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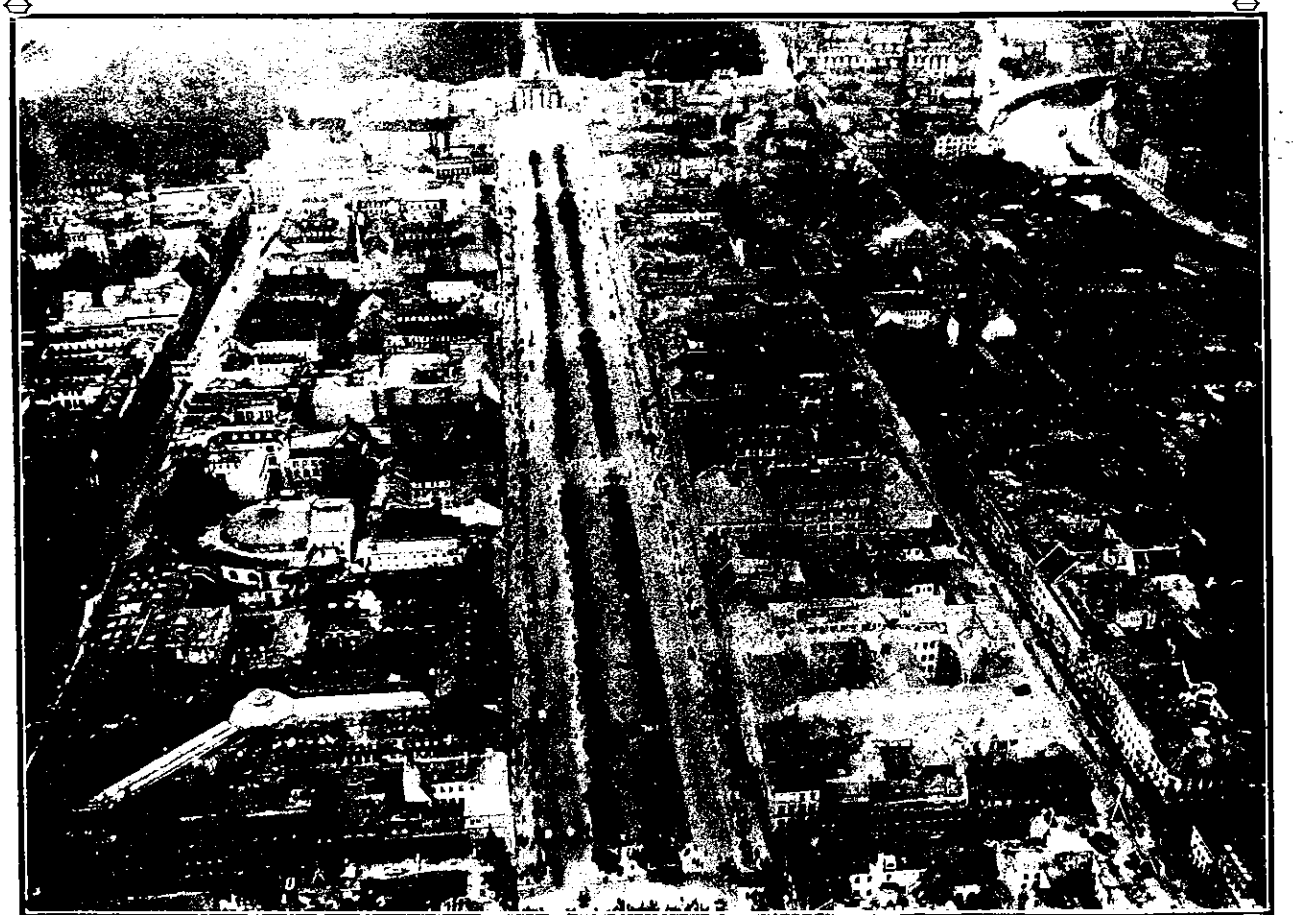
N.Z. BUILDING

Germany's Capital City—Berlin



A view of Berlin's principal street "Unter den Linden" taken from a Zeppelin Airship

OCTOBER 1914 PRICE 6d.

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 27th Competition for Architectural Students

We offer a prize of £1 1s. 0d. for the design awarded first place for a

TRAMWAY WAITING PLACE

with *Newspaper Stall, &c.*

The adjudicators make the following remarks re this competition:—"In selecting this subject we have endeavoured to set your student readers the task of designing, in cheap, durable, and readily obtainable materials, such as would be employed by any City Authority, a very common desideratum for the convenience of the citizen, in such a way that it may be an ornament and not a disfigurement to its surroundings. We venture to think that our City Authorities might pay more attention to the artistic side of their erections and trust that the outcome of this competition may excite the interest of some of your numerous readers in the subject and show them what might be done towards the improvement of their Cities in this direction.

This may also be regarded as an item in the Town Planning movement in which, like yourself, we are deeply interested."

DETAILS OF COMPETITION

The building is supposed to be situated facing on one side a principal thoroughfare with tramway and on the other a public reserve, and is to contain the following accommodation.—1. About 120 feet run of seating, including a portion facing the reserve to be so arranged that from whichever direction the wind may come some of the seating will be in the shelter. 2. Gentlemen's toilet room containing two w.c's., four urinals and one hand basin. 3. Ladies toilet room containing four w.c's., two hand basins, towel closet, and space for custodian. 4. "Lock up" newspaper stall, with counter in sheltered position, and so placed that attendant can supply towels etc., to gentlemen's toilet room without leaving his stall. 5. Two telephone cabinets.

Strict attention must be paid to hygienic arrangements of sanitary fittings and the privacy of them. Provision must be made to enable a City Council official to inspect and clean out the plumbing and drainage conveniently at any time.

Competitors are restricted to the following materials, viz.—brickwork, concrete, reinforced concrete, rougheast, plaster, asphalte, slates, roofing and other tiles, jarrah timber, glass, any or all of which may be used, and the necessary plumbing, and finishing materials.

The drawings required are: (1). Ground plan showing drainage; (2). Roof plan. (3). Elevations and sections to fully set out the design. The foregoing to be to ⅛in. scale. (4). A perspective sketch.

A skeleton specification describing the details of construction and finishings, and an estimate of the probable cost must accompany the design.

Messrs. Atkins & Bacon, Architects of Wellington have kindly consented to adjudicate in this competition.

Designs must be sent in, finished as above, under a nom-de-plume, address to PROGRESS, 10 Willis Street, Wellington, and marked clearly "Twenty-seventh Prize Competition" on outside, with a covering letter giving competitor's name and address and employer. Designs to be sent in by November 21st.

Our 28th Competition

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

GOLF CLUB HOUSE

to be erected for a club consisting of about 150 members (100 men, and 50 ladies). The site is open, and unrestricted, and the building is to be placed on a slight rise overlooking the links and facing North. The ladies', and mens' apartments, also the caretaker's rooms, are to be kept separate, but of easy access to one another.

Accommodation—MEN'S—One large Tea Room, two Dressing Rooms, one Sitting Room, two Lavatories, two W.C's., large Verandah.

LADIES.—One Tea Room, one Dressing Room, one Sitting Room, one Lavatory, two W.C's., Verandah.

CARETAKER.—One large Kitchen convenient to both Tea Rooms, large Scullery, one small Sitting Room; three Bedrooms, Bathroom, W.C., large Pantry, Store Room, Larder, Large Workshop, etc.

The building to be two-storeyed, the Ladies', and Men's Sitting Rooms up-stairs, opening on to a common Balcony, and with a Common Room between. The Caretaker's bedrooms etc., also on the first floor. Separate stairs to each. The whole to form one block, but the different portions—Ladies', Mens', and Caretaker's, to be marked, and apparent, from the exterior. A low, broad effect is desired, the upper rooms will therefore be better to be partly in the roof. The Balcony need not be covered. The materials to be brick, and rough-cast, with tiled roof. Cost about £1,500.

The sizes of rooms and other details are left to the competitors to decide, and to consider what is necessary for the purposes of the building and the sum allowed.

Drawings to be ⅛-in. to one foot, and to consist of a plan of each floor, three elevations, and one transverse section. To be inked in, and shaded in Sepia, but not coloured.

Mr. Basil Hooper, A.R.I.B.A., of Dunedin, has kindly consented to adjudicate.

Designs must be sent in, finished as above, under a nom-de-plume, address to PROGRESS, 10 Willis Street, Wellington, and marked clearly, "Twenty-eighth Prize Competition" on outside, with a covering letter giving competitor's name and address and employer Designs to be sent in by December 21st.

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.

VOL. X. NO. 2. MONTHLY [REGISTERED AS A NEWSPAPER]

N.Z. BUILDING PROGRESS

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

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

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WELLINGTON, AUCKLAND, CHRISTCHURCH, AND DUNEDIN, NEW ZEALAND, OCTOBER, 1914

Contents for October

Editorial Comment

We make no apology for reprinting in full the remarkable speech delivered by Abraham Lincoln on the battlefield of Gettysburg during the course of the American Civil War. It has always struck us that it is, perhaps, the greatest and most touching ever delivered. We can only compare it, in its great magnetic force and suggestive power, to the one made by Shakespeare's Mark Anthony over the body of the murdered Cæsar. As everyone knows the speech was delivered over the graves of the heroes who died at Gettysburg fighting for the cause of freedom.

The Speech is as follows:—"Fourscore-and-seven years ago our fathers brought forth on this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war, testing whether that nation or any nation so conceived and so dedicated, can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that field as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

But in a larger sense, we cannot dedicate—we cannot consecrate—we cannot hallow this ground. The brave men, living and dead, who struggled here have consecrated it, far above our power to add or detract. The world will little note nor long remember what we say here, but it can never forget what they did here. It is for us, the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us—that from these honoured dead we take increased devotion to that cause for which they gave the last full measure of devotion—that we here highly resolve that these dead shall not have died in vain—that this nation, under God, shall have a new birth of freedom—and that Government of the people, by the people, for the people shall not perish from the earth."

It is now a little over fifty years ago since these words were uttered by the Great President. We

think many scores of fifty years will pass before the world forgets them despite Lincoln's own prophecy to the contrary in the speech itself. In the hearts of all true Americans they should and probably will be treasured and preserved for ever.

* * * * *

An effort is being made in Dunedin to obtain a standard sized brick for building purposes. A committee of local Architects invited the brickmakers to meet them in conference to consider the suggestion, and we understand that they unanimously agreed to meet the Architects, and stated that they would be glad to fall in with the suggestion and alter the size of local bricks to a standard size to be agreed upon.

* * * * *

It is pleasing to see that Auckland has seen fit to ask the advice of Mr. Davidge, who recently visited N.Z. on a lecturing tour with Mr. C. C. Reade in connection with the erection of homes suitable for workers which it is proposed to erect on the old abattoir site at Richmond, Auckland. Though we have not heard of any, we hope Auckland was not the only city that took advantage of Mr. Davidge's visit.

In his report to the City Council, he said "I am strongly of opinion that the lower portion of the slope should be reserved for a public park and for recreation purposes. By reserving this lower portion the cost of development will be reduced to a minimum, and the difficulties of steep grades and costly road grading may be avoided. The upper portion of the site provides ample space for the immediate housing needs of the district and should, with economical development, give a very satisfactory revenue on the outlay necessitated. The reservation of the lower portion of the site for park purposes will leave the council free, at a later date, to take steps to secure the reservation of the remainder of this beautiful valley, extending from Archhill Gully to the harbour. Although it is somewhat out of the scope of this report, I may mention that the city would do well, in my opinion, to acquire control gradually of the many beautiful gullies which are such a unique feature of the town."

He considered the site very suitable for the purpose, and strongly advocated the preservation of the beautiful views to be obtained from the high ground of the site.

A point that Mr. Davidge made in his report was that the council should keep control of the estate, the idea being to work on the English system (in the modern-planned towns) of one central authority who shall be referred to and who shall have power to negative any proposal brought before it that will in any way act deleteriously against the scheme as laid down by the authorities. Short tenancies are suggested giving the council power to approve or veto any building or structure of whatever kind that might be contemplated. In Great Britain the usual policy in providing workers' homes was for the local body to lay out the necessary roads, build the houses, and let them at weekly rents. If it was not intended to sell the separate subdivisions there would not appear to be any statutory requirement to provide roads of the full width of 66ft., but it would be well, in any case, Mr. Davidge held, to set the houses sufficiently well back from the road to allow, in case of need, the statutory width to be dedicated at a later date.

The plan accompanying the report showed on the highest part of the land a central square reserved for a children's playground or a bowling green, with houses grouped on three sides. Trees, Mr. Davidge said, should be planted at each side of the green, leaving the central space free for the general use of the tenants. On the south side of the square a site should be reserved in a central position for a club of other public building, and for a public institute.

