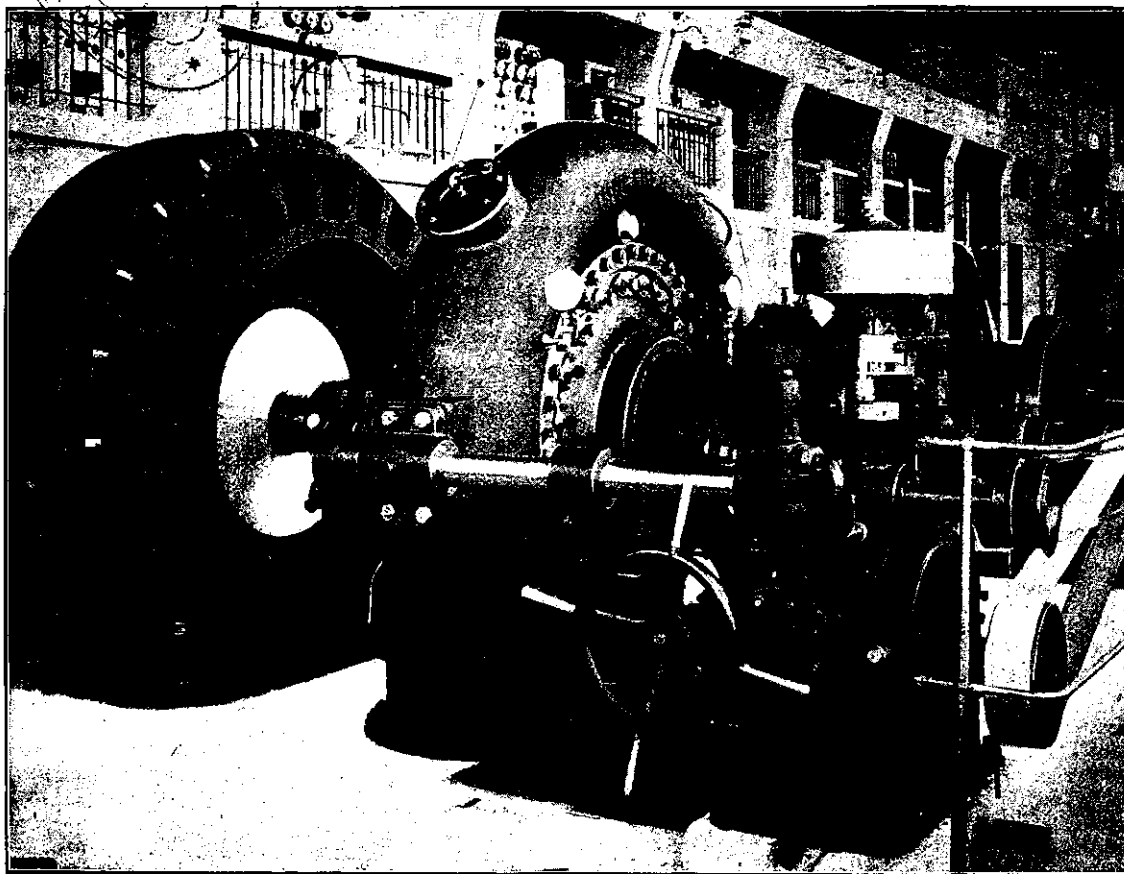


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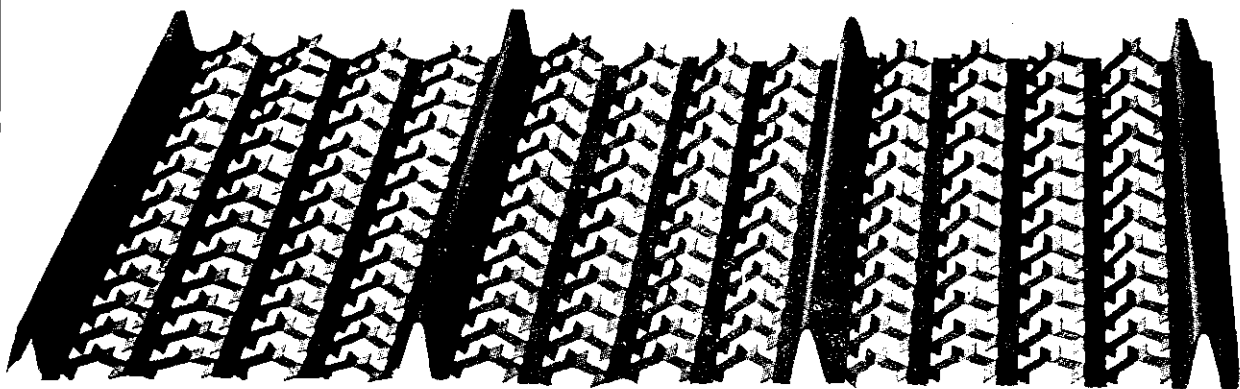


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### Publisher's Announcements.

#### Our 42nd Competition.

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

##### A Holiday Cottage

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

Each set of drawings is to be on one small sheet, to be drawn to a scale  $\frac{1}{4}$  in. to a foot, and to consist of plan, elevation, and section. Drawings are to be inked in, and shaded with diluted Indian ink. Any notes competitors wish to make are to be made on the drawings.

Mr. Leslie Coombs A.R.I.B.A. of Dunedin has kindly set this subject.

Designs must be sent in, finished as above, under a nom-de-plume, addressed to **Progress**, 8 Farish Street, Wellington, and marked clearly "Forty-second Prize Competition" on outside with a covering letter giving competitor's name, and address of employer. Designs to be sent in by May 10th.

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##### Small Club.

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

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

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

Perspective drawings optional. Drawings may be in any medium.

Mr. G. A. J. Hart, (Lic., R.I.B.A.,) has kindly set this subject.

Designs must be sent in, finished as above, under a nom-de-plume, addressed to **Progress**, 8 Farish Street, Wellington, and marked clearly "Forty-third Prize Competition" on outside with a covering letter giving competitor's name, and address of employer. Designs to be sent in by June 10th.

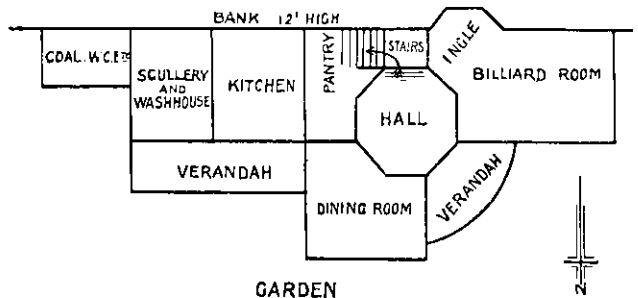
#### Our 44th Competition

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##### A Country Residence

The site is level; the residence to stand on an elevated position on the side of a hill with bush in the background and will be seen for miles around—good view.

The building to be built against a steep solid rocky bank 14 feet high at back, facing due N., and sheltered from S. and W. For the guidance of competitors the ground plan to be arranged somewhat similar to rough sketch; the first floor to contain three bedrooms, balconies and conveniences.



Drawings to be in black and white,  $\frac{1}{4}$  inch scale and to consist of two elevations; plan of each floor and section. Materials to be of rough stone rubble to height of ground floor windows and the balance timber or rough cast. Cost £1500.

Mr. J. C. Charlesworth of Wellington has kindly set this subject, and as an extra inducement to students has offered a special prize of £1 1 0 for best draughtsmanship **irrespective of design**.

Designs must be sent in, finished as above, under a nom-de-plume, addressed to **Progress**, 8 Farish Street Wellington, and marked clearly, "Forty-fourth Prize Competition" on outside with a covering letter giving competitor's name, and address of employer. Designs to be sent in by July 10th.

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

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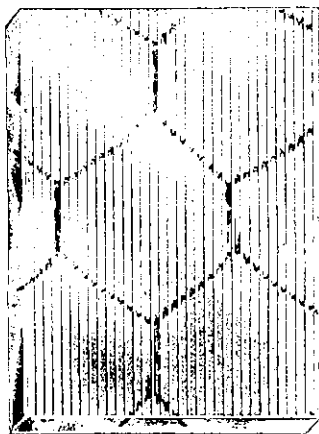
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## Editorial Comment

### The National Museum

After a good deal of uncertainty about location, owing to differences of opinion among the various ministerial authorities who have had to do with it, the Dominion Museum is to be located upon the admirable site at the back of Parliament building. A slight eminence, with a fair amount of open space in front, provides opportunities for a national building hardly second to those of the Parliament House now well under weigh. Who is to have the planning of this structure? We hear of designs already in existence—edited, curtailed, and altered, we understand, by the various ministerial minds which have concerned themselves with the problem of adequately housing the national museum. The Government should cast aside these well-thumbed and much criticised proposals of the Government Architect, and follow the course adopted in connection with Parliament Building, that of throwing the design open to competition by New Zealand architects. We remember that Colonel Vernon, formerly Government Architect of New South Wales, who adjudicated in the Parliament Building Competition, declared that the response of the architects of New Zealand to the Government's invitation was a spirited one, and the result gratifying, inasmuch as the architectural skill necessary for the designing and carrying out of that important national building was demonstrated as being at hand, and available. Thus, on the authority of the Parliament Building adjudicator, the New Zealand Government will run no risk of poor results by throwing open the Museum design for public competition, and we are sure there are considerable advantages to be gained by such a course. The Dominion is more likely to secure originality of design by widening the field, and it will also get more up-to-date advice regarding this special class of building if it seeks the co-operation of architects trained in a wide school. Haste is obviously not to be studied in view of the fact that money for museum construction would not be voted by the people's representatives while a great war is in progress. Thus the Government has ample time in which to call for competitive designs, first securing advice from some outside authority, preferably an English architect of

standing. The adjudication should also be taken out of colonial hands. To overlook this important point will be to cramp up the whole business within the limits of accepted colonial comprehension. The appointment of an English architect as adjudicator would remove all possible suggestions of bias, conscious or unconscious, towards any particular type of planning or design. Though there is no haste in regard to the building, there is need to put the plans in hand, and it would be a decided advantage if our best architects were able during this time of comparative slackness, to give their thought and skill to a national project.

