# PROGRESS

THE SCIENTIFIC NEW ZEALANDER

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## Publisher's Announcements

We hope to have something to say about the use of Bricks and Tiles in our October issue. Articles are in preparation on "Brick as a Building Material for New Zealand Homes," and "Tiles, and their Numerous Uses," and illustrations of the varying effects to be obtained from the judicious use of bricks and tiles for useful and ornamental purposes, together with some charming pencil sketches made direct from some of Sir Christopher Wren's work in England.

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# PROGRESS

WITH WHICH IS INCORPORATED

THE SCIENTIFIC NEW ZEALANDER

Devoted to the Interests of Industry, Architecture, Science, Engineering, Inventions, and the Home

VOL. VIII— NO. 2 MONTHLY WELLINGTON, N.Z., OCTOBER, 1912 [Price 6D. per copy ; 7/6 p.a. post free
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## EDITORIAL COMMENT

The Eugenic Society, which held its first conference in London in July, and intends to hold others at intervals of four years, had a most interesting meeting. Major Darwin presided, and, as became the son of his father, opened the proceedings with a speech in which he placed eugenics on the lines of evolution. The conveners glorified the occasion as one enabling the world to become acquainted with the aims of eugenics, and at the same time exhorted the eugenics to come to mutual understanding about the said aims. The latter line seemed oddly countered by a large number of the speeches. Speeches, for instance, teemed with suggestions for the welfare of the unborn, while others were full of complaints that soon there would be none born at all—one of them stating that the effect of the Bradlaugh-Besant propaganda was the shrinkage of the population increases during the interval by 25 millions. There were speeches going deeply into heredity with a pinned faith, and there were speeches ridiculing the doctrine of heredity as one of the mischievous fads of the age. "I would rather," said one man of science, "be the son of a robust burglar than of a consumptive bishop," while another declared that environment was everything and heredity practically nothing, taking the broad ground of giving opportunities to all in order to let all pursue the good that is in them. Sterilisation of the unfit was denounced right and left, and some scientific men wanted to know how are the unfit to be always known with certainty. For example, a child, he said was once born in the Midlands so frail and wretched that the nurse did not consider it worth while to let it live. But that child lived to grow scientific, to see an apple fall from a tree and to write his name on the page of history as Sir Isaac Newton. Prince Kropotkin asked who are the unfit, the toilers or the wasters? The poor, who can not help their surroundings, or the rich, who did nothing but amuse themselves to the utter disregard of all duties? The poor, whose wives suckled their children, or the rich, who showed themselves unfit for maternity by never doing so? The poor, who kept the cradle full, or the rich, who did their best to keep it empty? The poor, whose children were robust, or the rich, who bred degenerates? And the Prince was loudly cheered by the assembled scientists from time to time as he went on. On the subject of militarism the philosophers differed largely, one side decrying the waste of energy and the demoralisation, the other insisting on the bracing disciplinary effects on the race. There were discussions about the relative merits of dark people and fair people, and there was some very philosophic doubt about the reality of modern Western progress, some going so far as to stigmatise the same as reaction of the most rapid and complete. On the question of education, men of science occupied positions as far asunder as the Poles: one side declaring for the utmost practical learning at the university; the other insisting that the "blue" always ranked higher than the "double first," and was actually a better factor. It seemed, after all, the right thing to say, when the President closed the conference by declaring that he was hugely satisfied and delighted with the outcome of the meeting, but that it was as yet undecided whether any other authority than time could tell whether the science of eugenics would progress slowly or fast. One thing is clear enough to the most casual reader of the proceedings: it is that the discussions showed that the eugenic people are by no means sure of their ground, that they are modest of their efforts, and in all things capable as well as reasonable, and that there is not the slightest likelihood of any of the heroic measures being taken that once it was the fashion—amongst ignorant people for the most part—to insist glibly on establishing. On the contrary, the aims are shown to be rational, and empiricism was conspicuous by its absence. If the president's aspiration to make eugenics but the practical application of the principle of evolution is accepted all round as the guiding star, there will be for once unity among scientists of the religious and the materialistic side of the scientific world. Both believe in evolution, the religious side going further than their confreres in holding that evolution proceeds by a preordained law just as the march of the stars and under the eye of the all-seeing Creator. Under this system Wallace and Darwin will be no longer divided.

Mr. Herdman has displayed consistency in bringing in and sticking to his Bill for the reform of the Civil Service. His best friends, however, must admit that the fact of his bringing down some forty amendments while the Bill was actually in Committee gives colour to the idea held in certain quarters that the measure has not been adequately thought out by its consistent framer. Moreover, he has asked what use would be the Bill without the inclusion of the post and telegraph department, and in order to get the consent of that department he has prevented the interchange with other departments which is one of the main objects of the Bill.

* * *

Proportional representation, it is agreed on all sides, will give this country the representation of as many minorities as is possibly compatible with the rule of the majority. But single-seated constituencies will not do it. There must be, most authorities agree, constituencies returning five members at least. Take Taranaki as an instance. The five members now in the House since the Egmont seat went to the Government side, are all Government seats. But if the whole five districts were one returning five members, it is certain the Opposition would have some Taranaki representation in the House and so might Labour have. The general result would be very much more correct as a thing representative. Three volumes would not better show the superiority of the proportional system over the present.

Another good thing would come. The representation commissioners of the future would not have to alter district boundaries according to the changes of population revealed by the census. They would simply adjust matters by altering the numbers of the district representatives. There would be here an additional advantage in the matter of licenses. The decision of the Commissioners would not alter districts and therefore would not throw ends of Continuance districts into No-License districts. Local Option would then always be Local Option, whereas now in some cases it is an accident and a gamble.

The United Kingdom supplies late instances in the same direction. There is the Midlothian election, which thus resulted the other day:—

| | | |
|---|---|---|
| Major Hope (Unionist) | ... | 6021 |
| Mr. A. Shaw (Liberal) | ... | 5989 |
| Mr. R. Brown (Labour | ... | 2413 |

At the end of July the Crewe election gave the same lesson, with:—

| | | |
|---|---|---|
| Craig (Unionist) | ... | 6261 |
| Murphy (Liberal) | ... | 5294 |
| Holmes (Labour) | ... | 2485 |

Both these elections gave great joy to the Unionists. But the plain fact is that they did not have a majority in either, though they got the victory in both. The reason was the unreasonableness of Labour, which, without a hope of winning, went in on a sort of blind adherence to some vicious principle and split the vote for minority representation. There was great fear some time since lest such a thing might happen, and the controversy raged bitterly in the party journals. Labour insisted with its eyes open, and the result is loss to its only possible ally, with no advantage to Labour.

The general result of similar tactics here was shown last December by the aggregate of the voting, when, with the two main parties at 100,000 and 102,000 respectively, and the Labour and Independents at 97,000 in between, the consequence of the split was the return to party of one of the other parties without the constitutionally necessary concomitant of a majority.

The present state of parties in the House of Commons is worth considering just now, because we hear much of the solid losses to the Liberals of the by-elections, and a great deal more of the chances of civil war over the passing of Home Rule. In its edition of August 2, "The Times" gives the numbers:—

| | | |
|---|---|---|
| Unionists ... ... ... | | 270 |
| Liberals ... ... ... | 265 | |
| Labour ... ... ... | 42 | |
| Nationalists ... ... | 76 | |
| Independent Nationalists... | 8 | |
| | —— | 391 |
| Ministerial majority ... | | 121 |

Since these figures were published the Midlothian election has given another seat to the Unionists, 271; Ministerial, 390; Ministerial majority, 119. Since the election the Unionists have won six seats.

But the question of civil war does not depend on the votes of by-elections. At the end of July the Unionist party had a representative meeting at the Duke of Marlborough's place, Blenheim, and there Mr. Bonar Law declared that as the votes of the United Kingdom, without Ireland, had not pronounced for Home Rule, Ulster would be justified in going "to any length, even force," and that he and the Unionist party would support them to whatever lengths they might choose to go. In Parliament, the Opposition leader being challenged by Mr. Redmond for an explanation, reiterated his words, and explained that they had been carefully written down before they were uttered, with a due sense of responsibility as attaching to the leader of a great party in the State, and wound up by insisting that the whole Unionist party, comprising more than half the population of the United Kingdom, would support Ulster. The Prime Minister thereupon remarked with great severity that Mr. Law's statement was a "declaration of war," adding that if the doctrine were to be laid down that minorities might resist legislation by force there would be an end of Parliamentary government. That is the condition of the atmosphere in which the Home Rule problem is involved. How much of this is bluff and how much meant for action remains to be seen. In the meantime, one can only wonder at the state of mind to which the Unionists are reduced which enables them to actually hold out inducements to a minority to take up arms against Parliament. They do not mean it as high treason no doubt. But if there is civil war they will discover to their heavy cost that it is, and nothing less.

* * *

It is somewhat surprising to learn that a good many Americans, not only deny the soundness of British claims for equal treatment in the matter of the Panama Canal dues, but seem to suppose that British protests against the proposal discrimination are not made in earnest. That supposition, we need hardly say, is quite unfounded.

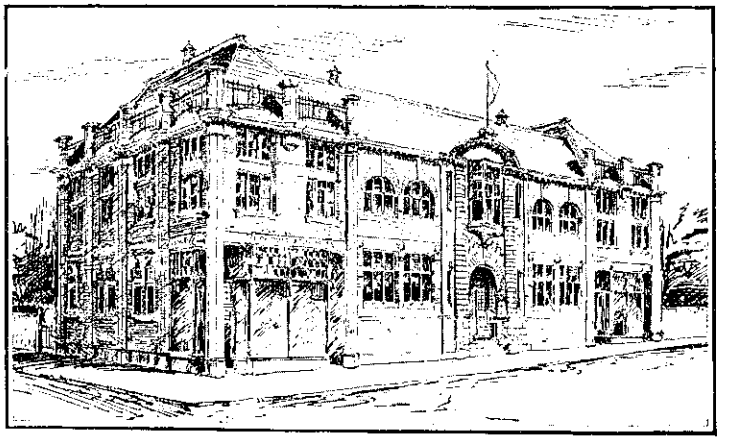
# Architecture and Building

## WANGANUI Y.M.C.A. COMPETITION

We are able to produce this issue, the first four designs of this competition. There were no less than 27 designs submitted altogether, and the Assessor, Mr. F. de J. Clere, awarded the prize to Mr. A. Wiseman of Auckland. The design of Messrs. Atkins and Bacon of Wellington was placed second, and that of Mr. Feilding of Wellington, third. The fourth place was awarded to Mr. Hugh C. Grierson of Auckland. The following is the complete list of competitors:—A. Wiseman, Wellington; Atkins (F.R.I.B.A.) and Bacon (A.R.I.B.A.), Wellington; W. Feilding, Wellington; H. C. Grierson, Auckland; E. M. Blake (F.R.I.B.A.), Wellington; Beere and Greenish, Wellington; R. M. Templeton, Waikouaiti; C. G. Munro, Auckland; C. C. Avery, Auckland; Bamford and Pierce, Auckland; E. R. Morton, Auckland; E. G. Baddeley, Auckland; J. M. Dawson, Wellington; J. A. Bertinshaw, Wellington; G. Robb (Lic.R.I.B.A.), Wellington; G. G. Schwartz, Wellington; D. M. Kean, Wellington (2); H. A. Jones, Masterton; S. Hurst Seager, F.R.I.B.A.; J. Barton and Son, Dunedin; F. G. Hood, Dunedin; H. Mandeno, Dunedin; W. Page, Wellington; T. Battle, Wanganui; G. L. McLachlan, Wanganui; H. Hehn, Wanganui.

We congratulate the Wanganui Y.M.C.A. on the large number of entries for, and the satisfactory result of this Competition. These are undoubtedly due to the properly drafted conditions of the competition, and to the fair and competent judging of the drawings. Architectural competitions conducted on the lines recommended to, and adopted by the Wanganui Y.M.C.A. are bound to produce the best possible results, and incidentally the standard of competive work is raised.

We hope that the N.Z.I.A., to whom a share of the credit is due, will always keep a watchful eye on any proposed competitions and endeavour to persuade the promoters to adopt their conditions of competitions and thereby induce the entry of the best qualified architects.



The Prize Design by A. Wiseman, Architect, Auckland, for the New Y.M.C.A. Building to be erected in Victoria Avenue, Wanganui

## TOWN PLANNING.

The subject of town planning which has been arousing such world-wide interest of late, formed the theme of a paper read before the Otago Branch of the New Zealand Institute of Architects at Dunedin, on August 26th, by Mr. Leslie D. Coombs, A.R.I.B.A.

Mr. Coombs mentioned that he was in London during the Town Planning Conference of 1910, and described his visit to the exhibition of drawings and models in connection with the Conference and the vast number of designs by English, Colonial, American, Dutch, etc., etc., artists.