As far as houses themselves were concerned he favoured the individual or semi-detached house as against the terrace house. It would be found that owing to the steep slope of the hill it would be both economical and more effective to place houses on the upper side of the road only, thus securing for each house an uninterrupted view across the valley. The construction and design of the houses should be varied as much as possible, but those buildings grouped around a particular open space should harmonise in general character and a general architectural character should be given to the whole.

* * * * *

There are decided signs of the depression which overcame the Dominion on the outbreak of war lifting. Mr. Massey in discussing the question of the Elections said:—"There is not now existing the stress and excitement that was general three weeks ago. People had made up their minds that there could be only one possible outcome of the war, but they had also made up their minds that the war would not come to an end quickly. As a consequence, people were settling down to their normal and ordinary business in a normal and ordinary way."

This applies to the building trade as to all businesses, and it is sincerely to be hoped that those contemplating building will not stop development work, but show their loyalty by continuing to keep the trade employed, thereby relieving the stress that is already in our midst.

In Australia Mr. Griffen, Minister for Public Works for New South Wales stated to a representative of "Building" that "The principal danger to the building trade likely to seriously hamper matters is the restriction of credit on the part of the banks and other institutions handling and controlling our capital, but I must admit I am unable to see, at present, any reason for such curtailment."

The banks in Australia have not raised their interest, and the government there is pushing on with its development work as though nothing had happened. If this happy state of affairs is imitated here it should go a long way to stop any further distress happening in New Zealand. We in New Zealand are in a position much more fortunate than the Mother Country, and there is no reason other than sheer timidity why building operations should not proceed on normal lines.

The Art of Brickwork

By R. NEWTON VANES, A.R.I.B.A., Dunedin

Being a Paper read before the Institute of Architects at Dunedin

INTRODUCTION

That brickwork is the cheapest and most common form of building material of a permanent and fire-resisting nature is a well-known fact; nevertheless, it is a material capable of a very fine treatment if properly manufactured and built. Some of the finest domestic work both in England and America is constructed of brickwork, while innumerable other buildings both large and small have the main body of their walls of brick, and depend largely for their effect on the character and quality of the brickwork.

It is not the object of this paper to treat with the manufacture of the brick, but rather with the finished article, its history and present day use and abuse.

HISTORICAL SKETCH

EGYPTIAN PERIOD

The manufacture and use of bricks may not be as old as the hills, but they certainly date back to the time of some of the later pyramids. Brickwork was used extensively in the construction of a pyramid in 2,400 B.C., and, from the manner in which the Egyptians used it in this instance, the actual invention of the brick must have taken place at a much earlier date.

In their monumental works and temples, however, the Egyptians principally used stone, though it is evident that dwellings were erected largely of brick. The Egyptian brick was a crude and sun-dried article, which was not fire-burnt, and was generally faced with stone, acting only as the core of an immensely thick wall. These sun-dried bricks were re-inforced with straw.

CHALDEAN AND ASSYRIAN PERIODS

As Egypt abounded in stone, there was not the need of the universal adoption of a brick construction. The Plains of Chaldea, however, were devoid both of wood and of stone, and it was therefore in this land that the brick first came into great prominence as a building material. We have early Biblical reference to the use of brick in these plains. "And it came to pass as they journeyed East that "they found a Plain in the land of Shinar, and they "dwelt there. And they said one to another, "Go to "let us make brick and burn them thoroughly." "And they had brick for stone, and slime had they "for mortar."

The Chaldeans, followed by the Assyrians and Persians used brickwork in a most extensive and comprehensive manner. Sun-dried bricks were very largely used at first, and subsequently kiln-burnt ones. They, however, took no risks in their construction, and their Architects were evidently not unduly harassed by clients who desired a £1,000 effect for £500 expenditure! Their brickwork was rather a heap of bricks than what we would consider a brick wall. For instance, in the Hall of Columns at Persepolis, the brick walls were no less than 10ft. 8ins. thick. Needless to say, there is no mention of strapping and lathing the walls to keep signs of dampness from the exterior, nor do their inscriptions refer to the use of toxement in the plaster!

Brick arches and vaults were evidently constructed as sun-dried specially moulded brick voussoirs have been discovered bedded in clay which must have been run into the joints in a wet state. The mortar, however, was often pitch obtained from the pitch wells, while later calcareous earths were used. Decorative brickwork was extensively employed, unglazed in various colours and moulded, also moulded and glazed and enamelled in various colours. One of the early buildings in Lower Chaldea is faced with vitrified bricks and the upper storey was vitrified after erection by some process we do not now understand. This storey now forms a mass of slag. Diaper work of various patterns and low relief carving formed delightful ornamentation and symbolic friezes in various buildings and have stood the ravages of time so well, that fairly complete samples of this early work are now in the Louvre and British Museum.

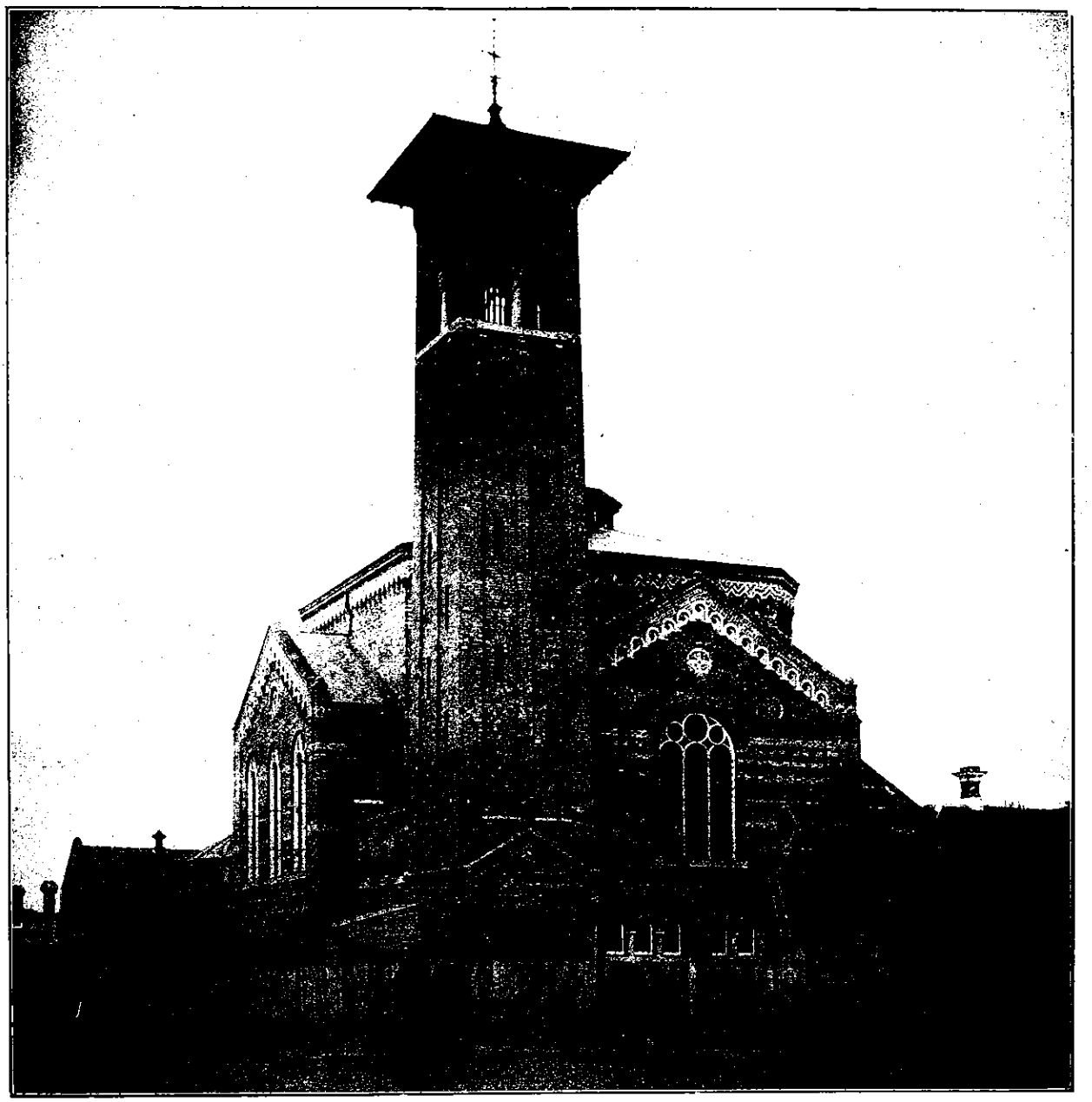
GREEK PERIOD

The Greeks were not by any means a brick using people, and why should they have been when marble was to be had for the mere quarrying of it? In the early Greek period, however, walls of the temple were often of poor masonry or of brick, and it was on this account that the dado became a structural necessity, as they protected the lower portion of these walls with thin stone slabs.

THE ROMAN PERIOD

The next great style was that practised by the Romans, and in this period bricks very similar in character to our red kiln-burnt brick were made and used. In their later works, however, they used them in a different manner from the Assyrians. While the latter made the whole wall of brick, the Romans more generally used concrete for the main body of the wall, and faced it with brickwork. That the principal building materials of the early Romans was undoubtedly the brick is evident from the boast of Augustus that he found Rome of brick and left it of marble. Among the ancient writings are lengthy

descriptions of unburnt brick and of the precautions taken to preserve the walls and rules relating to the thickness of the walls, the manufacture of bricks and the length of time they should be kept before being used. This undoubtedly goes to prove that brickwork was of universal use and the manufacture of the brick and the construction of the walls were arranged on a scientific basis and carried out to rules and regulations. A most interesting form of Roman brick, and one very largely used by the Romans, was of a triangular shape on plan and about 1½ inches thick. These were used to face up the concrete comprising the main body of the walls, the triangular shape making an excellent bond with the concrete. The construction of their vaulting was seldom of radiating solid brickwork, the brickwork to these generally consisting only of arched ribs round which the concrete was placed, and upon which the temporary boxing was probably supported. The famous Dome of the Pantheon is an exception. As far as it has at present been examined, viz:—the lower half and top rim, it consists of a tremendous mass and thickness of brickwork, the bricks of which were not laid in the form of radiat-



First Presbyterian Church, Invercargill, nearing completion
John T. Mair, A.R.I.B.A., S.C.A. Penn., Architect, Wellington

ing voussoirs, as one would imagine, but on an almost horizontal bed, the successive courses slightly overlapping. It is rather an astonishing fact that these courses have a slope down outwards of about 1 inch in 2 feet. What the intermediate portion consists of is not known, but it is 4 feet thick and it is presumed that it is of brickwork with possibly radiating arches.

BYZANTINE PERIOD

The exteriors of the buildings belonging to that period which we term Byzantine depended largely upon brickwork for their effect. Stone seems certainly to be the most accepted material for all large or monumental work and we find that the art of brickwork is strongly developed only in the countries which are deficient in good building stone. This is the case in the region round about Constantinople where Byzantine art flourished, and no doubt accounts for the extensive use of concrete and brickwork in this district. In their construction, the Byzantine Architects followed the example set by the Romans, and used the brickwork as the casting for the main body of the wall which was of concrete. The bricks which they used were only 1½ inches thick and the mortar joint was of the same thickness as the brick itself. Of course with such fat joints a considerable settlement took place. They therefore ran up the shell of the building and allowed it to settle before slabing up the interior walls and floors with marble and the domes and vaults with mosaics. The mortar thus became a very important factor and great care was taken with the choice of materials for it and the mixing of them. It was composed of lime, sand, and crushed pottery, tiles, or brick, and was as lasting as the best Roman mortar and equally hard. To give the necessary relief to the exterior, the bricks were varied, all sorts of designs being indulged in, as the chevron or herring-bone pattern, thus giving a greater richness and play of colour. The same class of construction was often used for their domes as for the main walls. In many instances large flat bricks were used and laid on horizontal joints, the structure being gradually corbelled out to the Domical form. These domes were constructed without centering. Another very interesting form of construction used by them for dome work is one so closely allied to brickwork as to be worthy of notice. They used earthenware hollow pots and fitted them one into the other, surrounding the whole in concrete, thus forming a very light and strong structure practically on the same principle as our present day hollow terra-cotta fireproof floors.

THE BEAUTY OF OLD BRICKWORK

And so we might continue with all the styles that have existed up to modern times. There is a warmth and charm about most old brickwork which is certainly lacking in our colonial article. I recall with pleasure watching the last rays of sunlight striking upon the old Norman brick tower of St. Alban's Abbey. The mellowed and yet rich tints in this tower are a delight. Age may have a lot to do with them, but the bricks themselves must have been good in the first place. This delightful characteristic which applies generally to old work and also to quite a good proportion of modern work in England is hard to describe. It is a somewhat elusive quality, but if present it can never be passed without a second look, and the thought invariably flashes through the mind, "what excellent brickwork."