### Restricted Trade.

The Imperial Government's embargo upon a number of lines of imports and exports shows that the economists are pretty wide awake, and that their ideas have to be put into practice under the stress of national need. The protectionist school seems to have enjoyed a good deal of satisfaction out of the changed plans of the administration, and the sight of Free Trade ministers abandoning temporarily at any rate, their fast-held doctrines. The Commonwealth Prime Minister, Mr. Hughes, who got to London just in the middle of a lively discussion on the subject, was hailed by the protectionist school as a heaven-sent champion of Imperial wisdom, but by this time we should imagine that the canny Colonial statesman has discovered that British politics and British journalism will give points even to the Commonwealth in partisanship. War time does not soften controversy in England, and Mr. Hughes, with his virile and audacious speech, has helped the protectionist school to prevail over the men who, at the moment, under national stress, are obliged to abandon the old "free market of the world" idea. We suspect that the embargo on paper pulp imports into England was a mild, bloodless weapon adopted by the British Government in its controversy with Sweden over the extensive trade which that country has carried on with Germany during the war. Ships carrying paper and paper pulp to England have taken back goods badly wanted by the Germans, but consigned to Sweden. The difficulty has been to prevent leakages into the Hun country. To cut down sea tariff between neutrals and England is one way, and this restriction of imports also has the good effect of improving the balance of trade. Britain has become a big importing nation. The goods it formerly exported to pay for its imports (and to earn profits a good deal in excess of the cost of those imports) are now going into the firing line. The nation has to be forced to live more upon its own resources, and keep down its growing indebtedness to outsiders, hence the strong hand of the Government has had to be exercised upon imports and exports. We feel it at this great distance from the Homeland, and if it means further sacrifices by the community, these will be cheerfully faced. Our readers may have noticed that "Progress" has had to come out in diminished bulk. Paper supplies are so uncertain that we count ourselves fortunate in being able to come out regularly, without sacrificing the high quality of paper so essential for reproduction of half-tone work and fine line drawings used in illustrating the letterpress. Running necessarily under short sail, we can keep up our steady association with a wide circle of readers, who, like ourselves, are only waiting the lifting of the war-cloud to launch out into full activity.

### Town Planning

Last session a hopeful deputation of town planners interviewed the Hon. G. W. Russell, Minister of Internal Affairs, in order to urge upon him the need of a comprehensive Town Planning Act in New Zealand. The ministerial answer, which we recorded at the time, was quite satisfactory, but many months have passed since the minister undertook to have a Bill prepared, and not a word has been heard of any official activity. It was recently decided by the Wellington Town Planning and Municipal Association to jog the ministerial memory, but we expect to hear that the Hon. G. W. Russell has been so busy on the useful work of making adequate provision for returned wounded and convalescent soldiers, that town planning has passed out of his mind. It is a ministerial privilege to get other people to do what they are told. Cannot the Minister find a competent authority to whom he may delegate the duty of preparing such a measure for his approval and amendment? He has had so much to do with local government that it would take him very little time to sketch in outline the main lines of such a measure, or he could do even better by calling to his councils a small committee of men interested in the subject, and actively concerned in municipal matters and the architectural profession, who could fill in the details with ease and ability. At least two of the Australian States are legislating this year on Town Planning, their opinion being that this is the kind of preparatory work which can usefully be done while constructive undertakings involving large expenditure are out of the question. Mr. Chas. C. Reade, who visited New Zealand under the auspices of the English Garden Cities and Town Planning Association, is still in Australia engaged on the work of preparing legislative machinery to put town planning ideals into practice. The Tasmanian Government has enlisted his services in compiling a Bill to come before an early session of the Tasmanian Parliament and we learn from a recent communication that the South Australian Government will introduce a Town Planning Bill into its legislature early in June. Unless our town planning enthusiasts show their zeal and capacity, a Town Planning Bill in the New Zealand Parliament will appear in the successive Governors' speeches as a kind of annual parliamentary promise which never materialises—a make-weight on the regular programme of promises put forward at the beginning of every session to dazzle the populace with a vision of the all-embracing wisdom and energy of the Government in power.

### Petrol Prices.

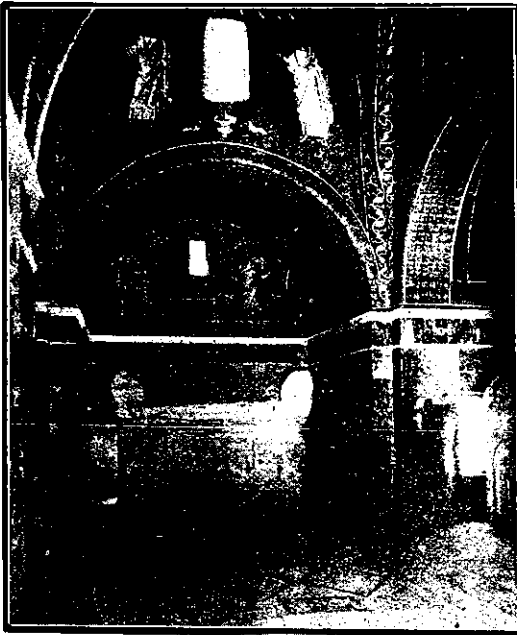
One hardly knows from hour to hour what he must pay for petrol. The position must be extremely difficult for taxi owners and the ever-growing number of commercial vehicle users. Many of the charges they make to the public are fixed by local by-laws, but under the exceptional conditions they are surely entitled to make up for heavily increased running costs by a proportionate rise in taxi-fares and transport rates. They have no Arbitration Court to fix a ten per cent. rise for them! Naturally, when prices soar, we suspect monopoly and market-rigging, but the Pacific freight rates prevailing to-day explain everything. If further consolation for our troubles is required, we find it in the fact that English motorists are paying 2/2 per gallon for their spirit, which is on a par with what we pay here.

# RAVENNA—Its Churches and Monuments

By S. HURST SEAGER, F.R.I.B.A., F.N.Z.I.A., Christchurch

To those who have studied the history of Ravenna and had the opportunity of visiting and revelling in its art, the news that bombs had been dropped from a German aeroplane and had partly destroyed the Church of Sant' Apollinare Nuovo comes as a great shock; a shock which vividly recalls and deepens the delightful memories of this intensely interesting but little visited city. It is not in the direct route of tourists, but to the student of Italian art and history it is, next to Rome, the most fascinating of

its buildings were raised on piles and the tidal waters of the Adriatic rose and fell against their marble walls. Its beauty and safety attracted the barbarian masters whom in the fifth and early part of the sixth century occupied the throne of the Caesars. The short occupation of Odoacer has left no trace but his conqueror Theodoric the Great, King of the East Goths, raised the city to its former splendour, and added to the beautiful works of art which already adorned it. He like most of the other Teuton leaders had embraced Christianity but they were pupils of Ulphilas the good bishop and apostle of the Goths,



The Mausoleum of Galla Placidia



The Mausoleum of Theodoric

all Italian cities. In some periods of art indeed Rome herself has nothing to compare with the works at Ravenna. For in the time of Rome's greatest troubles when the Empire was being battered to pieces by the northern hordes, it was to Ravenna that the Roman Emperor Honorius fled for safety and there founded in 402 A.D. a new capital. Here he and his sister Galla Placidia, the mother of Valentinian III., dwelt in comparative peace so that while Alaric and his West Goths were destroying the classic art of Rome, Galla Placidia was erecting Christian churches and other buildings, some of which now stand to remind us of this glorious time in the history of the city. Its strength and safety lay in the surrounding lagoons making it impossible for an enemy to approach the city except along an easily defended causeway. It was a second Venice,

who taught them that Christ was the first and noblest of all created beings but was not the Eternal Son of God and that there was no Trinity. These were the teachings of Arius the fourth century bishop of Alexandria, and thus his followers, the Arians, were held as heretics by the Roman Catholics—the upholders of the Nicene creed.

