BEAUTIFUL TARANAKI

PROGRESS

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PROGRESS

THE SCIENTIFIC NEW ZEALANDER

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

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.

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Publisher's Announcements

The following specialities are in course of preparation for subsequent issues of PROGRESS. The order in which they are given is not necessarily the order of publication:—

Motor Number.—This will contain articles of interest to all motorists, and will be published next month. There will be a description of the Hawke's Bay roads, with a map of the district showing all good routes. Mr. Somerset Playne, F.R.G.S., an English visitor to these shores, writes interestingly on a thousand mile trip round the North Island.

Builders' Number.—This will contain numerous articles on the uses of cement as a building material, with profuse illustrations.

Heating and Lighting Number.—Designed to bring before our readers the latest ideas in all branches of heating and lighting in the home.

Ideal New Zealand Home Number.—This will contain the concensus of professional opinion as to what constitutes an Ideal Home for this country.

An Electricity Number will show our readers the great strides made in electricity of late years, especially as a labour-saver in the home.

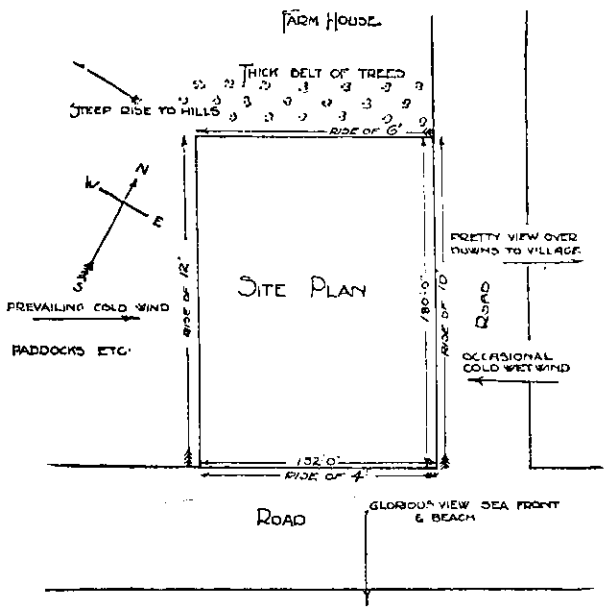
THIRTEENTH COMPETITION FOR ARCHITECTURAL STUDENTS

We offer a prize of Two Guineas for the design adjudged to be the best for

A SUMMER SEASIDE COTTAGE.

Drawings required to 1/8in. scale:—Ground floor plan, first floor plan, the most attractive elevation, block plan (1/32in. scale). All the above to be in Indian Ink, neither shaded nor tinted, and to be grouped together so that they can be reproduced apart from the remaining drawings. Windows to have a plain sepia or ink wash, and the walls in the two plans to be blacked in.

The following drawings to be in pencil only, and to be tinted and shaded:—Remaining three elevations; one section; ½in. detail section through living-room, showing fireplace.



Accommodation required:—Living-room (with fireplace), den (with fireplace), kitchen (3ft. 6in. range and h.p. boiler), scullery, washhouse, bathroom, three bedrooms (no fireplaces, each for two beds), maid's bedroom (one maid), verandah, sleeping balcony, necessary pantry, presses, fuel house, and E.C., and landings, stair, etc. There is no water supply, so tanks must be provided. Drainage allowed into a ditch in the road and on the sea front (show drains on block plan only). House may be set at an angle in any position in the section at the judgment of competitors, but must have two stories.

The house is presumed to be for a gentleman of fair means, with a small grown-up family, the members of which, however, will do a fair amount of entertaining. He stipulates that the contract price must not excede £700.

Walls to have wood studs, and external finish to be of weather-boarding, rough-cast, or shingles. Roof may be of any cheap, durable material. Make suitable for South Island climate. Use casement windows.

Designs must be sent in finished as above under a nom de plume, addressed to PROGRESS, 10 Willis Street, Wellington, and marked clearly "Thirteenth Prize Competition" on outside, with a covering letter giving competitor's name and address. Designs to be in by March 1st. Winning design will be published.

Mr. R. Newton Vanes, A.R.I.B.A., of Messrs. Salmond and Vanes, Dunedin, has kindly consented to act as judge for this competition.

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.

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PROGRESS

WITH WHICH IS INCORPORATED

THE SCIENTIFIC NEW ZEALANDER

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WELLINGTON, AUCKLAND, CHRISTCHURCH, AND DUNEDIN, NEW ZEALAND, FEBRUARY 1913

Editorial Comment

Labour has astonished the sober world somewhat by its Conference in Wellington. The reds and the whites—a sort of uncertain grey really as painted by the mixer from America—have unexpectedly shaken hands, and the world is induced to think that there never was any real difference between them. Hence it is natural that, having during their period of division voted the Massey party into office, they should now unite in cursing the Masseyites up hill and down dale. This unanimity, however, is not the cause of the astonishment felt by the public at the out-turn of the recent Conference. It is the expectation that the unanimous knights of Labour will get the votes of the rest of the world to oust the Massey Government, with their very extensive revolutionary programme. Nationalisation of everything, and the strengthening of the strike as against the force of arbitration, together with appeals to all and sundry discontents throughout the Dominion to come at once to the new federation for help—these, together with the references to the Waihi trouble are not the combination to win enthusiastic support from the moderate men of the Dominion. The reds have captured the whites and greys, but there is not much chance of their getting into a majority by capturing anybody else.

* * *

The cup of peace has been snatched away just as we were about to drink deep. One wonders what chance the Turks have of fighting out a better position for themselves. Are their armies in better heart? Have they money enough for a campaign or have they any chance of getting any? Have they any reason for expecting help from any of the other Powers? Are the Allies at the end of their resources in men and money? It is fairly clear that the allies are able to go on. It is certain that the Turks have no money. It is also beyond doubt that the Young Turks who are in power by revolution at the last moment are responsible for the inefficiency of the service which caused the Turkish defeats. Then it remains only to consider the chances of a disruption of the European agreement to hang together for the enforcement of peace. A cable of the 26th of January quotes that very well-informed paper, the North German Gazette, as stating that "the Powers are unanimous on the point of the maintenance of neutrality." At the same time an equally influential Russian journal declares that the attitude of Russia remains unchanged, as indeed does the rest of Europe. These things remind the world of the light thrown on the state of Europe a few weeks ago when the Triple Alliance was renewed between Austria, Germany, and Italy. Interest centred then in two points: (1) that the alliance was renewed without change of terms; and (2) because it was made "now," viz., at the outbreak of the peace negotiations. The basis of which satisfaction was universally declared to be the fact that the "Triple Alliance" is an important factor in the grouping of the European Powers, which grouping has "proved itself decidedly a peace factor." The two alliances therefore have agreed to keep the peace between them for the whole of Europe. The revolt of Turkish malcontents, no matter how patriotic, does not in any way traverse that position. On the contrary, as the terms of peace represent the utmost endurable by all the nations interested, it is unlikely that they will permit any change to be risked, one way or another. Fanaticism is fanaticism, and political malevolence is what it is, and will do what it will. But Force Major is the dominant always. Which is lucky, for this is in the practice of both sides the unholiest war.

* * *

Naval defence of the Empire is a thing above party. Therefore why object to the suggestion made in the House of Commons by a Conservative member and almost accepted by the Prime Minister, to invite members of Oppositions, as well as of Overseas Governments, to the Conference on the evolution of a fleet for the Empire? If that is carried out no doubt Sir Joseph Ward will be asked to join Mr. Allen in the representation of New Zealand at the Conference. Mr. Allen has not given any inkling of his views or those of his Government. On the other hand, Sir Joseph Ward has placed a very definite scheme before the Empire. His motion before the Conference of 1911 was for the raising of a loan of fifty millions sterling, floated on a levy of ten shillings per head per annum of the overseas populations, which would give twenty-five new battleships in five years and all the other

units of a great naval force with complete financial security. In this way would the Imperial fleet of the immediate future be able to do all its duty—of securing the headquarter seas as well as the sites of all the great trade routes. As all the Empire is prepared—has already subscribed to the doctrine—to pay more in the way of contribution to the navy, and to insist on the complete duty being performed, and as all are agreed except Australia that the command of such fleet under all circumstances shall rest with the Admiralty, there is no need to fear difficulties of arrangement. Canada has withdrawn from the Australian position most handsomely, and as the South African Union has declared that it only waits the expression of the wishes of the British Government before deciding, the field is clear for a conference and for a scheme of financial stability. If there is any difficulty it is for Australia, which is committed to the "tinpot" policy, which the other day laid down three small keels in Australian harbour water. But for Sir Joseph to take his seat with Mr. Allen who thinks alike is the easiest and best thing that has been suggested for some time.

* * *

Finance may be treated in the same way, for there ought to be no party sentiment about finance. Mr. Allen is on the way to raise some money, and Sir Joseph, who has reached Home before him, has already told a representative of a very influential financial journal that New Zealand is one of the best countries in the world for investment in the stocks. What could be better than continuance of a co-operation so happily begun?

* * *

When Mr. Massey announced his ideal of immigration as 25,000 a year from Britain, he gave a good many people a shiver—timid people, of course. He has now appointed an officer to make inquiry into the demand there may be in all parts of the Dominion for labour. It is a wise precaution. With land available for settlement and lots of employment offering, twenty-five thousand men a year coming here would be easily absorbed.

* * *

As to employment, what is the matter with the country and the employments of the country side? Some observers are now sounding a note of warning that the education system of the Dominion is forcing the minds of the rising generation into town grooves. The remedy proposed is to enforce the scattering of them over the face of the country to add to the coin in circulation instead of levying on the coin circulated by the exertions of others. The idea is excellent. Education at the same time should be given something more of a lean towards the teaching of things useful to the agricultural life. Some declare that rural life is not attractive, except to those who are fond of outdoor life. But the dullness of the country only proceeds from want of resources. The example of the town of Havelock (Napier) shows how vast are the resources of culture and amusement if men and women would only organise themselves in search of them. Sir Robert Stout has lately blown an encouraging note about this which ought to be extensively echoed. Certainly no sentimentality—otherwise a form of genteel laziness—should be allowed to justify the young people in flying from the land to stuffy offices and unproductive lives.

* * *

Our old friend Dr. Gilruth is attracting the attention of Australasia by careering round the vast dependency which the Commonwealth has set him to govern and develop and describe. We note that he is doing his work in a characteristic manner, bumping a motor everywhere a motor can and can not go, analysing things, describing them, pointing out the wants here and there and appraising the vast possibilities as truly as he can and signifying the drawbacks without fear or favour. It is just the sort of work that young Gilruth showed he was cut out for when he joined the Stock Department here in his raw early twenties, and refused to take laws from anybody, even from the despotic John M'Kenzie. He fought his way without compromise from one thing to another. He found himself in London studying biology at the Pasteur Institute, and became an excellent French scholar in the process if he did not also attain to scientific heights before unknown to all his faculties except his aspirations. Melbourne University admired his personality, and got him over with a high offer. Then the Commonwealth, wanting someone to knock something of order and development capacity into the great useless dangerous Northern Territory, appealed to his dominating instincts, and behold him in that motor car careering. We admit at once that if anybody can save the Northern Territory for the Commonwealth—in other words, for the white races of the world—it is Dr. Gilruth, of despotic nature, untiring industry, and distinguished ability. But on the other side of some narrow waters are millions on millions of people. These are cramped in their own quarters, while empty stomachs call to them to cross that water to the lands of plenty so congenial and so near. But the increase of Australian population is small, and the prospects of supplementing from the population of Britain will be extinguished absolutely when the reforms of the Liberal Government materialise. Nothing but fighting will keep the Northern Territory for the white race. Hence the need for military service in Australia.

* * *

The Australians recognise the fact, and they have an army. Some complacent gentlemen in the Dominion declare that there is no need for war. God grant they were right. Their idea is that the only thing required to prevent war is an agreement among the workers of the world to "down tools" when war is declared. But will the yellow workers who want to take the Northern Territory by force be ready to "down tools" for the purpose of keeping themselves out of the Northern Territory they regard as necessary to the preservation of their yellow race. That knocks the whole support from under the fabric of anti-militarism. Conscience won't even make the flag wave in presence of the enemy. Still less will it get any respect from him. Then why let conscience make cowards of any of us?

Architecture and Building

New Zealand Homes and Gardens

SOME CANTERBURY HOMES

By K. Butterworth

After 60 years of development, and having passed the hard pioneering and development stages, the time has arrived in New Zealand when her sons and daughters are at liberty to create the homes they would desire. Many such are springing up amongst us, but those that are wise are cherishing all that can be retained of the old, interesting, and picturesque, whilst building on newer and more lasting lines. That the older generation were not cramped in their ideas by our present shortage of labour is made very evident by a comparison of an "old" and a "modern" house. The former is straggling, and quite regardless of "wasted space" and long passages, whilst the latter, however large, is built with one eye on the labour-saving problem, to the loss of some picturesqueness and dignity, no doubt. The long straight front of the oldest house in Canterbury (illustrated here—Photo I.) reminds one instantly of England. It is still inhabited, and though built on to, the old part remains unspoilt, and retains its character. The Avon rises here, which gives the house its name of "Avonhead."

No. I "Avonhead"—The river Avon (Christchurch) rises in these grounds

A very different class of house is pictured in our third illustration—Photo II. The charm here of the broken gabled effect is very great, and is wonderfully well combined with the size of the house, which has unfortunately been recently burnt down. The river flowing through the grounds give these homes a great charm, for nothing endears a spot so much to one as does the addition of running water. A pond or a fountain are well enough, but a creek, a stream, a river, seem to wind themselves round the heart in a subtle way, perhaps because of the many thoughts they suggest, as well as by their intrinsic beauty. They are sure to have memories too. "Here Mary fell in," or "John caught his first trout," and the beautiful stream is hallowed by many recollections grave and gay.

In the two illustrations of "Ramornie" (photos 3 and 4), we have a charming example of house, garden and river, in which nature and art combine into a perfect whole. Only a small portion of the house (which is a large one) is to be seen in the third illustration, with the wide sweep of lawn and rose garden in front, beyond which flows the river with its charming banks, half cultivated, half wild, where arums and rhododendrons mix with the decorative native flax and bamboo, and graceful birches and the characteristic cabbage tree find a place in spite of the ubiquitous weeping willow, which adds its sweeping grace to the bend. It is natural that

the love of the garden should be combined with the growth of the home. In a country where every cottage has its quarter acre or more, and where nature is so prolific, that the barest patch may become a garden of roses in two years, there is every incentive to make the house and garden grow up, as it were, together. Thus the one takes its character from the other, and in the out of door life of the Dominion, the word home applies equally to both. The open-air balcony, so often used as a sleeping room, makes the garden almost a part of the house, or the house a part of the garden, and the living rooms themselves, though often opening on to lawns and flower-beds, are generally decked with many flowers. The love of flowers is a special characteristic of the British race, and one which seems to flourish and grow apace in New Zealand soil.

or a regular display of carpet bedding, is out of place, and at total variance with the spirit which ought to pervade the well ordered enclosure.

The flower beds ought to be as simple in form as possible; long straight borders laid down by the walks, with turf margins, are best, and contribute very largely to obtaining pleasant vistas.

The vegetable garden is a part of the general scheme, which adds greatly to the usefulness of the garden, and need not be banished to the region that "does not matter." In its own way it may be made a very delightful place with turf walks and margins, and its rows of luscious green things. A central feature may be made of a dipping well, if there is water available, where the water, exposed to the sun, is always at hand for watering purposes. All such erections as tool houses, potting sheds, etc.,

No. 4. In the Gardens—"Ramornie"

The Art of the Garden

(Continued from January issue)

Flower beds in fantastic geometrical pattern should be avoided, and carpet bedding banished utterly. Bacon says of these—"They be but toys, you may see as good sights many times in tarts." They destroy the repose and dignity of the garden. The flowers themselves set in masses of colour form the most beautiful decoration. A writer on gardens has spoken of the specimen tree as "the arch abomination" of the garden, and certainly anything which has the appearance of being on exhibition, should be seized upon and used with good effect in the garden scheme.