DESIRABLE QUALITIES IN NEW BRICKWORK

This quality of excellence, I take it, depends on several factors which might be enumerated as follows:—

1. The colour of the individual bricks.
2. The method of laying them.
3. The colour and method of pointing.
4. The proportion and size of the individual bricks.
5. Thickness of the joint.

So far, the points touched are hardly debatable, and I think you will have agreed with what I have said. Now we come to considerations which are open to argument and where individual taste is largely concerned. I shall, therefore, give a few somewhat fragmentary opinions of my own on this matter, which may not be in exact accordance with yours.

COLOUR

Referring to the divisions in the order before given, the first point is the colour of the brick. Whatever the colour is, each and every brick in the wall should not be absolutely the same colour. An unbroken mass in one tone is not to be found in nature and is quite inartistic. A painted surface is the only one that is uniform, and it, purely on account of this uniformity, never looks as well as a surface of unpainted material. You may say that an Oamaru Stone front is all one colour. So it is at first and it is then that it looks its worst. It is far more beautiful in after years when each stone has weathered to its particular shade. Now brickwork does not change much with exposure, therefore the bricks should be slightly varied in tone when taken from the kiln. It is in this respect that the clay burnt brick has the pull over the pressed sand brick. Unless great care be taken with picking over the bricks, there is always present this play of colour with the former giving a life and texture to the wall which is lacking in the sand brick. This drawback may, of course, be overcome mechanically by the discreet introduction of sand bricks of quite different colours in the form of patterns. Though personally I consider that the sand brick can never equal a first class burnt brick in the matter of colour, except that it somewhat resembles a limestone in its composition and therefore should weather like a lime-stone, and so ultimately give a play of colour. I am not advocating that brickwork should be like Joseph's coat—far from it—but that it is necessary that there be just a fraction of a tone of difference between each individual brick in a plain wall, if the wall is to possess the charm which belongs to much of the old work.

It is evident that the colour effect of the whole wall depends upon the colour of each unit, and for the mass of the colour to be pleasing, the general

tone of the brick must be good. We certainly have this variation of tone in our Dunedin bricks, but I think that the colour itself is not all that it could be. It seems to lack richness, and is too much of a pinky shade, whereas more orange or purple tones are to my mind more pleasing. I do not think it would be a very difficult matter for the manufacturers to experiment by adding some ingredients to the raw clay, for the purpose of ascertaining whether the colour could not be improved, quite cheaply and with little trouble to themselves.

BONDING

The next point is the method of laying or the style of the bonding. There is no doubt that the spacing of the joints and the insertion of bats are carried out in a somewhat haphazard method in Dunedin. The size of the brick varies considerably; this no doubt may account very largely for the defect. A common defect which is quite fatal to the appearance of a wall is the irregular fashion in which vertical joints often are placed one above the other. Unless all vertical joints are in a true straight line, there is a decidedly ragged appearance. As far as general effect is concerned, there is no doubt that Flemish bond is far ahead of all other styles for the majority of the brick walling. In our Residential, Ecclesiastical and similar work, I think we might well follow the lead of the Byzantine Architects, and more freely adopt the use of patterns and relieving courses etc. The new Presbyterian Church at Invercargill has some most interesting brickwork, and shows what can be done here if we care to take the trouble and insist on getting what we want. In this Church, as well as relieving courses of various coloured bricks, the ordinary walling in arch spandrils and similar places is set herringbone fashion and in various other patterns. I think if we ceased to use rough cast in small patches and cement facings, and obtained our relief and play of colour from the judicious use of say chipped clinkers and sand bricks in various tones and set in the form of diaper work and herringbone etc., we would obtain much more pleasing results. However excellent the brickwork, I think it is in most places quite spoiled where plain cement compo facings and dressings are used. The cold grey of the cement invariably clashes with the colour of the brickwork, and quite kills its appearance. If the cement work is tinted with hydraulic lime, as in the Public Library, a warm tone results which harmonises with the brickwork and gives a much softer and pleasing effect. I have noticed that many buildings in and around Dunedin have looked very much better just when the brickwork has been completed and before the plasterers have got to work. This has led me to the belief that we largely spoil our buildings in the finishing of them off, and that, whereas there is a general appearance of uniformity of surface about the semi-finished building, this desirable quality is, in many instances, totally spoiled, and the building made to look fussy and disjointed by the indiscriminate tacking on of patches of plaster. If the walls were relieved by coloured bricks and by panels and bands of clinkers and by chevron and diaper work, a far more modest and becoming structure would result and the harmony and continuity of the wall surface would not be interrupted and disjointed by harsh surfaces and disagreeable lines. For the finish of copings, sills, fire hobs etc., the plain brick on edge is quite simple and costs no more than the ordinary flat method, but it adds a decided finish to the work and gives it some character.

I do not think that we pay nearly enough attention to these small details, and allow the bricklayer to set his bricks as he thinks fit, provided he keeps a thin joint and an even face to his work.

Another relieving feature often used in England, but seldom seen here, is the tile creasing. The use of thin tiles with fat joints is centuries old, and for relieving horizontal courses, small arches, projecting labels over openings and oversailing courses, is I think, both simple and delightful. We are hampered here in not having the necessary flat tiles. Shingle tiles and Marseilles floor tiles are very expensive, and dished roofing tiles unsuitable. I see no reason why the brickmakers or terra-cotta workers should not make and stock plain flat tiles say about 6ins. x 9ins. x 1 in. thick, provided we make a custom of using them.

(To be continued)

Our Railways

MR. HILEY'S REPORT

The Report of Mr. E. H. Hiley, the new General Manager, on the N.Z. Railways, provides food for thought. It is unfortunate that since the report was written, war has broken out, as this will probably constitute a serious bar to the raising of a loan of £3,250,000, which is the figure Mr. Hiley states is needed to make the Railways up to date. His scheme includes the following:—

	£
New Stations and Station-yards—	
Auckland	450,000
Wellington	480,000
Palmerston North	40,000
Hastings	40,000
Lyttelton	100,000
Christchurch	320,000
Addington	100,000
Timaru	40,000
Duplications—	
Penrose-Papakura	75,000
Ohinewai-Huntly	40,000
Horotiu-Frankton	45,000
Newmarket-New Lynn ..	200,000
Lyttelton Tunnel	125,000
Grade-easements—	
Penrose-Mercer	150,000
Mercer-Frankton	10,000
Frankton-Te Kuiti	40,000
Palmerston North-Marton ..	50,000
New Engine depot and Approach Lines—	
Auckland	140,000
Additions to Railway Workshops—	
Newmarket	30,000
Petone	30,000

New Lines—	
Auckland via Hobson Bay ..	375,000
Signalling and interlocking ..	250,000
Level-crossing alarms	20,000
Bridge-strengthening	50,000
Locomotives—	
Ten Garrett Engines	50,000
	£3,250,000

Under the heading "Education of Staff," Mr. Hiley says "the problems dealt with in each branch of the Railway Service are complex in character, and the men on whom the ultimate administration of any branch of the service will fall, should unquestionably be trained in a manner that will fit them for their responsibilities later in life." A regular course is suggested to bring about this very desirable result, and we look for greater efficiency all round as soon as the system has had time to develop.

With regard to engines, Mr. Hiley suggests that 72 of them should be "scrapped" as being obsolete. He suggests that twenty Garrett engines should be imported from America at once, as local engine builders cannot cope with the amount of work offering. This matter has been taken up locally, and an effort is being made to get the engines in N.Z. instead of sending work away. Mr. Hiley says regarding this:—

"The engines now on order in the railway workshops are more than sufficient to keep the shops at Addington and Hillside going at full pressure for the next two years, and the contracts already let to the outside engineering firm will similarly keep their establishment employed for the same period. There is no reason to doubt that engine building at the shops within the Dominion will not be continued at high pressure for a considerably longer period."

The passenger accommodation is inadequate for present requirements, and Mr. Hiley proposes aditional cars, similar to the ones at present in use with slight modification. He is an advocate for the petrol-electric car, but wants engines that will develop greater hauling power than the ones the Government have in use at present. Electricity is to be installed in the main through trains after various systems have been tried out.

In November we are to have a little better service to Auckland. The time table which comes into force on November 1st will save one hour twenty-five minutes between Wellington and Auckland. On the Napier route sixty-four minutes will be saved, and on New Plymouth route thirty minutes. This is a move in the right direction, and one badly wanted. Several of the present stops are to be cut out of the express trains' timetable.

An idea for town ticket offices where passengers can obtain tickets without the necessity of going to the station early to make sure of a ticket, will commend itself to the busy man, and the experiment will be watched with interest. It is to be tried in the four main centres.

New stations are provided for in Auckland, Wellington, Christchurch, Palmerston North, Hastings, Lyttelton and Timaru. We illustrate the plans of the three first mentioned on the following pages.

Numerous bridges are to be strengthened, and wooden ones replaced with steel structures. This will enable heavier engines to be run on the lines.

The much discussed level crossing difficulty has been provided for, material for 300 crossings having been ordered similar to the one which has been on trial at Levin, which has proved satisfactory.

Regarding railway construction, Mr. Hiley gives us some sound business-like sense. We quote his remarks:—"The arrangements under which new railways are authorized and built in the Dominion are, I would respectfully suggest, capable of considerable improvement. At the present time a new line is undertaken without any consultation with the Railway Department, and in consequence the only official estimate available before the country is committed to additional expenditure is the Public Works Engineer's estimate of the cost of construction. The Department which will ultimately take over and work the new railway is not consulted at to the route, grades, and alignment, nor are the plans submitted to it before the new line is commenced. No estimate is obtained from the Railway Department as to the cost of building the additional rolling-stock required. No estimate is made of the annual cost in the shape of working expenses, and no figures are prepared by the Railway Department as to the probable revenue from the proposed line, therefore no reliable calculation can be made as to whether the net revenue will represent a profit or loss.

I believe I am correct in stating that there are over twenty new railways in course of construction at the present time, and I submit that this is not an economical method of procedure. It must be obvious that if the work of construction was concentrated upon, say, five of these railways, the cost of supervision would be lower and the speed at which the railways would be finished and become traffic-bearing and revenue-earning would be at least four times as rapid. Over twenty uncompleted and unremunerative railways are a serious handicap to a comparatively small undertaking. The Working Railways Department is vitally interested in economical construction, because the expenditure ultimately becomes a portion of the capital upon which interest has to be earned."

He then gives details of a form to be filled in for a proposed new railway.

A large sum of money is earmarked for reducing grades especially on the North Island Main Trunk, and also duplication works, the object being to use bigger engines which can haul greater tonnage.

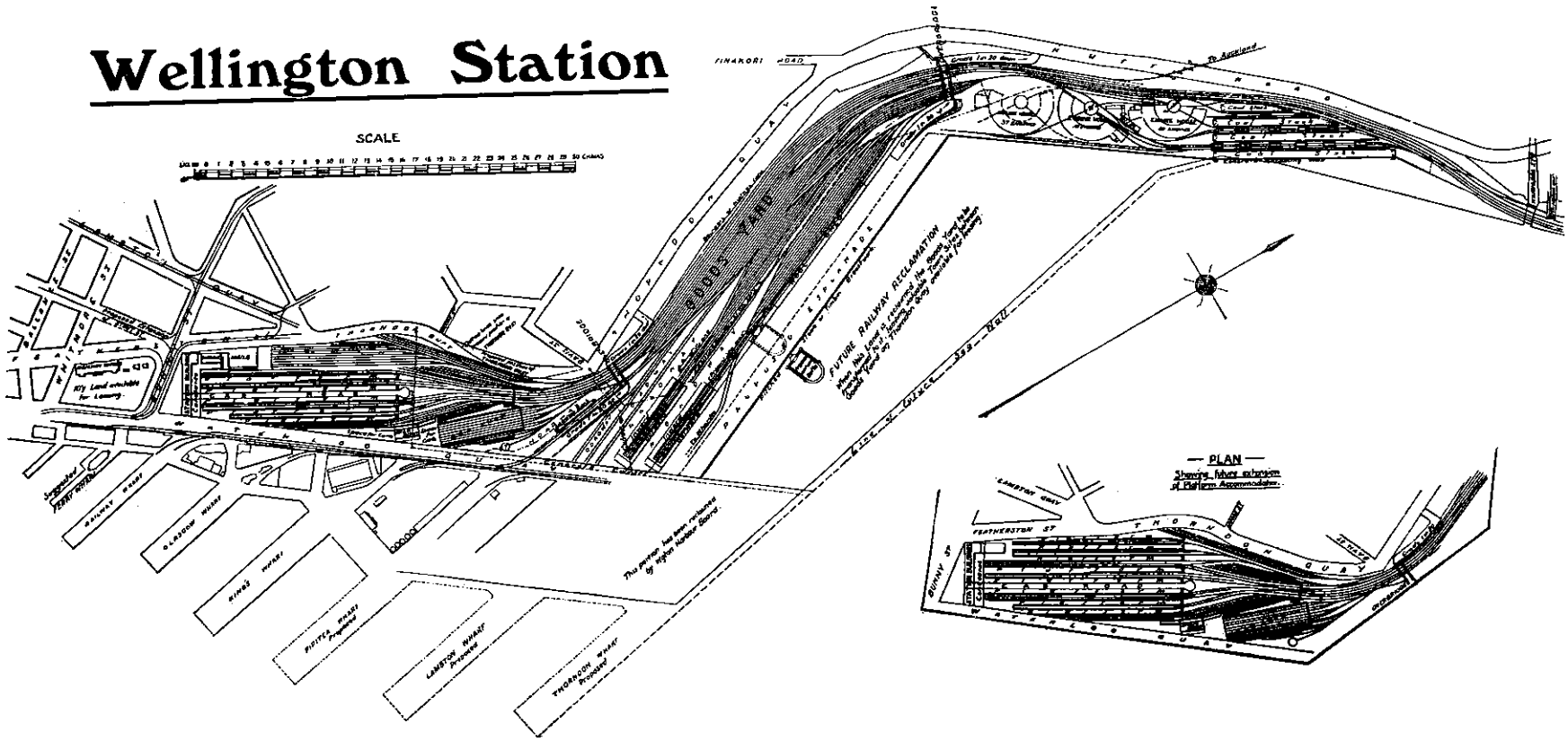
WELLINGTON STATION

The Wellington business is at present carried on at two separate stations (not counting Te Aro), neither of which is laid out in a manner conductive to economical or expeditious handling, having been added to and patched as increasing traffic has necessitated. The present method of working is inconvenient to the public, whilst it is impossible for the Department to deal with the traffic satisfactorily.