This has a most important bearing on the art of Ravenna, for Theodoric's great basilican church which has now been partly destroyed by Teuton bombs, was erected as an Arian church and sumptuously decorated with pictorial mosaics inculcating the teachings of the Arian faith. When in 526 the wise and tolerant reign of Theodoric closed and the eastern and western Roman Empires were again united under the Orthodox Christian Emperor, Justinian, this heretical church of Theodoric's was condemned and a part of the structure—together with the greater part of the pictorial mosaics—was des-



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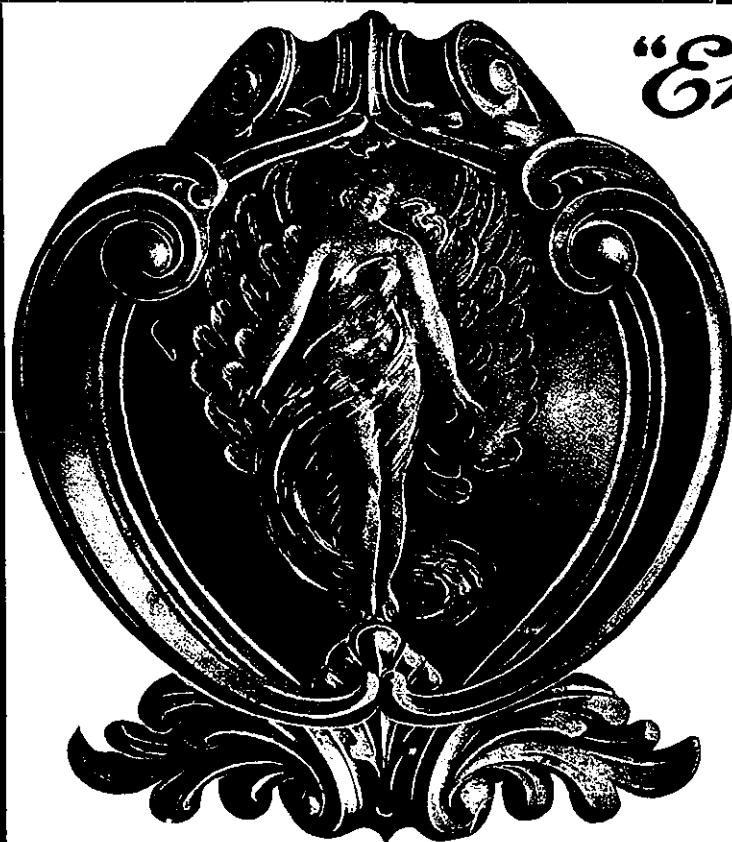
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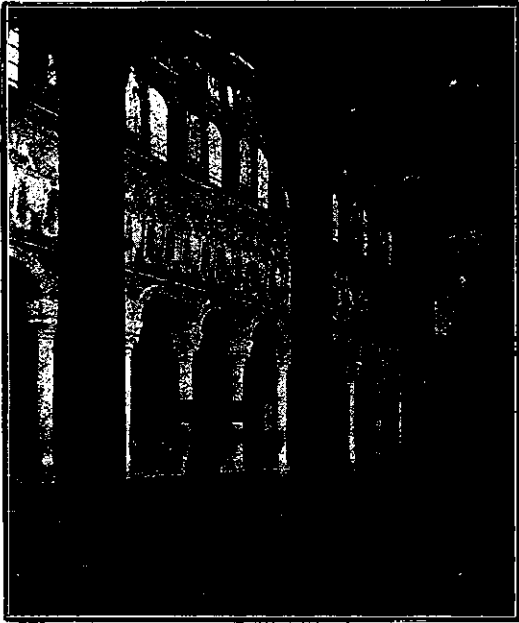
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stroyed. It was ordered by the Roman Catholic conquerors that everything which could serve to perpetuate the memory of this hated Arian Gothic king should be obliterated. His body was taken from his mausoleum—which was renamed the Rotunda—his name was cut out from the walls of his buildings, his churches re-dedicated. In spite of all this destruction Theodoric's memory lives in the history of Ravenna, and his name is indelibly associated with his church, his palace and his tomb. It has been left for his Teuton descendants with their criminal bomb throwing to endeavour to destroy what Justinian and succeeding conquerors and plunderers have left of his works; works which are treasured most highly by the Italians to-day, and on which large sums have

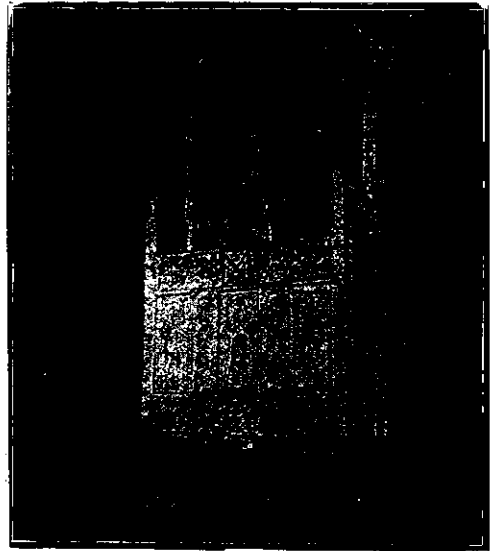
Ravenna churches, and that it was dedicated to Ravenna's patron saint.

The present dedication of Theodoric's church is thus misleading, the "Nuovo" referring not to the church which was commenced nearly half a century earlier than the church at Classis, but to the fresh dedication which was given it when the relics of the saint were transferred hither from Classis in the 9th century. By Theodoric it was dedicated to Christ, by his immediate successors to St. Martin the Roman centurion of Constantine's army who became the famous Bishop of Tours, while at the same time another warrior saint of Nero's army—San Vitalis—was chosen as the patron saint of Justinian's church in Ravenna.

This removal of relics from the church at Classis to that in Ravenna, emphasises the remarkable change which had been gradually taking place. Year after year deposits had been brought down the



Sant' Apollinare Nuovo, looking across Nave from the N.W. angle, showing the procession of Virgins



Ivory Throne, in Cappella di San Pier Gisologo. The panels in front represent St. John the Baptist (in centre) and the four Evangelists

been spent for their preservation. But although Justinian's conquering general, Belisarius, destroyed so much of Theodoric's work, to Justinian belongs the credit of erecting two of the most famous churches at Ravenna for his orthodox followers—the basilican church of Sant' Apollinare in Classe, and the Byzantine octagonal church of San Vitale—the most beautiful specimen of Byzantine architecture in Italy. The name of this Basilican church reminds us of the first bishop of Ravenna, St. Apollinaris—the companion of St. Peter, who sent him to preach the Gospel on the eastern coast of Italy, and it reminds us also of the time in the earlier days of the Empire when the port of Ravenna—some three miles from the city—was the headquarters of the Adriatic fleet. On the shores round the port arose the large and important suburb of "Classis," with its arsenals and ship-building yards. How important it was, can be inferred by the fact that during the reign of Justinian, was built there the largest of the

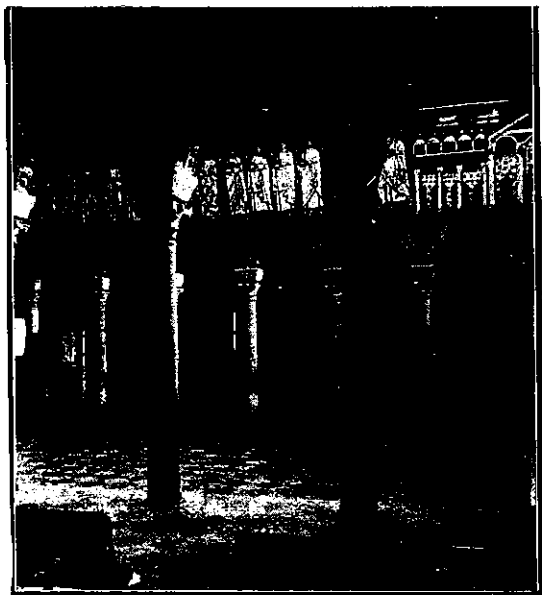
rivers Montone and Ronco, and the harbour where once two hundred and fifty sail had proudly ridden at anchor, was gradually filled up. The deposits extended into the Adriatic about three miles forming a barren malarial waste around the ancient suburb. The cause of its prosperity having thus ceased to exist the suburb quickly declined. It was destroyed in the 8th century by the Lombard Luitprand, even its ruins have now entirely disappeared, and Sant' Apollinare stands not in Classis but alone in a vast desolate plain, a noble historic monument—the sole memorial of the glory of ancient days.

No causeway is needed to reach Ravenna to-day. It is approached by means of a branch line from the railway running between Bologna and Rimini. The first impression is extremely depressing for the desolation of the district has extended to the town. There is no hum of city life for what life there is has hidden itself in the numerous Renaissance palaces which now do duty as stores and shops.