He said:—"The first thing I noticed, was that the types of plans from the various countries varied considerably. They showed that what must be considered good planning in one country was not so in another. In other words, that the people, their characteristics, the countries, the climates, etc., govern designs. Therefore, if we desire to plan our New Zealand towns and villages in the way to obtain the best results, we must study local conditions and use our own common sense. It would be foolishness to copy the huge American schemes

of cold magnificence or the forced picturesque German so called "model towns."

Without doubt we can learn many things from each and every country, but such lessons will be more of the nature of what not to do than of how to act. We must educate ourselves, and must use our own common sense in providing schemes for New Zealand towns.

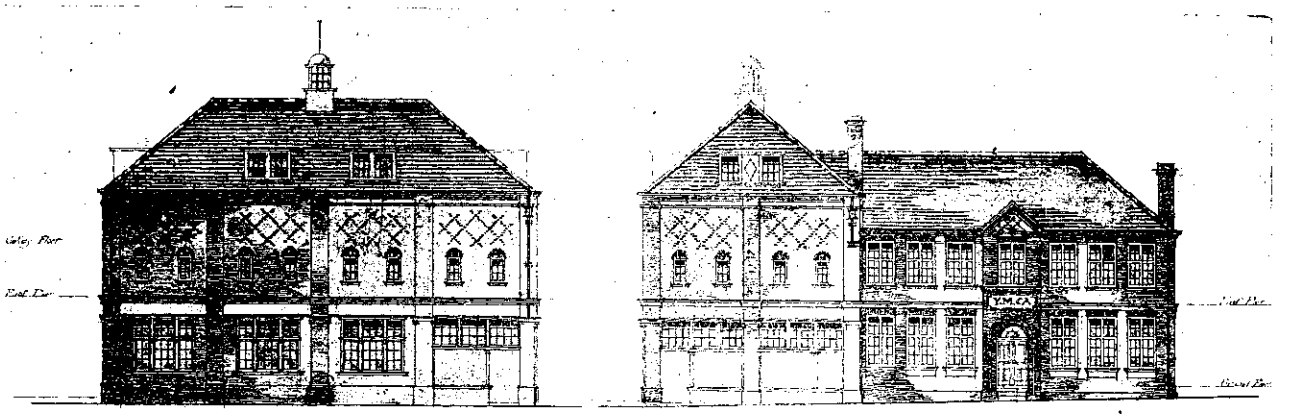
It seems to me that future progress depends upon the adoption of some method of general education that will bring about an appreciation of good proportion, refined outline, harmonious colour and reasonable design. This sort of real education will go far to remove the problem vexing the general public of to-day in respect to the proper development of our cities."

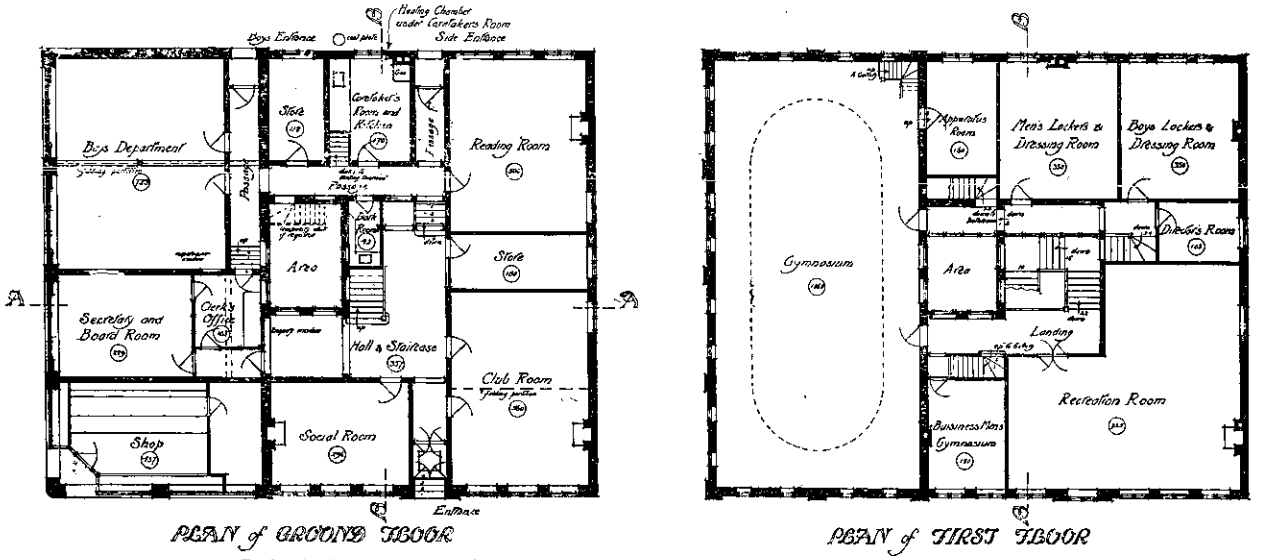
In connection with this subject it will interest Wellingtonians to know that Mr. Hurst Seager, of Christchurch, is to give a lecture on town-planning on October 14th. The Arts Club, we believe, was instrumental in inducing Mr. Seager to come to Wellington to lecture on one of his favourite subjects. There will be no charge for admission.

## Town Beautifying

From an exchange we are glad to notice that Masterton—the butt of many jokes as to its dullness—has at least a live Town Beautifying Society. There is somewhere in the heart of the town a certain corner section overgrown with weeds and defaced with those commercial abominations—advertising hoardings. The Society approached the trustees of the offending section with a request for permission to plant it with shrubs and make it look presentable. The request was only granted after much opposition—such is the horror some people have of orderliness and beauty.

The Masterton Society's efforts cause us to wonder what has become of the Wellington Society. Are there no places in Wellington that need improving and beautifying? We could name many, and some not a hundred miles from this office. There is abundant scope for a Society in this town, and some of our "spots" are a reproach to our sense of civic beauty and progressiveness.






PLAN of GROUND FLOOR PLAN of FIRST FLOOR

Design by Messrs A. Atkins (F.R.I.B.A.), and R. F. Bacon (A.R.I.B.A.), Architects, Wellington, placed Second in Wanganui Y.M.C.A. Competition

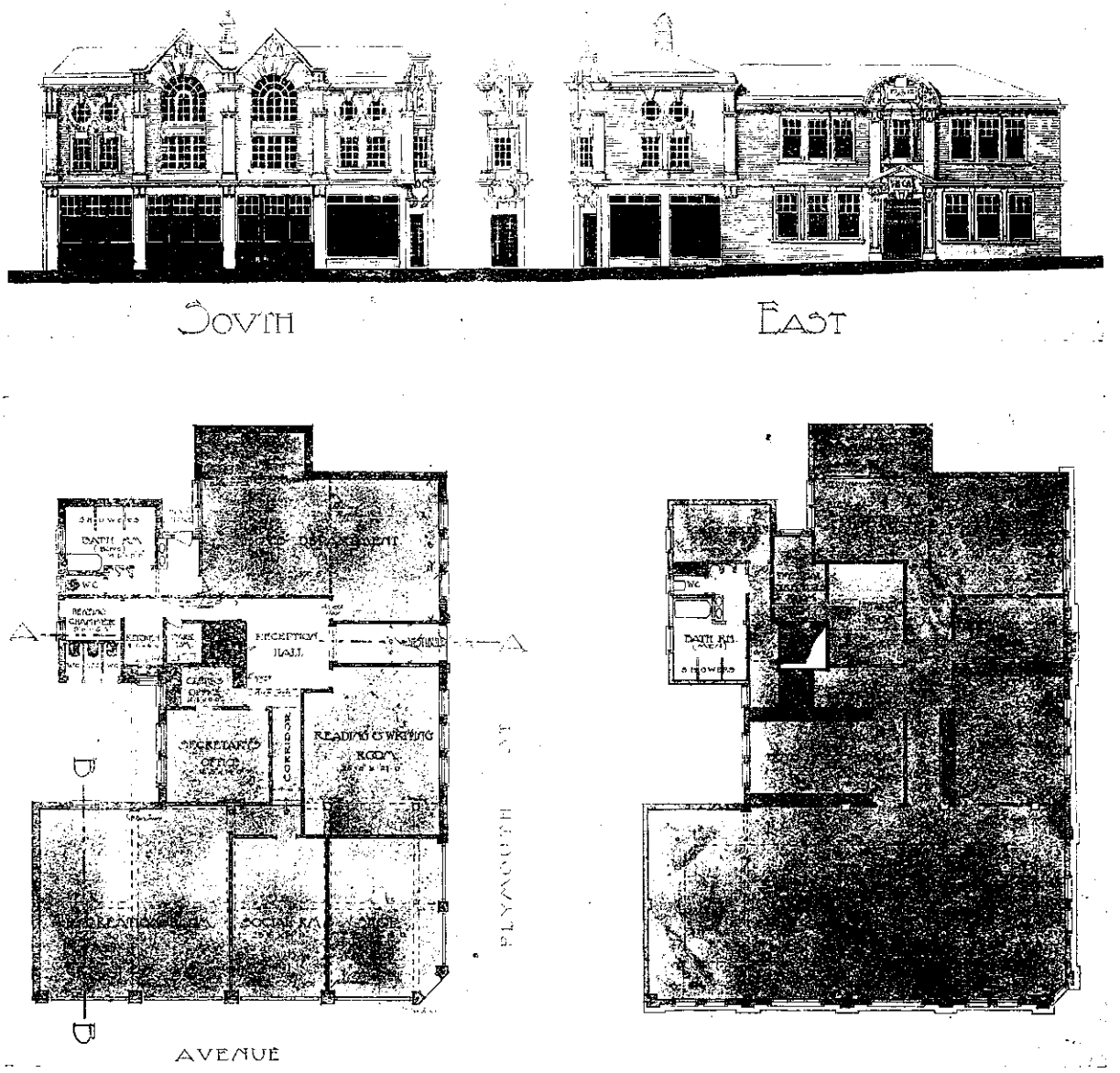
# THE DANNEVIRKE TOWN HALL

### Some Comments and a Reply

In the editorial section of the "Dannevirke Evening News" of September 14th appeared the following:—

THE TOWN HALL

"'Progress', the Wellington commercial paper, has been endeavouring to let us see the Town Hall as others see it, but that aspect generally makes no allowances for the compared with what has been expended by other municipalities in town halls and municipal theatres, it must be acknowledged that Dannevirke has got wonderfully good value for its money. 'Progress' has judged the building from the outside, and has given no consideration to what has been provided inside for the limited expenditure involved. The main consideration in erecting the Town Hall was to secure a building that would pay, and for this reason the Borough Council had to go in an economical way to work. The real grievance in the 'Progress' article, however, is that the building should have been designed by an Australian architect. There is no doubt some room for this




Design by W. Fielding, Architect, Wellington, placed Third in Wanganui Y.M.C.A. Competition

local point of view. The criticism which we publish in another column is unfair because it makes no allowance for local conditions. No one is going to attempt to argue that the exterior of the Town Hall is a monument of architectural beauty. The ratepayers' money was not intended to be expended in external ornamentation. What was wanted was a comfortable hall for the people, and when criticism when ignorance of the facts is allowed for. Under the arrangements made by the Borough Council the services of the first theatrical architect in Australia were obtained on terms that it would have been exceedingly foolish to reject. It is absurd to say that Dannevirke was unpatriotic. Had 'Progress' cared to properly inquire into the facts it might have learned that a local architect was employed in

supervising the erection of the building, and the recommendations that he made were adopted by the Hon. W. Pitt. It is a simple thing to dub a building 'crude and amateurish' when the value obtained for the money available is left out of account. We are not blind to some of the faults of the Town Hall, but the ratepayers are quite prepared to overlook minor deficiencies, and there is no justification for outside critics crying 'stinking fish.'"