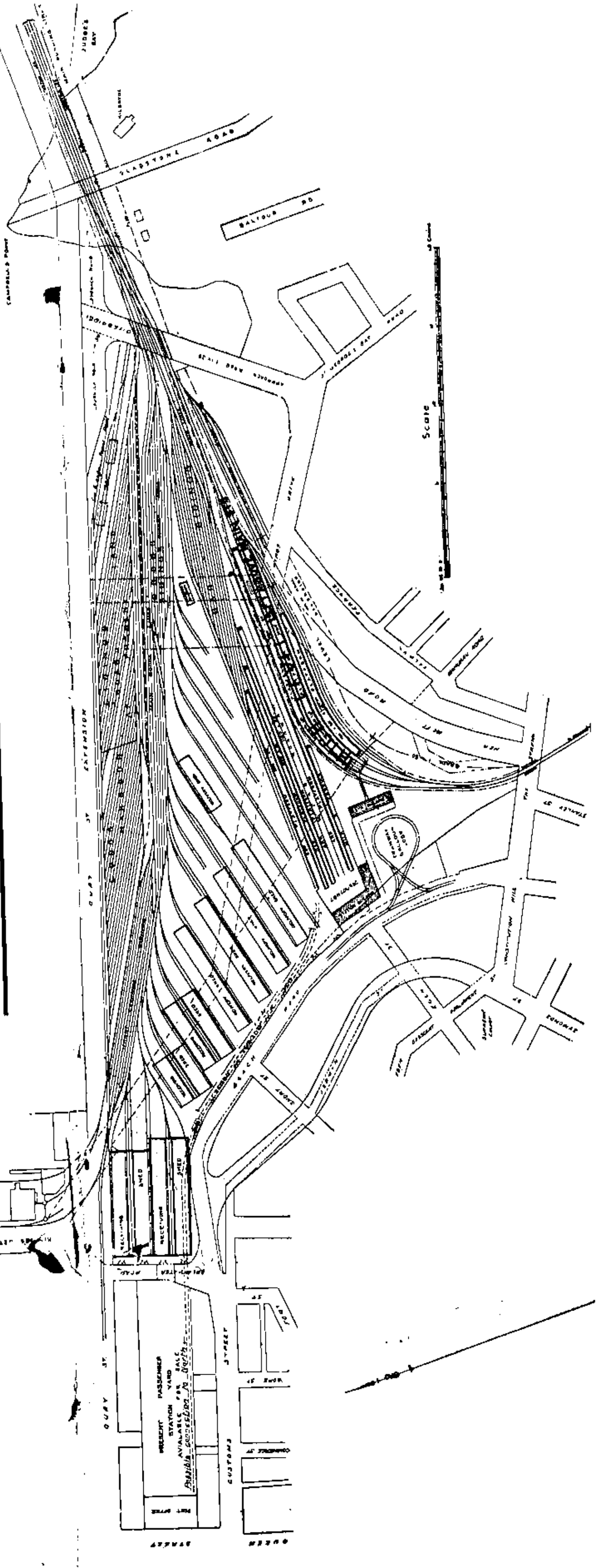
It is estimated that the traffic to be handled in Wellington will, at the present rate of progress,

THE PROPOSED
NEW RAILWAY STATIONS

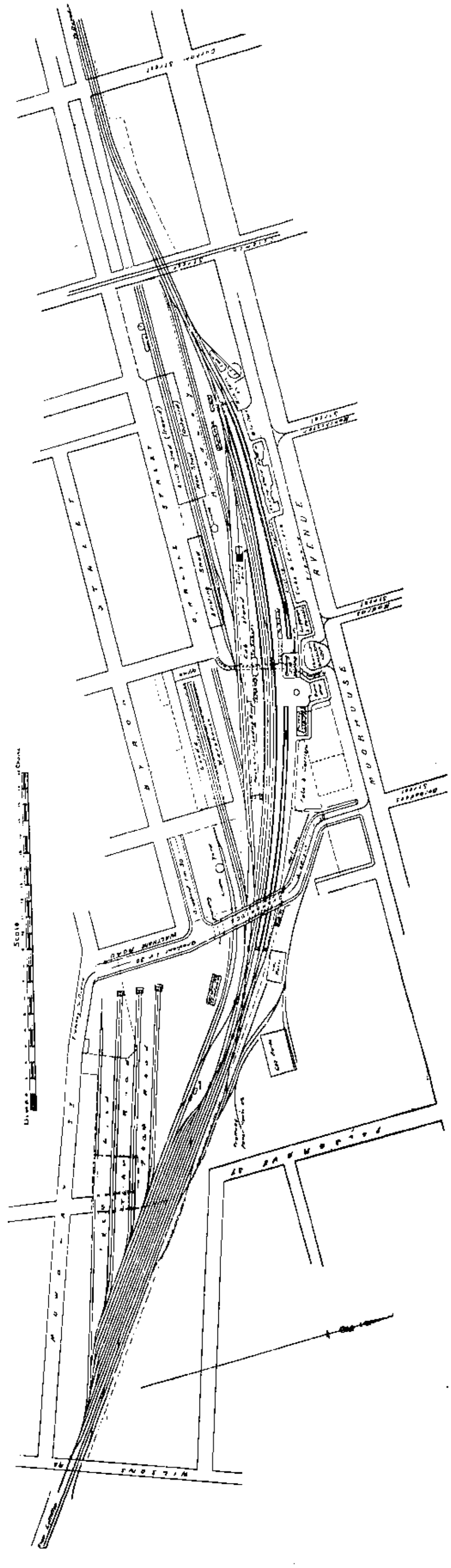
Wellington Station



Auckland Station



Auckland Station



Christchurch Station

double itself in less than ten years, and as the stations are now taxed to the utmost at busy periods, it is clear that no time should be lost in providing the increased accommodation in a central position.

Plans have been prepared showing a passenger-station fronting Bunny Street, and a goods-station slightly farther to the north, with entrance off Waterloo Quay. The station is in an admirable position, considering the area of ground required. It is necessary that the station should be adjacent to the wharves, especially the Ferry Wharf, to facilitate the exchange of both passenger and goods traffic.

The plan attached to this report (see pages 54-5) sets forth in detail the lay-out of the station, the inset on the plan showing how the passenger accommodation can be increased when the necessity arises. The lay-out of the goods yard can be straightened and improved when the reclamation is pushed out to the line of the future sea wall, and when this occurs the Department will be able to dispose of the valuable land east of Thorndon Quay shown on the plan as occupied by goods sidings.

The engine depot will be placed on land to be reclaimed between Thorndon and Kaiwarra. It is proposed that colliers with locomotive coal shall berth alongside the breastwork and discharge their coal directly on to the coal-stacking ground or into trucks for country stations.

The cost of the Wellington Central Station is £475,000, and the work will take five years to complete from date of commencement.

Regarding Te Aro Station, Mr. Hiley gives very good reasons for abolishing it entirely, and centralising all the railway work under one head.

It is not usual to have two stations within three-quarters of a mile of each other in towns such as Wellington. The traffic at present being dealt with at Te Aro is legitimate tram traffic, and can be better handled by the trams. In his opinion the greatest good to the greatest number will be promoted by closing Te Aro Station altogether.

LYTELLTON TUNNEL

A sum of £125,000 is set aside for the duplication of the Lyttelton Tunnel line which is badly wanted. Mr. Hiley does not give much space to the consideration of the electrification of the tunnel. He says:

"I have had practical experience of the substitution of electrical power for steam on a working railway, and am an advocate of electrification under suitable circumstances. Electrification is most desirable in the case of railways serving densely populated suburban areas where stations are numerous and close together, and where practically a continuous passenger service is required; the rapid acceleration of electrical multiple-unit passenger trains enabling a quicker and more frequent service to be given. But the circumstances of Christchurch do not warrant the expenditure, the passenger business can easily be dealt with under steam haulage. The line is not densely populated, and the goods traffic can be as well, if not better, handled by steam. The double line is necessary between Lyttelton and Christchurch, but electrification under the circumstances would be extravagant."

Our 25th Competition

ESSAY ON GREEK ARCHITECTURE

Won by "TORUS"—R. H. Saunders, Christchurch

Only two essays were received in connection with this competition, viz:—"Torus" by H. R. Saunders with Mr. T. L. Flaus, Christchurch, and "Kallicrates" by William J. McKeon with Messrs. Hoggard Prouse & W. H. Gummer, A.R.I.B.A., Wellington.

Mr. Leslie D. Coombs who kindly set this subject comments as follows:—

"From an educational point of view I trust this competition will be of the greatest value to the competitors. Each has had to study his text books and necessarily to write in words and sentences of his own his interpretation of the information contained in such books. Unfortunately all text books are not good. Some are decidedly bad, and there is a reasonable amount of excuse for a student propounding a theory that the latest authorities consider obsolete and incorrect. However, no such explanation will completely excuse the subject matter of the essay written by "Kallicrates." "Torus" writes much more accurately, but contradictory statements in text books have given him some trouble. On page 432 of the R.I.B.A. Kalendar 1913-1914 is printed a list of books recommended for students. They cannot do better than study from the books so recommended.

Neither competitor has written in a really good literary style, but "Torus" has done better than "Kallicrates." The sentences of both are in several instances rather ambiguous. Mistakes are also made in spelling and punctuation, and "Kilicrates" seems to consider that every sentence shall be a new paragraph. The quotation with which this same competitor terminates his essay is very weak and altogether wrong. This is the first time I have seen it written that a Greek Temple "presented an aspect of rich and sparkling gaiety."

Both sets of sketches are very good, but here again "Kallicrates" has made mistakes. A Greek triglyph at the corner of a building is right at the corner, not slightly away from it; the architrave (the lintel) of the Doric entablature is not jointed midway between the supporting columns, etc. "Torus" has made some mistake with the cornice in fig. 4, otherwise his sketches are free from important errors.

The following notes are intended to help to set each competitor right, and to bring his knowledge up to date, but he must not forget that modern research is throwing much new light on the architecture of ancient Greece, especially that of the earliest periods, and even present day ideas may in the future need modifying:—

Notes for "Torus":—

Windows are supposed to have existed in the east wall of the Erechtheum at Athens. It is therefore hardly correct to state definitely that the temple of (Jupiter Olympius) at Agrigentum was the only temple that had windows.

The evidence that some temples at least were lighted by openings in their roofs is very strong. At Bassal a portion of a roof tile was found with an opening pierced in it, and a raised rim around to prevent the rain running down through it. At Aegina Cockerell found a block of stone that had been a coping stone to an opening in the roof. The temple of Jupiter Olympius at Athens is mentioned by Vitruvius (Chap, I., Book 3) as having been hypaethral. The same writer says (Chap. II., Book I.) "temples are built, hypaethral and uninclosed to Jupiter, Thunderer, Coelus, the Sun and Moon; because these divinities are continually known to us by their presence night and day, and throughout all space." All authorities agree that the temple of Apollo Dilymaens near Miletus in Asia Minor was hypaethral, but here it seems to have been the case more by accident than design for Strabo mentions that after building the temple the builders were unable to roof it on account of the big span. The Greeks did not know how to truss timbers.