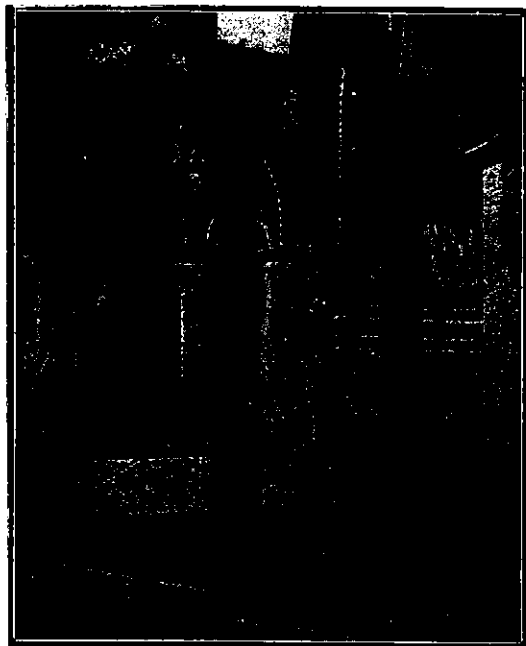
## THE ROMAN PERIOD

The historic monuments in Rome, Florence, and Venice, are surrounded by busy modern cities, but

Placidia, for we are transported at once from the grey depressing environments into the brilliant rays of art. It is one of the smallest of historic art treas-



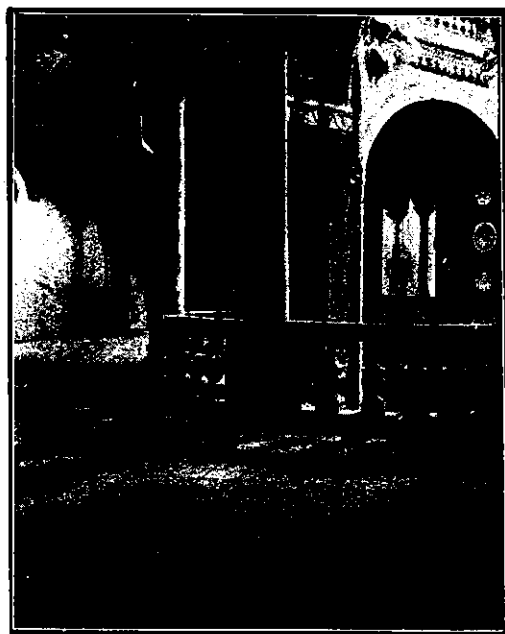
Sant' Apollinare Nuovo, showing representation of Theodoric's Palace and part of procession of Martyrs



San Vitale, looking into eastern Apse, showing Mosaics, Justinian and his Court



San Vitale from the gallery, showing semi-circular Archings, and semi Vaults under Dome

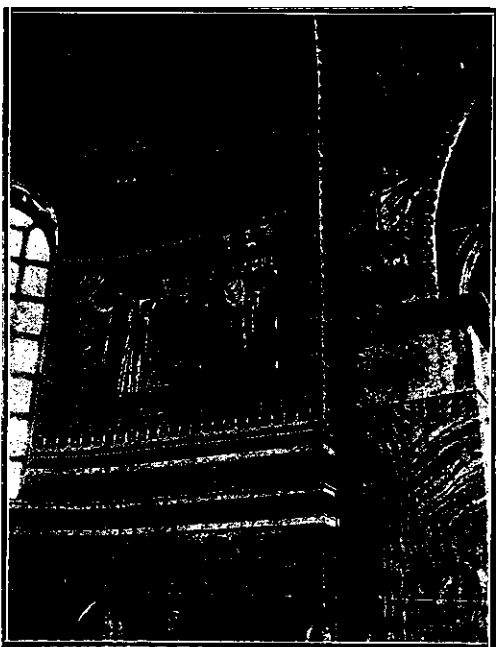


San Vitale, in the gallery, showing inner side of the semi-circular Arched Bays

Ravenna is essentially a city of the past, and the enjoyment of her monuments is perhaps intensified by their isolation. This is felt strongly on visiting its most ancient monument, the Mausoleum of Galla

ures, its plan is in the form of an equal armed cross—the greatest dimension being under fifty feet. The exterior is of plain brickwork, but the interior reveals to us a casket of Oriental splendour encrust-

ed with gems. The only direct light admitted is through the doorway at the end of one of the arms, what other light there is finds its way in through thin sheets of richly coloured alabaster in perfect harmony with the variegated marble walls. As we stand with our backs to the entrance, the flood of light behind us brilliantly illumines the large sarcophagus of Galla Placidia, standing in the opposite space, while in the spaces to the right and left, are partly seen those of Constantius her husband and Valentinian her son. Above them on the sweep of vault and circle of dome, are the symbols of their faith, gleaming forth from a deep azure background, spangled with golden stars and bordered by bands



San Vitale, Mosaics on S. side of Eastern Apse.  
The Empress Theodora and her Ladies

of classical decorative forms, all wrought in exquisite mosaics of lapis lazuli and turquoise matrix forming rich harmonies in blue, green and gold.

The walls only have been restored, the vaults and dome are splendid examples of 5th century Roman art, wonderfully preserved through the succeeding troubled times. The three churches built by Galla Placidia have been rebuilt to such an extent that but little of the original work remains, but in the Archbishop's palace there still stands a beautiful little chapel—the Capella di San Pier Crisologo—vaulted and decorated in the same manner as the mausoleum. On the arches are portraits of saints, while in the central vault white-robed angels support the monogram of Christ. In this chapel is placed one of the most valued art treasures of Ravenna—a richly carved ivory throne presented by Pietro Viscolo II. Doge of Venice, to the Emperor Otho III. in 1001.

Of the period immediately preceding the Gothic conquest, there remains a very interesting example,

the Baptistry adjoining the cathedral. The Cathedral is an 18th century church, interesting only because it stands on the 4th century crypt, but the Baptistry shows the adaptation of an ancient Roman bath for Christian purposes. This was a common practice among early Christians. No more suitable places could be found than the ancient frigidarium or the tepidarium for baptism by immersion. The Ravenna example which now bears the name of the Baptistry of the Orthodox, is a domed octagonal building and the very beautiful 5th century mosaics lining the whole of the walls and dome, have not lost their value to any great extent by restorations. There still remain around the walls, the fine figures of prophets, and the procession of apostles round the base of the dome, radiating from and leading the eye forcibly up to the mosaic of the baptism of Christ on the top-most part of it.

#### THE GOTHIC PERIOD

There was no break in the historic sequence of art when Theodoric continued the series of Ravenna's churches. Though educated in Byzantium at a time when Byzantine art was reaching its culminating point, he yet preferred to employ Roman artists to execute his designs, so that in his churches we find but little indication of Byzantine influence. His name is associated with two churches, the Arian Baptistry, his palace, and his tomb. Of these the church of Sant' Apollinare Nuovo, which has been damaged, is by far the most interesting in Ravenna. His other church San Teodoro, now Spirito Santo, has been rebuilt, and his Arian Baptistry has been freely restored. His circular tomb (thirty-six feet in diameter), covered with a single block of Istrian Marble weighing four hundred and seventy tons, still stands as he left it, but his palace was destroyed. The lower portion was being revealed by the excavations made at the time of my visit—1908. They had not long been unearthed, but already several fine mosaic pavements had been discovered, giving promise that the plan of the whole would be made clear.

The exterior of Sant' Apollinare Nuovo—with its circular bell tower of the 9th century—gives no promise of the glorious vision within. On entering the central western door of the nave, we are held entranced. In the whole range of Christian mosaics there is nothing more decoratively splendid than this. Over the long series of nave arches on our left, we see a procession of twenty-two maidens, who dazzle us by the splendour of their robes, embroidered with gold and flowers, their diadems, necklaces and girdles, glittering with gold and gems.

The very monotony of their forms and attitudes, fascinates and charms, becoming as impressive as the musical rhythm of a grand litany. The ground on which they tread is sprinkled with flowers, and they pass under palm branches laden with fruit. At the west end of this marvellous procession is the city of Classis, from which they are proceeding to lay the crowns they carry at the feet of the enthroned Madonna and Infant Christ, to whom also the three wise men are offering their tributes.

On the right hand side is another procession of white robed martyrs carrying crowns. At the western end is the palace of Theodoric, and at the east, a bearded Christ, enthroned, and attended by four winged angels corresponding to those surrounding the Madonna.

These glorious processions of virgins and martyrs are the work of Byzantine artists of the 6th century, who destroyed this portion of Theodoric's work, but left the end groups and architectural mosaics, together with the fine series of prophets and saints, and pictorial mosaics on the upper parts of the walls. Thus are brought together side by side typical examples of the Roman and Byzantine manner, the one showing careful individual statuesque figures standing out from a plain gold or coloured background, the other showing a total disregard for truth of human form, treating it only as an excuse for the skilful display of a superb decorative effect.