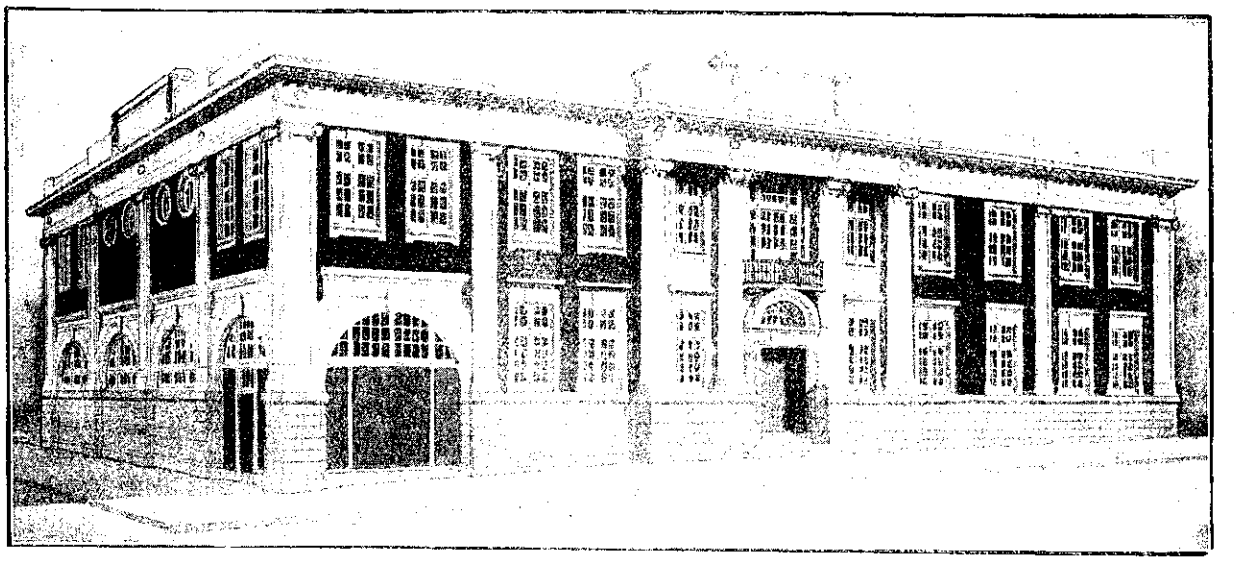
And in the same paper of September 16th the following:—

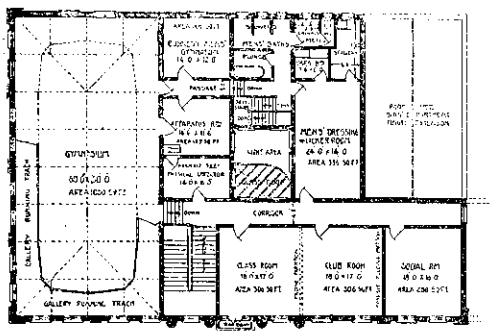
OUR TOWN HALL.—ANOTHER OPINION

"ALL THAT COULD BE DESIRED"

On Saturday we published one opinion which appeared in "Progress" concerning the Dannevirke Town Hall. It had been written by a man with a grievance—the burden of which was that New Zealand architects had been overlooked when the plans were required to be drawn.

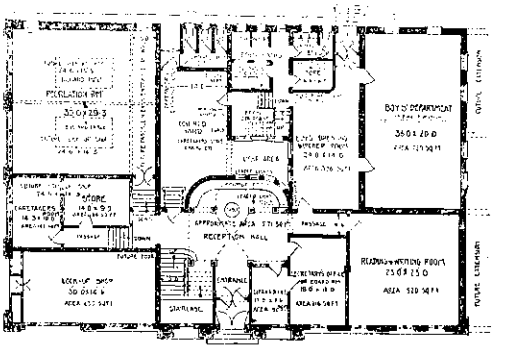
Speaking relative to our Town Hall, Mr. Berkeley said it was "absolutely up to the handle," because it was just right for the place, was just big enough, every appointment was adequate, and it was built on up-to-date lines to facilitate the working and the productions of big companies. "Take this pantomime of 'Sinbad the Sailor.' This is certainly the biggest ever shown in Dannevirke. It comprises 142 people. Here we can give the flying ballet, in which a number of girls fly off the stage and over the auditorium distributing bouquets. This can only be accomplished in an up-to-date theatre, because we must have height and depth of stage. The very fact that we are bringing 'Sinbad the Sailor' here is quite sufficient to show that the theatre is perfectly satisfactory and quite big enough for our gigantic production. You will get precisely the same show here as in the big cities, because we have the room on the stage. The acousties are splendid, I consider, and the hall should be very suitable for our big opera companies





FIRST FLOOR PLAN

WANGANUI Y.M.C.A. BUILDING COMPETITION



ESTIMATE OF COST £4000

GROUND FLOOR PLAN

Design by H. C. Grierson, Architect, Auckland and placed Fourth in the Wanganui Y.M.C.A. Competition

To-day we give another opinion—that of a gentleman connected with the theatrical profession on the managerial side, and who must be credited with knowing something about what he says. This is Mr. Chas. Berkeley, representative of J. C. Williamson, Ltd., who, when shown the "Progress" article, remarked: "Fancy anyone cavilling about the Hon. Mr. Pitt building a theatre. Why, he absolutely stands out on his own in this connection. He might possibly seem extravagant, but he will give you value for your money." Mr. Berkeley said he did not suppose that if the whole of the architects in New Zealand were picked over there would be found six in their number who had built theatres, while the Hon. Mr. Pitt had been building theatres for the last 25 years. He had also built the Opera House in Napier, which, for its size, was absolutely the best in Australasia.

when they come this way. If more money had been spent on your structure there could have been more ornamentation, but not greater essential satisfaction. You can do without the frills at present."

Mr. Berkeley said that all the circle seats were satisfactory in the views they gave of the stage, while the fact that the company had to dress over 100 people, and could do so comfortably in the rooms available, showed that the accommodation in this connection was quite sufficient for requirements for 25 years to come."

We are glad to read the editorial comments which appeared in the Dannevirke Evening News, and the subsequent paragraphs, all of which we quote above. We welcome this expression of opin-

ion, even though it does not coincide with our own. It is evidence that the matter is not regarded with apathy, and we are happy to have the opportunity of replying.

First, it is abundantly evident to anyone who reads our criticism of the building in question, that it applies only to the building as seen from the street. We only had a photograph of the exterior but for our own purpose it was quite sufficient.

Secondly, while it is quite true that we have a grievance, it is also evident from our criticism that the real grievance is not as suggested in the above editorial, that a New Zealand architect was not engaged to design and carry out the work, but that the building is disappointing from an architectural point of view.

Thirdly, we take up the position that every building *should* be "a monument to architectural beauty," or, more correctly, that every building should be good architecturally.

Fourthly, the money at disposal has nothing whatever to do with the matter, and "external ornamentation" on a building in no way redeems it if the general design is bad.

The editorial comments in the Dannevirke paper and "another opinion" are quite beside the mark. We would like to emphasise the fact that it is not because the new Town Hall and theatre is, comparatively, what is commonly called a plain building, that we take exception to it, but because the exterior design is not good and has little architectural value. We do not suggest for a moment that the Town Halls erected by other municipalities are good from an architectural standpoint. They are not good so far as we have seen, although large sums of money have been spent on their erection. It is not the amount of money available so much as the ability of the designer that is the determining factor as to whether the building shall have any merit or shall be quite devoid of the same.

It is quite true, of course, that the first essential of every building is that it shall fulfil adequately and completely its primary purpose, that is, the purpose for which it is built, whether it be for a dwelling, for business, entertainment, music, or worship. The building must be thoroughly well planned and, especially in these days, economically planned, to provide the necessary accommodation, and for this alone a thoroughly well-trained architect must be engaged. In addition to all this, however, something more is require before the building can rank as architecture. Every part inside, and outside, must be so proportioned and disposed that the whole shall be pleasant and satisfying to the educated eye and mind, and the compnete building must be carried out with honest material and in a straightforward manner. We presumed that the building in question fulfilled every requirement from a point of view of convenience, although even as regards this point we would not be prepared to accept the opinion of any but those who have the necessary knowledge to judge of these matters. And then there is the question of the interior decoration, or treatment which we would like to hope is better than the promise displayed on the exterior. It does not by any means follow that because a man has had long experience of a certain class of building he is specially successful in this particular branch of an architect's work. There is nothing mysterious about a theatre and municipal offices, and all the theatres, etc., of Europe and Great Britain are available as models, and in many of which all the mechanical contrivances of the stage, etc., are to be found in conjunction with good architectural treatment outside and inside. We have no hesitation in saying that a thoroughly well-trained architect who has never before built a theatre would approach such a problem, and solve it in a perfectly satisfactory manner from a strictly theatrical point of view, and in addition impart to it a large measure of architectural value.

We confess to a keen sense of disappointment that after twenty-five years of experience of this class of work the designer of the theatre in Dannevirke and the new Opera House in Welington is unable to produce something better architecturally. We cannot see that the local point of view has anything to do with the matter. It is for the architect to study the local conditions in every way, and as for the special terms upon which the architect's services were required we have always understood that the terms of all first-rate architects are the same.

We certainly do consider it unfortunate that a New Zealand architect was not employed in view of the fact that the result is not better than would have been achieved by, we will not say a local architect, but a New Zealand architect, and in the concluding paragraph of our criticism we state, that "we would like to think that the architects of New Zealand would be the first to welcome a fine building, were the architect for it seven times a stranger." Our real grievance, therefore, is as we stated at the beginning of this article. With regard to "another opinion" we do not question the author's experience and authority to speak on the matters discussed in his criticism, but those have no connection with the point at issue. These refer only to the inconveniences and contrivaces of the building. We hear too often that such and such a building is "absolutely the best in Australasia" and it conveys no sense of value of merit. In our buildings, both public and private, we should aim at a higher and better standard than that which Australasia affords. If we have no such better standard, not only for our buildings, but in our arts, then our progress will indeed be slow.

The fact that girls can fly off the stage only proves that there is adequate height and space in the theatre and has no connection with the architectural qualities of the building. If we in New Zealand are all that we fain would have others believe, then we think that our education and culture should be manifested in our buildings. In conclusion, we repeat that the building under review is lacking in this architectural quality which divides the commonplace from the beautiful—and it is not an isolated example by any means—and bears the same resemblance to good architecture, as such expressions as, "absolutely up to the handle," and, "absolutely stands out on his own," bear to good English.

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A vigorous campaign for a new building for the Y.W.C.A., Christchurch, is being carried out, and is likely to prove very successful, nearly £3000 having been collected at the date of writing.


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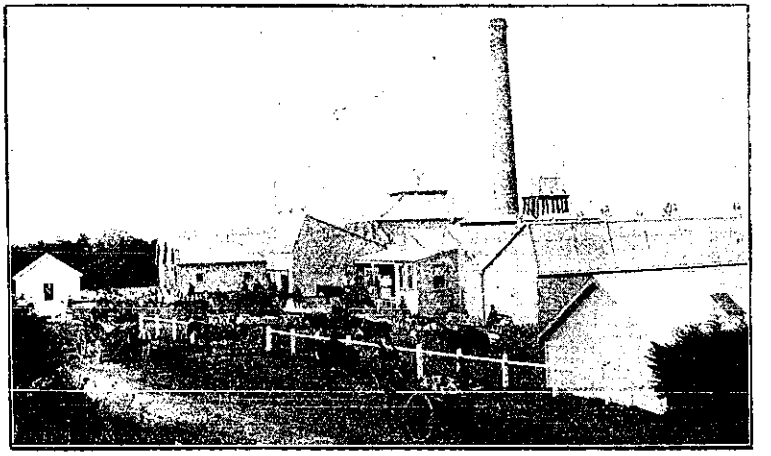


## Underwood Condensery

of which a view is given is situated about six miles from Invercargill on the Wallacetown Main Road and is one of the main centres of industrial activity in Southland. The milk supply is drawn from the surrounding districts, which are eminently suited for dairying purposes. The cows supplying Underwood are mostly of the Ayrshire type, and the Company has instituted a cow-testing department, whereby the suppliers can have their herds individually tested in order to determine which are the most profitable, a merely nominal charge being made for this service. The well-known and highly popular brand of

## Condensed Milk "HIGHLANDER"

is manufactured and packed here by the Company who have made a specialty of this class of milk. The manufacturing process is conducted under strict sanitary conditions and every precaution is taken to produce an article of a choice, even and dependable quality. The brand has been established in public favour some ten years now during which time the output has grown enormously.

Another department of Underwood is the Butter Room, where the cream from three outside Creameries and also home separated cream is churned and packed for the local trade under the Capstan and Titirea brands. Southland is pre-eminently a cheese producing district, but a certain quantity of milk for butter making still finds its way to Underwood.

# Power on the Farm

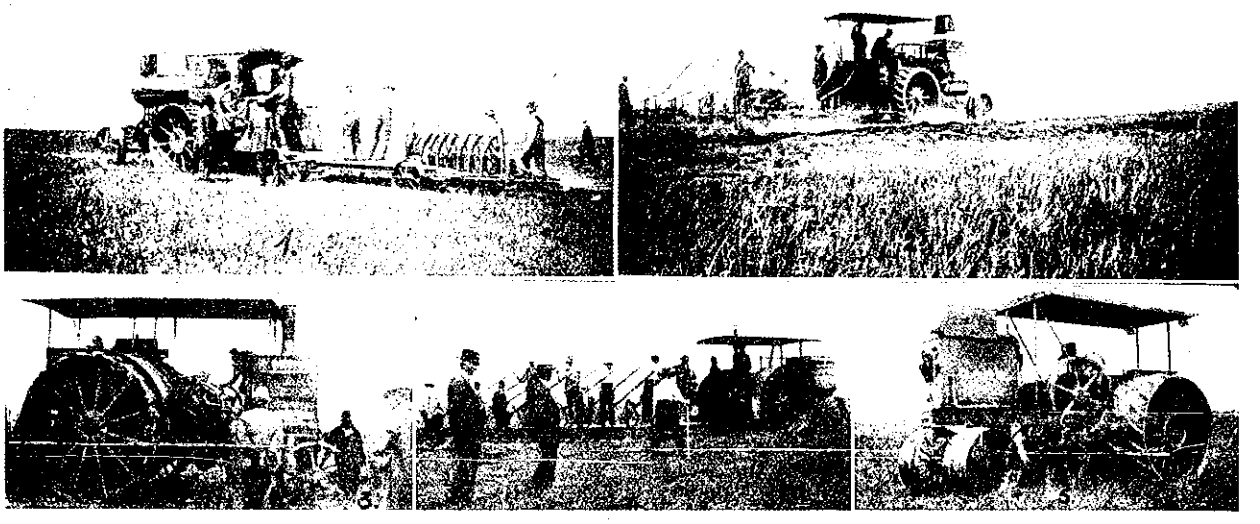
## Agricultural Motors

Unusual interest was shown in the fifth annual contest of agricultural motors, tractors and ploughs, held at Winnipeg, July 2nd to 20th, says "Motor Age," there being twenty-nine entries and enough of ploughing during the competition to turn over 320 acres of land.