The idea that the columns at Beni-hasan in Egypt were prototypes of the Doric columns is now considered wrong. What we know of the history of the Heraeum at Olympia tends to disprove the theory. The temple, which is considered the earliest of Greek temples originally had wooden columns which were gradually replaced by stone ones.

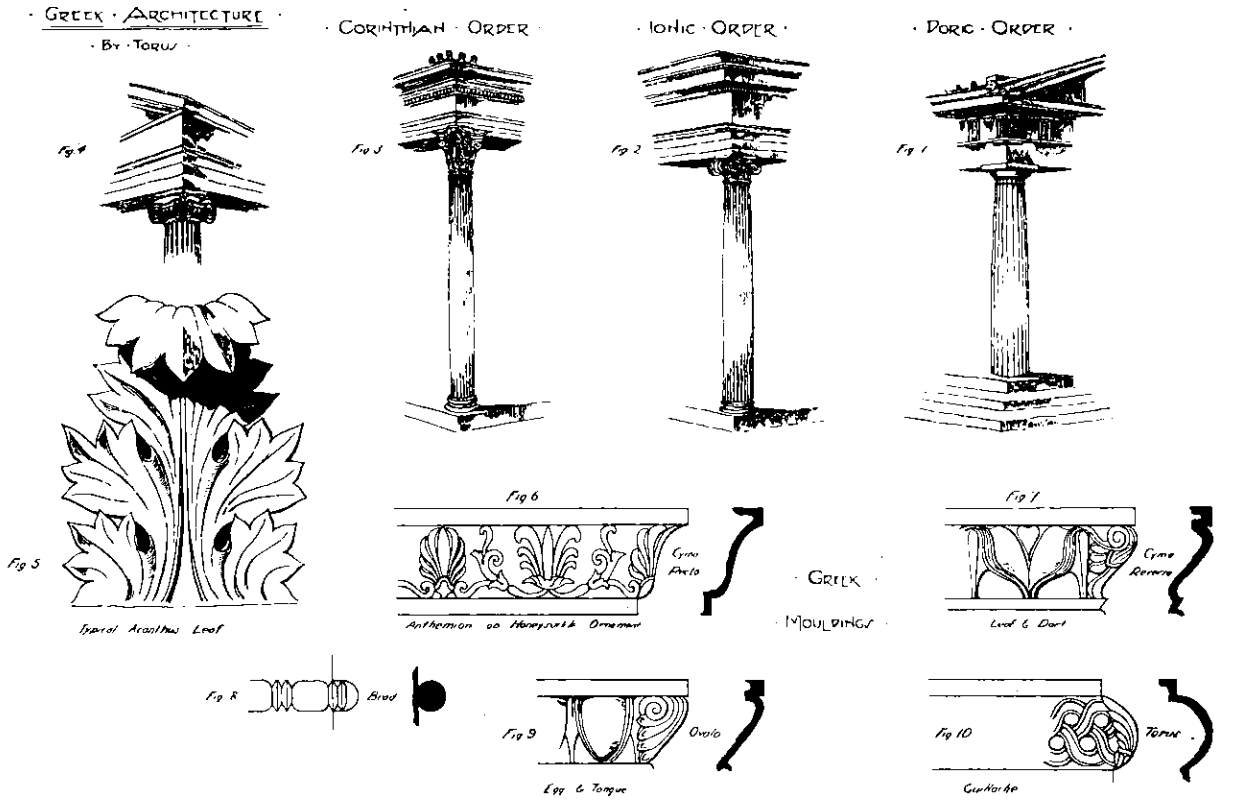
Notes for "Kallicrates":—

There are no remains of the earliest of Pre-historic Greek architecture that show by their design and construction the wandering nature of the people. In this, the Mimoan period, we have the example of the palace at Knossos in Crete. Another example is the palace at Phaestus. Both these palaces were certainly what are termed monumental buildings.

There is no evidence to show that, during the Niycenaean period, the principal buildings and tombs had but flat roofs of clay. At Tirens passages are roofed by courses of stone in horizontal beds, projecting one over another, and cut on the underside to the contour of a pointed arch. Similar construction is to be seen in the domed tombs, an example of which is the building known as the Treasury of Athens at Mycenae. When studying the plans of buildings we find such features as porticoes-in-antis as at the palace at Tirens, and even at the palace at Knossos (Minoan period), we may feel convinced that the ordinary roofs to important bulidings were of shape and construction similar to those of later date.

The Doric temple at Corinth is not the earliest of its kind known, the Heraeum at Olympia being probably at least 150 years older. This temple is the earliest peripteral Greek temple of which remains have been found sufficient to determine its restoration. The date of its foundation has been attributed to the eleventh century B.C.

The temples at Selinus were built of limestone covered with stucco, but I can find no evidence to show that stucco was used on the early temple at Corinth. However, the practice of finishing buildings with stucco was almost universal, especially in buildings of the Doric Order.



Our 25th Competition—Drawings by "Torus"

There was in Ionic Archaic period in Asia Minor from about 550 B.C., the historical importance of which must not be overlooked.

In the Archaic examples of Greek Ionic columns the flutings were shallow and separated by arrises.

The Volutes of the early examples of Ionic capitals did not always appear to spring directly from the shafts (like those at the tomb of Tomassas at Cyprus). The earliest example of an Ionic capital known, from the temple of Apollo at Naucratis, has quite a different appearance, being not unlike in character the well known example from the north portico of the Erechtheion at Athens."

THE PRIZE ESSAY

Affected though their architecture was by that of other and preceding nations, the Greeks evolved a style which is accepted as being beyond criticism. It has been studied and copied and has influenced to a remarkable extent succeeding architecture, having been a source of inspiration even to this day. The excellence to which the architecture of ancient Greece attained is no doubt due to the great care and consideration which they gave to the designing of their buildings even to the most minute detail.

The Greek style is essentially columnar and trabeated thus giving a system where strict observance of the laws of gravity is all that is required to ensure stability, the weights acting vertically and therefore needing only vertical resistances. A distinct character was given to the buildings by the use of finely polished marble or a fine cement composed of marble dust and lime forming a finished surface, capable of a high polish, to stone or brickwork. In some cases, even marble was coated with this cement, as it was capable of a higher polish.

As stone or marble lintels were difficult to obtain in any great length, the columns had necessarily to be placed comparatively close together and this fact had an important bearing on the design. Mortar was not used in the construction, because it was not required for the purpose of distributing the pressure between the component blocks, as necessary in an arcuated construction. Instead, the beds were rubbed to a very fine and true surface and the stones jointed with iron cramps. Care was also taken that the stones were laid on their natural bed or otherwise, according to the pressure they had to sustain. Thus the architraves, which had to withstand a cross-strain were placed with the planes of their beds vertical, enabling them to carry a load over larger spans and thus tending to a wider intercolumnation. The early Greek work, of the Hellenic period, is heavy and severe, revealing the influence of the Mycenaean period, but there was a gradual evolution towards refinement and beauty. In their buildings there was a combination of the qualities of harmony, simplicity and unity because of their excellent proportions, their truthful and apparent construction and the employment of one constructive principle throughout.

It seems astonishing that the Greeks took such pains to correct optical illusions; one, the most well-known instance, being the giving of an entasis to the shafts of the columns, as illustrated in Figs. 1-3, to counteract the apparent thinning of the column towards the centre.

Remarkably fine sculpture and carving was used to complete the edifices, being used with proper restraint and judgment. The high degree of delicacy and refinement attained was facilitated by the hard finegrained marble employed. Colour and gilding were also used to heighten the effect.

The Greeks developed three of the "Orders of Architecture," the Doric, Ionic, and Corinthian, which were subsequently copied by the Romans who added the Tuscan and Composite and thus completed the "Five Orders of Architecture." An "order" consisted of the support—the column with capital and base, the latter being absent in the Doric Order where the column rests directly on the stylobate, and the part supported—the entablature. The latter is subdivided into the architrave, frieze and the crowning member, the cornice, the proportions, mouldings and decorations varying with the different orders.

The sturdiest, oldest, and plainest—the Doric is traced to a stone Egyptian prototype, by many, while many others, again, trace it to a wooden origin. However, it is a point about which there has been, and is much contention. The supporters of the "wooden origin" theory have certainly good arguments in their favour the chief being the deriviation of the guttae from constructive wooden pegs; and this is supported by discoveries made a few years ago. The column, as before mentioned, has no base, standing directly upon the stylo-bate, or base of the building, usually of three steps. The column including the cap is from 4 to 6½ times the diameter at the base, in height diminishing to ¾ or ⅔ of this diameter at the top. The shaft is divided usually into 20 flutes separated by sharp arrises, though the number varies. Surmounting this order, as illustrated in Fig. 1., is a capital consisting of annulets, echinus and abacus. The abacus is a square slab, with the echinus—a large convex moulding—under. The latter varies, in the earlier examples approaching a parabolic section, and in the latter, a hyperbolic. Beneath the echinus are the annulets, or horizontal fillets varying in number from three to five. Immediately below is the Trachelion or necking having below the hypothachelion consisting of three grooves, in the earlier, and one in the later examples.

The entablature is usually about one quarter the height of the order and is divided into three main divisions. Resting on the abacus is the architrave which is of considerable depth and has only one vertical face. Separating it from the frieze is a flat moulding—the tenia which has beneath it, at intervals corresponding to the triglyphs, a narrow band called the regula, with six guttae. Decorating the frieze are triglyphs, having channels and the square spaces between called the metopes, which are, in some examples, richly sculptured.

The cornice consists of the upper part having cymatium and birdsbeak mouldings with a vertical face below, called the corona. The soffit, inclined upwards parallel with the slope of the roof, has flat projecting blocks called mutules, suggesting the ends of rafters, coming over each triglyph and metope and ornamented with eighteen guttae. This order is illustrated in Fig. 1.

The chief distinguishing feature of the Ionic order as illustrated in Figs. 2-3, is the volute or scroll capital, the origin of which has been traced to different sources. The columns, including shaft, base and capital are in height about nine times the lower diameter and therefore more slender than the Doric in proportion. The base is usually moulded with torus and scotia, the square plinth being absent. Later examples have a lower torus added, making what is named the Attic base. The shafts have flutes, usually twenty-four in number, differing from the Doric in being separated by fillets.

The capital consists of a pair of volutes or spirals at back and front of column, being, in height, about two thirds the diameter. It should be mentioned that the "diameter" is the lower diameter of the column, which forms a scale by which the other parts are proportioned.

The volutes are connected at their sides by what is known as the cushion which is either plain or ornamented and connecting them at front and back is an echinus moulding ornamented with the egg and dart, having a bead moulding under. The volutes, extremely intricate, were formed by hand or geometrically, those on the angle column being generally formed to face both facades, as sketched in Fig. 4. One example, the temple at Bassae, has all the volutes so placed. The entablature, though varying in height is usually about one fifth that of the whole order. The architrave is formed in three faces, apparently representing superimposed beams, and the frieze, though sometimes plain, is ornamented with a band of continuous sculpture. Forming the cornice are the cyma-recta moulding, the corona and usually a dentil course. The Doric Order provided a setting for sculpture while the Ionic incorporated the carving with the order.

The more ornate Corinthian Order was seldom used. Column, base and shaft are similar to those of the Ionic, the total height of the three being about ten times the diameter, thus becoming still more slender. It stands, as do the two previous orders, on a stylobate and its distinctive feature is the very ornamental capital, which is from one to one and one sixth times the diameter in height. The origin of the capital is clothed in obscurity. Its probable deriviation is from the Ionic examples, such as at the Erechtheion, where bands of sculpture occur beneath the volutes as illustrated in Fig. 2. As seen on the illustration Fig. 3, it consists of a bell upon which are carved two tiers of eighth acanthus leaves and between those of the upper row are eight caulicoli surmounted by a curled leaf or calyx, from which spring the volutes, supporting the corners of the abacus, and in the centre small volutes support a floral ornament. The moulded abacus is curved on each face, the angles being either brought to a point or chamfered off.

The entablature, its height normally about one fifth that of the whole order, resembles the Ionic, though the cornice mouldings are more enriched.

Practically all the important ancient buildings now found in Greece are the temples which were built in the fifty years following the final defeat of the Persians in B.C. 480, a period of national exultation. The temples were designed with special regard to external effect, richly sculptured, to form fitting shrines for the deities, in whose honour they were erected. They were erected in a "temenos" or sacred enclosure and consisted of a "naos" or cella, which was usually oblong in plan, containing the statue of the God or Goddess; a treasury or chamber beyond and a front and rear portico and flanking colonnades, the whole resting on a stylobate generally of three steps. The roofs were constructed of timber, covered with marble slabs, the overlapped joints of which had antefixae at the eaves. In most cases, the door was placed in the centre of the end wall, behind the portico and sometimes planned to enable the lighting of the statue opposite.