#### THE BYZANTINE PERIOD

Of the two existing churches erected under Justinian, one—Sant' Apollinare in Classe—follows the Roman basilican plan, and the vault of the apse is decorated with a beautiful 6th century symbolic mosaic after the Roman manner. Here therefore the sequence is not broken, but on visiting the other church—San Vitale—we see at once the striking difference in architectural and decorative forms which had been developed by the combination of Roman and Greek art at Byzantium. For this church based wholly on Byzantine art and carried out by Byzantine artists, at the same time as Santa Sophia, at Byzantium (now Constantinople), shows, in contrast to the simple basilican plan, with its long nave and aisles—an octagonal plan, with a central, two-storied octagonal space, having at its angles eight massive piers, supporting arches which carry a well-lighted dome. The openings between the piers are filled with lower and upper triple arcades, semi-circular on plan and terminating in a semi-vault under the pier arches.

It can at once be realized that this architectural form, though simple in itself, would produce a most beautiful intricate effect, and wonderful play of brilliant light and depth of shade, a delightful mingling of columns and arches, and infinite variety as we move to different points of view especially from the gallery—the "Matroneo"—or place reserved for women. It would be beautiful if built of plain brickwork, but imagine this beautiful form, clothed in choicest variegated marbles, in beautiful mosaics, rich in design—full of symbolism and of resplendent colour—the capitals richly carved, and you will realize what a perfect gem of art Justinian has left for our instruction and delight.

The decoration was not completed in the main body of the church, and unfortunately modern art is doing what it can to spoil it, but the eastern end is as I have attempted to describe it, and has a mosaic on one side representing Justinian surrounded by his court, and on the other, his queen Theodora, surrounded by her ladies.

There are in Ravenna also, some mediaeval fragments and many churches of the Renaissance period,

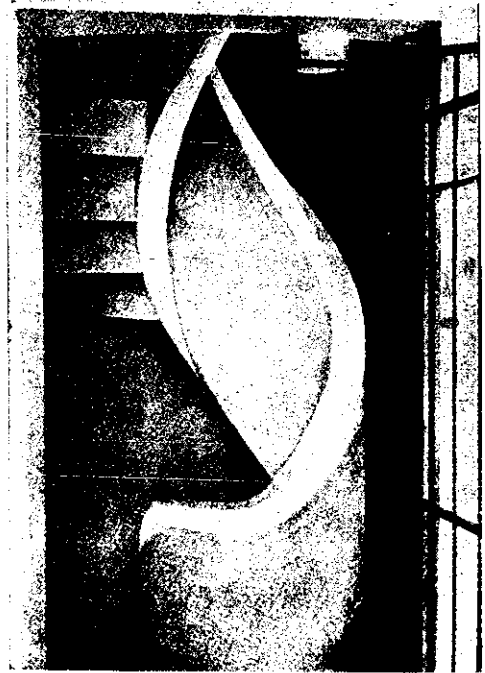
neither better nor worse than the mass of them to be seen elsewhere.

The glory of Ravenna is as I have said in its past, but there is promise of a glorious future, for science is turning the malarial wastes into good agricultural land, and there is reason to hope that the Italian prosperity which Garibaldi made possible, will be extended to this ancient city, where his wife Anita laid down her life for her country's sake and where Italy's greatest poet lies at rest.

## A "Snail-Shell" Stair

### NOVEL CONCRETE STAIRS

The only spiral concrete staircase of its kind in the world has just been placed in the tower of the Southwest Museum in Los Angeles, California.



The only Concrete Spiral Stair in the World

Similar stairways exist elsewhere, as in the tower of St. Paul's and the tower of the cathedral in the city of Mexico, but they were built before the age of concrete. When viewed from above, its resemblance to the shell of a snail at once gave it a name. Mr. Frank Reed, writing in "The Engineering Record" (New York), says:—"It is, for its purpose here, an improvement over Sir Christopher Wren's masterpiece—the spiral stairway ascending the interior wall in the tower of St. Paul's Cathedral, London. The Southwest Museum helical staircase is built inside a well in the centre of the tower, thus not only preserving for shelves or mounted objects the entire interior wall-space of the tower, but also supplying on its own exterior wall additional space which may be employed for museum-purposes... The tower contain-

ing the stairway is seven stories in height, with three mezzanine balconies in the three upper stories, giving the equivalent of ten stories. The tower is thirty-five feet square, and is supported by twelve



How the "Snail Shell" Stairway gets its name. Looking down Four Flights of Uninterrupted Spiral

columns and external walls eight inches thick, reinforced with steel. It rests on a solid concrete slab or raft three feet six inches thick. The total height is one hundred and twenty-five feet and the weight is one thousand tons. The construction was carried

the photographs. With one exception it is the only helical staircase in America having a hollow centre, the other one being an ancient stone staircase in the tower of the cathedral in the city of Mexico. The stairway contains one hundred and sixty steps with seven and a half inch rise each, and was built around a galvanized iron form in the shape of a pipe, while wooden forms were placed for the stairs. Material was prepared at a special rock-crushing and sand plant located about one mile from the building, in a dry river-bed."

### Additional Drainage Installed in Auckland

The Auckland and Suburban Drainage Board have signed a contract with A. D. Riley and Co. Ltd., of Auckland, Wellington and Dunedin, for the supply and installation of 8 'stereophagus' crude sewage pumps electrically driven and complete with automatic starting equipment. The pumps are to be of the horizontal type and there will be 4 stations each containing 2 pumping sets, duplicates. The volumes vary from 400 to 900 gallons per minute and the largest motor is to be 32 B.H.P.

The advantages of the pump are that the makers claim it is the only centrifugal pump that will lift crude sewage without screening of any kind and it thus dispenses with labour and maintenance charges almost entirely. Similar pumps supplied by the same firm have been at work at Petone since August 1915 with highly satisfactory results and the agents have been able to give better efficiencies than they guaranteed. There is no doubt that there is a great future in a developing country such as New Zea-



Design of a Chicago Railway Station now in process of erection. It is to cost £12,000,000

on continuously, a story being poured at a time. The staircase well is nine feet two inches in external diameter and is supported by four corner columns with eight inch walls between them, with light and ventilation openings at each story. The stair is known as a caracole, on account of the likeness to a snail-shell presented by a vertical view, as shown in one of

land (where many towns do not yet possess a separate sewage system) for pumps of this kind involving little labour and automatic in their operation, but even in the old country where most towns already possess something of the kind they are replacing in many instances pumps of the older types.

## Christchurch Beautifying Association

That the Christchurch Beautifying Association is not a moribund institution is proved by the following report of the annual meeting which took place in Christchurch last month, and which we take from a southern paper:—

"The annual meeting of the Beautifying Association took place yesterday. Present—Mr. A. Kaye (chairman), the Hon. H. F. Wigram, Dr. Chilton, Messrs R. Hill Fisher, S. Hurst Seager, and A. D. Dobson.

The annual report was adopted.

The chairman also reported on the year's operations. He stated the work for the year had been rather of a watchful than a spectacular nature, and

thought that steps should be taken to educate the public in this matter. He would like to see facades with some uniformity in architectural exteriors, and he instanced Collins street in Melbourne, as the worst instance of this abuse of art as it was possible to conceive. He was also desirous of increasing the advantages bestowed on Christchurch by the city having the river Avon. He regretted that the fathers of the city in years past, while they had taken much pains in regard to other matters, had not gathered any data about the river. Now they were making efforts to get data concerning it, and the work would be finished in about eighteen months.

The report was adopted.

Dr Chilton was then elected chairman, Mr. Kaye refusing the office, as he was leaving for England



Friend's Hostel, Glen Road, Kelburn. Accommodation provided for 35 Students. *W. Gray Young, Architect.*

he complimented the City Council and its head gardener on the manner in which the Domain and the City reserves had been improved and kept. More should, however, be done to displace the disfiguring fences which hid some lovely grounds. He moved the adoption of the report.

In speaking to the report, Mr. Hurst Seager brought up the question of the disfiguring which spoil so many of the best parts of the city, and he strongly condemned the electric signs. He also spoke of the ivy on buildings, and recommended that it be supplanted by the Virginia creeper.

Mr. A. D. Dobson, city surveyor, also condemned the use of electric signs, and said he thought the remedy lay with the people themselves. He also dwelt on the barbarian idea that the roads in a city should be bare strips with a water-cart running over them, and strongly advocated the extension of grass in the city roads wherever possible. There was no uniformity in the buildings in the city. He

in a short time. The other officers were re-elected, as was the General Committee, the Executive Committee being Messrs A. D. Dobson, R. Hill Fisher, J. A. Frostick, S. Hurst Seager, Jas. Jamieson, H. G. Ell, M.P., and E. Smith, Mr. H. G. Ell was re-elected honorary curator and Mr. G. L. Donaldson secretary and treasurer."

It is a pity some of our other centres do not follow the lead given by Christchurch. There is ample work in almost any town in New Zealand for some similar public spiritedness for which the people would one day be grateful.

## Personal

Mr. George Robb, of the firm of Robb and Page, architects, Wellington, left Auckland last month by the Makura for South Africa. He intends to proceed to England to offer his services to the Imperial authorities for the duration of the war.