From very small beginnings, this annual affair has become a classic in its field, and drew a large number of those interested in the agricultural end of the motor industry to the Canadian city for the days of the contests.

## How the Gasoline Traction Engine is Revolutionising Farming Methods

The nineteenth century witnessed the development of a series of inventions for doing by machinery the various operations connected with harvesting that have placed that part of the farmer's work abreast of modern requirements in every particular, says Dun's Review. In the course of an interesting article the writer further states that in labour-saving quality, speed of operation, capacity, durability and all-round economy American harvesting machinery has won a place in every country in the



Annual Test of Agricultural Motors at Winnipeg Competition

(1). Case Steamer, Gold Medal Winner, 100 h.p. and over. (2). Rumely Oil Engine, Gold Medal Winner Kerosene Engines, over 500 c.ft. piston displacement per mile. (3). Aultman-Taylor Gold Medal Winner Gasoline Engine, 36 h.p., four-cycle. (4). International Harvester Co.'s 30 h.p. Titan Silver Medal Gasoline Engine. (6). Case Gasoline Tractor, 60 h.p.

Both steam, kerosene and gasoline machines were pitted against each other on the test field, hauling huge gangs of ploughs for an average pull of 6 miles. A most unusual sight was the big four-cylinder tractor made in St. Paul, and fitted with self-steering apparatus and pulling as many as twelve ploughs at once. While this machine did not win any prizes, being in a class apart, it was the centre of attraction for a large crowd.

The grand prize for best all-round performance went to the Rumely oil tractor of class E, rating over 500 cubic feet of piston displacement per minute, while gold medals were won by the Case and Aultmann-Taylor in the gasoline class, the International and the Rumely in the kerosene class, and the Case in the steam division. The judges were selected largely from the agricultural college faculties of the adjoining states and provinces.

world in which large-scale farm operations are possible.

The opening years of the twentieth century have witnessed an equally striking and complete, and far more rapid, development of machinery for the preparation of the ground to receive the seed. From time immemorial, ploughing, harrowing, and planting have been done by methods essentially as primitive as those practised in the time of the Pharoahs. It was not until the close of the eighteenth century that the horse-drawn iron plough was invented, followed some decades later by the steel plough. The improvements meanwhile in the composition of the ploughshare, and in the structure of the implement as a whole, were too numerous to be here recounted, but the work still remained essentially one dependent upon horses or other animals for tractive power. At length the steam engine began to be adopted as a tractor for

"bonanza" farms, and the invention of the modern gang plough brought about a rapid development of traction engines for this purpose.

It was not, however, until the advent of the gasoline engine that power ploughing became possible, not merely for the huge farms, but for up-to-date farmers everywhere. With these tractors the farmer could take care of his ploughing, harrowing and planting as efficiently as his harvesting. Those who have never seen a modern gas traction engine pulling ten breaking ploughs across a broad stretch of virgin soil have missed a wonderful sight. The powerful engine travels along as smoothly and majestically as a ship over the waves; the great wheels, eight feet high, dispose of from 25 to 50 acres a day; the rattling fire of its exhaust sounds like a racing automobile, and as it travels the sod in its wake is turned over into rich, chocolate - coloured earth ten clean, smooth furrows, as straight as a surveyor's line.

On ahead in the furrow travels a small pilot wheel which is attached to the front axle of the engine and guides it with mathematical accuracy. Above this wheel, some eight feet in the air, a sheet-iron arrow points over straight ahead, showing the direction in which the pilot wheel is turned. All the operator has to do is to start his engine in the furrow at one end of the field and turn it when it reaches the other end: it needs no attention other than this, it just grinds along, doing its work without fuss or ostentation.

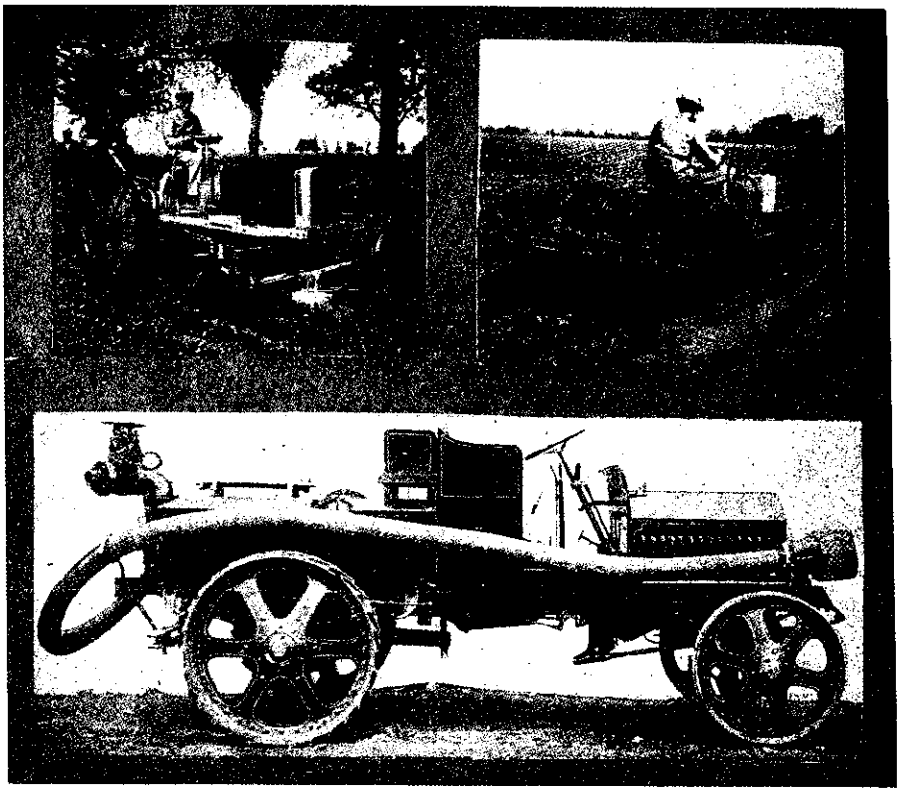
These great engines are revolutionising farming all over North America, and should be taken advantage of by the New Zealand farmer. They are traversing the African veldt, with their strings of ploughs and harrows; they advance tirelessly over the broad, rolling pampas of the Argentine; the bleak steppes of Russia and Siberia echo with the sharp rattle of their exhaust. Wherever there are broad areas to be reclaimed and turned into fertile fields, there these giant farm horses are at work, increasing the world's productive acreage and reducing the cost of the world's food.

But what does all this mean? It means that thousands upon thousands of acres of bare, brown prarie land are being turned into farms; it means thousands of new settlers; it means new towns, new industries, new ways of increasing the wealth and developing the untold possibilities of the country; it means that the great railroads will have trainloads of grain and produce to haul out of a territory that used to be considered only good to haul passengers through.

The wonderful thing about the modern gas tractor is its versatility—its all-round efficiency and economy. It enables the farmer almost entirely to do away with the expense and trouble of horse traction, for it pulls his ploughs in breaking and stubble ploughing, his discs, drags, drills and binders; it runs his separator and hauls trains of loaded wagons to the elevator. With it he can pump water, saw wood, grind feed, shell corn, run his cream separator and do many other things at a wonderful saving of time, expense and trouble.

The instant the engine stops all expense stops—other than interest on the investment and depreciation; the latter amounts to very little if the engine is given proper care, for there is little about it to wear out. Both these items should be charged against horses in figuring the expense of horse traction, but they seldom are. The farmer who farms with horses must feed and take care of them all through the long winter, when little or no work is done. The engine stands silent and cold all through the winter, unless it is desired to do some stationary work with it. A turn of the crank—and the power of thirty horses wakes into life, ready to do the owner's bidding.

However, the engine's greatest value is not in enabling the farmer to do his ploughing and other work at a much lower cost than that of doing it with horses, but in the fact that it enables him to do his work just when soil and weather conditions



Showing Motors in use for Agricultural Purposes in France
A Combination Traction Motor and Irrigation Machine in use in Canada

are most favourable and to get through with it quickly. In farming, as perhaps in no other business, this is all-important. Horses can do only so much, and the farmer can work his horses only so many hours a day. Many engine owners work their engines night and day without fear of tiring these giant horses or wearing them out.

Furthermore, with the engine the farmer can pull several different machines at the same time. Many farmers plough, harrow and drill at one operation. With four ten-foot drills and two twenty-foot drags behind, two men with an engine can drill and drag from 100 to 150 acres a day at a cost of less than 10d. an acre.

The modern gas traction engine does the work of 30 draft horses at one-third the expense, and cuts down the hired help on the farm by two-thirds. It breaks from 25 to 50 acres a day, stubble-ploughs from 30 to 60, drills and harrows (simultaneously) from 100 to 150, double discs from 60 to 75; harvests from 60 to 100, and threshes from 1,500 to 2,500 bushels of wheat running 15 bushels to the acre.

over the soil lightly with a view to conserving the moisture it contains. In all farm operations the traction engine affords the immense advantage of enabling the owner to do the work at just the moment when it should be done, instead of dragging it out over too protracted a period. In the case of ploughing and harrowing the powerful traction engine performs these two operations simultaneously, thus saving time and labour and preparing the ground for seeding without permitting it to drag out between ploughing and harrowing, or get heavy and packed by an intervening rainstorm.

The tendency on the part of the up-to-date agriculturist to give more attention to the employment of power operated machinery is kept pace with by the manufacturers of farming implements, so that those in use to-day show many radical changes from those of only a few years ago. In fact, the general employment of traction engines on the farm is of such recent date that many farmers have been compelled to practically revise their systems of cultivation, but in common with the movement in other industrial lines that calls for more improved methods

Garrett Traction Engine drawing a six 16in. Furrow Engine Gang Plough cutting 7in. furrow At work on the farm of W. D. Hunt, Esq., Southland

It was not until the gas traction engine had been in practical use for several years that a device was invented which makes it possible to pull four or five binders, the engine running alongside the uncut grain, and each binder cutting its full swath, without any side draft, so that with five ten-foot-cut binders a strip 50 feet wide can be cut at one trip across the field. This completed the all-round service of the engine, for until the invention of this contrivance, it was necessary for the farmer to keep horses throughout the year with which to do his harvesting.

The gas traction engine is also invaluable for doing the hauling about the farm for which draft animals were formerly required, a single engine drawing a train of several wagons over grades or through mud that could not be negotiated by animals at all. It can also be utilised as a portable power plant for driving light machinery, such as a portable saw-mill, feed cutters, silo stackers, etc. Many up-to-date farmers in regions where rainfall is deficient are utilising traction engines to plough

and machinery, they are rapidly adopting these improvements. There are, of course, many who are deterred from employing these new machines, partly because they are doubtful of their ability to properly care and handle them, but this feeling is rapidly dying away as they become more familiar with them through seeing them in use by their neighbours and having their profitable possibilities brought closely to their attention.

The steadily increasing cost of farm labour is leading more farmers each year to investigate the possibilities of power farming, with the result that traction engines of all kinds are being sold in ever-increasing quantities wherever grains and similar crops are grown. A machine that practically eliminates all horses formerly kept on a farm; that reduces the labour cost of ploughing by something like two-thirds, and of harrowing altogether; that can do the work in far less time, yet more thoroughly, is one that merits the careful investigation of every up-to-date farmer in the world.

# SOUTHLAND

The Southland District may be stated to comprise the Counties of Fiord, Stewart Island, Southland, Wallace, and part of Lake, and is bounded on the north and east of the Otago District and on the south and west by the Tasman Sea.

