion in relation to the exposed piers in the ground floor.

"Ionic's" draughtsmanship, especially of the eight scale, is certainly capable of improvement, and the design is worthy of being better expressed. Owing to the influence of the French and American schools of architecture, much more attention is being paid nowadays to the careful delineation of architectural drawings, and the slap-dash style once in vogue is now fast losing favour. It therefor behoves all students to aim at making themselves as perfect as possible in this respect.

In conclusion, there is very little to choose between the two designs, both of which show a really good idea of proportion and Architectural detail, and it is chiefly on account of his having avoided the serious mistake which "Ionic" has made of carrying his cornice past the building line and thus necessitating its mutilation that I award "Link" first place. Otherwise the restful effect of "Ionic's" design might possibly have reversed the choice."

(Signed) BASIL HOOPER, A.R.I.B.A.

The Position of the German Cement Industry

The German cement industry has, says a correspondent of "Engineering," fared badly during the war, and the Halberstadt Chamber of Commerce has, on its behalf, made an appeal to the military authorities to consider the Central German cement industry in connection wth their requirements of cement in the occupied enemy districts. The Central German Cement Works have an annual aggregate capacity of 5,000,000 barrels, and a capital of 20,000,000 marks is invested in the industry. The export trade, which under ordinary conditions accounts for about two-fifths of the total production, has entirely ceased and the wants of the private building industry are but small, during the present year a sale of not more than one-fourth of the average aggregate production has been realized. The war certainly has made matters materially worse, but even if the war had not happened a satisfactory outcome of the work of the Cement Union could hardly have been expected.

The adverse conditions from which the union suffers will also remain after the war. For years to come remunerative trading by the union will be handicapped by the forward sales of several works not belonging to the union. Amongst the unhappy Kartel agreements must be reckoned that with the blast-furnace cement works. The allowance of one penny per barrel is out of all proportion to the harm done to the union by the way in which the blast-furnace cement works undersell the union. The position of the Cement Union is becoming so critical that the question of a premature dissolution of the union invited serious consideration. Even if it would be possible to persuade the outside workers to join the union, of which there seems but very little prospect, this would only lead to the formation of new outside works. The aggregate production of the outside works up to the autumn of 1915 may be put at about 1,000,000 barrels, which figure probably will be doubled by the end of 1916, a quantity which, with the production of the Kartel works, will suffice to supply the demand of the area in question, in any case approximately, the more so as the union of blast-furnace cement works and other outside concerns will probably grasp the lion's share of the increased business which may be expected after the war.

The Aniline Dye Crisis

An American claims to have beaten the Germans at their own Game

A BLACK ANILINE FAST DYE

At this time the shortage of aniline dye-stuffs is affecting the whole world to a very serious degree. Only recently a keg of a certain colour happened to come upon the English market through a forced auction sale. Normally a keg of this particular dye can be purchased for some sixty shillings, but so pronounced is the dearth of this colour, that this solitary keg called a bid of some £312 before the hammer fell. There are other dyes for which not only England but other countries are in urgent need, and these colours have risen to prohibitive prices.

Efforts to ease the situation have been made in England and the United States, but until recently they are of almost negligible significance. An elaborate and well-equipped aniline dye manufactory, capable of competing with the German organizations upon level terms, cannot be brought into operation in a day. It has taken Germany many years to establish this industry, which is now virtually a world-wide monopoly.

The result is that Germany does not view British, French, or American activity in this field with the slightest apprehension. She could flood the market to-morrow so effectually that every competitor, coming into existence during the war, would not merely be snowed under but wiped out of existence.

No firm will be able to sell aniline dyes at the prices which the German Trust will unload them. It must be remembered that the cost of producing these enormous stocks has been defrayed. The Teuton government has not only paid a high price for its essentials from coal-gas distillation, but also for the waste as well, and the dyes could almost be given away at a profit.