Australasians, who are the greatest meat eaters in the world, especially would derive nothing but benefit by growing and eating more vegetables.

Unlimited pleasure, too, may be had from even a very few well-cared for fruit trees, and when these are grown upon espaliers, look particularly well.

The garden may be set with such accessories as summer houses, arbours, pergolas and seats, but these must be very carefully placed and not merely "introduced" into the scheme for the sake of having them. Carefully designed sundials, sculpture,

fountains and water pools may also be used with charming effect and grace. It is clear, however, that every garden cannot have all these accessories. and it is very essential to the repose of the garden that too many be not crowded into the space at disposal.

The more necessary features, such as flights of steps, the coping or balustrade to the terrace wall, gateways and trellis fences and arches, should be carefully proportioned and of simple detail. The entrance to the various sections of the garden may be emphasised by an archway or by a gate of wood or of wrought iron, carefully designed. Even a very modest garden requires a tool or garden house of some kind, and if well placed and of suitable design, may be so made as to add to the interest of the garden. Every garden, too, requires a seat or seats, and these also must be properly placed and led up to, either at end of a vista or commanding some special prospect of the garden or a peep of the country beyond.

Pergolas are frequently badly placed. One which came under our notice recently started from the wall of the house, only half its width being clear of the corner, and it led up against a hedge! A pergola ought always to start from some definite point and lead to something, to the rose garden or to an arbour or seat. for instance.

Arbours, too, ought to be placed in definite positions, say, at the end of a path or grass walk to close a vista.

Care must be taken that pergolas and arbours are not such as will become dark, damp places. All the erections in the garden should be well built and of a permanent character, otherwise they will soon

No. 2. "Ilam," Canterbury.

fall into decay, become overgrown, insect infested and uninviting.

The pond and water tank, which had their origin in mediaeval Catholic England, to the demand for fish, and were developed into charming features in later times, also add greatly to the beauty and interest of the garden, but these, as indeed all accessories and features, must be designed by a cultured hand and be endowed with character and simple grace.

Sculpture is beyond the reach even of most people who may have fine gardens, because it must, when used, be absolutely of the highest quality. It can only fitly be used where the character of the house will proclaim it to be appropriate.

In the warmest and sunniest climes it may, of course, be of marble, but in other countries it is better to be of another stone, or of bronze or lead. Vases and other ornaments must not be set about on the lawn and elsewhere at random, where they

No. 3. "Ramornie"—A Peep through the Roses.

are merely in the way and destroy the breadth of effect, but must always be placed in definite relation with terrace walls and the piers of gates and steps.

A certain amount of mystery should be aimed at in designing a garden. The whole prospect and delight should not be laid bare to the casual observer glancing out of the window or in at the garden gate. It should be so arranged that one is led from part to part, from house to terrace, down the steps on to the velvet of the lawn, through an archway in the hedge into a stretching vista leading to a fragrant realm of roses, the eye being carried along always to discover the beauties and seclusion beyond.

Much of what we have written would appear to apply only to gardens such as only the wealthy and well-to-do may have. Certainly a garden including all the features we have spoken of must necessarily be extensive and the property of one who could expend a lot of money on its formation and upkeep. The underlying principles of garden design, however, apply equally to the smallest as to the largest garden. The garden should reflect the character of the house. A magnificent house may have a magnificent garden, but the modest house, even the most modest, may easily have a garden which is just as truly a work of art. A tiny plot may be made as delightful as the great demesne. Indeed, as we write our thoughts go back, not to the magnificent gardens of England and Europe which we have seen, but to many of the lesser and small gardens in which we have lived happy hours. We can call to mind the gardens of mere cottages which in their way were perfect. In these gardens of delightful memory the sun seemed to shine more brightly than outside, and the shade was more inviting. The

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garden orchestra was tuned to perfect harmony, and the flowers had added beauty and fragrance, while over all there was a sense of quiet dignity and restfulness. In such a garden we are

"... ensealed and hid from passers-by
With high inceinte, preserving sheltered nooks,
whose quiet this morning fair
Is broken only by the blackbird's melting air."

So writes a poet of a garden that is serene and beautiful as a fair woman.

We appeal to the people of New Zealand, who are already great lovers of growing flowers, to take up the question of garden design. We appeal especially to the architects to give this matter their serious attention and equip themselves to design not only better houses, but good gardens. As we have already pointed out, it is the architect who designs the house who should also design the garden; at least he should design the broad lines of it, and, of course, all the various accessories and features for these must, in our ideal garden, be endowed with architectural quality.

The garden is inseparable from the house and from the very first the architect should consider and design the two together, in order to produce an harmonious whole. After the broad lines of the design are laid down he should enlist the sympathetic collaboration of the nurseryman, and if he —the architect—is endowed with tact in addition to ability in garden design, there should be no difficulty in bringing the garden to a happy conclusion.

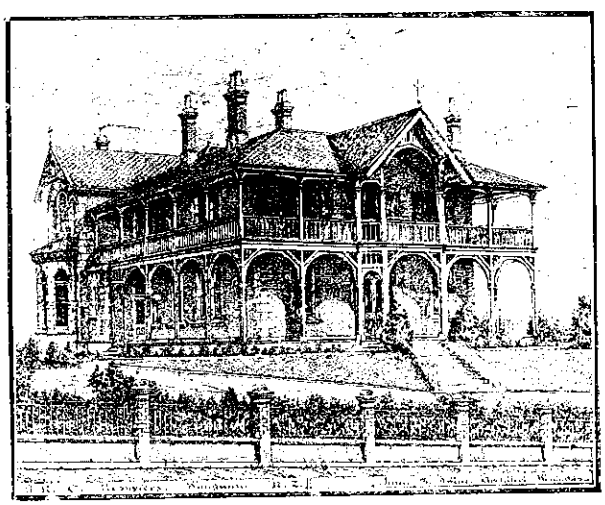
The old order changeth, and with the improvement in our domestic architecture, which we are sure will soon come, we look forward to the garden receiving the share of attention to which it is justly entitled.

It is of the highest importance for the well-being of the country that the people should take root in the soil and the provision of good, well-designed houses and gardens will do much to bring this about and knit their interests and affections to the land. The garden should be looked upon as a part of the home, where one may breathe a fuller, sweeter air and come into closer touch with nature. For the sake of the children, if for no other reason, the garden should be valued and regarded as an important factor in the development of the young mind. Most children take an instinctive interest in gardens, and it is easy to make all the events of the garden's seasons marvels of delight and wonder for the young minds athirst for knowledge. Times have changed since the days when our great-great-grandmothers knew all about herbs and "simples," but we think that the underlying principles—seclusion, usefulness and pleasure—still hold good. We think that the garden may again be revived and developed as were the old gardens of England. They can only be so revived and developed, however, if we regard them in the proper light. The old garden was regarded as a necessity, and the people added something of beauty to it because they could not help it and because they did not talk about art. The garden and the house grew up and were designed together, for each was the complement of the other. In these days of rush and restlessness, there is more necessity than ever that men and women should have seclusion in which they are at peace to think and to rest, and nowhere can it be had better than within the enclosure of their garden.

For study, too, the garden offers a quiet to be obtained nowhere else, for, as Sedding said, "an hour in a garden is better than a month of sixpenny days in a stuffy museum."

In some instances the usefulness and necessity of the garden may be more psychological than materialistic, but, as we have already pointed out, we would only benefit by making the garden more of a necessity from the material point of view. We have no grudge against the market gardener, who, indeed, has his special province, but the system of having everything brought ready to use to our doors and the principle of "things made easy" are not without their disadvantages.

The pleasure we derive from the garden ought to be as great, or, considering our boasted cultivation and increased knowledge, greater than our ancestors experienced.

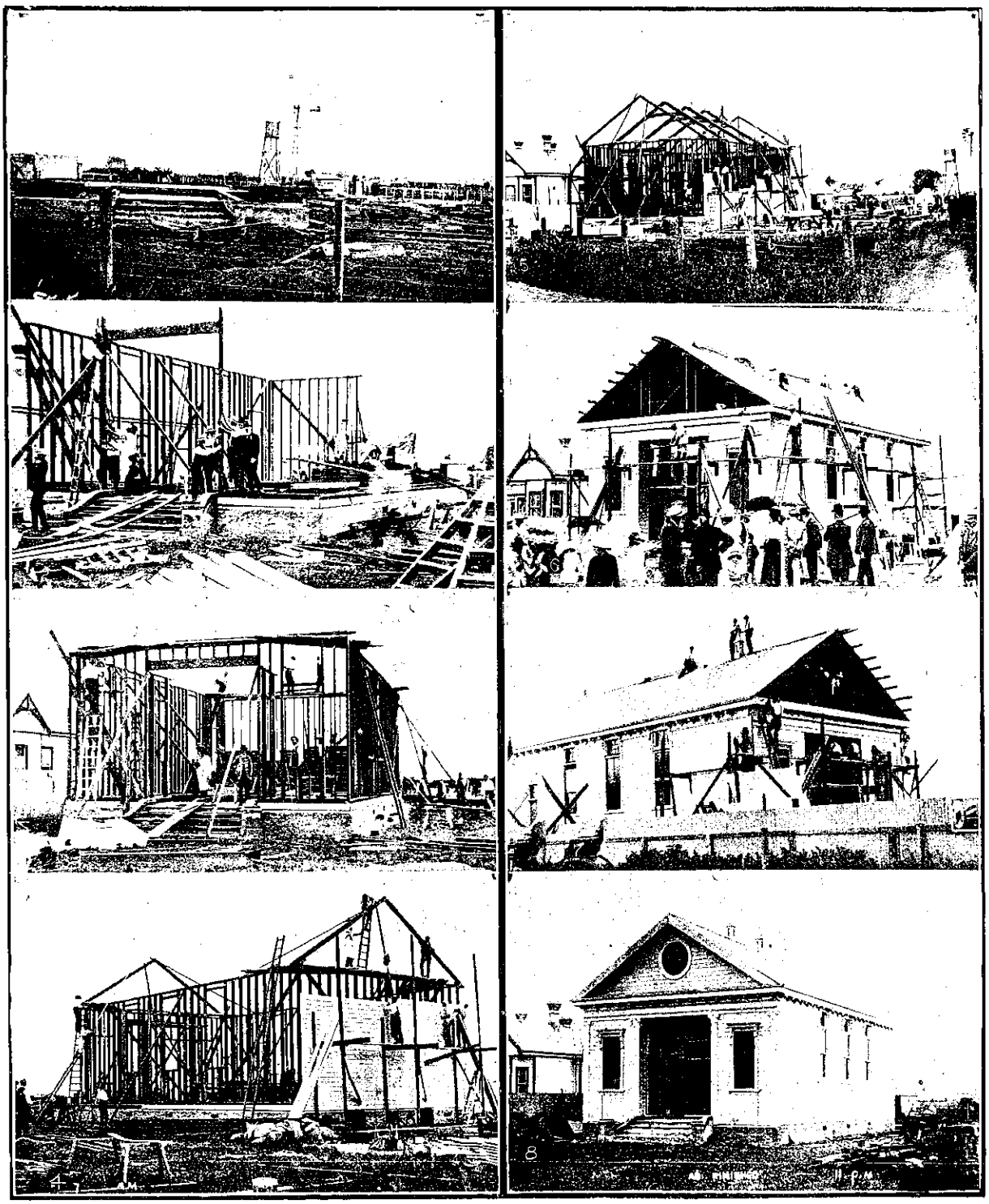


R.C. Presbytery, Wanganui. John S. Swan, Architect, Wellington.

We cannot here embark on a paper on sociology, but we think that there may be found in the garden cures for many modern ills. Certainly there are pleasures better and sweeter than are to be found in the feverish excitements and endless amusements of to-day.

Why go abroad for the entertainment of "moving pictures" when, in a well-ordered garden, we may be purified and disciplined, and at the same time charmed with the ever-changing pictures around and above us. Here in our tenderly nurtured and garnished enclosure we may have ever changing feasts of beauty, of form and colour. Here we will find simplicity, the simplicity of a carefully ordered plan. Here we will find truthfulness, because our garden does not pretend to be more and other than what it really is, namely, a deliberate piece of design on a given piece of ground. Here there is perfect fitness because "all is fine that is fit," and our garden is tuned to harmony. Here there are dignity and refinement, because we have

A Church (50 x 29) that was Built in a Day at Papatoetoe, Auckland.



1. Showing section ready for the start at 4 a.m.
2. After one hour—5 a.m.
3. At six o'clock.
4. Three hours' work—7 a.m.
5. At 8.15 a.m. the weather boarding was half way up the sides.
6. At 4.30 p.m.
7. Nearing completion.
8. As finished at 11 p.m. same day.

fashioned our garden in truthfulness, simplicity and fitness. because "the garden is a little pleasaunce of the soul." and within its fair enclosure we derive to day

Some Wood Carving by Students of Wellington Technical School

Here we have tranquil seclusion, because we have shut out the world, with all its noise and hurly-burly. The pleasures we seek are not selfish, that which will help us in the world and amongst our fellows to-morrow.

A London Proposal for Training Architects

PROPOSED LATIN QUARTER

A scheme just adopted by the Society of Architects, and now being put into operation by a special committee of that body, is likely to bring about a revolution in the training of the British architect. It will have the effect, in the opinion of its promoters, of rendering the architect of the future immune from the criticism frequently levelled at his brother of to-day—that he is a first-rate clerk of works but knows little or nothing about design.

The council of the society decided a few days ago that one or more ateliers should be established in London to provide training on the lines of the Ecole des Beaux Arts in Paris. A financial guarantee having been given at the same time, the special committee is now busily engaged in carrying out the details of the plan, and hopes before the close of the week to have chosen a suitable building for the start, probably in Soho.

"A Bohemian district such as Soho would be quite in keeping as the nucleus of a Latin Quarter for London," stated Mr. Percy Tubbs, F.R.I.B.A., president of the society. "Almost any studio would do, provided it were spacious and well lighted.

"To begin with, we shall put up about thirty drawing-boards, and pupils to that number will, as in Paris, be under the general supervision of a patron, who will be a qualified practising architect of Beaux Arts training. He will set the subject—

Residence for Mr. G. H. Keesing, Wanganui East T. H. Battle, Architect

say, the design of Houses of Parliament for a new country, or other monumental work.

NEW STYLE AND PRESENT STYLE

"The pupils, working under a French massier, in charge of the atelier, will draw up their own designs. As these develop, the massier will criticise and make suggestions. Thus the pupils will learn by error, by the mistakes made by one another, and so receive a thorough practical training in original design."

"At the present time," Mr. Tubbs continued, "young architects have no such opportunity of learning in this way, and are consequently handicapped in comparison with the Paris-trained craftsman. The tendency in England, when a young man is articled, is to make him a good clerk of works. He will copy specifications until he almost gets writer's cramp, and then fill in details, until he knows all about buiding construction but has practically no knowledge of design.

New Business Premises for Messrs R. & W. Hellaby, Auckland —Fred. Souster, Architect

"Our first atelier will be at work in the beginning of the new year, and more, we hope, will follow, so that each centre can compete with the others—the spirit of competition and the opportunity of comparison being the keynotes of the whole idea.

"Ultimately we shall aim at establishing a string of ateliers throughout the country. Though no specific towns have been decided on, they will be such centres as Liverpool, Manchester, Birmingham, Leeds, Glasgow, and Sheffield."