## The Costliest Church in the World

ST. BARTHOLOMEW'S, NEW YORK

A reproduction from a model of a new church (St. Bartholemew's, New York), is shown on this page. It is estimated to be one of the costliest

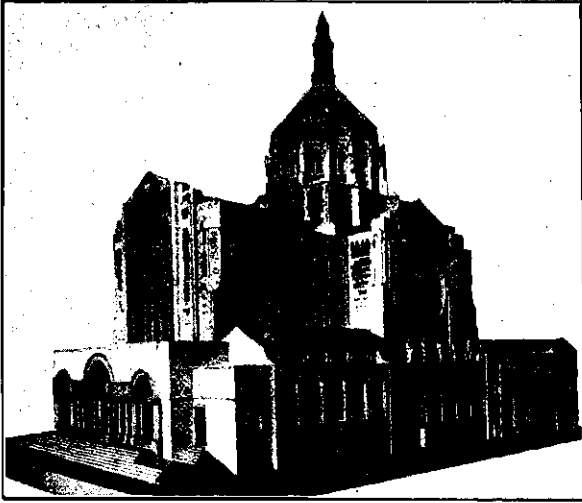


Photo of a Model of St. Bartholemew's Church, New York.—Bertram G. Goodhue, Archt.

The necessity for a Romanesque motif is therefore obvious, says Mr. Cortissoz in the New York "Tribune," and the architect has gone to Italian rather than to Provencal sources for his inspiration, and what is more has used them with originality. Speaking broadly the design is an organic composition. The facades are exactly expressive of the plan. And their successive stages are united with a fine sense of proportion, a fine sense of architectural values. Let the reader explore, one by one, the different passages in the design, the relation of the portal to the nave and that of both to the dome, the placing of the columns and arches just below the roof-line, the adjustment of the chapel and Sunday-school building on the street side to the mass of the main structure. These later episodes, it is true, constitute stubborn elements in the problem, and we could wish them otherwise. But since they have to be there, they are remarkably well handled. Consider, finally, the effect of the whole, the warm picturesqueness of the conception, combined with its essentially massy character, and the rich play of light and shade secured, the qualities or relief, of texture, developed without fussiness. It is Romanesque, yes; but is it so with any implications of pedantic borrowing? The design is large and free; in the impression of living architecture that it conveys it makes us think of that other fine example of style individually exploited—that Westminster cathedral which was founded on Byzantine ideas, but embodies the genius of a modern artist.



These Beautiful Doorways erected as a Memorial to Cornelius Vanderbilt, will be retained from the old Structure and added to the New

churches in the world when finished and is an interesting piece of American architecture designed by Mr. Bertram G. Goodhue.

The present church is to be pulled down—except the beautiful portals shown herewith—and the new one erected in its place.

"The waste of actual workmanship is always painful, as soon as it is apparent.

"Wriggly" French new art—H. L. Honeyman.

"It is not the building we admire or condemn but the mind that appears in it."—Garbett.

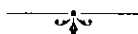


# Lake Coleridge Power Station

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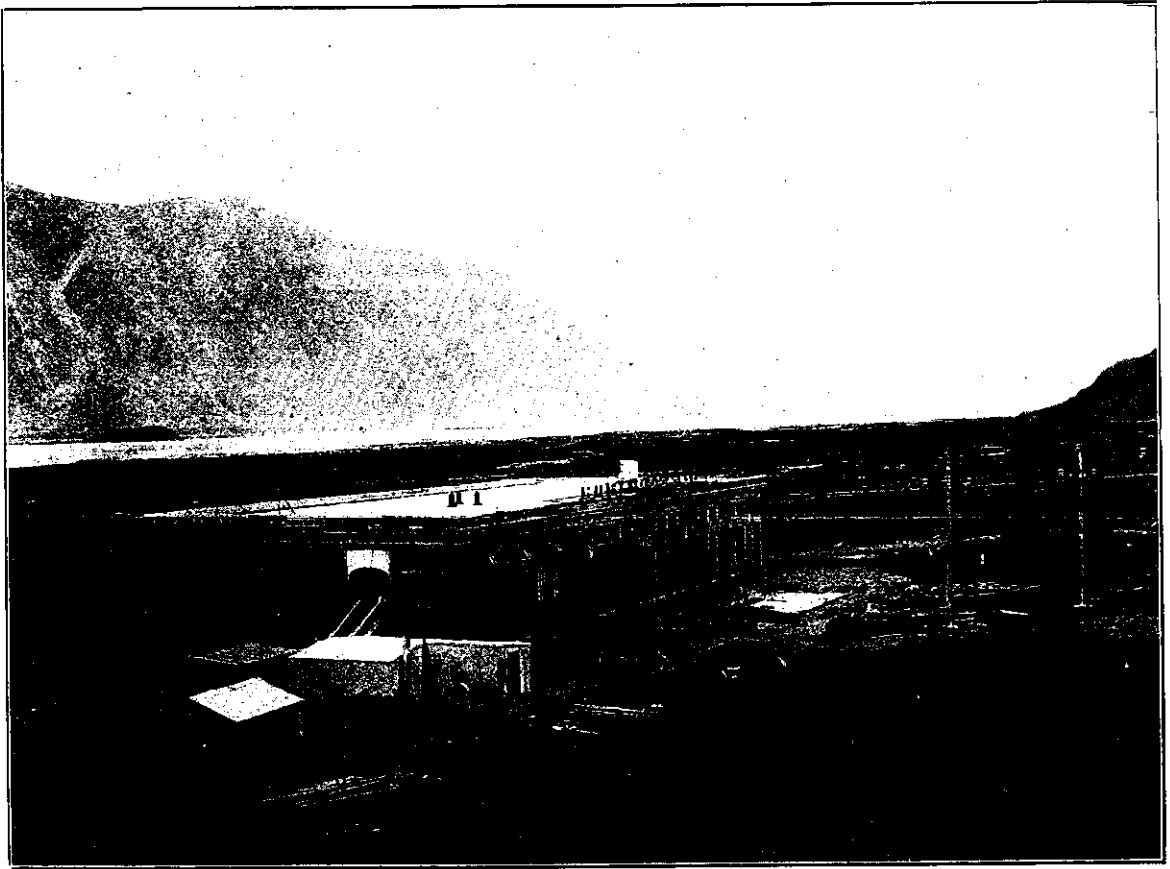
# Lake Coleridge Hydro-Electric Scheme

Christchurch well supplied with Electrical Power.  
Three Units now in operation.

By ROBT. WHITSON, Engineer.

The Water Power Act of 1903, vested the rights of all water power within the Dominion of New Zealand in the Government, and conferred on the Min-

rainfall and the flow of the most important rivers. Mr. L. M. Hancock of America at this time also reported on the general possibilities of hydro-elec-



The Power House, Lake Coleridge

ister of Public Works the necessary powers to construct and operate hydro-electric installations.

The comprehensiveness of this Act was not fully brought home to the people of the Dominion until the opening of the initial undertaking at Lake Coleridge in November, 1914, and even now it is only those who come into close contact with the direct effects of the installation who realize that this is only the small beginning of bigger things. In 1904 the Public Works Department investigated all the available sources of power within the Dominion, gauged the rivers and instituted a system of recording the

tronic development. A full report was prepared by the late Engineer-in-Chief Mr. P. S. Hay dealing entirely with the available sources of power, which has formed the basis of most subsequent investigations on the subject.

The Government after much discussion decided to carry out the development works themselves in preference to leasing them, and in 1910 the "Aid to Water Power Act" came into force. A special branch of the Public Works Department was established to carry out the work and placed under the charge of Mr. E. Parry.

We are indebted to the Department of Public Works for the photographs shown herein and we append a brief description of the various units and machinery employed.

#### LAKE COLERIDGE

Lake Coleridge is situated about sixty-five miles west of Christchurch at a height of 1,667 feet above sea level. Approximately it is eleven miles long by two broad.

Harper and Wilberforce rivers empty into the Rakaia. From this point the Rakaia river runs eastwards nearly parallel to the shore of the lake, and divided therefrom by a ridge or bar of shale and shingle varying from one and a half to two and a half miles wide.

As from the western end of the lake to the point opposite the intake of the power tunnel, the distance is some sixteen miles, and the average drop is about



Surge Chamber and Penstocks

Despite the height of the lake it is said never to freeze, and the total absence of driftwood and refuse round the shores make it an ideal source from which to draw power supplies.

The natural outflow of the lake is at the western end, where the waters after junctioning with the

30 feet per mile on the river bed, the head available for power purposes works out at about 480 feet or to be exact it has come out at 485 feet.

The lake has four feeder streams and the outflow by the lake stream is estimated at 160 cubic feet per second.

### THE TUNNEL

The water is conveyed from the lake to the top of the river bank by a concrete lined tunnel 6,970 feet long. This tunnel is semi-elliptic in shape 8 ft. x 8 ft., and has an area of 50.35 square feet on the cross section. The grade of the tunnel floor is one ft. in 1,000, or just 7 ft. fall in the total length of the tunnel. Midway along the line of tunnel a shaft was sunk to a depth of 198 ft. so obtaining two additional working faces during construction. This shaft is lined with concrete for some distance above

From the surge chamber the main penstocks—steel pipes 52 inches in diameter and 2,730 ft. long—run down to the power house on the river bank giving an effective head of 485 ft. At present only two of the ultimate four pipes are installed. These pipes branch at the lower end into two 36 inch pipes, each of these supplying one of the main turbines.