As regards a fast black dye a syndicate of capitalists in Kenosha, Wisconsin, U.S.A., who are owners of a big hosiery mill located there, have, they say, solved the difficulty. These men have excelled Germany in producing fast black just as the Germans do from coal tar products. The dye is pronounced a faster black than the imported article. It has withstood every conceivable test for colour. It has been found strictly harmless to fabrics. It is completely sanitary and, above all, is available at a very reasonable cost.

The American Government has sought by every diplomatic means at its command to relieve the dye difficulty. Quite recently a bulletin was published by the Department of Commerce going into details, which bulletin was forwarded to every manufacturer in America engaged in the production of knitted goods. At that time no relief was anticipated by the authorities at Washington.

The diplomatic explanation of just why Germany could not supply the needs of American manufacturers has been somewhat vague. The facts, as nearly as it is possible to get them, are that all the German companies formerly engaged in the production of aniline dyes have centred their attention on war supplies. Yet, it has been hinted that if raw cotton could pass free to Germany, plenty of dye materials would be available.

But with cotton and cotton goods a contraband of war, this exchange has not been possible, so that the use of German-made dyes, particularly fast black has been limited to the stocks on hand at the time shipments from Germany were discontinued.

Any number of manufacturers have succeeded in producing blacks which under test were found to be unsatisfactory. Some would turn green. Others would become streaked. None of them was considered perfectly safe for hosiery, which must be a perfect black unquestionably sanitary. It has been assumed that any manufacturer could produce fast black at a commercially right price provided he would undertake a big investment in machines, laboratory equipment and the necessary chemicals and experiments. Until recently no concern has had enough faith in Yankee or English ingenuity to finance the preliminaries. This was the stumbling block for the knitted goods industry in both countries. The Kenosha financiers who are owners of the Black Cat Hosiery Mills, determined to produce fast black from coal tar products, regardless of expense.

What took place in the search which the Kenosha men made to produce aniline black becomes one of the most romantic incidents in American commerce. But what is far more important, it assumes economic value of tremendous proportions because there will be no crisis in the production of fast black hosiery; the millions who are facing idleness will not be thrown out of employment; retailers will be supplied as steadily as before.

Although this is a commercial undertaking absolutely on the part of the Kenosha men who have financed it, they nevertheless take a very broad view of their achievement and the announcement will shortly go forward, even to their most aggressive competitors, that the aniline fast black is available to whomsoever may desire it at a commercially fair price.

The inside story of just how the Kenosha syndicate succeeded in producing black dye is a record maker and will be an encouragement to other industries dependent upon dye and colours for their continuance.

In the first place there was discovered a genius who believed he could produce black from coal tar products and chemicals. This man interviewed dozens of manufacturers and financiers, all fully capable of undertaking the production of fast black. Every interview terminated in discouragement. Finally a representative of the Black Cat concern was interviewed. He became immediately interested. He communicated with his principals in Kenosha and it was indicated that upwards of £20,000 would be required to undertake the preliminary experiments, research and tests. To the everlasting credit of the Wisconsin men it is to be stated that they undertook the gamble without hesitation. They bought expensive machinery and retained the services of all the experts available. Day and night for weeks they have carried on their laboratory tests, their factory experiments and their proof of the resultant colour.

There is now in full working order at the Black Cat Mill a complete dyestuff plant. It is manufacturing enough for the needs of its owners and will have a surplus from which mills in America can obtain supplies.