Messrs R. & W. Hellaby's New Buildings, Auckland

This block, which is expected to be occupied during the current month, is 60ft. square, built of brick throughout, cement faced. The contract price was £4500, and the contractors are Messrs. Pattison and Brooks, of Auckland. The main corner is devoted to the butchery, the whole interior, including ceilings, being tiled in white enamelled tiles, the fittings being of white marble, and the whole fully complying with the latest requirements of the Food Act, special features being the ventilation and fly-proof fittings. The front plate windows running direct into the tile-cased pillars without any wooden framework whatever. Complete sanitary arrangements on the septic tank system have been installed to all shops and dwellings. Mr. Fred Souster was the architect.

Old People's Home Competition, Awapuni

We understand that Messrs. F. de J. Clere, F.R.I.B.A., and W. B. Busby, of Wellington, were awarded first place in this Competition, Messrs. Penty and Lawrence being second. The Chief Architect of Public Works, who acted as assessor, advises that in his opinion the winning design could not be built for the sum stipulated, viz., £5500. In consequence of this the prize is being held over until a builder's estimate is obtained.

TARANAKI

PICTURESQUE HISTORICAL AGRICULTURAL INDUSTRIAL

Picturesque Taranaki

Governor Hobson called the Taranaki country "the Garden of New Zealand." Then it was the home of the forest primeval. It is still the garden of New Zealand, but much of the forest has ceased to be primeval. Nevertheless, the country is most fascinating to the lover of the picturesque. It is a country typical of the scenic style of Maoriland, so unique in the scenery of the world. For example, like most of the districts of these "fortunate isles," the scenery is dominated by mountain shapes. But the domination is of the handsomest mountain in the Dominion, and one of the most graceful in the world. Every landscape centres in that wonderful cone, and from the sea the traveller has it in his satisfied eye always. Seen from Hawera the beauty of the mountain is greatest. One does not know which to admire the most—the majestic grandeur of the mountain, the grace of the icy cone poised in the "blue dome of air," the marvel of the curve uniting it to the plain as an integral part of itself, the tints of the forest, of the ice and the pleasant land.

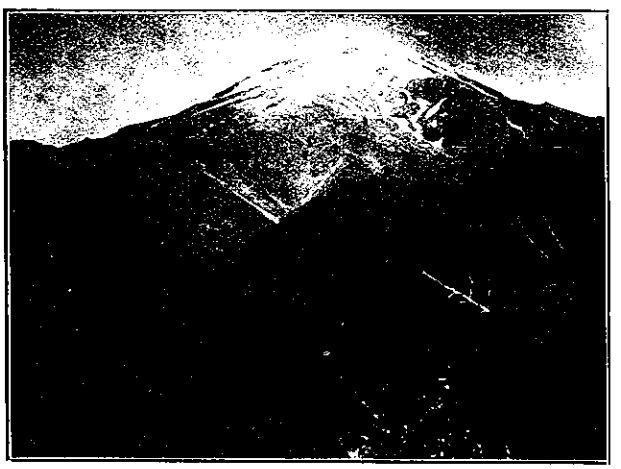
Tasman saw it in 1642 and said nothing except that he saw a mountain. Cook saw it in 1769, and described it as "a high mountain greatly resembling the peak of Teneriffe." The French navigator, Marion de Fresne, adopted the middle course of calling the mountain "Le Pic de Mascarine," after his ship. But the first stranger eyes set on it were those of the great Maori navigator, Kupe, and his crew, who called it "Pukehaupapa," which Mr. Seffern in his history of Taranaki translates "Ice Clad Hill." That is estimated to have happened some six or seven centuries ago.

[New Accommodation] House, Mount Egmont (on [New Plymouth Track) *Photo. by Frank Messenger, N.P.*

The further description of Cook is interesting, because in his usual practical style. "It lies near the sea, and is surrounded by a flat country of a pleasant appearance, being clothed with verdure and wood which renders it the more conspicuous." He added: "The shore under it forms a large cape which I have named Cape Egmont." At the same time he named the mountain Mount Egmont.

Mr. Seffern, whose story of this district is so interesting and full, and who loved the mountain as all the district loved it then and does now and ever will, for the fascination of the mountain world never leaves the people who dwell in the land of the great hills, has left a fine tribute to the commanding peak.

"What can be more beautiful to greet the vision at sunrise than Mount Egmont? Towering aloft in the clear blue sky, old Taranaki rears her stately snow-crowned head, blushing with rosy radiance beneath the golden kisses of the morning sun, and below the snow dense foliage clothes the giant with a kingly robe of verdure. Later on in the day a belt of fleecy clouds hovers lovingly awhile about midway, slowly ascending they melt away before the ardent breath of the noonday sun."



Looking up Ngatoro Gorge from back of New Hostelry, Mt. Egmont
—*Photo. by Frank Messenger*

The solitude of the mountain much enhances its grandeur. A fact that may be understood from the descriptions of many who have likened the cone of Taranaki to the cone of Fusiyama, and though the latter rises to an altitude of 16,000 feet (double the height of Egmont) there is no hint in any of their pages of lesser majesty as the portion of the smaller mountain. From the summit the view is far reaching, for it includes the chief mountains of the Dominion, the Southern Alps on a clear day, and the great characteristic shacks of Ruapehu, Tongariro, and Ngaruhoe. As for the view of the country, taking in the coast to the Manukau, the whole of the Taranaki district, and a filmy edition of the bulk of the Wellington province, it is indescribable, as it is exhilarating to the climber to whom it is the pleasant reward of his enterprise.

Not that it requires much enterprise nowadays. Dr. Diffenbach, the first to climb the cone, made two attempts in 1839, the second of which consumed seven days of his time. To-day you can reach the mountain hotel, close to the snow line, in an hour and a half by motor car, and from the hotel the rest is easy. There are within reach half a dozen trips, the best being of course to the crater at the summit, and this ladies can accomplish on foot in two to four hours, according to strength and disposition. The other attractions are Dawson's Falls, Bell Falls, the Ranges, and others. There are tracks everywhere well graded and safe, a there are guides for those who wish to go off the tracks or to be secure in case of bad weather. The hotel is up to date in all things modern, and on the whole a very pleasant week can be spent here. Those who prefer a more independent method of spending their holiday can secure the mountain hut not far off at cheap rates, and there they can arrange their picnic in any way they please.

The other great attraction of the Taranaki district is the Mokau River trip. Opinions differ as to whether the Mokau or the Wanganui is the more picturesque stream. But this presents no difficulty to the traveller through Taranaki, as he can easily see both, for while the Mokau is all within the district boundaries, the Wanganui River is a portion of the south-eastern boundary, and can be reached from Taumarunui in the ordinary way by the steamers.

The Mokau is picturesque and full of memories of the old race which flourished in these parts for seven centuries. The beauty is of leaf and flower of tree and shrub, of white beach and sombre rock, with blue of the water and blue of the sky. The hills on either side are of noble proportion and glorious outline of contrasting and unexpected curves, the special characteristic of New Zealand combination. The reaches are splendid, and the gorges are wonderful, the garment of forest is rich in the extreme, and the occasional views of peak and plain magnificent.

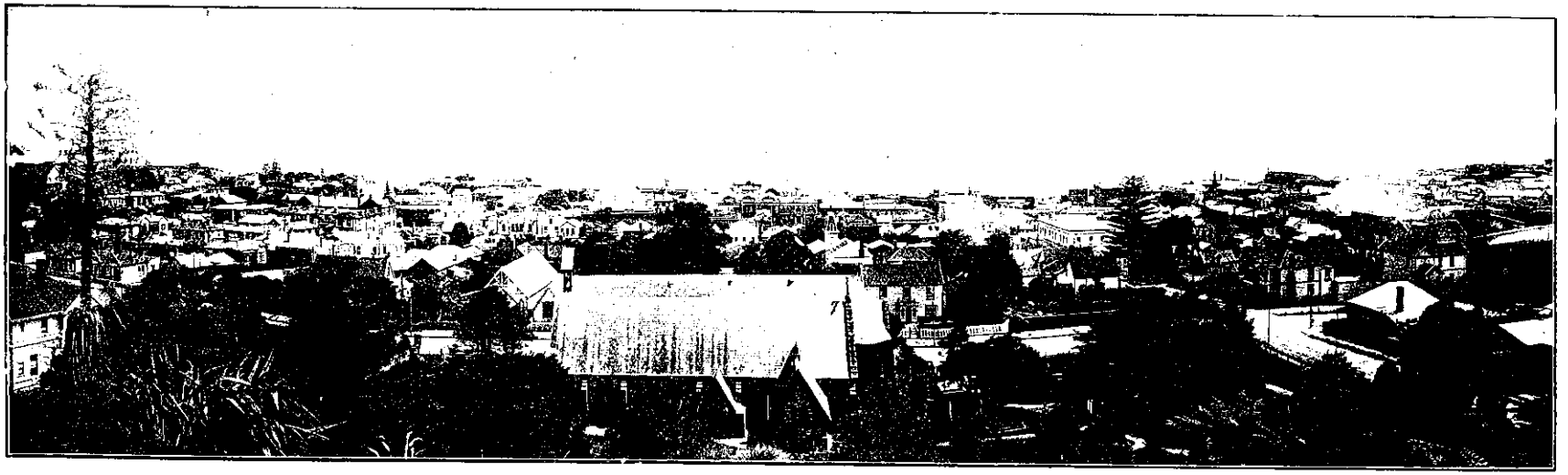
There is a comfortable launch for the traveller which will take him twenty miles up the stream, and canoes are ready for another ten miles to the head of this picturesque enjoyable navigation should he so desire. The coal workings of the Mokau are very famous now for many reasons may be seen by the way, and the store of legends makes the Mokau truly a haunted stream. The road from Waitara to Mokau mouth over Mount Messenger is one of the most picturesque in the whole Dominion, so rich in scenic magnificence.

New Plymouth, with its baths, its oil-wells, its breakwater, its "Sugar Loaves—one of these, Paratutu, of 600 feet offers a delightful climb, from which stone-cut steps and convenient roping have removed all hazard—and its beautiful Park—the most fairy place in all New Zealand, and its historic memories—among the most interesting and striking in the Dominion, offers irresistible attractions to the holiday maker. There are many trips of great beauty and interest in the neighbourhood besides. The flowers of this country are of surpassing splendour. There is also magnificent trout fishing by land and great fishing by sea all the way from the breakwater up the coast. On the whole, it is safe to say that he who has not dwelt awhile in Taranaki knows little of the best of New Zealand, or of the best of life therein.

The recently formed Tourist Association has splendid material to dilate upon.

Panorama of New Plymouth taken from Island of Moturoa ($\frac{3}{4}$-mile from shore)

Photo. by E. C. Rennell, New Plymouth



Panorama of New Plymouth looking seaward. St. Mary's Church in the foreground

Historical Taranaki

The history began with the arrival of the Maori navigator Kupe in the canoe "Aotea." He stayed awhile in the district, began to harry the inhabitants, whose origin is mysterious, and whose fate was sad—they disappeared before the more hardy and warlike strangers. His contribution to the history of the place was his naming of the rivers, capes, headlands, bays, peaks, and plains between Wanganui and Patea. This was also the method of Cook, whose names remain, and whose surveys are as accurate to-day as if made by the most modern instruments. It is one of the wonderful things about these Maori navigators that they had the faculty of going and coming, making many voyages to and fro, between their starting point and the country of destination. Kupe it is certain made voyage after voyage. His figure looms large in Maori history as the chief captain of the explorers. Even now he is supposed to be resting in his canoe, surrounded by his crew, at the bottom of Lake Waikaremoana. To the ordinary eye it is only a big rock seen through the clear water of the lake. But the Maori imagination sees the great Kupe reposing with weapons and comrades of many adventures waiting for the signal to call him back to the scene of his exploits.

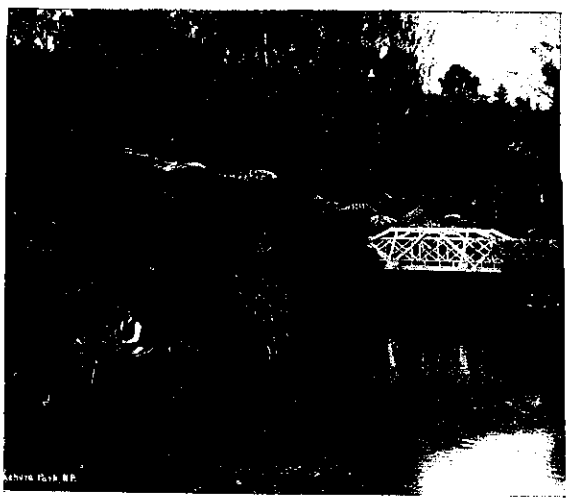
The next navigator to do geographic work was, according to Maori tradition, Manaia, who came in the canoe Tokomaru, and he surveyed and named the points between Patea and the Waitara. A rising township recalls the first of these names, while the second recalls a battle of doubtful issue between General Cameron's forces and the enterprising Maori.

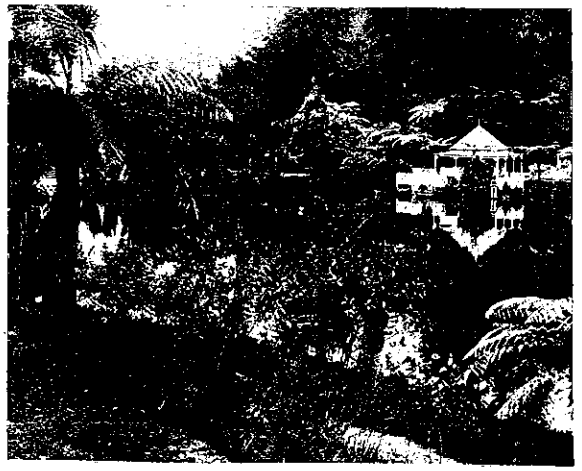
The Maoris established after this first coming six hundred years ago or so, grew and multiplied on the lands of the ancient inhabitants known to their traditions as the "Ngatimokotorea," whom, finding to be unwarlike, they exterminated duly. The only sign of them given to the world was seen by Cook on that voyage which took him within sight of Mount Egmont. During the night he records that he saw "several fires" on the sides of the mountain and in the country below. A country illuminated, but mysterious three-quarters of a century before the "first ship." Look at it now!

The first authentic account of the race established in the district is the account of John Rutherford, the sole survivor of an American crew-ship, Agnes—murdered by the Poverty Bay people before 1817. Being expert in hunting and fishing, he was admired by the Maori, and eventually made a chief, being given two wives. Very soon he was bitten with the mania for exploration, and determined to cross the island. The story of the journey is told in his book entitled "Narrative of Ten Years' Captivity by the Maoris." He started with his wife Epeka and twenty women slaves, each carrying her own rations and thirty pounds of potatoes for the general use, and driving before her a "porker" (poaka), held by a string of flax. (N.B.—Compare with the picnics of to-day by motor car and train.) There was an armed party of men, of course. Travelling "sometimes by land and sometimes by water" (an enigmatical sentence), they arrived in a month at "a place called Taranaki." All the unprejudiced pakeha of to-day who knows the country between, its ranges and its rivers, can say is that either they made wonderful time, or that the record proves them to have lost all idea of time. The chief point of the story is that they found the people of the "place called Taranaki" very flourishing.