The total area of the district, including Stewart Island, but exclusive of Solander, Ruapuke, and the other small islands enumerated above, is 7,583,892 acres, of which 2,405,040 are covered with bush. A considerable area in the Fiord County consists of wild alpine country with scrubby bush reaching to the snow-line. This little-known country extends to the western sea, and there presents the remarkable indentations of the coast-line known as the West Coast Sounds. The whole region is a paradise for the artist, and, indeed, for all enthusiastic lovers of nature. The bush land suitable for timber lies in the neighbourhood of Forest Hill, Longwood, Hokonui, Waikawa, and on Stewart Island. The timbers of commercial value are totara, rimu, miro, matai, kahikatea, rata, towhai, and kamahi, in mixed bushes; but "Fagus Menziesii" and other beeches predominate on the high lands.

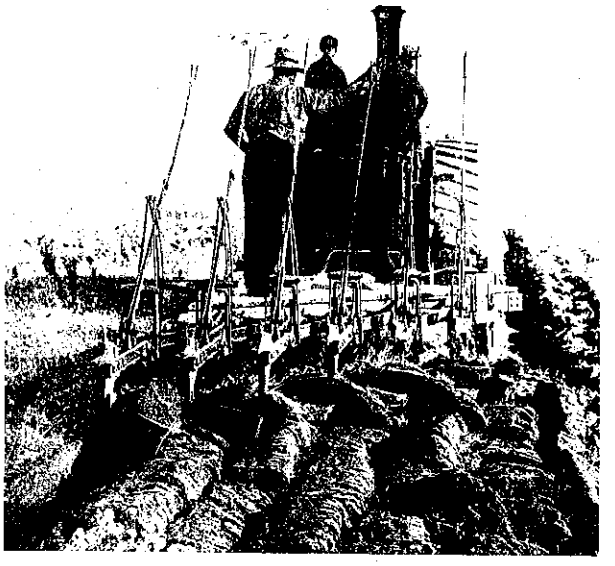
According to the Report of the Commissioner of Crown Lands, the number of tenants in Southland


An 'Ivel' Three-Wheeled Tractor

has increased by 756. The total area held is 2,170,365 acres, as against 1,862,042 last year, the annual rent payable being £39,989 as compared with £26,434 last year. The gross revenue received was £56,664, being an increase of £18,766 over last year's receipts. The large increases in tenants and revenue are mainly owing to the taking-over of the late School Commissioners' leases, there being 722 such tenants, holding 318,745 acres, with an annual rent of £12,855.

### The Various Tenures

Under the heading "Lands sold for Cash" the area purchased from the Crown shows a decrease of 918 acres, but the revenue received is £1,216 greater



Garrett Tractor showing furrows. 20 acres ploughed in 9 hrs.

than last year. Under the occupation-with-right-of-purchase system the selections show a decrease of 5,900 acres as compared with previous year. The total number of holdings has been increased by seventeen, but the area held is 3,773 acres less than last year, owing to the freehold acquired exceeding the area selected. The increase in annual rent payable is £48. The freeholds acquired during the year show an increase of 6,748 acres over last year's purchases. Under the renewable-lease system the area selected during the year is 585 acres more than last year. The total number of holdings has been increased from 93 to 123, the area held from 8,969 acres to 12,599, and the annual rental payable from £360 to £518. Under the perpetual-lease tenure only seven tenants exercised their right to acquire the freehold, while sixteen tenants did likewise under the lease-in-perpetuity system. The remaining tenures are practically the same as last year.

### Freehold Titles

The number of provisional titles issued by the Receiver of Land Revenue, compared with last year, shows an increase of 59 with an increase in area acquired of 10,469 acres.

### Lands Opened During the Year

The demand for land is still exceedingly keen, and as soon as a block is placed on the market large numbers of applications are received. The following table shows the number of applicants who applied for land at four large ballots held during the year, which might be of interest and which goes to show that much has yet to be done to satisfy the demand for land in Southland:—

| Block | No. of Sections | No. of Applicants |
|---|---|---|
| Winton ... | 9 ... ... | 104 |
| Forest Hill ... | 10 ... ... | 193 |
| Longwood ... | 5 ... ... | 23 |
| Spar Bush ... | 10 ... ... | 156 |
| Totals ... | 34 ... ... | 476 |

The Terepa Estate, containing 5,505 acres (an education reserve), which was purchased by the late School Commissioners prior to their abolition, was also offered in seven sections during the year, and 3,357 acres representing five sections of it were selected prior to 31st March.

### Lands Proposed to be Opened for Selection during the Year

During the year the Commissioner of Crown Lands hopes to be in a position to place about 25,000 acres in the market, and states that he has no hesitation in saying that the majority of the sections will be selected the day they are opened for application.

The surveys of an area of 5,685 acres in Campbelltown and Invercargill Hundreds, and 1,626 acres in Aparima Hundred, have been completed and some of the sections already advertised. Surveys of 6,000 acres in the Longwood district and Jacob's River Hundred are almost completed, and will be dealt with as soon as possible. Further blocks in Campbelltown Hundred, Aparima Hundred, and Longwood and Mokoreta districts will also be available for settlement. The majority of the lands under survey are worked-out bush areas and well suited for settlement, and this area should assist to cope with the demand.

### Land for Settlements

There have not been any new settlements purchased during the year. In the eastern portion of the district, where dairying is the chief occupation of the settlers, there has been an abundance of feed, but the cold and unsettled weather has somewhat operated against the yield of milk. Still, it is generally agreed that the season's returns will more than reach those of the past. The white crops, generally speaking, are very good, but the root-crops will, as a rule, not be up to the usual standard of excellence. The settlers in this part of the district are keeping their holdings in a high state of fertility by the application of lime and other artificial fertilizers coupled with a judicious system of cultivation. This year an area of 2,770 acres of new grass has been laid down. The settlers in the western portion of the district are chiefly occupied in mixed farming and grazing, and the high prices ruling for all produce have been of material assistance to them. The climatic conditions have been very suitable for the light lands in this district, the result being that there are some really excellent white crops, while the root crops are looking healthy and of good promise. An area of 1,682 acres has been laid down in new grass. Taking the settlements as a whole, it may be said that the conditions of lease are very well carried out, there being only a few defaulters; and the settlers now appear to be in a very satisfactory position in every way. The required amount of improvements is £60,477, and the value actually made is £94,477.

### The Timber Industry

During the year sixty-one mills out of sixty-three were working mostly full-handed. It was the busiest year that Southland sawmillers have had for the past twenty years. These sixty-one mills produced, approximately, 60,000,000ft. of sawn timber; 400,000ft. were shipped to Australia and England, and of the balance, 27,000,000ft. were delivered inside the Southland District, and 32,000,000ft. delivered outside the district—viz., Gore to Christchurch. About 50 per cent. of the timber produced was manufactured into mouldings and dressed lines of different kinds. During the year about 1,100 persons were engaged in the industry, and £125,000 paid in wages.

### The Invercargill Tramways

Invercargill is the sixth town in the Dominion to install electric tramways, and the townsfolk may well be proud of the result of their enterprise and the efficiency of their service.

No doubt by this time the few that voted against the tramway scheme are quite satisfied with the way things have turned out, and are enjoying the benefits of the progressive policy of the far-sighted majority.

The service is good and frequent and perfectly adequate for the present needs except occasionally, at rush times, but in the near future, with the rapid expansion of the suburbs and population a much greater service will be necessary. Extensions and new lines will be called for, and then additional rolling stock will be required.

The authorities foresaw this, and in building the car-shed wisely provided accommodation for more cars than were built, and made provision for extending the shed to twice its present dimensions.

In addition to providing power for the cars, the plant which is driven by three engines of an aggregate of six hundred horse-power, provides light for the streets as well. The lighting system is most complete and up-to-date and equal to the best in New Zealand.

So far has Invercargill journeyed towards the goal of municipal excellence, and it is carrying its progressive policy still further. It is now turning its attention to providing private lighting power for industrial purposes; and tenders are now being called for a plant for this purpose. A great fillip will be given to local industry when this clean, cheap and ever-ready source of power is available.

### Tourist Resorts of Southland

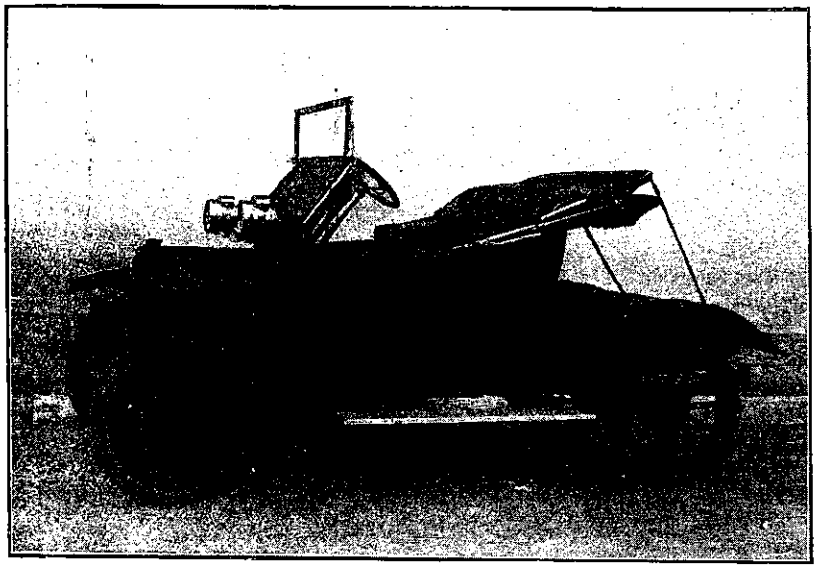
Stewart Island (in the Maori tongue "Rakiura" —the isle of the "Glowing Sky"—) is probably the pride of Southland from a scenic point of view and as a tourist resort.

This beautiful island so detached from the rest of the busy world, is, with its bush-covered mountains and lovely land-locked harbours, like Scottish lochs, a perfect haven of rest at holiday time to tired Southland business men, and, for that matter, the Northerner as well. In fact "Rakiura" has admirers and visitors from all over the world.

The principal place on the island is Oban, in Half Moon Bay. This little village, nestling in the bush, is just twenty-two miles across Foveaux Strait from

the Bluff wharf. Good accommodation may be had at most of the settlers, as well as the boardinghouses all over the island.

Close to Oban is Paterson's Inlet, one of the finest harbours in the Dominion. It is a splendid sheet of island-sprinkled water, about ten miles in length, with a maze of land-locked coves and bays and hidden creeks. The entrance is sheltered by groups of islands. Ulva, one of the beautiful islets



10 h.p. De Dion Body built by J. Bath & Sons, Invercargill

in Paterson's Inlet, is the home of Mr. Walter Trail, brother of the celebrated scientist, who conducts the most southerly Post Office in Australasia.

There is a fairly extensive settlement of Maoris at the Neck near the entrance to the inlet. Most of the natives spend their time fishing and oystering, and in March and April each year they go catching mutton birds on the rocky offshore islets.

Port Pegasus, William, Adventure and Lord's River are all beautiful and worthy of a visit, and many happy days may be spent exploring and fishing in these charming harbours.

In the early days they were the rendezvous of hundreds of whale ships, and many a battered New Bedford Whaler staggered into their placid waters with a good right-whale in tow.

F. T. Bullen has many pleasant memories of Stewart Island, and sings its praises in his famous "Cruise of the Cachelot."

Stewart Island is approximately triangular in shape, its coastline is about 130 miles, and it is in area about 655 square miles.

### Lake Manapouri

The loveliest of all the lakes of the Dominion is undoubtedly Manapouri in the Southland District. Manapouri has a surface of nearly forty square miles, but through the extreme irregularity of its formation one is never very far from land when cruising on its waters. It is dotted over with lovely little islands, all richly wooded, and is bordered by snow-capped mountains and dense luxuriant bush.

The head of the lake presents some exceedingly grand pictures, walled in as it is by precipitous mountains, broken into peaks of wild and jagged outline.

The Tourist Department runs regular trips with their steamer, which is comfortable and well appointed.

Manapouri is reached by a coach journey of twelve miles from Lake Te Anau.

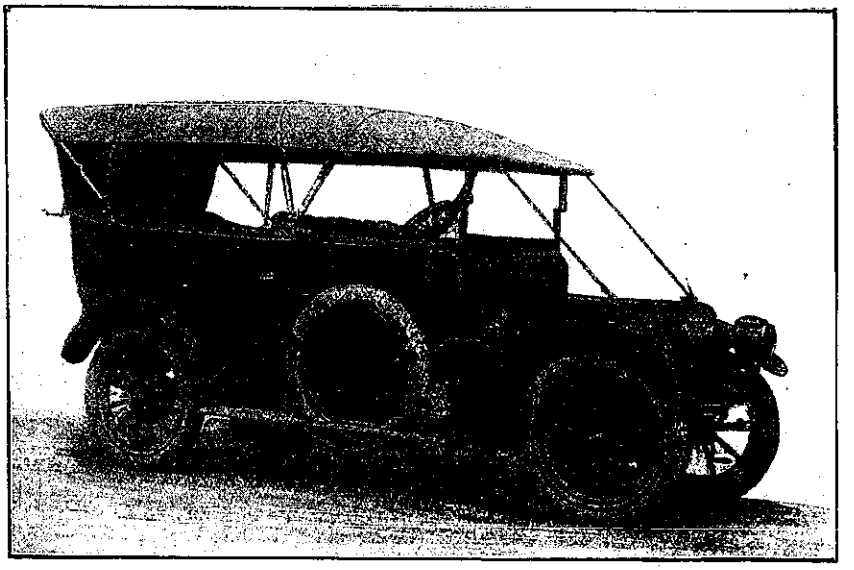
A portion of Lake Te Anau is in Southland. It is reached from Invercargill by rail to Mossburn, the terminus of the railway, 62 miles, and thence by coach about 50 miles.