As the temples had no windows, with one exception, at Agrigentum, many theories have been advanced as to the method of lighting. Many authorities maintain that light was obtained only through the doorways, while others hold that transparent Parian marble roofing slabs sufficed, or that artificial illumination was resorted to. However, there seem grounds for believing that a "hypaethral" opening was formed in the roof; but as the roofs have naturally long since disappeared, there is no conclusive evidence. In the larger temples, internal colonnades of columns placed over each other were employed to support the roof. The two end facades had a triangular pediment, corresponding to the slope of the roof, frequently filled with sculpture.

The temples are classified according to the disposition of their columns. For instance the simplest is termed "di-style in antis" where one end only has two columns between the antae or pilasters terminating the side walls.

The exterior columns with their entablature constitute the entire height of the building. The example which is regarded as the most representative of Greek architecture is the Parthenon on the Acropolis at Athens. It is, "peripteral octastyle" on plan, that is, having porticos at each end with eight columns and columns on each side, in this instance numbering seventeen, thus being completely surrounded with columns. In addition to the cella, at the western end of which was the famous statue of Athena, and which was called the "Hecatompedon," there was, at the western end of the cella, the Parthenon, or virgin's chamber, from which the temple took its name. The latter chamber was probably used as the Hieratic treasury.

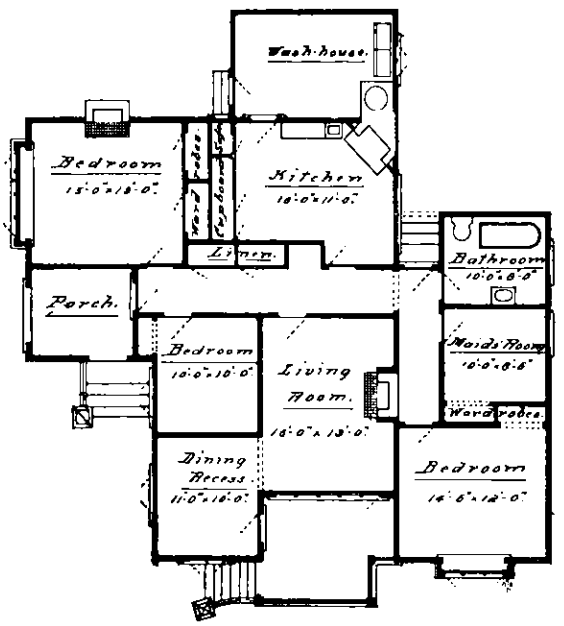
In addition to the temple many other buildings were erected, including the theatres, palaces and tombs. The orders were an outstanding feature of the architecture. The first used, the Doric, was also mostly employed. The succeeding, the Ionic is seen in fewer examples while the Corinthian was least employed. The succession is well expressed in Thomson's lines:—

"First, unadorn'd,
And nobly plain, the manly Doric rose;
Th' Ionic, then, with decent matron grace,
Her airy pillar heaved; luxuriant last,
The rich Corinthian spread her wanton wreath."

Some Hastings Residences

The accompanying photograph of a residence for Mr. J. Kruse was designed by Mr. Ball (formerly of Grant and Ball). It stands snugly on a sunny site backed by trees. The building is constructed of timber, roughcast, with hooded windows, and shingle treatment to gables. The porch is a restful nook and the verandah with loggia complete composition.

1—Residence for Mr. J. Kruse at Havelock North
J. Ball, Architect



Plan of above house of Mr. J Kruse

The house cost £950 and was built by Messrs. Stanley Bros. The plan of this house is shown above.

Illustration No. 2 is a home for Mr. T. Chaplin also designed by Mr. Ball. It contains 7 rooms comprising study 14ft. x 12ft., drawing room 14ft. x 12ft. dining room 18ft. x 13ft., 4 bedrooms, etc. The hall is treated with "Amiwud" and the ceilings are of "Eternit" with exposed ceiling joists. The overhang of the roof gives protection from the weather and the simple balcony effect with curved supports to verandah make a most effective treatmennt by simple means. The house cost £800 and was built by Messrs. Stanley Bros.

The third illustration was designed for Mr. T. W. Bowrie by the same architect. In character it is remindful of the houses at present in vogue viz., Elizabethan, but with provisions made for modern

2—House for Mr. W. T. Chaplin, Hastings
Mr. J. Ball, Architect

3—House for Mr. T. H. Bowie, Hastings
Mr. J. Ball, Architect

comfort with due consideration for chosen site. The building is of two storeys asbestos sheeting being introduced with timber strappings in the upper portion. The living room is 22ft. x 16ft. with angle windows. The kitchen is 14ft. x 10ft. and the drawing room is 18ft. x 14ft. There are four rooms on the upper floor with bathroom, lockers, etc. The building cost £1,070 and was erected by Mr. H. H. Campbell.

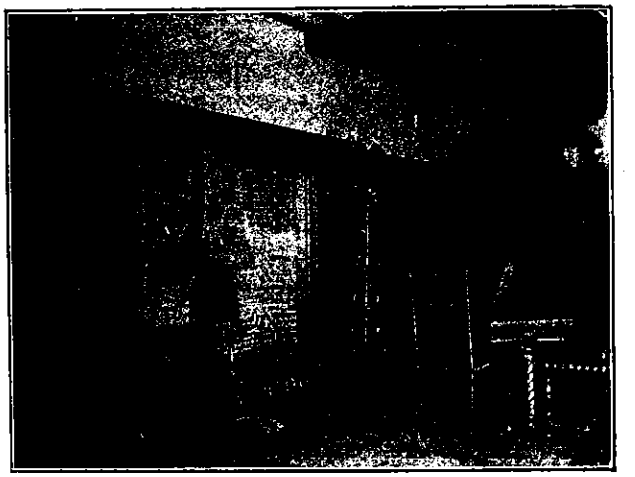
Residence in Dunedin

Residence at "Sunshine," Dunedin, for Mr. Jas. McAslan, consisting of seven rooms and offices, plastered throughout, and fitted with all conveniences. Cost about £550.

Basil B. Hooper, A.R.I.B.A., Registered Architect, Dunedin

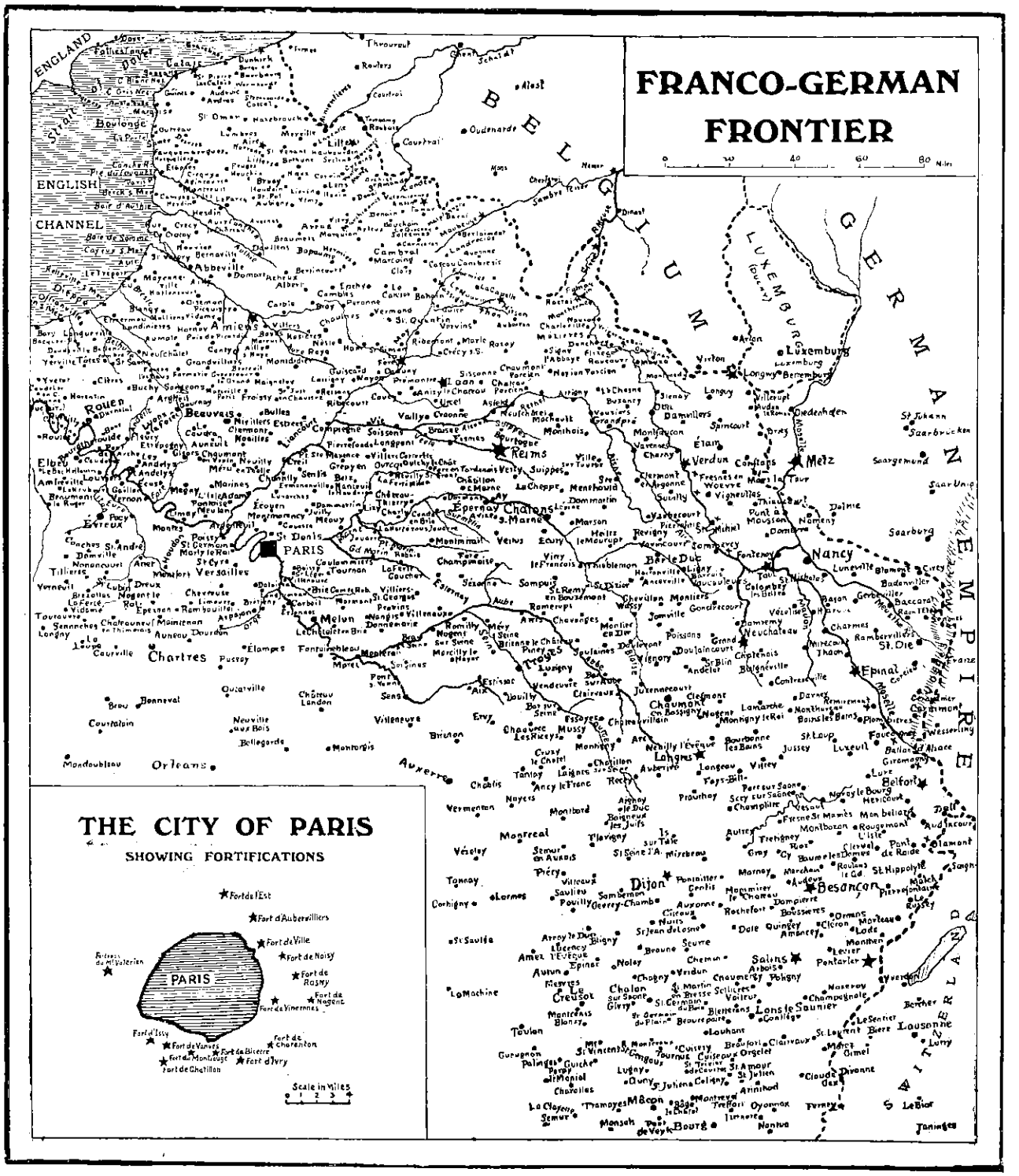
Two Interiors

Ingle nook in own house of Architect E. A. Williams, Napier



Reception Hall by J. L. Sutcliffe, A.R.I.B.A., work of which was supervised by Architect E. A. Williams of Napier

"Progress" War Map



This map is one of a series of five special maps appearing in our Special War Supplement, "The Great European War of 1914," price 1/7, postage free

MOTORING

By "SPANNER"

Lubrication

I wonder how many, or rather how few, cars are run on oil of a properly high viscosity, and here I use the word "viscosity" as indicative of a good "body" at all usual engine temperatures. Statistics would be difficult to obtain, since most motorists would return an answer to the effect that they are using the class of oil recommended by the manufacturers of their cars. And that is just where the trouble lies. When a car is new, when it is just as received from the makers, the mechanical conditions of the motor are such that the clearance between parts is of the minimum order. Then, certainly, a fairly thin oil gives quite good results, and, as thin oil feed is the easiest to regulate, lubricant of this character is what the manufacturers usually recommend. Another reason is that thick oil tends to gum up the piston, and this makes for difficulty in cranking. But after the parts of the engine have worn a little (and bedded in), largely because of the insufficient gravity of the lubricant, what happens is this: The thin oil freely works past the pistons, particularly after the throttle has been closed, and instead of adhering to the cylinder walls, enters the combustion chamber, where it carbonises, thus inaugerating a condition which leads to pre-ignition and other hateful ailments.

Again, when the pistons and cylinders have become worn, the compression does not hold up, and this means that petrol vapour works down past the pistons, thus entering the crank chamber and further reducing the viscosity of the oil. For example: A motorist told me last week that he used about a gallon of lubricating oil every couple of hundred miles. He had tried to reduce the feed, with a seized bearing as the result. On examination we found his motor was badly worn internally, and, moreover, as I suspected, he was using a fairly thin oil. We drained his crankcase, and the content was a light fluid which possessed little lubricating value. It was far thinner than the oil in the tank, and this connoted that the processes above detailed had been in operation. Oil, modern high-grade oil, does not decompose in the crank chamber, and in the instance under mention the fault lay with my friend in sticking to the same sort of oil ever since he had bought the car.

A Safe Rule

The right thing to do is to experiment with a view to discovering what is the heaviest high-grade oil possible to use. Provided the lubricating system will deal with a heavy variety, use it even though it does make the engine rather difficult to crank, since it undoubtedly makes the pistons hold the compression better and, in many other ways, is inherently economical. The question of starting up can be got over by judicious priming, and in this regard a good plan would be to fit a small priming cup high up on the induction branch to be used just before cranking. Some motorists use a cup of this description and prime with kerosene immediately after the day's work, but, on the whole, this practice stands condemned. It results in the kerosene condensing in the cylinders and then percolating into the crank chamber, where it acts as a diluent and so affects the viscosity of the oil. Of course, if the car is already fitted with priming cups to each cylinder, all the better, as this enables the pistons to be freed instanter. Petrol can be used with advantage immediately before starting. It ensures a rich mixture, it does not act as a diluent and it frees the pistons.

The rapidity with which China is rapidly receding from its century-old habits, and taking on modern clothes, has often been pronounced one of the twentieth century marvels. In no way has this progress been proven more forcibly than in the part Chinese women are taking in affairs, social and political. The above picture is from a photograph taken in China of 6 Studebaker 1914 models of 25 h.p. four cylinder. They were all ordered for one family.