That state of things did not continue long. The Waikatos disturbed their peace and there were great wars and much fighting. Before this the tribe of Te Rauparaha fleeing from these Waikatos had passed through and escaped from attack by stratagem. This chief made his first appearance in this country about 1820, having determined that to withstand the powerful Waikato at Kawhia would be impossible. He established himself on the island of Kapiti, and thence arranged expeditions and alliances by which he made himself master of the whole country between Patea and Wellington, extending in due time his conquests to the northern sounds of

A Glimpse in Recreation Grounds, New Plymouth, showing Band Rotunda and Lake





Some Charming Peeps of Recreation Grounds, New Plymouth — *Photo. by Collis, N.P.*

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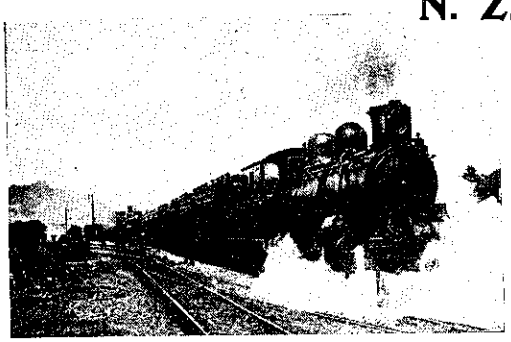
On the way to the Mountain House, Mount Egmont

N. Z.



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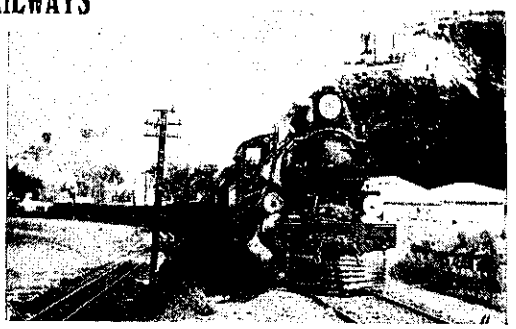

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Countless strange and wonderful sights are to be found within an easy railway journey of the large centres, and are approachable without difficulty from any part of the Dominion.

On occasions of public holidays, races, agricultural and pastoral shows, etc., special concessions are made in fares, and additional travelling facilities are provided. For particulars, see advertisements in local papers and posters exhibited at railway stations.

For further particulars of trains and coach and steamer services in connection with Tourist Excursions see official pocket time-table issued by the Railway Department, which can be obtained at railway stations, price threepence.

The Railway Department is not responsible for the coach or steamer services conducted by private enterprise and is not answerable for their fulfilment.

The Mokau River, Taranaki

the South Island. Thus was prepared the country by devastation of the people and destruction of their villages and cultivations, for the coming of the Pakeha. The presiding directing genius, Te Rauparaha, was a mixture of the military genius of Napoleon and the diplomatic ability of Metternich.

The Waikatos inflicted sad slaughter on the Ngatiawa tribes, who held the Taranaki country, their chief, Te Whero-whero, being particularly conspicuous in the many raids made and the battles fought. After the taking of the Pukerangiora Pa, fifty of the best blood of the prisoners were brought before him in single file, and he scattered the brains of each with a single blow of his "mere." After that this ferocious savage looked like a Petone slaughterman after a hard day at so much per 100.

When they got to Moturoa—near the site of the town of New Plymouth—they found a "pa" strongly fortified and garrisoned by some 350 men. Among these were half a dozen white men, old sailors under the celebrated "Dicky Barrett," a whaler of great repute, in those far off days. Dicky and his friends had mounted four small guns on the stockades of the pa, and had laid in a great store of rivets, old nails, gravel, and every conceivable thing that would lend itself to a whistling scatter from the cannon's mouth. When the Waikatos, three thousand strong, attacked, they came on a very good imitation of artillery machine fire and they bolted. But they were warriors. All guns miss or are dodgable, they said. They besieged the place.

For months the siege lasted with varying fortune, the white men and Dicky doing the work of watching and keeping the garrison from surrender. At last the Waikatos, driven by hunger, having eaten up everything edible in the neighbourhood, made a grand assault, and being decisively repulsed marched off to their own country—not without some frightful blood orgies at the hands of the triumphant garrison, who fell on the flying columns and massacred the wounded in every direction. Barrett was so impressed with these adventures and so sure that the Waikatos would come back one day for revenge, that he migrated to Wellington—Port Nicholson. There he was when the Tory arrived with Colonel Wakefield, and was accepted as interpreter. He acquired the piece of land near Plimmer's Steps about that time, and built on it a hostelry known for years as "Barrett's Hotel." The name is borne now by a stately building near the said steps. Such was the origin of "Barrett's Hotel."

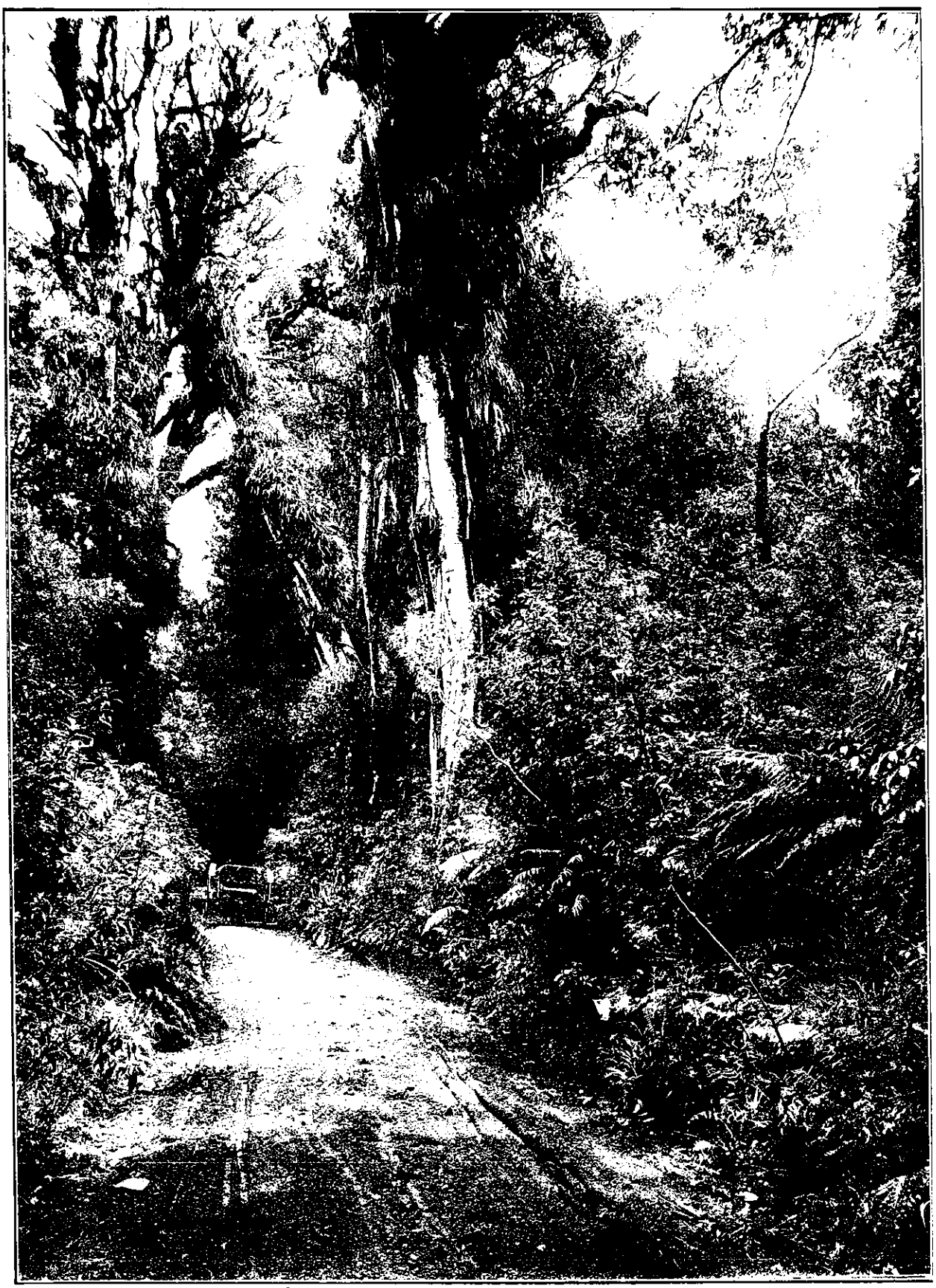
The fears of Dicky proved correct, for the Waikatos came back for "utu," and between them and the raids of Te Rauparaha the ancient race was driven out—what was left of it—and, according to Maori usage, the land became the property of the conquerors.

When the Pakeha came he bought land from the conquerors, but the conquered returned as soon as he made it worth their while to work, and made them safe into the bargain. The conquerors objected when they heard that compensation was being given to these returned slaves. Governor Fitzroy sustained the "slaves" against the Maori land laws. Hence grew the differences between the races brought to war, which lasted for many years, to the great disturbance of settlement and the desolation of much of the land. Here lies the whole source of the disturbances.

There was another cause of trouble. The New Zealand Company started to colonise before the Queen's Government was ready to annex the islands. When the Queen's Government did annex the islands, the two clashed much, especially in the matter of the lands bought from the natives by the New Zealand Company and sold by them to the New Plymouth Company, its offshoot. The doubtfulness of title and the inability to get land at all were the fruits of this state of things. Before the final emergence from trouble the Maoris fought, and we had ten thousand red coats in the country, four thousand of them in Taranaki. Chute made a remarkable campaign behind the big Mountain of Egmont and back to Patea by the coast, destroying cultivations, pas, and all the Maori depended upon. After this the self-reliance period opened, and the Maori re-opened his wars, intending to drive the pakeha from the land of his fathers for ever. Tito Kowaru came to the front as Maori chief and priest of a new religion—the Hauhau fanaticism—and Te Kooti joined him. Te Whiti appeared as a force making for peace.

Self-reliance produced some good soldiers, the greatest of whom was Major Atkinson, the fighting Major, the head of the incomparable "Forest Rangers," the inventor of the tactics now practised by mounted infantry, a chieftain fearless in fight, resourceful in ambush, untiring in enterprise, with a genius for command. No such soldier has ever come out of New Zealand as Sir Harry. No such man either, for after his war service he went into politics, and became the greatest of our Treasurers, and one of the noblest of the Prime Ministers we have ever had. Here his commanding abilities gave the country tremendous service, and his unceasing industry so sapped his strength that his labours brought him to an untimely grave. His sudden death in the precincts of the Legislative Council was a shock to the whole Dominion, and his funeral was the signal for the general recognition of this great man as the noblest, the most strenuous, the greatest citizen of his day in New Zealand. Such men are the salt of the earth, the glory of pioneers, and the foundation of states. It is because they are examples of courage, uprightness, enterprise, enlightenment, studious modesty, and unflinching adherence to principle. He indeed was the Bayard of New Zealand, the knight without fear and without reproach. When we look upon his like again we shall be the better for it.

Of those earlier times when Atkinson was fighting in the field, the leading names are Bell—Francis Dillon of that name—Carrington, Richmond, J.C., Native Minister, and so forth; Carlton, ripe scholar and great Parliamentarian; King, descendant of a great sailor of the Nelson day; and others too numerous to mention. These all did their part. Under their hands the Constitution came into force and grew to busy life. Under their hands and those of their successors the Breakwater grew out of the surf of the ocean, and the dairy factories rose out of the mullock of the plains. In connection with the latter

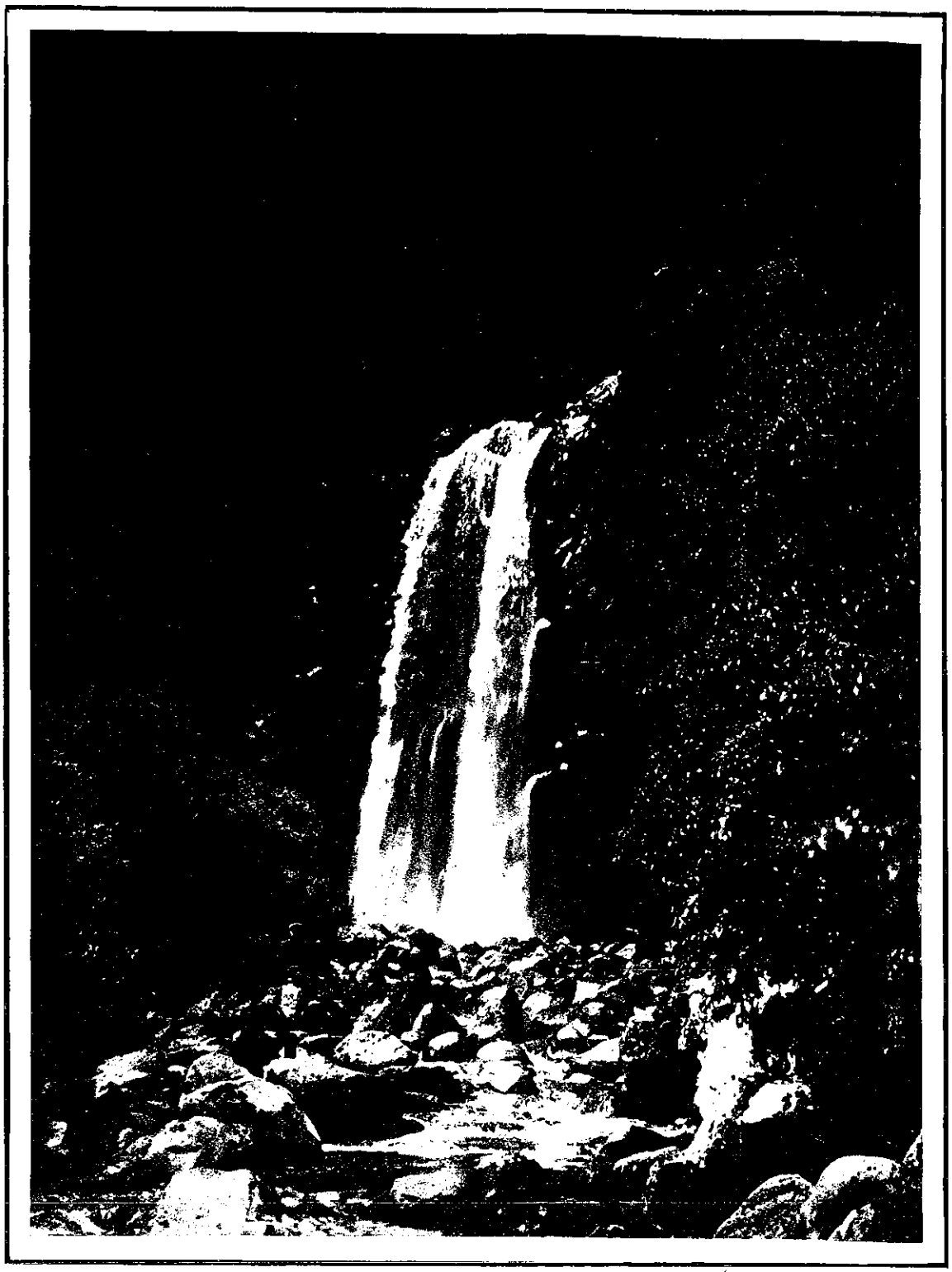


On the way to the Mountain House, Dawson Falls

one instinctively thinks of Trimble—Colonel, and admirer of Gladstone, and strong appreciator of Sir Harry, whom he followed always consistently to division and beyond.

When the wars ceased, after the crowning victories of Whitmore, the Public Works policy came in. Thus on the day of the opening of the line between New Plymouth and Hawera, the people were startled with the proclamation inviting Te Whiti to surrender, and the sequel proved how completely the works policy had done the work of pacification. The railway track had proved more potent than the rifle or the cannon, and the platelayer more formidable than the armed constable. Since then we have progressed from day to day after the blessed manner of the country of which it is said that it is blessed because it has no history. In other words the only true history is the story of advancement on lines of self-reliant endeavour in the paths of peace, through a country of natural wealth undeveloped.

The sentiment brings us to these pleasant days of 1913, when the Consul Plancus is personified among us by the sturdy figure of Mr. Massey, well versed in the best traditions of his forbears.