A 15 inch bus pipe connecting the main penstocks at the lower ends is used to drive the exciters, and this connection further equalizes the flow in the main pipes.



Interior of Power House, showing Units already Installed

lake level, thus serving as an additional surge chamber to assist in taking up the fluctuations of energy, and adjusting the flow of water in the tunnel to varying conditions.

The lake entrance to the tunnel is provided with duplicate gates and screening chambers, so designed that the screens are accessible at any time without cutting off the supply and so that the pressure on the gates may be equalized before raising. The tunnel outlet is provided with a surge chamber 38 ft. in diameter and with gates and screens operated on the same principle as at the inlet. The surge chamber plays an important part in conjunction with the governors and reactances of the generating sets in minimising the disturbances due to changes in the load, and enables the output to respond automatically to the requirements of the service.

### TURBINES AND GENERATORS

The main turbines, three of which are already installed and at work are of the Francis Type, each 2,150 horse power normal output, at 500 R.P.M. but capable of handling an overload up to 2,700 B.H.P. if necessary. The exciter wheels are of the Pelton type of 225 horse power normal output. An order has been placed for a fourth unit of 2,150 horse power capacity and tenders are at present being called for a fifth unit of 4,300 horse power and for a third pipe line. The generators at present in work are three in number, each 1,500 K.W. 3 phase, 50 cycle, 6,600 volt units. The exciters are of 150 K.W. 110 volts direct current generators. In addition to the exciter generators, a battery of 56 cells of 800 ampere hour capacity is installed to insure a supply

## To ARCHITECTS



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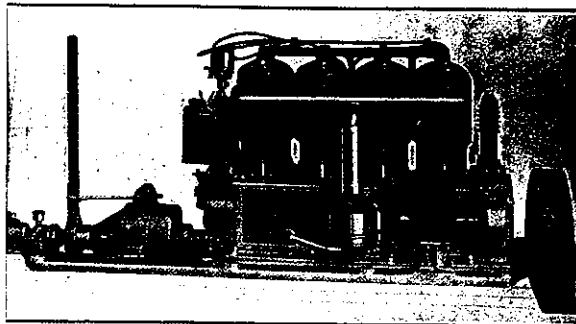


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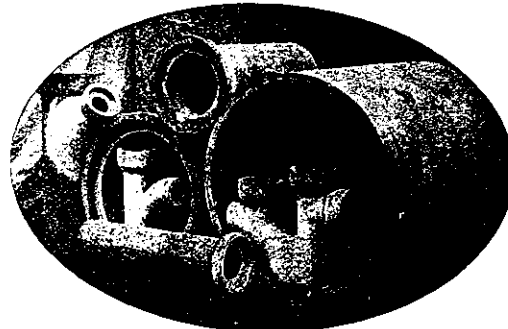
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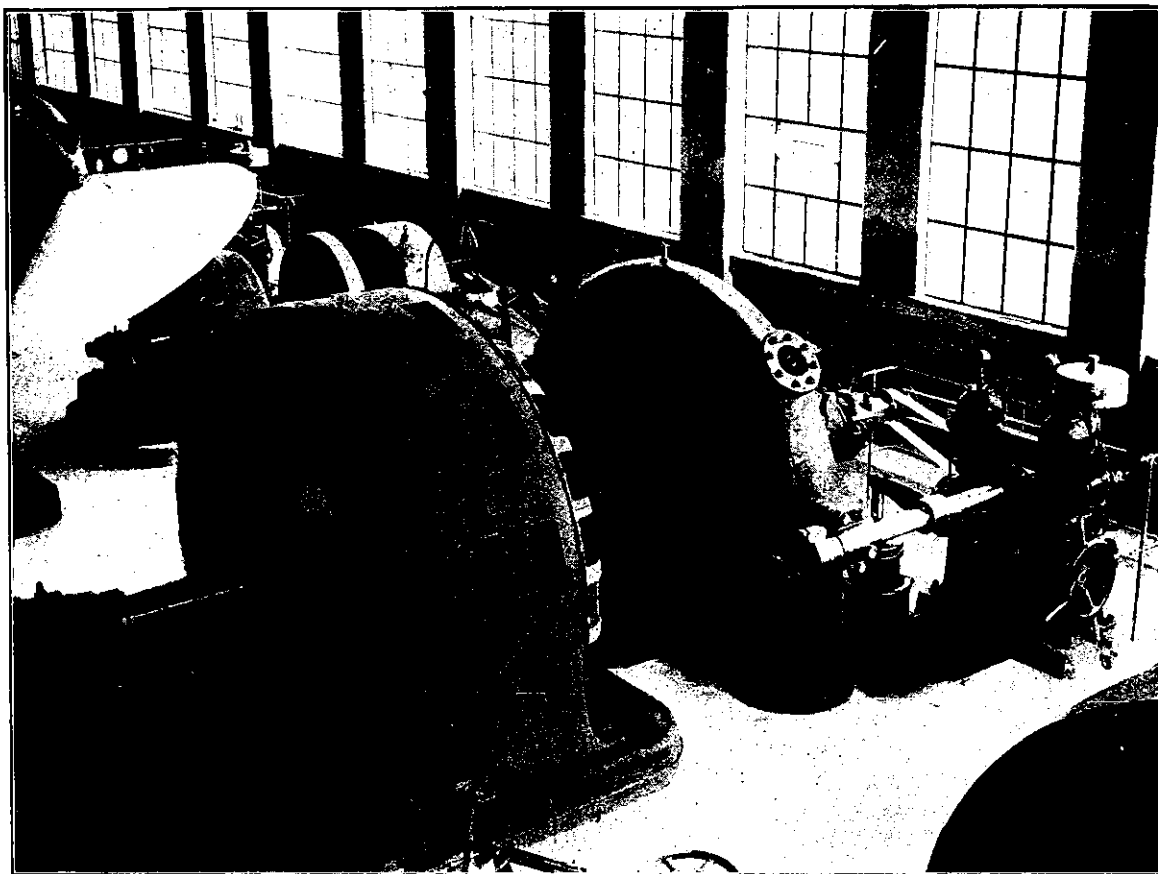
TRADE **BRUNNER** MARK

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of energy for excitation under any emergency which may arise.

In the original lay out of the power house six units of equal capacity, i.e. 1,500 K.W. were provided for, but we understand that owing to the prospective demands for electrical power the Department have decided to install 3,000 K.W. units in the place of the last two 1,500 K.W. ones provided for. This will give an ultimate capacity of 12,000 K.W. for the whole installation. The step-up transformers at

ium conductors, each 7/135 ins. The conductors are carried on ironbark poles, on pin type insulators spaced trinangularly six feet apart. Over the majority of the transmission routes the difficulties were immense, as in addition to having to haul great weights over partly made, and in some cases altogether unmade roads, none of the bridges along the route could be used, as a weight of five tons was all they were guaranteed to stand up under. This of course meant haulage through watercourse



View of Generating Unit

Lake Coleridge Power House, at present consist of two banks, each of these 1,500 K.W. single phase oil and water-cooled transformers, raising the voltage from 6,600 to 66,000 volts for transmission.

#### TRANSMISSION LINES

The transmission lines from the power house to the main sub-station at Addington, Christchurch are some 66 miles long, and in order to obviate as far as possible breakdowns in the transmission system the two lines have been kept distinct and apart from each other. At places the distance between the lines is as much as forty miles, and in case of accident to either line, the other one is capable of handling the entire output of the power plant. The current is transmitted at a pressure of 66,000 volts, and each transmission line consists of three alumin-

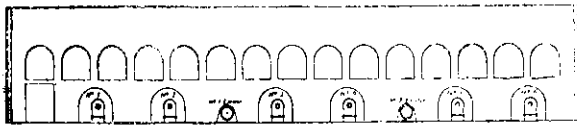
beds, and the making of temporary roadways, that added immensely to the difficulties of transport. The average span between poles on the transmission lines is about 400 feet, and the maximum span 1,300 feet. At the Addington sub-station the 66,000 volt pressure is reduced by two banks of step-down transformers identical with the step-up transformers at the main power house, but here they are star connected on their secondary side to give 11,000 volts, 3 phase for the primary distribution.

A branch of the 66,000 volt transmission line will eventually run to Timaru and other centres, with substations at intervals transforming down to 11,000 volts, at which voltage the current will be distributed throughout the province.

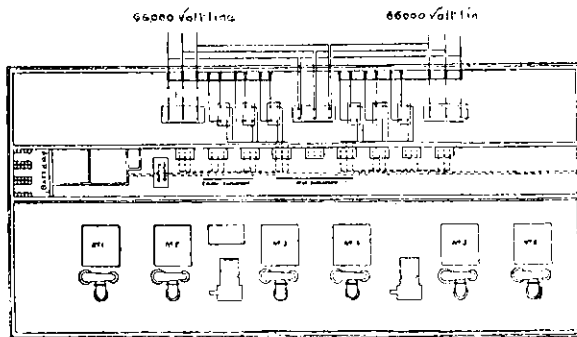
Probably no work of the size of the Lake Coleridge installation has ever been put into commission

with greater freedom from interruption or mishap, and those temporary stoppages that have at infrequent times been necessary, have been from causes outside the main power house, and the majority of these incidents have been caused by malicious damage to parts of the transmission line system.