Engineering

The Panama Canal Locks

A Brief Description of the Machinery Operating Them

By ROBT. WHITSON

One so constantly sees reference to the Panama Canal in the daily papers, and so much has been said and written about the Canal proper, and the engineering difficulties that have been met with, and each in its turn overcome, that one is apt to miss features of the construction, in every way as wonderful as the actual cutting of the Canal itself, that have been designed and carried steadily to near completion, without break or set back of any kind.

The arrangements made for the working of the machinery connected with the locks at Gatun, Pedro Miguel, and Miraflores, are a most interesting feature from an engineering point of view.

The electrical energy employed for this purpose is generated at a 7,500 k.v.a. hydro-electric station at Gatun Dam, with an emergency 4,500 k.v.a. Curtis steam turbine plant at Miraflores, and is transmitted across the isthmus by a 44,000 volt line connecting Christobal and Balboa with those two stations.

The extent and intricacy of the installations may be judged from the fact that at Gatun Locks there are 218 electric motors, at Pedro Miguel 122, and at Miraflores 160, a total of 500. These motors range in power from ½ to 70 h.p. and their aggregate h.p. is no less than 12,020.

In addition to these, many other motors are employed for the sump pumps, spillway gates and other purposes.

The machinery provided for working the ships through the various locks consists in the first place of the lock gates. A pair of these is placed at each point where a change of water level occurs, dividing the locks into chambers 1000 ft. long.

In case of failure of the lock gates, at both the ocean, and lake ends of the locks are placed duplicate or guard gates, and in order to economise water when only small vessels are being passed through, each lock of 1,000 ft. is fitted with intermediate gates dividing the main lock chambers into two compartments.

At Gatun there are 40 motors of 25 h.p. each for moving the leaves of the gates, at Pedro Miguel 24, and at Miraflores 28, a total of 92 motors. When the gates are closed they are held in place by what is called a "mitre forcing machine" which requires no less than 46 motors of 7 h.p. each to operate at the three locks.

For regulating the flow of water in the culverts by which the locks are filled and emptied a large number of valves are employed, and with a view to prevent interruption of working, an elaborate system of duplications is installed. These valves are known as rising stem gate valves, guard valves, auxiliary culvert valves, and cylindrical valves, and 266 motors of 7, 25, and 40 h.p. with an aggregate capacity of 6,014 h.p. are needed for their operation.

These figures are given here not only with a view to pointing out the enormous power necessary to operate the mechanical part of the Canal work, but to also draw attention to the very large number of units over which the work is distributed.

The subject of control of these units presented a very formidable difficulty.

Local control of the individual machines stationed along the locks, by men placed at local controls, would not only have necessitated a very large staff, but among such a number, it would have been difficult to secure efficient co-ordination.

Any mechanical system of control from a central point seemed impractical, owing to the great distances involved, for it must be remembered that the Gatun locks extend over a length of approximately 6,200 ft. or say one and one sixth miles. The centralized electrical system was finally decided on, as being the only one possible under the circumstances.

The whole of the operations necessary for the working of the locks, are effected from control boards situated in houses placed on the centre walls between the locks, and although these houses are built at the points which command the best view of the locks, it would be practically impossible for the operator to follow the movements of shipping—gates etc., by eyesight.

The control boards situated in the houses are fitted with indicating apparatus which reproduces any movement of the various appliances. They are of great size, in order that the detail may be presented to the operator on a fair scale, the board at Gatun control house being 64 ft. long, at Pedro Miguel 36 ft., and at Miraflores 52 ft.

The three together weigh some 39 tons, and their construction required the employment of about 6,000,000 ft. of control leads made up of 5 and 8 conductor cable, 732 indicator motors, and 464 control switches.

The operator can see at a glance exactly what is happening in any part of the locks under his control. The indicator for each of the lock gates consists of a pair of aluminium leaves, which travel horizontally just above the top of the board. The position of the fender chains that protect the lock doors, the position of the rising stem valves, fitted in the filling and emptying culverts, and the level of the water in the various locks are all clearly shown, every movement taking place in the actual working of the locks being automaticaly reproduced on the control board, as it happens.

So perfectly has this work of installing the tell tales on the control boards been carried out, that an accuracy of one-twentieth of a foot in the level of water in the various locks has been obtained.

Labour Saving Devices for Freezing Works

The designer of plant and premises for manufacturing purposes is ever on the qui vive for mechanical methods to supersede manual labour. In this direction two patents have recently been taken out in connection with Freezing Works, which quite warrant consideration by owners of existing and proposed works of this nature.

The first patent refers to an "Automatic Meat Rail Point" and the second to an "Improved method of extracting Tallow from digested offal."

With the hand operated meat rail point at present in use the carcases when approaching a point have to be stopped, the point set by hand and the load started in motion again, then the point has to be reset open to allow other carcases to pass along the main rail, whereas with the automatically operated point the carcases are deliberately as it were pushed over the open point, the feature being that at the moment when the weight of the carcase comes on the point, the weight closes it and the meat is transferred to the next rail and the point resets itself open, leaving the rail clear for carcases from other rails to pass. Another advantage of the automatic point is that it does not have to be reached to be operated, therefore a short man is as capable of running meat as a tall one and it is difficult to estimate exactly what the time saving to the industry would be in a twelvemonths with this point in use.

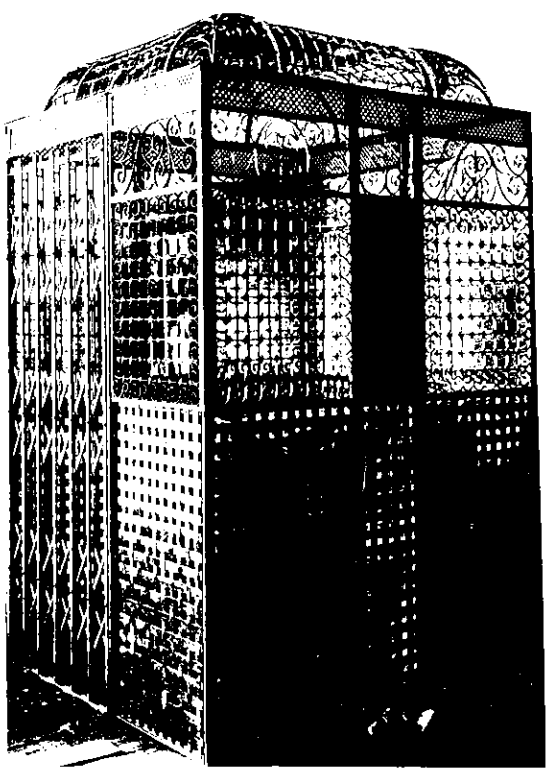
With regard to the second, tallow is extracted in the majority of freezing works from the digested offal and refuse by placing the material in sacks which are submitted to hydraulic pressure in a platform press, the pressure forces the tallow through the sacking and is caught in a suitable receptacle, however the pressure and weight of pressing is restricted otherwise the bags would burst, after the material is pressed it is then emptied from the sacks and further treated to make manure. The point to be emphasised is that the material is put into sacks and again emptied out, which represents a large amout of labour of an awkward greasy nature. The new press eliminates the use of bags entirely therefore obviating the labour entailed in filling and emptying, in fact when the material is raked from the digestor it need not be man-handled again until it is completely converted into fertiliser, delivered into bags, weighed and ready for delivery to the merchant.

The improved system is capable of increasing the output of the department by about 33 per cent. with the same manual labour

These inventions are not theoretical contrivances conceived by a casual observer of the *modus operandi* of a works but the results of experience of Mr. L. G. James, Consulting Engineer and Architect of Wellington, who has had actual practice as a Freezing Works Engineer, and whose business for many years has been closely connected with the freezing industry, in fact at the present time Mr. James has

in hand the remodelling of the Longburn Freezing Works, which work is costing in the vicinity of £26,000

Mr. Massey working the large Copper Boiler Maker at the Methven Works, Dunedin, on June 2nd. The machine is 90 tons in weight, and has the largest Draw Press in the Southern Hemisphere

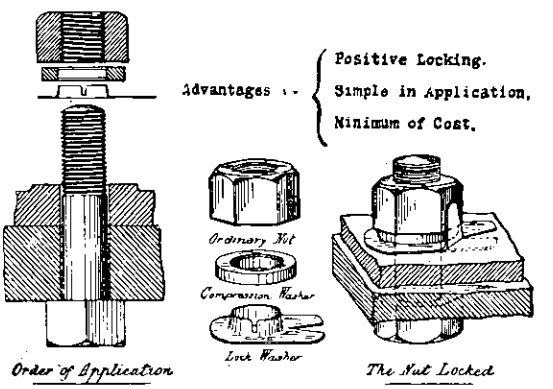


Steel Lift made by Messrs. Stonex & White of Auckland, for the new A.M.P. Building

An Effective Nut Lock

We illustrate below a new patent nut lock which is cheap, simple and effective. It is manufactured by the Shekleton Nut Lock Co. of Sydney, and if it is anything like as good as the patentee says it is, there ought to be a fortune in it.

Ever since the ordinary bolt was invented there has been a search for a locknut, a method of locking that would prevent the nut from working off a bolt no matter how great the vibration, a contrivance that would be simple and cheap in construction, easy of application, and that would be sufficiently neat in appearance to be capable of utilisation in good work. The usual plan in rough jobs is to split the end of the bolt and to prize it open, and sometimes a hole is bored through, and a split pin is inserted. Such methods are cumbersome, ugly, and unsatisfactory. The bolt itself is weakened by being thus split; such a device is not applicable where there is not room for considerable length of the bolt to extend beyond the nut; and it is always unsightly. Mr. Manfield Newton, patent agent, of Sydney, has recently patented for the inventor, Mr. J. H. Shekleton, a nutlock that appears



to have no shortcomings whatever, and to be capable of being used with assurance and satisfaction in every situation where a locked bolt is required. As will be seen from the illustration the contrivance consists of a thick washer, called the compression washer, and a thin lock washer of brass or some other soft metal. In application the lock washer is placed over the bolt threads, the compression washer is then applied, and the nuts screwed home upon this. The cone of the lock washer by this means locks on to the bolt threads and finally its projecting flanges, when turned up around the nut, render it impossible for it to become loose under any working conditions. Among the many advantages claimed and proved of this nut, may be mentioned the following:—

(1) Its application is perfectly simple, and immunity from accidents is assured where the nutlock is used. (2) it can be made with any machinery now in use for making bolts, and nuts. (3) It can be used with ordinary trade nuts and bolts without requiring that either be altered, and is applicable also to every class and size of bolt. (4) There is no spring attachment or other intricate part to get out of order, or to corrode and perish.

Personal

Mr. J. Kelly of the Southland County Council Engineering Staff has been appointed Engineer to the Awakino County Council and takes up his duties immediately.

The funeral took place on September 12th at Wellington of Mr. John Twist, who for fifty years past had been identified with the building trade in that city. He was always recognised as an expert craftsman, and many of the buildings erected during the last half-century bear a tribute to his workmanship. In 1868 Mr. Twist was associated with the late Mr. Samuel Brown in laying the telegraph line from Wellington to Masterton. During the later period of his life Mr. Twist had been connected with the Public Works Department.

Building Notes

ASHBURTON

The foundation stone of the new hostel which is being erected in connection with the Ashburton High School was laid by the Hon. Jas. Allen last month. Mr. Ivor Matthews is the contractor and Messsrs. England Bros. the architects.

AUCKLAND

Mr. W. H. Glover Architect received the following tenders for the erection of a three-storey brick building at the corner of Victoria and Albert Streets:—W. J. Grevatt & Son, £5,666; J. T. Julian & Son, £5,927; W. E. Hutchison, £6,100; F. Nelson, £6,134; J. E. Guthrie, £6,590; J. H. Coleburne, £6,600; McCallum & Bull, £6,728; Pearce & Grover, £6,737; J. Webster, £6,886; S. J. Clarke & Son, £7,037; G. Garner, £7,224; L. McKinstry, £7,277; G. H. Edwards, £7,278.

Amended tenders were called from Messrs. Julian & Son and Grevatt & Son, excluding a portion of the basement provided for in the original plans, and reducing the thickness of the walls and lighter steelwork, besides sundry alterations to the ground floor. The amended tenders were as follows: —Messrs. Julian & Son, £4,897; Messrs. W. J. Grevatt & Son, £5,300. It is probable that the lower tender will be accepted.