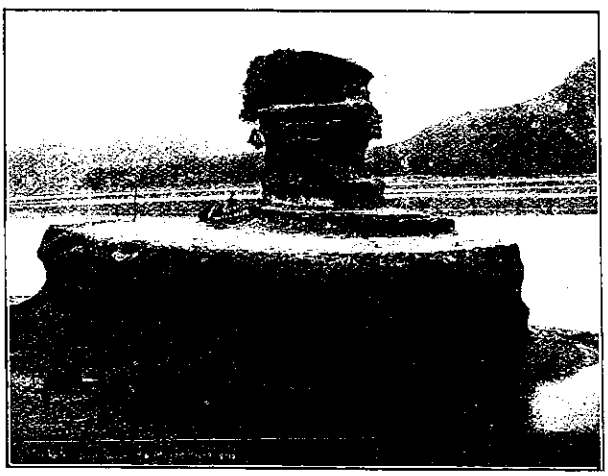


Bell's Falls, Mount Egmont

Photo. by Frank Messenger, N.P.

Taranaki Ironsand—Oil

The future is, it is hoped, big with the wealth of petroleum. The oil is flowing from wells bored well and truly, some capital has been invested, the attention of English capital has been arrested, and of the bonus offered by the State of £10,000 the Taranaki Petroleum Company have won and been paid £5000 for the winning of 500,000 gallons of oil. The other £5000 is to be won—£2500 on reaching an output of one million gallons and £2500 on the production of 500,000 gallons of refined oil refined in local plant.



The beautiful Mokau River showing rock at entrance

There is indication of oil in other parts of the Dominion—Dannevirke, Gisborne, Grey, and Southland. But nowhere has anything like the Taranaki result been as yet achieved.

The Maoris were familiar with the outcrop of the oil at Moturoa near the site of the breakwater.

S.S. Manakau steaming down Mokau River —*Collis, Photo.*

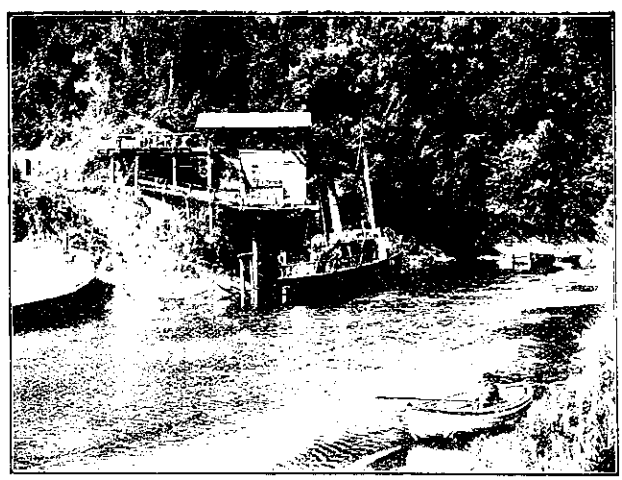
With their usual imaginative method they accounted for it quite satisfactorily. A great Atua had died suddenly by the sounding sea, and he had got himself underground, buried we presume, and was slowly undergoing decomposition. This belief, after lasting for ages, gave place to something more scientific and more satisfactory, as the above bonus proves to the reader of books, and the numerous derricks on the flat attest in another way—as also the vicissitudes and uncertainties of the share market of a bygone day.

English expert opinion, crystallised in reports and a most valuable book from the pen of Mr. Henry, the expert, is that the stores of oil are very large.

At present all the bores are flowing well, and gas veins have been struck and are being utilised. With regard to the refinery plant, it is announced that everything is in full swing, and good progress has been made with the work of erection. Heavy machinery comprising eight-ton boilers has been put in position. The wages earned during the period have reached for a fortnight the aggregate of £400. This plant is on the ground of the Taranaki Petroleum Company.

On the whole the prospects are decidedly good so far.

Various companies have been formed from time to time and have invariably got into difficulties for various reasons, but back of them all has been the want of knowledge. Indeed, the whole industry in



Landing Place at Upper Mines, Mokau River — *Tourist Dept., Photo.*

Taranaki has suffered in this respect from all time.

It may safely be said that a new era in the oil development of Taranaki has started with the arrival of Engineer Ritter von Fedorowicz, who arrived in New Zealand on the 1st of January this year.

Engineer Fedorowicz is an Austrian by birth. He was educated at the Vienna University, where he obtained his degree of "Engineer." After leaving his University, he spent a considerable time in the large engineering workshops, and later went through a practical course of drilling for petroleum. The marked ability which he displayed was soon noticed by the prominent oil men of Galicia, and consequently he was very early engaged in very important oil-producing works.

Engineer Fedorowicz has worked under Professor Zubert, who is generally considered to be the greatest authority on oil in the world. He has been

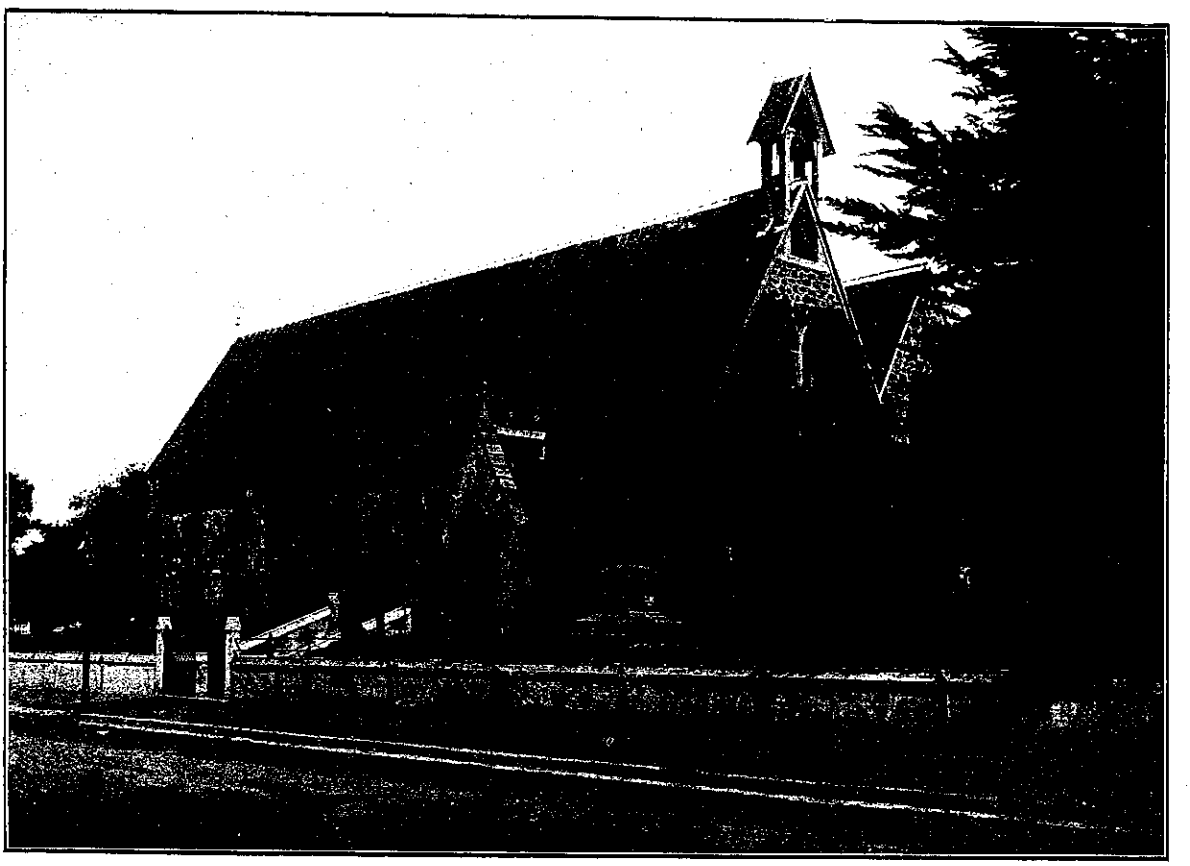
particularly successful in the opening up of the various oil fields which have been entrusted to his care. He has been engaged to supervise and generally manage several new oil companies whose interests lie chiefly in Taranaki and Weber. The directors of these companies are men of considerable business attainment, and it is only natural that when men of this nature become interested in a matter like oil, their first move is to secure the highest advice that is procurable, and it would appear from all accounts from Home that these men have been exceedingly successful, and indeed are to be congratulated on securing the services of this clever engineer.

Many men are able to put down holes into Mother Earth, but that is merely the "A.B.C." of oil boring. It required science and skill and great practical knowledge to handle the oil and make wells produce to their fullest capacity after the oil has been struck, and it is in this particular that we look for great results from the work which will come under his supervision.

The first well which he will supervise is on the property belonging to the Taranaki Oil Lands Acquisition and Development Company, Ltd., situated close to the present flowing wells of the Taranaki Oil Wells, Ltd. The erection of the derrick is in progress, and drilling will start early in March.

Ironsand

There is a wealth of ironsand along the coast for miles, and many attempts have been made to utilise the same. So well have the more recent ones succeeded that enterprise is organising. When mixed with clay and moulded in the form of brick the ore has been readily smelted in the blast furnace, and the iron produced has proved to be of the best quality suitable for steel-making purposes. Capital is required, and there are at present some indications that it will be found in the quantities required. The cheap coal readily obtainable at the Mokau workings must be a factor in the future production. Many articles have been manufactured from this iron obtained from the sand and pronounced by experts to be of very fine quality. The late Mr. E. M. Smith, for many years Member for New Plymouth in the General Assembly, was for a long time the foremost exploiter and most enthusiastic and capable supporter of this industry. In the course of his work he became an expert metallurgist, and did some excellent service as the pioneer—an honour his memory will ever retain in a grateful district which admired his ability and perseverance, and hopes one day to derive much benefit in the establishment of one of the largest industries of the Dominion.



St. Mary's Church, New Plymouth, showing Memorial to Taranaki Troopers who fell in the South African War

Taranaki—Rural

Cook's description we have already alluded to, how, looking from the sea upon the land he spoke of the pleasant country lying at the foot of the mountain. The mountain, to come to the geological facts, "is the centre of distribution," to use the words of one of the official surveyors—some of the best in the world by the way—"for a radius of twenty miles of the volcanic formation known as the 'drift,' which covers the volcanic rocks below an altitude of 3000 feet. Hummocks composed of trachyte boulders and cement crop up here and there and make excellent metal quarries." In other words, the western portion of this district is eminently adapted for cultivation.

The surveyor's report continues: "Beyond the volcanic formation—that is, from Urenui on the north and Hawera on the south—the country is generally broken, and the formation is known as 'papa,' a calcereous blue clay, capped in many places by shelly limestone."

This is the formation also of the eastern portion of the district. In the same there are no mountains worthy of the name. But there is much hill country, long low ranges forest covered, extending towards the mountain system of the centre of the island, with fertile valleys, narrow and steep-sided. The altitude of these stands for the most part between 1000 and 1500 feet, and there are a few instances of 2,500, such as the Waiarea and Matenateonga ranges. In this region grass takes the place of the fallen timber with great readiness, so much so that the settler can have his stock depasturing on grass within twelve months of his final burn. Sheep do well, and dairying is carried on with much profit. But the want of this part of the district is of the material for roads. Experiments have been tried extensively with burnt "papa," which being laid down after roasting gives a sort of brick-like pavement, but the lasting power did not come up to expectations.

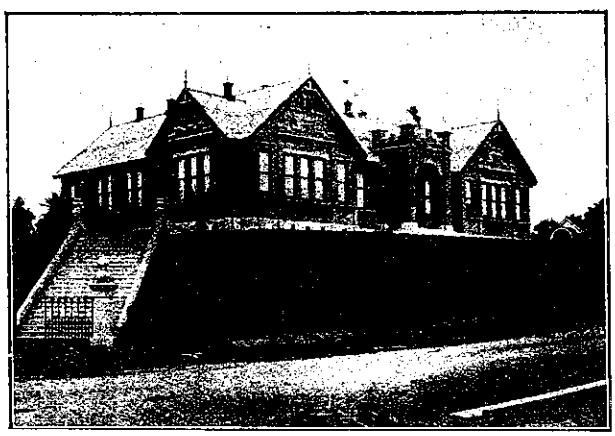
Between the Mokau and the Patea, the northern and southern boundaries of the district, there are eighty-five named rivers. These cross the district at all angles on their way to the sea. Sixty of them have their sources in Mount Egmont. Thus with the volcanic soil of the east, and the papa of the west, the abundance of water everywhere—perennial water be it remembered—and the shelter of the hilly country and the forests—what remains of them—it is an ideal country for the pastoralist. The western portion is the finest dairying ground in the world.

But though it is the fashion to regard the land as pastoral, and though there is a prejudice against the growing of grain, it is recorded by the early settlers that they grew very fine crops of wheat and other grain, the wheat yielding in many instances up to sixty and seventy bushels to the acre. There was rust as one might expect in a climate of the Taranaki rainfall. But the settlers using sulphate of copper for steeping the seed before planting secured immunity from the much-dreaded evil. It is worth knowing. Be that as it may, the fact for present consideration is that the dairy industry and the raising of sheep for the London market and lambs—especially lambs— are the profitable industries. What has been said about the growing of wheat, and we may add that lucerne and maize are well-known crops in the district (the western portion) shows that the land is admirably adapted to the growing of all the food requirements of a dairying industry and of fattening farms.

The Future

There is much timber still, though not to be compared to the prolific forest wealth of other days.

From the foregoing it will be evident that Taranaki is destined to be one of the foremost tourist resorts of the Dominion—one rather for the people of the middle district than for strangers to our shores. There is so much to see and so many picturesque excursions to be taken, such an interesting chief town and such a pleasant climate. The district is well supplied with the means of locomotion, and will be better supplied as time goes on. It is noteworthy even now that the accommodation in connection with the mountain tour is inadequate, and we must remember that the tourist traffic is increasing by leaps and bounds, as is natural for so



Technical School, New Plymouth

easy and pleasant a tour in the midst of such fine scenery. Beds are booked far in advance now. The remedy, if the attraction is not to be choked, is to largely increase the accommodation. Add house on house, and they will always be full.

It is already a great dairy country. The test of the herds properly and systematically conducted will double the output without increasing the number of head. Later the development will be almost incalculable. The western country also has a tremendous future. It will not be long before the railway is through to Ongaruhe, and then the shedding of the traffic both ways, Auckland-wards and to New Plymouth, will be of phenomenal effect. The mineral future is assured so far as oil is concerned. In this matter we shall hear of rivalry to the great American Trust and a refuge against it. There will surely be a 50 per cent. drop in the price of petrol in this connection. That means a vast revenue to the Taranaki wells. Lastly there is the coal of Mokau, which will make fortunes for lucky owners of stock in the "sweet by-and-bye." On the whole the "Garden of New Zealand" is destined to justify a great part of what we may call the well-founded prophetic welfare of the Britain of the South.

The Motoring World

The Prospects of Aviation

About six years ago Santos Dumont flew in an aeroplane 300 yards in very uncertain fashion at Paris, and to-day there are in various parts of the world 2500 aeroplanes, with a limit of 360 miles, 70 miles an hour, and 16,000 feet of altitude. A few years sooner Zeppelin improved the dirigible in a notable way, and after many failures the dirigible is recognised a fairly good craft of the air. She is carrying passengers, and is attached to navies in squadrons. Both types have been used in war, and the great question of the day is of the superiority of type. Each has its good points and each its bad ones. But all are agreed that both are capable of very much improvement. In fact, so great is the room in both for improvement that the science of aeronautics, astonishing as the improvements are of the last few years, is still to be regarded as in its infancy. Much is said about the accidents, but it seems to be established that the death roll is far less than that of the railway train, the steamer, or the automobile. One Titanic drowns 1700 people, but all the aeroplane fatal accidents have failed to reach fifty: since the year 1908 the deaths were 32 out of 250 accidents, while the railways of the United States in the year 1910 killed and injured some 88,000 persons.