Te Anau is the largest of the Cold Lakes and runs nearly north and south for 38 miles. It varies from one to five miles in breadth.

At the head of this lake Mount Anau, from which it takes it name, towers to a height of 7,000 ft., rising from the vast forest of pines which surround its base and climb high its sides.

### Motor Car Body Building

Motor car body building is a recent industry which is making rapid headway, owing to the tax on imported bodies. It is now not necessary to import the whole car, the chassis being the only



24 h.p. De Dion body built by J. Bath & Sons, Invercargill

part that cannot be easily made in New Zealand. Intending purchasers can have the car bodies built to suit their own tastes, and to any style compatible with the design of the chassis, while the price of same compares verp favourably with imported work.

In Invercargill, Messrs. J. Bath and Sons have a plant capable of turning out almost any kind of motor body. They have recently completed the body building of several of the New Zealand Express Company's new motor vehicles, and quite a number of torpedo and phaeton motor bodies for various owners. There are some excellent examples of Messrs. Bath's work illustrated on page 78.*

## Traction Engines and the Farm

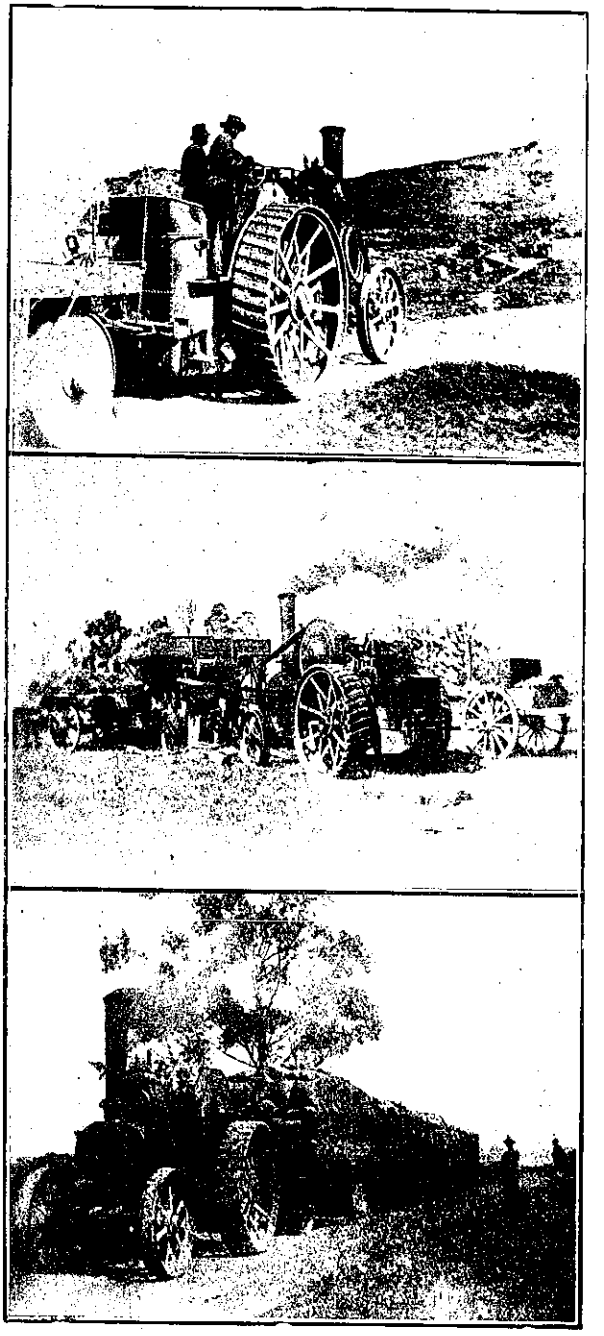
There is no branch of industrial enterprise which is of more importance to a young country like New Zealand than that which deals with the application of the latest and most improved machinery to our primary industries. We have always prided ourselves on being in the van in this respect, and have demanded the best the manufacturers can turn out, and we have got it.

Of course different conditions necessitate different plants, and the manufacturer who studies the conditions that obtain in the country where he desires to sell will always have an advantage over those who do not give the question the same consideration. The work required of a traction engine on a New Zealand farm is very varied, as a rule. There is the threshing to be done, the chaffcutter to drive, the wool or grain to cart to the station, and the ground to be broken up by the plough, to name a few of the more general uses to which an engine is put. This naturally means that to be suitable for all these classes of work, an engine must be very carefully planned, and the illustrations given on this page show that the well-known manufacturers, Messrs. John Fowler and Co. Ltd., of Leeds, are giving the question that consideration which it deserves. It is a somewhat difficult matter to design an engine which will not be too large for chaff-cutting, is economical and reliable while threshing, and which can stand the wear and tear of continuous haulage of large loads on the roads, but it has been done, and we tender our congratulations to the makers on the success which has attended their efforts.

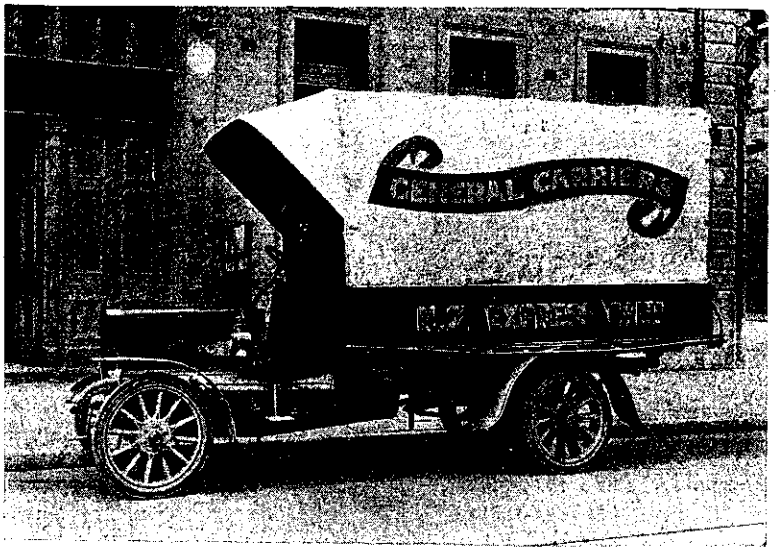
Every driver knows the trouble he is put to when he gets on to soft ground, and the way these engines extricate themselves from difficulties under their own power has been an eye-opener to those who have not seen their capabilities.

Fowler's New Zealand agents, Messrs. William Wood and Co. Ltd., of Christchurch, inform us that they are now remodelling their types, embodying all the latest improvements in traction building. So the march of progress goes on, and the producer on the land in New Zealand gets the benefit of the technical skill and ability of the Home engineer. A point which is becoming of increasing importance is the consumption of coal and oil, and this has received special consideration, with the result that these engines now work on a very low scale indeed.

The question of the uses to which we will put the product of our new petroleum industry will shortly be engaging public attention in New Zealand, and these makers are introducing a traction designed to burn this fuel. Altogether, the Fowler engines have a wonderful record of work done in New Zealand during the past thirty-five years, and the latest models show that there is to be no departure from the high standard of former years.*



Top—Class B. 10 h.p. Fowler Special Road Locomotive
Middle -Class B. 10 h.p. Fowler Engine Threshing
Bottom--Class R. 8 h.p. Compound General Purpose Fowler Engine drawing 30 tons




New Argyll Lorry purchased by N.Z. Express Co. for use in Wellington.

The order of affairs has somewhat changed of late. A few years ago it was quite a common occurrence to see a motor car being towed home by a horse, but during the recent rough winter when the roads in Southland were badly cut up, the N.Z. Express Co. found their Argyll motor lorry a useful adjunct to their plant. Whenever one of their horse teams got bogged they sent out the lorry with sufficient wire rope and pulled it out. The lorry has never yet failed to perform its duty.


First Argyll Lorry imported into New Zealand. Has covered 45,000 miles to date after four years work with the N. Z. Express Co. at Timaru.

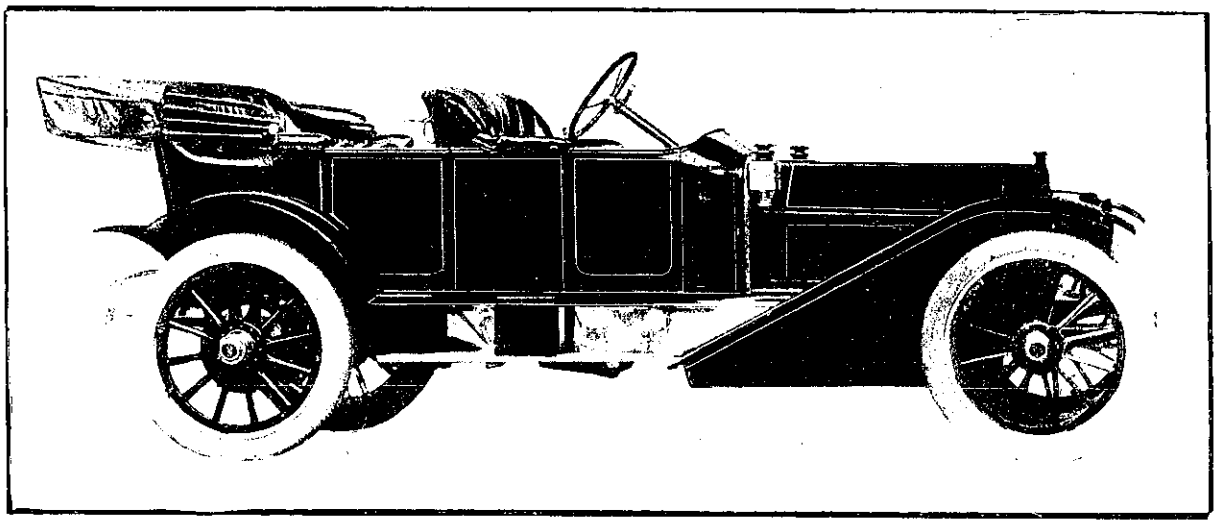
# THE "1913" MITCHELL

Nearly seven years ago the Mitchell car made its first appearance in New Zealand, the owner being Mr. Garnet Holmes, of Wellington. A representative of "Progress" had many opportunities of then noting the excellent engine features which have gone so far towards placing the Mitchell in the front rank of American motor-car construction.

But the Mitchell of 1913 is a far remove from its prototype of 1905, and is undoubtedly a great testimony to the wonderful advances made by the manufacturers in so short a period. The new Mitchell, of course, embodies some special refinements, such as complete plant for supplying electric light throughout the car; the self-starter, an equipment perfected and applied by the makers, and

The "Little Six" Model: Five passenger, 6-cylinder, 48-h.p., 3¼in x 6in. bore stroke, Bosch dual ignition gate charge, gears three speeds forward and reverse, wheels 36 x 4, fitted with Michelin tyres and demountable rims, wheel base 125 inches, full floating back axle, handsome roomy fore door body, finished in either grey or black, and equipped with hood, windshield, speedometer, five lamps, horn and tools, also one spare rim and carrier. Silent as the foot of time and speedy as the greyhound. Complete £525, with electric lights and self-starter.

Four-cylinder Models: Four passenger, 4-cylinder, 30-h.p., dual ignition, full floating back axle, wheel base, 115 inches, wheels 32 x 4, fitted with



The Mitchell "Little Six" 1912 Model, in contrast with which, the 1913 Model will present some extra refinements

which enables the driver to dispense with cranking, and so start up his engine without leaving his seat by merely depressing a small pedal. Then, again, the long-stroke motor, enclosed valves, and the accessibility of all working parts present in themselves a combination of merit sufficient to justify an opinion that the Mitchell is in the van of reputable makes.

The exceedingly handsome lines of the roomy and beautifully upholstered bodies, coupled with the low setting of the double-drop frames, complete the cursory inspection to a pleasurable degree.