On the cost of the installation, as far as it has gone, no great profits were to be expected, but with the installation of the fourth unit (already arranged for) the Department confidently expect that the returns will more than pay working expenses and interest on expenditure, thus leaving the returns from the two final units to be installed, for capital charges, payment of interest paid out of capital during construction, and losses on working during the preliminary stages, after which the surplus can be applied towards making a reduction in the charges for current.



LONGITUDINAL SECTION OF POWER HOUSE.



Lay-out of Power House at Lake Coleridge

An interesting development is the possibility of retail reticulation to farmers and dairy companies in proximity to the lines of transmission, and through contracting companies, retail contracts have been already let to individual users. Having regard to adverse comments of critics, when the Government made the announcement that it intended to handle the hydro-electric proposition with its own officers and staff, one cannot but admit that the gloomy anticipations of these "experts" have proved to be without foundation, and that despite the difficulties of the undertaking, including the getting into shape of a practically new engineering section, the Government have, so far, handled the proposition in a masterly manner.

The contractors for the power house at the lake site were Messrs Taylor Bros. and Moorhead of Christchurch, and it is worthy of note that the cement used throughout the erection was supplied by Messrs Reese Bros. the Canterbury agents for the Golden Bay Cement, and that every shipment was accepted as being fully up to sample.

We are indebted to the Construction Engineer Mr. F. T. M. Kissel, B.Sc., A.M.I.C.E., for his courtesy in supplying data and figures quoted above.

## Cement Fibre and Pumice Concrete.

A patent, "Konka," has been taken out by Mr. R. M. Maunder, Palmerston North, and already a large number of houses have been constructed of this material in Palmerston North and Wanganui. It is made up in large sheets, about three eighths of an inch thick, which are nailed to the studs, the whole being rough casted with two coats. The cost is not more than wood, and the effect is good. The result is great strength and durability, in addition to being absolutely waterproof and fire-resisting.

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## Correspondence

To the Editor, "Progress."

Sir,

In congratulating you upon the fine article on New Zealand Marble appearing in the February number of your interesting and most instructive paper, I would respectfully draw your attention to one glaring inaccuracy which rather detracts from the value of an otherwise admirable and well handled subject,—I refer to the comparison drawn between Iona Marble and the marble from Kairuru, Takaka Hills.

Iona Marble, (as it is termed) is really a rich green serpentine, somewhat similar to, but more beautifully variegated than the Ringborg Green Serpentine, owned and worked by the Nya Marmorbanks Aktiebolaget, Norrköping Sweden, or to the American "Verdi Anteo" Serpentine, but really most like the famous decorative Serpentine termed Green Mexican Onyx. The nearest approach to Iona marble in New Zealand is the Serpentine worked by the Greenstone Coy., near Kumara, on the West Coast, and another point of similarity exists, in that, both Nephryte and Serpentine are found in Iona. There is therefore, not the slightest similarity between Takaka Hills Marble and Iona Green Serpentine, and they come under an entirely different classification.

The Iona variegated Serpentine is entirely used for ornamental and decorative purposes. There is but one quarry in the island of Iona, and it was originally opened by myself only ten years ago, for the late Duke of Argyll, I was afterwards manager at the quarries for the Iona Marble Coy. Ltd., whose present address is, 36 Southampton Street, Strand, London, W.C., and their quarry manager's address is Mr. W. Edgar, The Quarries, Iona, Argyll, Scotland, to whom you may refer for confirmation of my statement. Several of the Wellington architects have seen a sample of Iona Marble, which I brought out direct from Iona Quarries six years ago, and Mr. Charlesworth may still have a small

*(Continued on next page.)*

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polished piece in his office. It is surely, extremely absurd to say that a beautiful white, grey or blue marble is infinitely superior in quality and colour to a beautiful green serpentine. Where no similarity exists, there can be no comparison.

I am, Sir, Yours respectfully,  
William H. B. Vass.

### Building Notes

#### AUCKLAND

A new theatre which, it is claimed, will be the largest and most up-to-date in New Zealand, is now in course of construction. Recently it was decided to close the Albert brewery in Queen street. This valuable site is now being converted into an up-to-date theatre. The actual structural alterations have been in progress for some weeks past and at a cost of between £10,000 and £12,000 a fine ferro-concrete building is taking the place of the old brewery.

A new five-story ferro-concrete building is about to be erected on the three frontage block of land next to Stewart Dawson's and facing Queen street, Vulcan Lane and High Street, for Messrs Whitcombe and Tombs Ltd., who are opening a branch of their ever increasing business. The block measures 185 feet by 35 feet and Messrs Chilwell and Trevithick are preparing the plans.

Auckland has again been fortunate. A park of seven and a half acres valued at £10,000 has been presented to the Borough of Mount Eden by Mr. Fred Potter.

#### CHRISTCHURCH

A new wing has been added to the Lewisham Hospital in Bealey Avenue consisting of a ward, bedrooms and sitting rooms.

#### DUNEDIN

(Contributed by Mr. Leslie D. Coombs, A.R.I.B.A.)

The prospects of the building trades for this winter are now much better than may have been anticipated. Most of the architects have a fair amount of work in hand for which contracts will be let in the immediate future. We are, however, rather dubious re the effect of the threatened rise in the price of timber, a matter of twenty-five per cent., so we understand.

Undoubtedly such a rise will be "the last straw that breaks the camel's back" with many investors, especially those people contemplating the erection of wooden residences.

Mr. E. W. Walden, architect, reports having completed the following works:—Business premises, Princes Street, for Messrs Whitcombe and Tombs Ltd., Fletcher Bros. builders; "Everybody's" Picture Theatre, Princes Street, W. McLellan builder; alterations to the "D.S.A." building, South Dunedin, G. Simpson and Co., builders; alterations to Messrs Donaghy's Rope Works, J. E. White, builder; a two-storey brick residence at Dunotter, L. Warren, builder; a single story brick residence at St. Clair, A. Dempster, builder; a wooden residence at Mornington, W. H. Mills, builder. Alterations to a residence at Mosgiel, J. Lindsay, builder.

Mr. Walden also reports a large three story building in Moray Place for Messrs Fairbairn, Wright and Co. as nearing completion, J. McGill and Son, builders, and the C. T. and W. A. Associations Club building in Dowling street as being course of erection.

Mr. E. Anscombe, architect, reports that operations have been commenced in the erection of a building to cost £5,000 for "The Evening Star Company." The building will be occupied on the ground floor by the International Harvester Co., and on the two upper floors by Messrs Raich and McLennan.

#### WELLINGTON

The tender of A. A. Renner, of Wellington, at £6,490, has been accepted by the Masterton Picture and Entertainment Company for the erection of a picture palace in Queen street. The work of erection is to commence at once, and as the company has provided a bonus for early completion the building should be ready for opening on first November. In addition to the contract price of the building, a sum of £2,000 is to be expended on fittings, seating, illuminations, etc.

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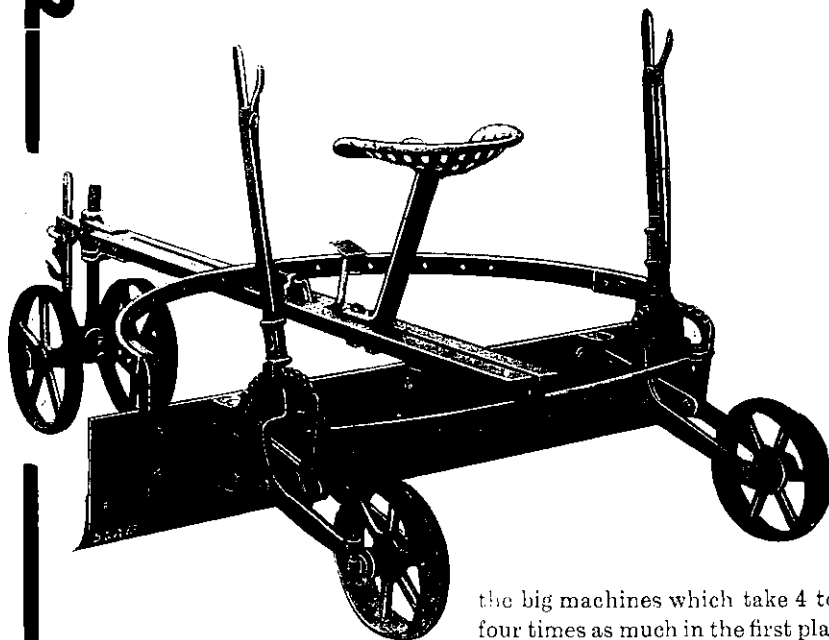
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