One very important discovery was made during the later years of the last century. It is the discovery that has made flying possible really. Whereas in the beginning the idea was that the heavier the flying body the broader the stretch of wing would be required. Science talked of a flier requiring miles of width of wing. This would have been prohibitive of course. But careful observation, supplemented by minute measurements of birds and insects, proved the very reverse to be the case. It is now established that the sustaining power of a flying body increases as the cube of the dimensions, whereas the propelling power required to keep pace is but according to the square. Thus if you double the length and the breadth of your flying body—airship—you will get eight times the sustaining power, whereas you will require only four times the propelling power. This is something like the proportion in great steamships, and explains the advantage of the mammoth liner and its great speed. Under the circumstances, who shall set limits to the advancement of aviation? As a matter of fact, the late Professor Newcomb has demonstrated mathematically that the building of a dirigible half a mile long and 600 yards broad, driven at the rate of 100 miles an hour, is within the compass of engineering power. At present one can only wonder and wait without too much scepticism.

At this point it is well to introduce a new claimant to the favour of the world. An engineer of California, Mr. C. Birch, has, by going back to first principles, invented a dirigible which he claims will set the fashion and be the mould of carrying and flying form. The first principle of flight in the air was the lifting and rising power of heated air. This was the secret of the original Montgolfier balloon, which so astonished our ancestors 120 years ago or so. The difficulties of heated air, however, early caused the substitution of gas and hydrogen, and the latter is the more constant medium. Its difficulties are too well known to detail.

The engineer in question determined to return to the use of heated air, believing rightly that in the present conditions of heating apparatus there would be no difficulty. He has therefore designed a dirigible 289 feet long, carrying only air, weighing 6500 lbs., capable of carrying 65 passengers, of being driven 45 miles an hour, of being lighted by electricity, free from danger of fire, and of lifting enough gasoline fuel to take it to any part of the globe. Steel is used in the construction instead of the aluminium of the Zeppelins. Advantage has been taken of the fact—utilised in the great Brooklyn Bridge—that the tensile strength of steel is far greater than the compression strength. Thus though steel is three times the weight of aluminium, a dirigible built after this fashion is a third the weight size for size of the metal employed of the Zeppelin type. It is moreover 90 per cent. cheaper.

The new type is divided into six compartments like the other dirigibles, with this difference that whereas they are filled with hydrogen gas these are filled with pure air. The heating is in two ways: (1) each compartment has a gasoline burner; (2) the waste of the propelling engines—86 per cent. of a loss—is utilised to heat the compartments by being passed through a chimney of canvas so that there is no deposit, and the air remains clean during the process of heating, and at the same time there is no addition to the general weight. Descent is secured by a controlled admission of cold air.

It is claimed that the cost of the new type is only 6 per cent. of the cost of the Zeppelin, and that the cost of inflation is only one per cent.

A hopeful feature is the use of auxiliary reefable planes, combining the advantages to some extent of the aeroplane type, and greatly assisting steering and elevation.

Should all these claims turn out correct, then the problem of flight will be solved for both pleasure and commerce. And the time for the solution is getting near—in fact, the question is pressing. The desperate efforts of great cities to cope with the requirements of locomotion and the immense strides fruitlessly made in the American railway system to handle the vastly increasing traffic have driven it into the minds of men that the advantages of the airway with its vast spaces and many tiers of travel must be utilised.

A claim is made that the cheap freighter of the air will be of this type presently, and run without propellers, relying only on her heaters. In this way, the lifting by the burners and auxiliary planes will be so managed that the ship rises at an angle bow higher than stern. Of this the consequence is forward motion through the friction of the air. When she has travelled a certain distance moving upward the angle is reversed, and the ship descends bow first again, moving forward this time downwards. Thus she advances, tacking as the albatross is often in the habit of doing, vertically instead of horizontally, as ships do. On the whole it is probable that we may hear of some most interesting developments presently.

Paris Motor Show

From our English Correspondent

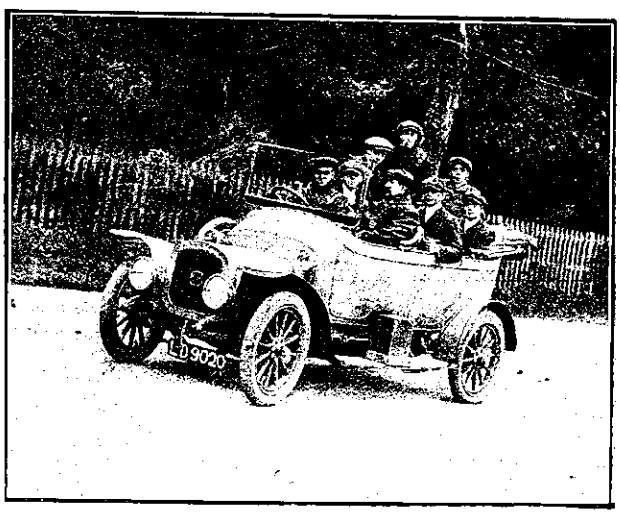
PARIS, December 10th, 1912.

The international display of motor-carriages in the Grand Palais, Paris, France, differs in many respects from the recent show at Olympia, London. Though the building is full of cars and accessories to the remotest corners of the many galleries, yet chassis and private motor vehicles do not compose the entire display. True, pedal and motor cycles are no longer introduced to the main avenues to mar the effect as a whole. On the other hand, about twenty per cent. of the exhibits there consists of industrial motor vehicles of various sorts, ranging from motor omnibuses to automobile ambulances.

Some of the best-known American cars occupy the most prominent places. Indeed, the American industry has never before been so well represented at a European automobile show, quite a dozen different trans-Atlantic types being staged. Among them, however, is to be found only one thing fresh to the European motor student. This is the miniature Cadillac two-seater exactly to two-fifths scale, and having under the bonnet one of the electrical self-starting dynamos that serves to send the machine along at eighteen miles an hour. This, of course, provides a feature that appeals directly to the Gallic temperament, and numbers of inquiries have been made whether it would not be possible to be supplied with similar miniature cars for New Year's gifts to children, price being seemingly no object.

For the rest, one's first impression is that the French are behind in electric lighting; but fully abreast in devices for absorbing vibration. The slipper type bonnet and the dashboard cooler would appear to be on the increase; also the overhead worm drive is beginning to be exploited by not a few makers. British cars, including notably Sunbeam, Austin, Humber, Daimlers, and Argylls, are prominently staged, and Mors shows a double-sleeve valve Knight type of engine. Although the French coachbuilders were not very complimentary in their remarks at Olympia, the fact revealed at the Grand Palais is that there is really no originality in the body-building here, either.

Quite one of the most important collections of car novelties in the Salon is introduced on the new 30 h.p. Austin machine. It is several seasons since Herbert Austin introduced any fresh constructional features into his always original vehicles. All the old distinctive points are retained in this newer model, and in addition there are introduced fresh features, each of which has been dictated by sound sense, born of practical experience. The company has always used the sub-frame for carrying the engine, flywheel and gear-box, the three-point suspension having been on the principle of having the apex of the triangle at the forward end of the car, whereas in this new model the sub-frame is rigidly connected to the main one on the foremost cross-member of the vehicle, the rear support being provided by the middle cross-member of the car frame, which is flanged inwards at its centre. Between the flanges formed on the outside of the torque ball casing there is a thick circular rubber pad supported externally on the flange of the cross member of the frame. Therefore the whole of the power unit from motor to spherical torque ball is borne at two points, on the front cross-member to the car frame and on one point by a rubber cushion held between that middle cross-member of the frame which corresponds with the rearward extremity of the engine and gearbox carriage, so that the driving mechanism becomes a self-contained unit, in addition to which the torque is transmitted direct from the back axle to the front cross-member of the frame, no thrust whatever being taken by any portion of the car mechanism behind that point, because the back full elliptical springs of Austin cars have always been shackled at either end. This idea of providing a rubber pad for carrying the rear half of the power transmission plant has two important gains—firstly, the isolation of the rest of the car from vibration, and, secondly, the prevention of the frame of the car serving to amplify gearbox noises. The engine, moreover, is for Austin practice relatively a long-stroke one, a bore measurement of 4¾ inches being provided in conjunction with piston travel of 6 inches, while the new crank-case is designed to provide a water channel in the angle formed above the camshaft bearings.



A 12-16 Delahaye Car fitted with Thomas Transmission climbing hill 1 in 16 with full load

Each cylinder casting has a waterway down between the wall and the plate behind the valve tap-

pet. The lower water lead from the pump to the four cylinders is concealed in the crank case and behind the valve tappets, to the gain of accessibility to the valves, the stems and springs of which are each covered by a separate aluminium plate, kept in place by a spring tongue. The clutch is of the multiple disc sort, while the four-speed gearbox has the lay-shaft fully immersed in oil below the primary one, the gate for controlling the mechanism being mounted on a trunk attached to the gearbox, and therefore quite independent of the frame of the car, while the steering has been designed so that the joint could not separate in the case of such an out of the ordinary occurrence as the breaking of a steering pin. This is possible, because a strong collar is formed on a rod behind the closed jaw on the steering arm, while the companion collar is fixed at the end of the rod, so that if a pin gave way the driver would only feel that the joint had gone very slack, and would therefore have ample warning to investigate the matter. Moreover, the emergency foot brake is not in the conventional position at the rear of the gearbox, but at the forward end of the torque tube through which the propeller shaft passes, the brake drum itself being attached to the front end of that shaft just behind the forward universal joint, so that none of the effort of checking the progress of the car is passed through the front universal joint or taken on the gearbox or frame of the vehicle. The reaction is transmitted entirely to the back axle through the trunnion joint between the axle and torque tube. This rear portion of the power transmission mechanism has been designed on the principle of allowing the back axle to swing laterally, and of taking the torque through a tube, which, however, is not in this case concentric with the propeller shaft, but is made separate from the back axle and jointed to the forward extension of the differential gear cover by two vertically set trunnion joints. The back end of the torque tube is spherical and borne on a ball-shaped housing in the forward extension of the differential cover, the tube itself serving also to shield the rear universal joint of the propeller shaft.

Seven British firms show motor-carriages—namely, Argylls, Austin, Daimler, Humber, Rolls-Royce, Sunbeam, and Wolseley—while such concerns as Arrol-Johnston are reported to be preparing to display vehicles in the supplementary show that will be opened in an adjacent building in a week's time. The following American cars are staged:—Bedford (assembled in England with bodies made there), Buick, Cadillac, E.M.F., Flanders, Ford, Hupmobile, Overland, R.C.H., Reo, and Studebaker, so that, while the British industry has never been so widely represented, nevertheless that of the United States, formerly scarcely known in Paris, is also especially represented; nor must it be forgotten that there are more British cars here than Italian, German, Austrian, or Belgian; hence the French have begun to talk for the first time of the American invasion, concerning which the United States folk, however, are none too confident, for their representatives tell me that the French tariff wall, on a scale according to the weight of the car, makes the proposition very much more difficult of solution than what they deem the invitingly easy conditions that obtain in Free Trade Britain. The United States cars have shown signs of having attracted widespread patronage.

In regard to new style internal combustion engines, quite one of the most interesting hails from Orleans, where the 10 h.p. four-cylinder Delaugere-Clayette pleasure car of 85 millimetres bore measurement by 120 millimetres piston travel is built. In this the valves take the form of ports or slits disposed on opposite sides of each cylinder. Instead of having a complete sliding sleeve, however, the cylinder is bored in a manner that is not a true round, because on either side, corresponding with each port, there is introduced between the cylinder wall and the piston a piece of metal set vertically, of crescent section, and given an up-and-down motion by means of cams, so that the ports are by turns covered and closed in the ordinary sleeve-valve engine way. This car is also equipped with an ingenious variant of the sun and planet gear. On the other hand, the 14 h.p. four-cylinder Theo-sleeve valve motor has no sleeve interposed between the piston and the cylinder wall, but consists of a single short sleeve set above the top of the piston, and having a maximum travel reaching merely to that part of the piston. As inlet and exhaust valves are superposed, the one slit or port in the vertically rising and falling sleeve serves to uncover each in turn. The C.I.D. is another car with a single short sleeve-valve engine. Apart from staging the four-cylinder 50 h.p. rotary engine, Itala Ava valve chassis, there is shown on the same stand a 40 h.p. Itala poppet valve engine chassis, with variable stroke motor. There is also the four-cylinder Buchet valveless type, which, however, is not a novelty to Paris.

The Martini exhibits include a motor sleigh that presents the appearance of an ordinary four-seated touring car, with four metal runners in place of wheels. It is propelled by the motor turning two sausage-shaped metal cylinders that lie on the ground lengthwise in relation to the car, and each of which is equipped on the outside with a metal worm like the thread of a screw, so that the vehicle is really worm driven along the ground. The Grand Prix Sunbeam and Peugeot cars, as well as the monster Lorraine-Deitrich, with which Heuvrey lately attained unprecedented speeds at Brooklands, are shown in all their war paint, for there is here no rule, such as obtains in London, to prohibit speed machines figuring in private motor-carriage shows. Among the larger machines one observes the Italian built six-cylinder Aquila car, with overhead valves, ball-bearing crankshaft, and the extraordinary long stroke measurement of 180 millimetres, in relation to a cylinder bore of only 80 millimetres, a combination of dimensions which Hispano-Suiza has essayed in connection with a type of four-cylinder motor. The last-named car is shown equipped with a self-starting device worked by compressed air by means of a pump in the gearbox. The Clement Bayard has also an air-cylinder self-starter together with such features as slipper shaped bonnet and dashboard cooler, while the back springs are unusual, in that they are of the full elliptical type, but the upper member is much shorter than the lower one, which is carried below the back axle in accordance with the growing practice, to which Charron is also a

recruit. The rear suspension of the four-cylinder Alda car, with dashboard cooler, is out of the ordinary, putting one in mind of an ingeniously elaborated Ford device, in that the main and lower of the two transverse springs that carry the back of the car is almost identical in shape, but is surmounted by a semi-elliptical spring of shorter length, the details that link these springs respectively to axle and to car frame being well worked out. An old friend of the student of uncommon constructional practices, the Stabilia, the original of all the cars with the pressed steel, channel section frame carried below the axles, is staged in further advanced form with three-quarter elliptical rear springs, wherein the quarter spring is the member that passes below the back axle, over which is set the half-elliptical one, an absolute reversal of general practice. No fewer than three distinct models of the Edison electric cars are staged in one of the galleries.

Motor Notes

PLENTY OF POWER

Mr. F. W. Jane, the naval critic from Portsmouth, recently recorded that he has been using a one-time Grand Prix racer fitted with a two-seated body as a voiturette or runabout, and although not desiring to utilise the possible speed of the car, has found its great power wonderfully attractive, and, at the moderate speeds at which he has travelled, not unduly expensive. "Whilst not advocating the use of 120 h.p. cars for runabouts, or for any other purpose except racing, I do contend that true economy is more certainly to be found in the possession of a superabundance of power than by the employment of an under-powered vehicle with many gear changes to make up for the deficiency. I contend that it is truer economy, as well as very much more pleasant driving, to have high enough power in

your car to enable you to drive throughout the day practically without changing gear, and to work the engine below, rather than above, its normal output. The opposite course is to employ an under-powered car with four gear changes and the engine working its heart out all the while. You cannot have everything always, and, whilst considered only from certain individual points of view, either method may be contended to have its advantages, I contend that the balance of advantages over disadvantages distinctly rests with the principle of ample power, moderate gearing, few gear changes, and moderate speed."