We have received the following interesting specifications from Messrs. J. F. Best, Christchurch, and H. Rollinson, Timaru, agents respectively for the Mitchell:—

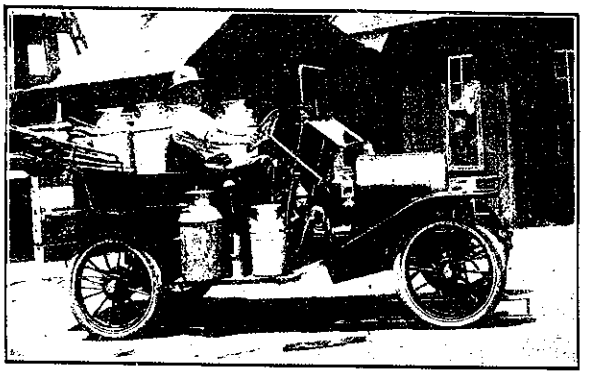
Michelin tyres, handsome body, finished in grey or black, and equipped with hood, wind-shield, speedometer, five lamps, horn and tools. Complete £375.

Five passenger, 4-cylinder, 35-h.p., Bosch dual ignition, gate change gears, three speeds, forward and reverse, wheels 36 x 4, fitted with Michelin tyres. 120-inch wheel base, handsome, roomy, fore door, body finished in either grey or black, and equipped with full floating back axle, hood, windshield, speedometer, horn and tools, 5 electric lights, and self-starter, etc., bright parts plated. Complete £425.

Messrs. J. F. Best, Christchurch, and H. Rollinson, Timaru, advise us that they will be pleased to furnish catalogues and arrange demonstrations.

## The Farmer Motorist

Ever since the farmer became the proud possessor of a general-purpose motor car he has to a great extent removed the disabilities of way-back pioneering. He has now a rapid and reliable method of locomotion for himself, his family, and his produce. The farmer can mix pleasure and business together in his motor trips. He can load in his cream or eggs and make a quick trip to town and back, while the team rests in the barn. He can attend church service and let the horses enjoy their well-earned rest in the home shade, unbothered by the heat and burden of the day. He can visit neighbouring sales and pick up bargains without losing time from the necessary work of the farm. He can make hurried trips to town to replace broken castings, when otherwise the horses must be taken from urgent work and much valuable time lost. He can put the lever into "top speed" and eat up miles in his mission of life or death when sickness or accident comes and the life of a loved one is at stake. He can add that desired touch of gaiety and pleasure to a busy life by taking his family to town to theatre, lecture, or various entertainments, and still give the horses the rest which is their due. He can take advantage of the fluctuations of the



The Farmers' "Overland"

market and carry his small produce of all kinds to the nearby town when prices are highest, and buy at bargain sales when prices are lowest. Aside from a portion of the winter season and a few days during the spring, summer, and autumn, when the roads are muddy, the auto can be made to answer every use of a driving team, and at a pace which no team can hope to make. All this means time and money saved to the farmer. The city man can in no way make his auto work for him in his business; every cent he spends on the machine is spent for pleasure alone.

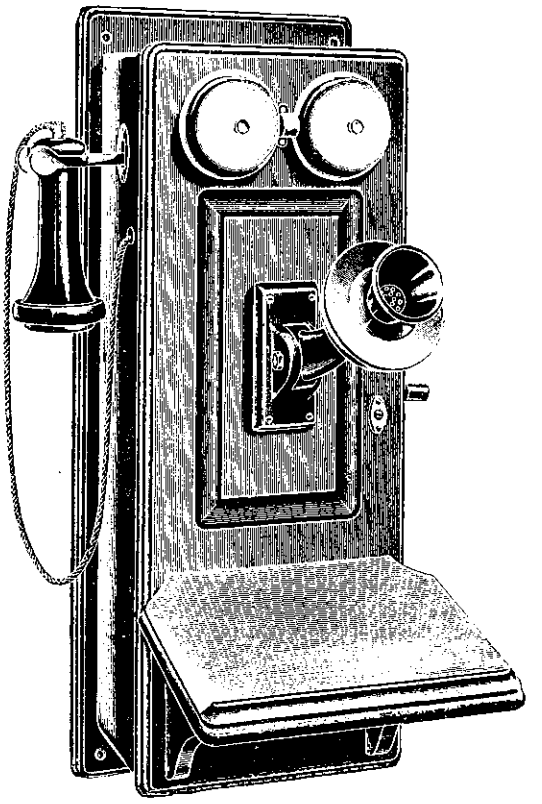
The popularity of the motor car amongst farmers in the South Island is established, and it is significant that the Farmers' Co-operative Associations from North Canterbury to Southland handle and report an enormous demand for that ideal general-purpose car, the "Overland."

To Messrs. Webber and Smily, Ltd., Barnard Street, Timaru, who act as selling agents for the "Overland" in South Canterbury, we are indebted for the accompanying illustration.

## Useful Farm Appliances

The farmer is rapidly becoming educated in the uses of electricity, and has now come to realise that there are no dangers attendant on the application of this power within the limits of voltage applied to farm work.

Electric energy can be utilised for driving all farm implements, such as chaff cutters, circular saws, sheep shearing machines, milking machines, cream separators, pumps, etc., etc.



**The Farmer's Telephone.**—A telephone suitable for the farm will at all times interest our readers who may be living in the back-blocks. We illustrate in figure 3 a telephone which has been specially designed to meet the requirements of the farmer. This telephone is of the long-distance magnetic bridging type with a five magnet generator, capable of ringing to any distance in either the North or South Island. The particular telephone illustrated was originally designed for use in Canada, where distances are even greater than in New Zealand, and as it is of the approved pattern it can be conveniently connected up to the Government system.

These telephones have been supplied to syndicates consisting usually of 10 to 12 farmers, living within a range of 30 miles. The farmers erect their own line, using fencing posts, and in some cases ordinary fencing wire. This work can be just as well done by the average farmer as by a trained electrician, so that an expert is only required to erect and connect up the instrument at the homesteads.

**Sheep Shearing by Electricity.** — In figure 1 we illustrate an electric motor which has been specially designed for attachment to any of the well-known makes of sheep shearing machines or horse clippers. Large numbers of these motors are now in use in different parts of the Dominion. The motor is dustproof and is rated at one third of a brake horse power, which has proved by experience to be about the power required for satisfactory working, especially in shearing heavy close-wooled sheep. Ball bearings and special oil lubricators are fitted at each end of the motor spindle, and the only care and attention required is in oiling the machine and keeping it clean, a duty which is quite easily performed.

The great advantages which electrically-driven sheep shearing machines have over the ordinary belt driven type lie in the fact that no shafting is required, and the machines run practically noiselessly without vibration. This results in more agreeable conditions for the shearers and in less wear and tear on the machine.

Then again, each shearer has an independent motor, the speed of which can be regulated to suit his particular wishes. The motors can be hung up in any part of the shed or outside in the open if need be. Farmers who have had these machines in use for some time agree that sheep shearing by electricity is the ideal way, and that faster shearing results from the reduced vibration and less tiring effect on the shearers.

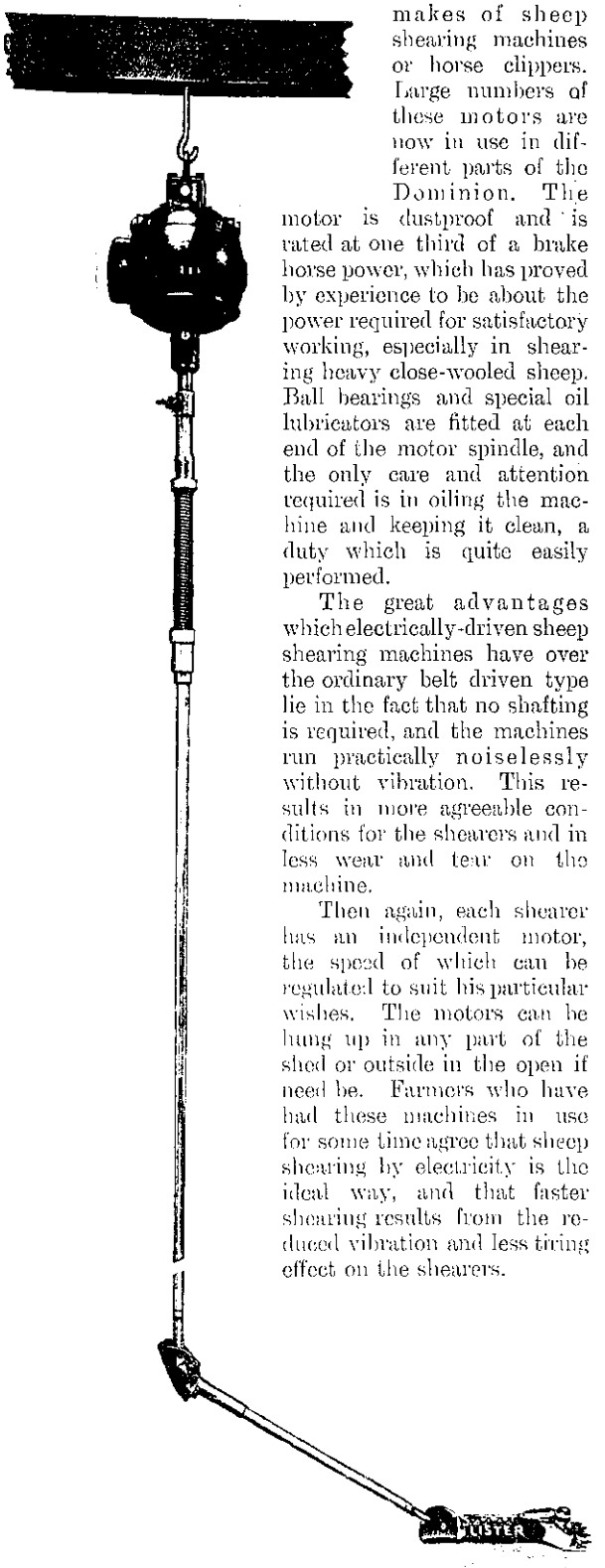



Fig. 1. ⅓ h.p. Electric Sheep Shearing Motor

**Electric Grinder.** — For the purpose of grinding the blades of these sheep shears an electric motor has recently been designed by the British Westinghouse Electric Co., and is illustrated in figure 2, which clearly shows the grinding discs and method of applying the blades to the emery face.

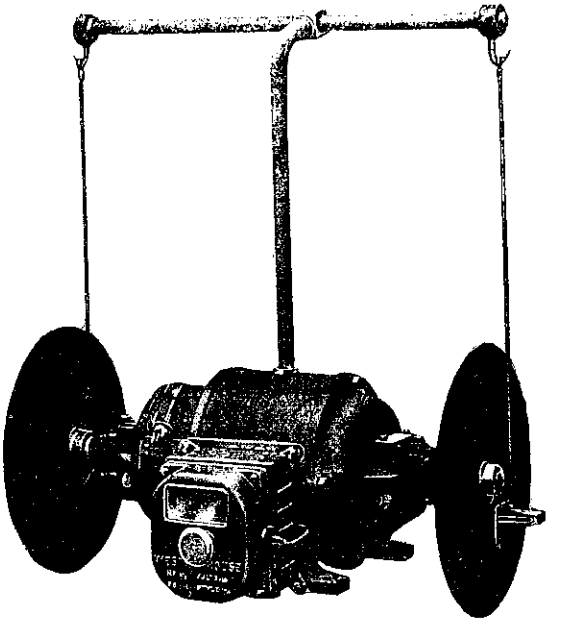
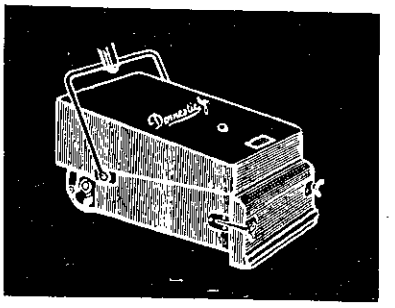


Figure 2. Electric Grinder

The speed of this motor can also be regulated, and it has the great advantage that no belts are required. The motor can be mounted at any convenient place in the shed, on the top of a timber post or concrete block.

## The "Domestic" Vacuum Cleaner

With the market abounding in various types of vacuum cleaners, and mostly bad or indifferent at that, it is pleasing to have to admit that our personal examination of the "Domestic" leaves no

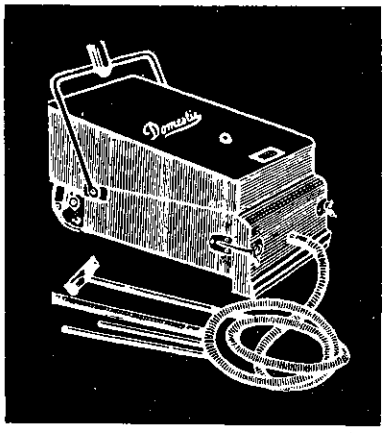



The "Domestic" JR. 2 Bellows

room for hesitation in pronouncing this simple and effective vacuum cleaner one of the best so far to come under our notice. The "Domestic" unerringly absorbs the minutest particle of dirt from carpet, wall, or picture, at a touch of the little

finger, and without the bother of independent pumping. Moreover, there is nothing in its mechanism to get out of order or to puzzle the maid or mistress, the air being generated by bellows worked by the revolving wheels as the machine is gently operated to and fro.