The amended plans provide for a three-storey brick structure of attractive appearance. The site has a frontage of 39ft. to Victoria Street and 79ft. to Albert Street. On the ground floor there will be three shops of modern design, fronting Victoria Street, and four shops of similar design will front Albert Street. The main entrance will be from the latter street. The three floors of the building, with the exception of the portion devoted to the shops, are to be subdivided to suit tenants for warehouse purposes. The basement portion of the building is to be used as a billiard room. An electric lift is to be installed, and the building will be lit by electricity. The exterior of the building, which is pleasingly designed, will be plastered, and there will be a suspended verandah to both frontages. The building is to be erected for Mr. Gypren Hannah.

Mr. Glover has received the following tenders for the erection of a new Prebyterian Church in Crescent Road,

Birkenhead:—G. and E. Ohms, £547; R. Shepherd, £590; M. R. Souster, £621; G. H. Edwards, £668; F. Robertson, £697; J. Giles, £705. The church is to be erected in wood, the size of the main building being 45ft. x 25ft., with a classroom, a kitchen, and an entrance porch in addition.

Mr. W. A. Cumming, Architect has received the following tenders for a three storey building to be erected for Messrs. Sanford Ltd. at the corner of Customs Street and Little Albert Street:—J. Webster, £4,664; J. J. Holland, £4,854; J. T. Julian & Son, £5,257; F. Nelson, £5,367; S. I. Clarke & Son, £5,437; G. Baildon, £5,546; J. E. Guthrie, £5,550; E. Morris, £5,883; J. Burfoot, £5,900; G. Garner, £6,058; G. H. Edwards, £6,814. The lowest tender that of Mr. Webster, was accepted.

The structure will be built of brick and ferro-concrete. Provision has been made for a large basement. The ground floor will contain a fish mart, store, and three commodious shops, which will face Customs Street. The two upper floors will be divided into offices. The floors are to be of ferro-concrete, while the partition walls will be of brick. The site has a frontage of 60ft.. to Customs Street and 40ft. to Little Albert Street. The two fronts of the building are designed in red brick, with cement dressings. Electric light and gas are to be installed throughout the building.

The Hobson Street Baths are nearing completion, and the Mayor hopes to open them this month. The cost of them is £10,000.

The Works Committee of the City Council have selected a site for a new temporary fish market.

CHRISTCHURCH

Building permits granted for July, are as follows:—

Central Ward (Inner) four permits value £11,250, (Outer) six permits value £3,645; Linwood ten permits value £3,180; St. Albans twenty-two permits value £10,188; Sydenham seven permits value £3,275, making a total of forty-nine permits value of £31,538.

Messrs. Clarkson & Ballantyne, Mr. B. J. Ager, and Mr. J. S. Guthrie architects of Christchurch sent in drawings for a proposed new Masonic Hall to be erected in Gloucester Street. At a meeting recently held it was decided to proceed with the work, and not allow the war to interfere with the arrangements. The directors it appears awarded prizes themselves, placing the firms in the order above named.

Presumably Messrs. Clarkson & Ballantyne are commissioned to proceed with the work.

DUNEDIN

The foundation stone was laid last month of a new Drill Hall on a portion of the Southern Recreation Ground in Bridgman Street, Kensington, by Col. E. R. Smith, V.D. to designs supplied by Architects Mason & Wales. The plans having been approved tenders were, in July, 1913, authorised to be called for, but those for the building (as designed) being deemed excessive, modifications were made and fresh tenders called for—that of Messrs. Armstrong and Moore being accepted on June 8, 1914. The site comprised one acre two poles, and was all occupied by the building with the exception of a strip of two or three feet at either end and at the back, required for the spread of the foundations. The main drill hall, which would have a clay floor, was 259ft. 3in. x 115ft. from wall to wall, and it was, therefore, nearly five times the size of the present one. In addition to the drill hall provision was made for a miniature rifle range, lecture room, band practice room, officers and non-commissioned officers clubs quarters, storage of transport and machine guns, caretaker's quarters, etc. The new building will also provide accommodation for the group office, headquarters of the Mounted Rifles, Infantry and Field Artillery Brigades and the Coast Defence troops, whilst storage and office accommodation for headquarters of units, companies, and cadet companies was arranged for, and the Engineers and Medical and Army Service Corps have their wants provided. The architects were Messrs. Mason and Wales, who have had no light task in fitting in all the requirements of the military authorities. The contractors had undertaken to complete their contract in 14 months from June 12. The present contract, however, would not complete the building, certain non-essential parts of the interior would be left unfinished to be completed later. The contract price for the work now in hand was £13,884 7s. 6d.

GORE

The tender of Mr. Owen Kelly, Gore, £2,150, has been accepted for the erection of a post office at Mataura. The other tenders were:—Messrs. Lister & Philpot, Invercargill, £2,300; Mr. John Walker, Invercargill, £2,300; Mr. Thomas

Latham, Gore, £2,352; Mr. Adam Speden, Gore, £2,379; Messrs. A. Latham & Son, Gore, £2,500; Messrs. Kay & Kellock, Invercargill, £3,600.

HASTINGS

The Union Bank of Australia, a corner block of two storeys in brick in the main thoroughfare 90ft. x 54ft. (to be completed with plaster stone finish) is advancing rapidly. The Bank chamber is 31ft. x 43ft. 9in. with entrance set off corner; manager's room, strong room etc., with two shops and separate stairways at extreme ends of site. First floor well arranged corridors for offices with strong room, and one wing reserved for residential quarters for officers of the Bank. The distribution of pleasing details well balanced and good proportion of brickwork will complete scheme, Architects Penty & Lawrence Wellington. Contract about £6,700; contractor J. Beagley Napier; foreman S. I. Crabb; clerk of works Mr. Gorgenson.

Messrs. Stanley Bros., builders are constructing a homestead for Mr. W. J. Douglass, Architect Mr. Louis Hay; cost about £10,000; also bungalow of six rooms, porch and verandah, £500. Cairns & Paton builders of Havelock North Post Office, Marseilles tiles cost £1,450 and Waipukurau Post Office, cost £2,600, the latter work is under construction.

The new Anglican Church, in ferro concrete designed by Mr. F. de J. Clere is well advanced, and shows the great possibilities for Ecclesiastical work of ferro concrete construction. The church now consists of chancel, tower-transept, sanctuary, chapel and two vestries, while the nave will be a further construction; the existing church will be retained and the interior treated in harmony with the new church, cost £7,000, Messrs. Ritchie & Co. are carrying out contract for electric lighting; contractor Mr. I. W. C. Monk.

Mr. H. H. Campbell, builder has under construction a residence containing fourteen rooms of two storeys, roof Poilite slates, cost about £4,000, Architects Messrs. Rush & James; also residence of ten rooms, two storeys, roof Poilite, and a residence of six rooms, two porches, large bay window, hall, oak wainscotting, price £800.

Mr. T. Stiles, builder has completed a residence for Mr. C. J. Tipping, Architects Messrs. Rush & James; also a residence of nine rooms, cost £1,100 Marseilles tile roof, Architect Mr. Garnett; also a bungalow for Mr. T. Hill of six rooms, loggia rough cast, cost £700. Architects Messrs. Natusch & Sons.

The Building Returns for the year ending March 31st, showed 206 building permits comprising 69 dwellings and 30 factories. Value, £55,470. For current year 101 permits to July 31st, value £27,991.

INGLEWOOD.

A dwelling of five rooms for Mr. A. N. Frankland; verandah, Venetian windows.—Price, £500; builder, J. C. Rowe.

Messrs. Percival and Messenger, architects, have completed a new dwelling for Mrs. Julian, Kaimata, of six rooms, verandah two sides.—Cost, £550; contractor, Mr. Codd.

Additions and alterations for Mr. C. Dobson, Everett road, of timber, external walls, covered with corrugated iron. Alterations, etc., for Mr. Chas. Young, Tariki.

The town Hall, designed by above architects and built by Mr. Codd.—Cost, £3300. The seating capacity is about 700. Retiring-rooms, dressing-rooms, and offices, render scheme complete. The introduction of timber with pilasters Ionic caps and panelling of ceiling in auditorium is most effective, and the gallery is relieved with carrara work. render it a handsome chamber. The walls and ceiling enrichments were the work of Carrara Co. The Ionic caps were wisely treated in colour to harmonise with timber, and effect is warm and pleasing. Great attention was paid to the ventilation.

INVERCARGILL

Mr. Arthur R. Dawson, A.N.Z.I.A., 70 Esk Street, reports the recent completion of the following works:- The Redan Valley-Mokoreta Presbyterian Manse, Mr. R. Richardson of Wyndham was the successful tenderer; Clifden Presbyterian Church (the first church erected on the West side of the Waiau River), Mr. J. P. J. Karlson Contractor. Messrs. Smith & Fraser have just finished the Riverton Presbyterian Manse, the contract price for which was £1210. It comprises nine rooms the lower storey being in pressed brick

and the upper storey in common bricks rough cast. The Dining Room, (19ft. x15ft.) is panelled with "Amiwud" and has beamed ceiling, a larger panelled Hall, four bedrooms, kitchen, sleeping porch, verandah and balcony. Lit throughout by "Dreadnought" petrol gas. The Bayswater church Hall (near Otautau) was also recently opened.

The following works are at present in course of erection:—

Brick residence at Waverly, North Invercargill for Mr. Lachlan Fraser, contractor Mr. Alex Dingwall, contract price £600; residence for Mr. Alf. Brickley at Otaitai Bush, Messrs. Stevens & Wilson contractors; residence at Waimatuku, for Mr. Wm. McLeod, Mr. J. C. Johnston being the successful tenderer; a two-storey brick and rough cast residence for Mr. Dawson in Morton Road, Georgetown, with large panelled hall with beam ceiling, dining room (with alcove) with panelled dado, and fibrous plaster ceilings breakfast room, kitchen and three bedrooms, besides porch, verandah and sleeping porch, lighting throughout to be electric light, contractor Mr. Alex Cowan. The North Invercargill Manse is also under construction, the successful tenderers being Messrs. Smith & Fraser and the contractors price being £942. There are eight rooms in brick with the usual conveniences. Mr. R. S. Young recently secured the contract for the erection of Mrs. David Younger's brick residence in South Riverton and Mr. R. Morris the contract for Mr. Jas. King's residence at Tuatapere. Extensive additions and alterations including the installation of an up-to-date sanitary system to the offices of the National Mortgage & Agency Co., are under way, as also is new plumbing work in two other large mercantile offices in the Crescent.

Plans are now being prepared and tenders invited for two brick shops for Mr. F. W. Perry at Riverton and for a brick residence in Invercargill.

Plans, etc., are also being prepared for large brick residences at Riverton and Centre Bush, for a large concrete building for a firm of carriers at Balclutha and for extensive additions to an Invercargill residence.

TE KARAKA.

6 dwellings completed, 2 new shops, tea rooms and living rooms, under construction, asbestos treatment. Cost £750. Contractor, H. J. Peacocke.

Two Railway Stations are being built with necessary sheds and out houses at Rakauroa and Matawai. Concrete front is introduced in former. Contract, £2,700. Contractor, T. Haisman three residences are under construction. Home with river frontage, Aberdeen Road. Contractor, T. Haisman.

The Architects and Builders have a good amount of work in hand, and the winter has been very favourable for conducting work. The City of Gisborne and neighbourhood offer bright promise in the future.

Mr. Chas. Taylor, Contractor has in hand a new picture theatre to seat 650 persons, walls and ceilings treated with asbestos and plaster being alterations and additions to an existing building. Price £1800. The Royal Hotel work in connection with same £800, for Mr. D. I. Barry. British Empire Hotel for Mr. B. E. Oman, most modern fittings for bar with radial ends to counter, and Hotel accommodation with public and private rooms, £3000. A new building in ferro-concrete, providing store, 2 show rooms, for cabinet manufacturer and workshop in two storeys for contractor's business, a gallery around store will provide show-room space for furniture etc. The Workshop, 230ft. x 57ft. 6in. now in hand. Cost about, £15,000. 3 bungalows of 6 rooms etc., cost £800. Seven new buildings to be constructed.

WELLINGTON

Building operations are very slack just now. One architect states that of nine separate contracts he was engaged on no less than seven have stopped till things get more settled.

The New Parliamentary Buildings are getting on well, the contractors Messrs. Hansford, Mills & Hardie having had very little delay in the supply of materials so far. They anticipate some delay, however, through the steel not arriving from England at due date which will mean an extension of contract time (two years). They have now been six months on the work above the foundations and until recently kept all their men employed. There was a short stop of a day or so last month owing to Coromandel stone not arriving, and twenty-four masons had a day off in consequence. Four electric cranes are used for placing the blocks in position; they carry a weight of three tons, and have a range of 70ft.

Messrs. Beere and Greenish, Architects, have completed—a cottage in Tar Street, Highland Park Estate, S. Harris, Builder. In coure of erection a House in Grant Road in asbestos walling and roof throughout with curved ceiling of asbestos in living room. Messrs. Ranson and Rosser, Builders. Proposed alterations to houses in Goldie's Brae, Petone and Paekakariki. Designs for Houses at Oriental Bay, Thorndon and Karori.

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