AMERICA MOTOR MAD

Such is the title of an article by Mr. Charles Y. Knight, inventor of the "Silent Knight" engine, in a contemporary. Mr. Knight states that at the intersection of two boulevards in Chicago more than 10,000 cars pass daily, 99 per cent. of them being privately owned. There are firms in the States that have turned out as many as 275 finished cars in a day. He has heard estimates for the current year of a production of 250,000 cars, but in his opinion the output will not exceed 150,000, which is, however, a prodigious figure. He warns the English trade that should a financial panic visit America, such as occurred in 1907, there would be a wholesale dumping of American cars on the British market. The Ford Company alone, he states, will probably turn out more cars in 1913 than all the motor plants in England combined. He does not think, however, that America will ever be able to maintain a steady market in England or Europe. When dumping becomes necessary, the cars are, as a rule, hastily thrown together, and are calculated to give the American article a bad name, as has occurred already in connection with cycles.

MOTOR CARS FOR MILITARY PURPOSES IN RUSSIA

It is announced that the Russian Ministry of War is considering a scheme, the effect of which will be to oblige every motor-car owner in the Empire to register his car at the nearest military district, and the moment war is declared to deliver the vehicle to the war authorities for the use of special military motor brigades.

COUPLING UP PIPING

To properly couple piping, the pipes should be of the right length and shape so that the coupling seats easily before the nuts are tightened. The pipes should not be under a strain when they are pulled to a seat in the coupling with the tightening of the nut, as the soldered joints will soon give way under it.

PIPING AND OIL TUBES

Should be held firm so that they cannot rub against each other. When tubing is allowed to vibrate it soon breaks from crystallization. If piping rubs against anything a hole is soon worn through it.

EXTRA WIRING

When wiring a car for electric lights where the current of the storage battery is to be used, great care should be taken. The wires should be well insulated and all "joints" must be well wrapped with friction tape. These wires should not lay against the gasoline tank or the gasoline pipes. Conceal all wiring if possible, so that the "job" will look more "workmanlike."

OVER THE IRISH SEA—SUCCESSFUL BALOON TRIP

For some little time past Mr. John Dunville, of the well-known North of Ireland firm of distillers, was anxious to undertake a journey by balloon over the Irish Sea, but from various causes was prevented from doing so until a short time back, when the weather conditions being favourable, orders were given for the inflation of the balloon. By 10 a.m. Mr. Dunville, accompanied by Mr. C. W. Pollock, of the Aero Club, were ready for the start. Mrs. Dunville had arranged to accompany her husband, but almost at the last moment it was found that the carrying capacity of the balloon was limited to two passengers and the various impedimenta necessary for the voyage. A stiff westerly wind was blowing when the balloon ascended from the gas works at Ringsend in the presence of a large number of spectators. At a height of 600 feet the desired current of air was reached, and the balloon rapidly proceeded in the direction of Howth, and finally disappeared from view, pursuing a course towards Holyhead.

In the evening the following telegram was received in Dublin from Mr. Dunville:—

"Ascended from Dublin in balloon St. Louis, accompanied by Mr. C. W. Pollock, 10 o'clock this morning; reached west coast south of Holyhead, passed over Conway Bay and Chester, descended near Macclesfield three o'clock. Maximum altitude 10,000 feet, where the thermometer registered 27 degrees of frost. Average speed 34 miles an hour."

THE PETROL TANK.

Nothing is too small or unimportant to be considered in the running of a motor-car. For instance, the petrol tank, though it is simply a metal receptacle, quite frequently does its share towards making trouble, especially the tank with the gravity style of feed. On more than one occasion a weak engine has been made strong by simply opening up the vent hole in the tank-filling plug or drilling one where none was provided, as with no vent the petrol level is held up by the formation of a partial vacuum above it, and will not flow to the carburettor freely enough to make the requisite amount of mixture. Another point in the gravity system is the liability to an interruption in the flow on a steep hill when the petrol becomes low in the tank, on account of the lack of fall from the tank to the carburettor. This can be got over by arranging a small supplementary reservoir under the bonnet near the carburettor.

THE WIND SHIELD.

An American motorist writes:—"In my estimation, the best way to keep the wind shield from clouding in damp or wet weather is to coat the glass with a thin film of glycerine. Merely carry a piece of cloth soaked with glycerine in a closed tin can or some receptacle. To apply, first wipe off the moisture and then give the glass a thin, even coating. The glass will appear rather dull at first, but not necessarily opaque. As soon as it has been rained upon it will become clear again. As to cold weather, it need only be pointed out that, since glycerine freezes at a very low temperature, a thin coating of it will serve to keep frost off the glass. This will not need to be renewed often, and a little can be made to go a long way."

Engineering

Water Raising by Compressed Air

By Chenery Suggate, M.I.C.E.

About the year 1846, one Crockford is credited with making experiments in lifting water by means of air; later, he employed the method, with more or less success, in lifting petroleum from American oil-wells. Since that time this great discovery has been little used, although several large installations on this system are working well in America.

The plant consists of: (1) a bore pipe, of required size, driven down to the underground water supply; (2) any means of power to actuate a compressor which shall lift the water into a surface tank; and (3) any approved pump to force the water to the required tank or reservoir. With this simple arrangement, water can be raised from any required depth of underground water supply, and where circumstances admit, the force-pump may be dispensed with, and a second air-lift substituted.

Some time ago, the writer studied the question minutely, and conducted a number of experiments, proving (1) that the depth of air-pipe, size of bore, and pressure of air must be in a certain ratio to the depth of the water below ground surface, the height to which it has to be forced, and the quantity to be delivered; (2) that, when these are in the correct proportion, the only limit to the quantity of water raised is the capacity of the supply underground; and (3) that the water can be delivered at an infinitesimally small cost—a mere fraction of the cost of any other known method of raising water. Very much less power is needed to compress air to the required amount than would be necessary for lifting the same quantity of water to a corresponding height in any other way. This is proved on a large scale by two town installations just completed by the writer. One, at Pukekohe, has been working in a very satisfactory manner for some months past, throwing 9,000 to 10,000 gallons per hour. In the other case, at Frankton Junction, although the ultimate plant is not quite finished, the tests made with a temporary plant gave 9,000 to 10,000 gallons per hour for many days' continuous running, a supply sufficient for a town of 4,000 to 5,000 inhabitants, and at a minimum cost per 1,000 gallons.

The theory of the system is this: when, under certain conditions, air is forced into a bore pipe of water, alternate layers of air and water are formed; the air layer acts as a piston, forcing up the layer of water above it; as the air piston ascends, the water above it finds egress at the prepared outlet, the pressure continually decreases, and the air piston expands; this expansion of volume increases the speed of the column of water above, until air and water together escape at the outlet with considerable force. Each piston of air acts, of course, in a similar way, and thus a continuous flow of water is secured. For convenience in re-handling it is advisable to allow the rising water to flow into a surface tank, of say one hour's pumping capacity, from which the water will be taken in the usual way, by a force pump of suitable size and form, or by a second air-lift arrangement.

In pumping water from great depths in the ordinary way, all engineers realise the great cost of excavation and the uncertainty in action, especially where the water fluctuates in depth; in some cases the writer has known the water-level to rise 30 to 40 feet within a short time of the stopping of the pump. This necessitates continuous pumping, or else heavy expense in other ways—for such a variation would ruin any pumping plant. But with the air system just described, a variation of water-level makes no difference; the submerged parts are not subjected to any friction, and are not affected by any fatty water, which is so fatal to ordinary pumps.

The heavy expense and uncertainty involved in the sinking of large and deep wells, and the erection of costly machinery, are now obviated; one or more bore pipes take the place of the large well, at a mere fraction of its cost. The water is handled on the surface of the ground under the most favourable hygienic conditions; the water raised by the air-lift is well aerated, and so more palatable and healthy to drink. The system is very suitable for town and public supplies. One compressor can work any number of bores. Thus at Pukekohe, where one bore did not deliver sufficient water, a second was made some distance away, both being worked by the same compressor.

Views Nos. 1 to 4 are of Pukekohe Works.

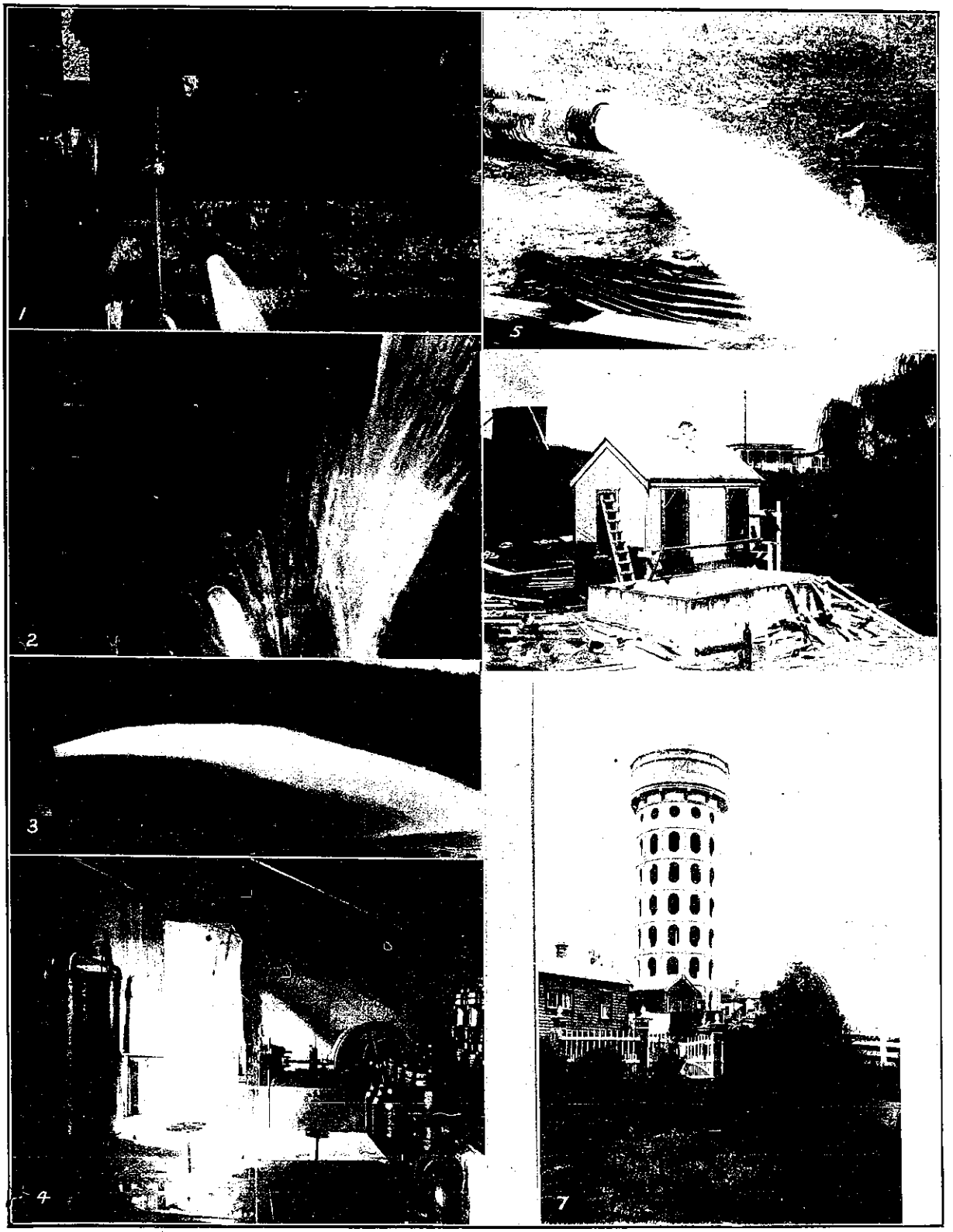
No. 1 shows the water from one bore rushing into the well, which acts as a surface tank; the second bore being in the centre of the well is not visible in the photograph.

No. 2. Fantastic effect of water striking opposite side of tank, and shows the force of water that can be secured by increasing the air pressure.

No. 3. Temporary display of 10,000 gallons being raised by air from 70 feet below surface of the ground.

No. 4. Air compressor and air vessel, pumps for forcing the water as raised to a reservoir some 350 feet higher up the hill is seen on right hand of photograph.

Views Nos. 5 to 7 are of Frankton Junction Works: No. 5 shows over 10,000 gallons of water per hour being lifted by air from about 75 feet below surface of ground. No. 6, surface tank in process of erection, showing bore pipe in ground in front and compressor room at back. No. 7, ferro-concrete tower, with storage tank on top, into which the water is pumped after being raised to the surface of the ground by air. Tower would not



1. Water from one bore rushing into water tank.
2. Shows how force of water can be secured by slightly increasing air pressure.
3. Temporary display of water lifted by air from 60ft. below surface of ground.
4. Air Compressor and air vessel.
5. 10,000 gallons of water per hour from about 75ft. below surface being lifted by air.
6. Re-inforced concrete surface Tank and Compression House, showing bore pipe in the foreground.
7. Ferro-concrete Tower with Storage Tank on top.

have been required had there been any hill sufficiently high upon which to build a reservoir.

The pressure of compressed air is much greater at the commencement of the lift, and gradually decreases to the normal after a few minutes.

The air-pipe can be placed either inside or outside the bore-pipe, the former being the better arrangement. If inside, the pipe should terminate at the bottom in a saucer-shaped hood, to give an upward turn to the air current; or the bottom end of the pipe may be plugged, and air-holes, equal in area to the sectional area of pipe, drilled in the side of the pipe, at an upward angle.

The air-lift system, having no valves or working parts to get out of order, is specially suitable for lifting liquid chemicals.

Now as to cost: In one case, where the power was available, the actual amount of the tender for the supply and installation of compressor, air-vessel, belting, outlet-head on bore-pipe, etc., was under £500 (raising 9,000 to 10,000 gallons per hour). In another case, where a surface tank, compressor, power-house, and pump lifting 10,000 gallons per hour to a height of about 180 feet, had to be provided, the cost was under £1200. In both these instances the water was lifted from about sixty to seventy feet below the surface. Had a well been constructed and the usual plant installed, the above costs would have been increased to three or four times as much. There is no limit to the amount of water that can be raised on this system, and the larger the installation, the greater will be the advantages over other systems.

Pipe diameters and approximate delivery in gallons.

TABLE A.

Diameter of pipes in inches. Size of bore.	Air pipe.			Approximate gals. of water delivered per minute.
$1\frac{1}{2}$	$\frac{3}{4}$	...	...	24
2	$\frac{3}{4}$	...	...	50
$2\frac{1}{2}$	$\frac{3}{4}$	...	...	70
3	1	...	...	90
$3\frac{1}{2}$	1	...	...	135
4	1	...	...	180
$4\frac{1}{2}$	1	...	...	250
5	$1\frac{1}{4}$	...	...	300

The following table shows the advantage of proper submergence: The submergence being shown as a per centage of the depth of air pipe below level of liquid in proportion to the depth of liquid below the outlet of delivery pipe:—

TABLE B.

Submergence per cent.			Efficiency per cent.
65	...	...	51
55	...	...	41
43	...	...	32
35	...	...	27
30	...	...	23

Electricity Direct from Colliery

Our readers will no doubt remember that only a very little while ago one of the leading English professors stated that the time would soon arrive when, instead of excavating the coal and transporting it to the generating station, the generating station would be at the coal mine. Whether the American engineers have acted upon this statement or have thought the question out themselves we cannot say, but it is nevertheless a significant fact that a large company has been formed for this purpose.

The plans of the Lehigh Navigation Electric Company, Philadelphia, Pa., include the erection of a generating station near the coal mines at Hauto, Pa., and embody one of the most important steps towards the economical use of coal without transportation, and the transmission of electrical energy on a large scale, so far undertaken in the United States. The site of the central generating station is about ten miles west of Mauch Chunk at the mouth of a railroad tunnel leading to the main body of anthracite coal owned by the Lehigh Coal and Navigation Company. From this point the energy for heat, light, and power will be distributed by high-voltage transmission lines extending throughout Eastern Pennsylvania and New Jersey, and covering a territory with a population of 2,500,000.