The New British Monitors

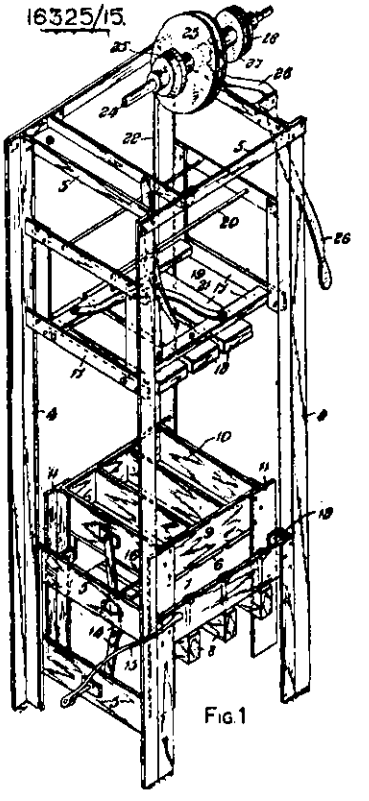
The British have been so well pleased with the work of the small monitors, that they have launched out into the construction of a larger class carrying guns of 14-inch calibre. The following description by Ellis A. Bartlett of some of these monitors at the Dardanelles is illuminating: "It was impossible to tell at a distance whether the craft was broadside on, stem on, or stern on, for she seemed to be quite round. On the top deck, nothing showed except an enormous turret from which projected two 14-inch guns." They set off in boats to investigate, and found that just below the surface the sides "bulged out some 10 feet and then turned under, affording a platform just washed by the waves. If a torpedo strikes the side of the vessel it will explode in a variety of substances which I must not mention and the hull of the vessel will escape injury." It is more than likely that instead of the "variety of substances" the space between the vertical wall of the outside shell and the hull proper of the ship is filled with water and that this space is open to the sea. This would have the advantage that the blowing in of the outer shell by torpedoes would not increase the displacement of the vessel or produce any list.

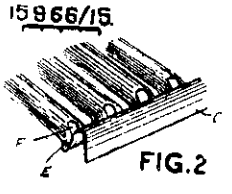
Recent Patents

MOULDING BUILDING BLOCKS

A patent for a machine for making concrete blocks, taken out by G. Chidger and R. Tanner, New South Wales, is illustrated on this page. A presser head **17** is suspended by a rope from a loose pulley **23** which can be brought under the control of a hoisting clutch **25** or against the brake disc **28** when lowering the head.

When the mould frame **9** is filled the head **17** is lowered and repeatedly dropped to compress the material in the mould. The top is then raised into engagement with the latch hanger **19**, and the toggle links **14** are folded by throwing over the lever **15**.





The mould frame **9** is thus lowered and rests in slots in the bolsters **7**, and the contents are exposed for removal.

METAL RE-INFORCEMENT

A patent to increase the rigidity of the metal sheets for reinforcing concrete has been taken out by C. P. Curlewis, N.S.W. The metal sheets are slit and bent into longitudinal ribs, the ends of which are connected by uncut transverse portions of the sheets.

The transverse connections may be flat for nailing to studs, or bent to form hollow sections **C**. The ends may be doubled and the shoulders of the ribs slotted at **F** to prevent fracture.

Personal

Mr. Andrew B. Hamilton, son of Mrs. J. K. Hamilton, late of Oriental Bay, writes to his mother from London, stating that he has passed his final examination for the A.R.I.B.A. Mr. Hamilton, who obtained the Jarvis scholarship twelve months ago, served his time with Mr. W. C. Chatfield, architect, Wellington.

Mr. Mitchell who went home to further his architectural studies is about to return to New Zealand to join the forces here.

Mr. Cecil Trevithick, A.R.I.B.A., of the firm of Chilwell and Trevithick, Architects, of Auckland went to Wellington to offer his services to the country.

Mr. Coleridge, architect, of Wellington has left that city and taken up professional practice in Masterton.

Extract from letter received from—

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Notes

INVERCARGILL

Probably at no time in the history of Invercargill have there been so many tenantless houses, says the "Southland Times." In the south part of the town the legends "To Let" and "For Sale" are particularly conspicuous, no fewer than twenty of these placards being visible within a small radius. The majority of these dwellings have apparently never been occupied, and bear evidence of having been constructed with a view to sale in the pre-war days, when house building with this intent was considered a lucrative proposition. Some of the buildings, however, are of considerable age, their former tenants having possibly removed into more up-to-date establishments. It would not seem that, apart from those who have gone to the front, there has been any diminution in the population of the town since 1910, when empty houses were a thing unknown. Overbuilding, with the consequent excess of supply over demand, probably accounts for the present state of things, while there have been many instances in which young fellows, now at the front, built homes in anticipation of getting married prior to the outbreak of war.

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