The company have a waste production of about 500,000 tons of coal a year consisting of coal dust and particles which will pass through 0.1in. mesh screens, but in the present scheme this refuse, which is not marketable, will be consumed under the company's boilers. The choice of Hauto as the site for the main generating plant was also influenced by the fact that an abundant water supply was available, as the plant to be employed ultimately will require about 300,000,000 gallons a day. To provide this amount the capacity of an existing reservoir is being increased by the construction of a higher dam to 1,000,000,000 gallons with an area of 400 acres.

The *maximum* output contemplated will be 100,000 k.w., and it is estimated that 1,000,000 tons of coal a year will be required, a quantity which would require 20,000 of the largest cars to transport to market. It is proposed to supply energy to the slate and cement industries in Lehigh and Northampton counties, all of which are in a territory from 20 to 40 miles distant from the Hauto plant, and probably substations will be established at once in the heart of these two districts to step down and distribute the energy to users. There are about 20 large cement mills within a radius of 75 miles from the main station. The transmission lines will be erected along the Lehigh Navigation Canal, and also on the right of way of the Lehigh and New England Railroad, which the company control, and in this way but little property will have to be acquired for the pole lines. With the assistance of these companies a complete census of the motors used in the industries has been taken, and it has been found that within the district which will be reached by the first section of the Hauto plant power to the extent of over 100,000 h.p. is being employed. The Lehigh Navigation Electric Company have prepared a schedule of rates running from eight mills up to 2½ cents per k.w.-hour, according to the amount of power contracted for and the steady rate of consumption, and at these prices the company will deliver energy materially under the cost at which the industries are able to produce steam power.

According to present plans the first installation at the Hauto plant will be in operation before the end of the year. The company have arranged for an initial expenditure of 3,000,000 dol., and an order has been placed for three 10,000-k.v.a., 11,000-volt, three phase, 25-cycle horizontal turbo-generating units, complete with 300-k.w. turbo-exciter sets and one 300-kw. motor-generator exciter set. The equipment of the plant will be increased gradually, the expectation being to supply energy to Allentown and Easton, Pa., to Trenton, N.J., and finally to Philadelphia, which is within 80 miles of the Hauto plant.

We think that in parallel with the utilization of our water power for the production of electricity our engineers should turn their attention to the development of electric energy direct from the coal mine.

There are two cases that at once suggest themselves, they are the Mokau and Waikato coal mines. In both instances there should be a big demand for current among the farmers, and the many towns scattered throughout these districts would be greatly benefited. We should like to see this question taken in hand at once, if only to prove that it would not be satisfactory.

Portland Cement Company

At a recent Directors' meeting of this Company, the Works Manager (Mr. W. J. Wilson) put in a report in which he stated that he was prepared to recommend a site for a wharf, which would give a minimum depth of 25ft. at low tide, thus enabling loading to be carried out at any time. He had also made a close inspection of the property with a view to the erection of a suitable site for the works and quarry, and was satisfied that an excellent site, adjacent to the wharf, could be obtained without difficulty. Other necessary work had been carried out by him with a view to an early start being made with the commencement of active operations regarding the installation of the necessary plant. The question of the early acquirement of plant and machinery of the latest and most suitable type was also discussed with Mr. Wilson. It was decided to provide a suitable guarantee in connection with the installation by the Whangarei Borough Council of electric power, to be generated from the Wairua Falls. A sub-committee, consisting of the Chairman (Mr. Reed), and Messrs. N. Wilson, S. J. Nathan, and G. Winstone, jun., was appointed to confer with the Works Manager, and arrange other matters requiring attention. The Company allotted another 12,000 shares, bringing the total contributing shares up to 80,000.

It is gratifying to the building trade to find that the prospect of getting so much of this useful building material is as good as it is reported to be.

Astronomy and Science

Astronomical Notes for March

By the Hon. Director, Wanganui Observatory

The Sun is in the constellation Aquarius till the 11th, when he enters Pisces. His southern declination, and greater elevation at noon, in our latitudes is now decreasing. He will cross the Equator at 4hrs. 48min. on the afternoon of the 21st, which is the autumnal equinox for this hemisphere. A few small sunspots have been observed during January, but so far there is little sign of awakening activity so far as this form of solar phenomena is concerned; nevertheless a good watch should be kept, as large spots may make their appearance at any time.

The Moon, in her monthly circuit of the heavens, comes into the vicinity of the planets and some of the brighter stars, and serves as a convenient pointer to them. She will be near Jupiter on the morning of the 3rd; Mars on the morning of the 5th; Mercury on the morning of the 10th; Venus on the morning of the 12th; and in the close vicinity of that planet on this and the preceding evening; Saturn on the 14th, the Moon being considerably to the north of the planet. She will be visible as a crescent in the western sky on the 11th in Aries, just entering that constellation, through which she will be passing on the 12th and 13th; through Taurus on the 14th and 15th, and nearest the groups of the Pleiades and Hyades on the 14th; Gemini on the 16th and 17th, and nearest Castor and Pollux on the latter date; Cancer on the 18th, and the early evening of the 19th, Leo on the latter date till the 21st, and nearest the bright star Regulus on the evening of the 20th; Virgo on the 22nd, 23rd, and 24th, and nearest Spica on the 24th, after which she rises late in the evening.

Eclipse.—There will be a total eclipse of the Moon on the night of the 22nd. The first contact with the shadow begins in New Zealand mean time 9hrs. 43min. Beginning of total phase, 10hrs. 41 min.; middle of eclipse 11hrs. 28min.; end of total phase, 15min. after midnight, shadow pass off 1hr. 13min. a.m.

Phases of the Moon in New Zealand (mean time):

New Moon	8 days	11 hrs.	52 min.	a.m.
First Quarter	16 days	8 hrs.	28 min.	a.m.
Full Moon	22 days	11 hrs.	26 min.	p.m.
Last Quarter	29 days	12 hrs.	28 min.	a.m.
Apogee	6 days	8 hrs.	6 min.	p.m.
Perigee	20 days	11 hrs.	6 min.	p.m.

Mercury is an evening star, during the greater part of the month, in Pisces. He is in his ascending node on the 2nd; in perihelion on the 7th; in conjunction with the Moon on the 10th; at greatest elongation (at greatest apparent distance from the Sun) on the 11th, towards the east; stationary amongst the stars on the 18th, and passes out of sight between the Sun and Earth on the 28th.

Venus is still a brilliant object in the western evening sky during the earlier portion of the evening. She is in perihelion on the evening of the 4th; in conjunction with the Moon on the morning of the 12th, and will be to west and east of the planet on the evenings of the 11th and 12th; she will be at greatest brilliancy on the 20th, and will be at greatest heliocentric latitude north on the 26th. As viewed in the telescope at this time, she has the appearance of the Moon a few days old, as seen with the naked eye.

Mars may be seen in the early morning sky drawing slowly away from the Sun. He will be in conjunction with the Moon on the morning of the 5th.

Jupiter is a morning star in Capricornus, drawing away from the Sun's place. He will be in lunar conjunction on the early morning of the 3rd, and again on the afternoon of the 30th.

Saturn is still an interesting object in our evening skies, being situated in Taurus, over the position of the Pleiades. He will be in lunar conjunction on the 14th, the Moon passing at a considerable distance to the north of below the planet.

Uranus is a morning star in Capricornus. He will be in lunar conjunction on the 4th, our satellite passing at a distance of 4.2deg. to the south.

Neptune is an evening star in Gemini, on the border of which he may be found in r.a. 7hrs. 40min. and dec. N. 20deg. 56mins. during the middle of the month.

The Constellations are placed in our evening skies during the middle of the month at about 8.30 p.m. as follows:—Gemini and the bright stars Castor and Pollux nearest the horizon and to the left of meridian, Cancer to the right. Leo is now well up in the north-east, as is Virgo over the eastern point, the long form of Hydra being over both, with the two small constellations Crater and Cornus. The ship Argo is passing the Zenith and the Cross, and Pointers are rising, well up, in the south-tast.

The Triangle, Peacock, Toncan, and Hydrus, with the clouds of Magellan, are in the southern sky, Phoenix going down in the south-west. Cetus has partly set in the west, and Eridanus and the brilliant Achernar reach over the whole western middle sky. Taurus lies over the north-western horizon with Orion above and the brilliant Sirius in Canis Major still higher. The Milky Way reaches from a point slightly north of Taurus, across the Zenith, past the Cross and the "Pointers," and runs out south of the stars in Lupus.

February 28th, 1913.

Building Notes

NEW PLYMOUTH.

Mr. F. MESSENGER, architect, reports that designs are now being prepared for six residences in New Plymouth, for which tenders will shortly be called.

The work mentioned in the previous number has now been completed.

Messrs. SANDERSON AND GRIFFITHS, architects, New Plymouth, report: The completion of a residence at "Dartmoor," six rooms in wood; the completion of a residence in Liardet Street, seven rooms in wood; contractor, Mr. W. A. Graham. Alterations to Imperial Hotel, for Andus Raynes, Esq.; contractor, Mr. Wm. Howson. In course of erection, additions (in reinforced concerte) to premises of Messrs. McLeod and Slade, printers; contractor, Wm. Howson; agricultural laboratory for the Board of Governors A.P. High School; contractors, Boon Bros. Renovation contract, at "Herald and Budget" premises; contractors, Bellringer Bros.

The buildings which will house the Deeds and Stamps Department, Registrar of Births and Department of Agriculture, is of old English style, constructed of brick-hollow walls on a concrete foundation; roof of Marseilles tiles; ceiling of Breeze concrete on expanded metal, that in the search room being supported by steel girders, weighing 3½ tons on 14in. iron-moulded columns; floors of concrete in rooms 1, 2, and 3, with tiled hall; other floors of wood; skirtings and cornices of plaster; well ventilated with Boyles' vents; windows protected with Brady's patent shutters; strong-room door by Mann, Dunedin; height from floor to ceiling 13ft. 6in. Contract price, £3500. Contractors, R. Coleman and Sons. Overseer, Mr. A. Davis, Public Works Department.

In course of construction a bungalow containing 6 rooms, price £700; also a villa of 8 rooms; price £800. Contractor, Mr. J. Buckman.

The Baptist Tabernacle is being built in reinforced concrete, 60ft. x. 36ft. The porch is approached by ten steps, and supported on four columns, classical in treatment. A vestibule and cloak room are arranged in entrance. A vestry and provision for extension. A schoolroom is under the church, well lighted by windows. Ventilation will tend to comfort, from scheme of arrangement. Wunderlich rough-cast sheeting are employed over porch, etc. Poilite roof. The cost of the building is £1500. Contractors, Coleman and Son. The seating capacity is 250 persons, the contract for which has not yet been let.

DAVID HUTTON, architect, New Plymouth, has nearly completed a two-story residence for M. D. Hutchens, Esq., containing 9 rooms, including breakfast room, dining room, drawing room, and kitchen opening out of vestibule hall, inglenook, and well fire-grates provided in all rooms with fireplaces.

An English cottage of seven rooms at Stratford, for F. J. Morgan, Esq., consisting of living room, study, and drawing room; panelling in principal rooms, and stained glass by Smith and Smith, Wellington. Arrangements for heating, lighting, and cooking by electricity.

STRATFORD.

JOHN D. HEALY, architect, Stratford, has in course of construction an isolation block for the Stratford Hospital; roof, Marseilles tiles; contract, £1500. J. W. Boon, contractor. Two-story residence in New Plymouth, in ferro-concrete, veneer and wood internal treatment; Poilite roof. Twelve rooms, £4040; Boon Bros., New Plymouth. Residence Miranda Street, 7 rooms, Poilite tiles; £1000; Mr. N. J. King, contractor. Residence in Inlet Street, £600; J. W. Boon, contractor. Residence at Midhurst; £650; J. W. Boon, contractor. Additions in Fenton Street; £632; N. J. King, contractor. N.Z. Loan and Mercantile additions; £580; J. Martin, contractor.

INGLEWOOD.

Messrs. PERCIVAL AND MESSENGER, architects, have in hand a dwelling for Mr. J. Conaglen. Contractors, Coleman and Son, New Plymouth. Cost £1200. The same firm have in hand the Town Hall for Inglewood Borough Council, tenders for which were called for up to the 19th inst. The main hall is to seat 400, and the gallery 100. The walls and ceiling of the hall, also proscenium, are pan-

elled with Wunderlich steel sheeting. Three cheese factories have recently been completed by this firm, and numerous other works.

WANGANUI.

Tenders will shortly be called for the new R.C. Presbytetry (illustrated on page 291 of this issue), which is to consist of 17 rooms, in two stories. Mr. J. S. Swan, of Wellington, is the architect.

WAITARA.

In course of construction:—A building 90ft. x. 60ft., to be used as works and storeroom for the Cement Pipe Co., Ltd., Masterton. The building will be lighted by toplights. Contractor, Mr. T. C. Wilson.

ELTHAM.

FRANK A. MOORE, builder, reports having built nine cream factories and one large cheese-curing building during the past year. This builder built the works at Kaupokonai, the largest cheese factory in New Zealand, and for his work employs Wilson's Portland cement.

WELLINGTON.

In our January issue we inadvertently stated that the repairs to the Hotel Cecil, and that several plans had been prepared for buildings by Messrs. Penty and Lawrence. This work should have been credited to Mr. J. Bennie, and not to Messrs. Penty and Lawrence.

Personal

Mr. Stuart Seddon, who left Messrs. T. Turnbull and Sons, F.R.I.B.A., Wellington, to go abroad to further his studies, returned to New Zealand on the 19th.

Engineering Notes

A school that can boast of passes in its engineering course amounting to hundreds in the past few years, commands one's attention. The Auckland School for Engineers managed by Mr. Jas. W. Bower, M.A.I.M.E., has a record of 734 passes (as announced in another column) for its students in the engineering course. This is surely a record to be proud of.

Correspondence

Sir,—As a constant reader of your valuable journal, I should be extremely obliged if you, or some of your kind correspondents, could give me some advice through your columns on the following. I have designed myself a five-roomed house and conveniences, which I intend building in concrete on a section (volcanic soil) that I have bought in Auckland. The section is of a slopy nature, on the side of a hill, and I am proposing the following mode of construction: All outside walls to go down to footings (stepped), all intermediate partition walls to be carried on beams, the latter supported by piers. Sizes as follows: Footings for outside walls, 2ft. in ground, 1ft. x 6in.; footings for piers, 2ft. in ground, 18in. square x 6in. thick; piers to support inside walls, 8in. x 6in.; beams tto support inside walls, 8in. x 6in.; inside walls to be 3in. thick (built central on the 8in. beam); outside walls to be 7in. thick from footings to wall plate for floor joists, and above this 4½in. thick right up. All concrete up to floors and base would be 5 scoria ash, 1 of sand, 1 of cement; above floors 6 scoria, 1 of sand, 1 of cement. I should be pleased to know if these proportions are good enough, and if so, what is the best means of putting in damp-proof course, and treating outside walls to make waterproof. I was thinking of using Maduso cement wash, and finishing outside rough-cast, coloured with hot lime well mixed with tallow. If I use a 4½in. outside wall, what space should I leave for window and door reveals. I propose reinforcing as follows: For pillars, 3 ½in. diameter rods, spirally wound with No. 6 wire, about 1½in. pitch; for beams, 4 ½in. rods, wound with No. 6 wire; for walls all through No. 6 wire to about a 4in.

mesh (crimped). I should also like to know if Keene's cement is reliable for a finish in a bathroom, instead of glazed tiles.

My chief question, however, is whether the Maduso wash can be relied upon to keep out damp from inside of wall, where same is made with all fine red scoria ash, instead of shingle, as I can get the scoria ash close to the site, and will come much cheaper than shingle. My walls, of course, are solid. That is, they are not cavity walls. Trusting you can assist me either direct or through the columns of your next "Progress."—I am, etc.,

ENGINEER.

Auckland.

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