The main features of the "Domestic" may be stated as follows:—Exceptionally easy working, due to the machine's rolling on ball-bearing wheels which actuate the bellows; no part to rub the nap off the carpet; power of suction regulatable so that




The Domestic 3 Bellows

a child can operate; extra attachments provided, enabling the cleaning of stair carpets, chairs, and the like; three bellows, good width of machine, and three-ply wood used in its construction.

Considering the boon that is inseparable from the use of a "Domestic" vacuum cleaner, the price with attachments (£6 18s. 6d.) is very reasonable. If desired without attachments, the "Domestic" Jr. can be supplied for about half that price.

Mr. J. Hattersley, Domestic Supply Co., Box 532, Christchurch, and Box 392, Auckland, will be very pleased to supply full particulars regarding the "Domestics."*

## Mineral Resources of Otago

By Noel Carless, Otago University School of Mines

(Concluded from page 29, September issue)

QUARTZ REEFS.—Quartz mining in Otago has not yielded the quantity of gold that has been obtained on the West Coast and in Auckland district, the bulk of the gold having been obtained from alluvial drifts.

BENDIGO.—The most successful quartz mining company in the Otago district was the Cromwell Company at Bendigo, which paid dividends amounting to approximately £100,000.

CARRICK RANGE.—This goldfield is situated at altitudes varying from 2,000 feet to 3,000 feet above sea level. The main workings lie at the head of Smith's and Pipe Clay Gullies. Crushings from the Robert Burns lode are said to have yielded 25 dwts. per ton. One of the companies (Royal Oak) paid about £14,000 in dividends to the shareholders. The old workings on the John Bull lode tend to show that the ore was payable for a considerable depth.

Full particulars of the gold-bearing lodes of the districts already mentioned may be found in the bulletins published by the New Zealand Geological Survey in 1906, etc.

BAREWOOD.—Several promising reefs were opened up in 1890. The Barewood Goldmining Company started operations in 1902, and continued until 1911. The whole of the share capital was returned to the shareholders in dividends before the mine closed down.

NENTHORN.—In 1888, a number of gold-bearing reefs were discovered at the head of Nenthorn Creek. Batteries were erected, but the result did not come up to expectations. Warden Dagliesh, referring to this goldfield, stated: "At the outset the management of many of the claims fell into inexperienced hands, and the work was carried on without system and in a very costly manner."

SADDLE HILL.—The mine was worked prior to 1875, and irregularly until 1896. In the latter year a trial crushing of 2½ tons was sent to the Otago School of Mines Battery for treatment, but since then nothing further has been done.

MACRAES.—In the Hyde-Macraes district, some prospectors discovered a gold-bearing reef in the Mareburn Creek in 1887. Since that date, quartz mining has been carried on continuously. In 1911 a Christchurch syndicate took over the Golden Point and Highlay mines, and vigorous development has been undertaken under the direction of Professor D. B. Waters, and present prospects are good. The presence of scheelite in the reefs is a valuable asset.

### COAL

The provincial district of Otago is fortunate in the number of its existing coal deposits of varying extent, ranging in value from lignite to brown coal and pitch coal of superior quality. In the New Zealand Mines Statement for 1911, 56 mines are reported as producing coal in Otago, and the total output for the province up to December 31st, 1911, was 5,685,134 tons. The deposits may be also expected to become of enhanced importance in the event of their being used for the production of gas for power purposes.

Lignites occur plentifully as Fluviatile and Lacustrine deposits, mainly following the courses of the ancient river valleys or occurring on the margins of the inland lake-basins. They usually occur near the surface, and are overlain by gravels and clays. The seams vary from six feet in thickness to 20 feet and over. At Alexandra the seam is 28 feet thick. At Clyde the two seams aggregate 80 feet, and at Coal Creek, Roxburgh, one seam as exposed at the surface is 100 feet thick; but this development is local and exceptional.

Large deposits of pitch and brown coal occur at Kaitangata, Green Island, Tokomairiro, Taratu, Shag Point, and in a lesser extent at Lovell's Flat, Gibbston, Nevis, Cardrona, Bannockburn, and other places.

The principal coal mines in the province are the Kaitangata and Castle Hill collieries, the property of the N.Z. Coal and Oil Company, Ltd. During 1911, 134,829 tons of coal were raised, and the total output to the 31st December, 1911, was 2,714,181 tons. The seams worked are 35 feet and 18 feet thick, the latter occasionally split into smaller seams by partings of variable thicknesses. The mines are equipped with efficient haulage and pumping plants, air-compressors, loading banks, screens, and suitable machinery for conducting the works. Kaitangata Mine is ventilated by an electrically-driven fan, and Castle Hill by a furnace. The collieries are connected by private branch lines with the Main Trunk Railway at Stirling Station.

The average composition of samples of coal from these mines is:—

| | |
|---|---|
| Fixed carbon ... ... | 44.17 |
| Hydro carbons ... ... | 38.24 |
| Water ... ... ... | 2.17 |
| Ash ... ... ... | 2.17 |
| Sulphur, 2 to 3 per cent. | 100.00 |

Next in importance is the Green Island coalfield, which includes Abbotsford and Saddle Hill, etc. During 1911, 72,025 tons were raised from this field for consumption in Dunedin and surrounding districts. The total output to 31st December, 1911, was 1,352,228 tons. In the several collieries forming this group the seams vary from 12 to 20 feet thick. Two branch lines of railway connect the mines with the main line at Abbotsford and Green Island Railway Stations respectively.

The average composition of the coal from this field is:—

| | |
|---|---|
| Fixed carbon ... ... | 40.84 |
| Hydro carbons ... ... | 36.57 |
| Water ... ... ... | 18.67 |
| Ash ... ... ... | 3.92 |
| Sulphur, 2 to 2.4 per cent. | 100.00 |

OTHER COALFIELDS.—Other mines in Otago having considerable outputs are the Waronui, Milton, and Taratu Coal Company, Lovell's Flat, each having private branch lines of railway from the collieries to the main line.

In Central Otago the chief mining centres are Alexandra, Clyde, Bannockburn, and Roxburgh.

### SCHEELITE (Calcium Tungstate)

Scheelite has been mined in Otago for some years. It occurs in gold-bearing lodes, is concentrated during the process of gold extraction, and shipped to Europe, where the tungstic acid prepared from it is used in the manufacture of high-grade steel. Tungsten steel is mostly used for making high-speed, self-tempering engineers' tools, and for the inner tubes of big guns. The tungsten imparts to the steel increased hardness and toughness.

Tungstic acid is also made into some fine grades of paint, moreover, it is used by dyers as a mordant for hardening plaster of paris. Tunstate of soda is used in conjunction with starch for renderng light fabrics non-inflammable.

The main sources of supply of this mineral in New Zealand are Glenorchy (Lake Wakatipu) and Macraes, both in the Otago province.

GLENORCHY.—During the year the output from the Glenorchy Scheelite Syndicate's mine was 33 tons scheelite concentrate (72% WO/3), valued approximately at £3,180. Six other parties are prospecting in the district, the ore produced being brought into Glenorchy for treatment. During the year the output from these scattered propositions amounted to 30 tons of 72 per cent. concentrate, valued at £2,900.

MACRAES.—During the year the Highlay Tungsten Mine, which was developed and successfully operated for many years by Messrs. Donaldson Bros. (the pioneers of the scheelite industry in the Dominion), was sold to a Christchurch syndicate, who have since carried out operations on a larger scale.

Professor D. B. Waters, A.O.S.M., supplies the following report of operations on this field:—

"Gold and scheelite-bearing reefs have been worked more or less continuously in this district for fully 20 years, but most of the work done has been on a small scale. The known reef-bearing area extends from Dunback to Hyde, a distance of 20 miles, but the width is probably not more than two miles. The field is accessible, no part being more than 16 miles from a railway station.

"The reefs are easily worked, and the ore is readily crushed; but so far the methods employed for saving scheelite have been crude. The whole system of treatment requires alteration. The mines can be very cheaply worked, but large areas require to be held for economical working. This field possesses considerable possibilities, and should prove a field of mining activity for many years to come.

"At present much prospecting is going on, there being ten companies at work; but only three of these have so far reached the producing stage."

Scheelite is sold on the tungstic acid basis, at prices which fluctuate between 24/- and 34/- per unit. The quantity of scheelite exported from New Zealand in 1911 amounted to 138 tons, valued at £11,853. The total output since 1899 has been 813 tons, valued at £66,918.

### OTHER MINERALS OF ECONOMIC VALUE

CINNABAR.—Samples of this mineral are found in the alluvial claims in Nevis, Nokomai, Waipori, and Waitahuna. A sample from the Carrick Range contained as high as 82 per cent. of mercury, whilst samples from Waipori and Waitahuna contained from 70 to 75 per cent. of the metal. So far no payable lode of cinnabar has been found in Otago.

ANTIMONY.—According to Hutton and Ulrich's "Geology of Otago," samples sent from the Carrick Range yielded 50 to 54 per cent. of antimony, whilst a sample from Miller's Flat, Tuapeka, contained 58 per cent. of metallic antimony. An antimony lode exists on the west bank of the Molyneux River, Alexandra. In 1900 a few tons were sent to Melbourne for assay. Samples were also assayed at Otago and Thames Schools of Mines, and by the Government Analyst. The report from Otago School gave 65 per cent. metallic antimony, Thames 50 per cent., and the Government Analyst 52.8 per cent. It was found, however, that the cost of production and heavy freights in conveying the mineral to a seaport town absorbed the profits. The mine was kept unwatered until August, 1911, when pumping was discontinued.

COPPER.—Samples of copper ore, containing 13.5 per cent. of metallic copper, have been found on the Carrick Range; others containing 10 per cent. from the Arrowtown district. A sample discovered at Moke Creek, near Queenstown, contained 24 per cent. of metallic copper, the sample also containing gold. Copper has also been discovered at Ready Creek, Waipori, and a parcel of undressed ore sent to N.S.W. was reported to yield 11 per cent. copper. Machinery was erected, but the cost of drainage was heavy, and for various causes the work was discontinued.

In 1904 a quantity of ore was taken from the Wakatipu lode, and parcels were sent to Thames and Dunedin for valuation, but development was not continued.

A recent discovery of copper in the hills south of the Mataura River is attracting some attention amongst prospectors in North Southland. Samples have shown the presence of copper in varying amounts from 3 to 12 per cent.

GRAPHITE.—Graphite is found at Gibbston, Otago, where it is of fair average quality, and near Bannockburn in the schists.

MICA.—This mineral, which is so largely used in electrical machinery, occurs at a high altitude at the head of George Sound, Western Otago, in the gneissic schists. A company was formed to develop the deposit, but the prospects met were not very encouraging, and in a short time work was abandoned.

ASBESTOS.—A deposit of asbestos was discovered in the vicinity of Milford Sound in 1886, but its position was rather inaccessible for economic working. The mineral has also been found on Mount Cairnmuir and Mount Pisa, Central Otago, but not in profitable quantity.

ROCK PHOSPHATE.—In 1901, a deposit of rock phosphate was discovered at Clarendon. Since that date active development has proved the deposit to be a most valuable one. The rock is calcined on the ground adjacent to the workings, and afterwards forwarded to the chemical works for treatment and conversion into artificial manures. The Ewing Phosphate Company treated 10,000 tons of this mineral during 1911.

BUILDING SAND.—Fine quartoze sand occurs in large quantities on the Freeman's Colliery Company's property, Abbotsford.

MARLS.—These are abundant in the Lower Tertiary coal-measures at Burnside, Puketeraki, Waikouaiti, and Oamaru district. They are marine muds of uniform composition, and hence of great value in the manufacture of cement. During the year 1911 the quantity produced at Burnside was 6,600 tons.

### FUTURE PROSPECTS

It would be a needless affectation to shut our eyes to the fact that the richest and most accessible of our alluvial gold has already been won. It is, however, quite certain that much gold still remains buried in the deep terrace gravels and lacustrine drifts of the Clutha Valley and Central Otago. The successful working of these deposits is a problem involving the expenditure of considerable capital. The development of these gold deposits is a matter that should be encouraged both by private and public enterprise, and while it would not be advisable for the Government to become owners of gold-mines, or even silent partners in such ventures, it is desirable that the preliminary work of prospecting should be subsidised on a liberal scale.

Systematic prospecting ought to be undertaken in the mountainous regions lying west of Lake Wakatipu and Lake Te Anau, and a careful search made for the rarer minerals, such as scheelite, monozite, and tin ore.

Owing to the activity now being displayed in the development of sheelite-producing mines, a considerable increase in the production of scheelite may be anticipated, unless the market price falls.

The amount of brown coal in Otago is estimated at 217,000,000 tons. The quantity available is sufficient to supply the domestic requirements for some 100 years or more; moreover, it is certain that in time to come much of the inferior coal will be used for the generation of electric energy at the mines for transmission to Dunedin and other industrial centres.

# Engineering

## THE BROOKFIELD SILENT ENGINE

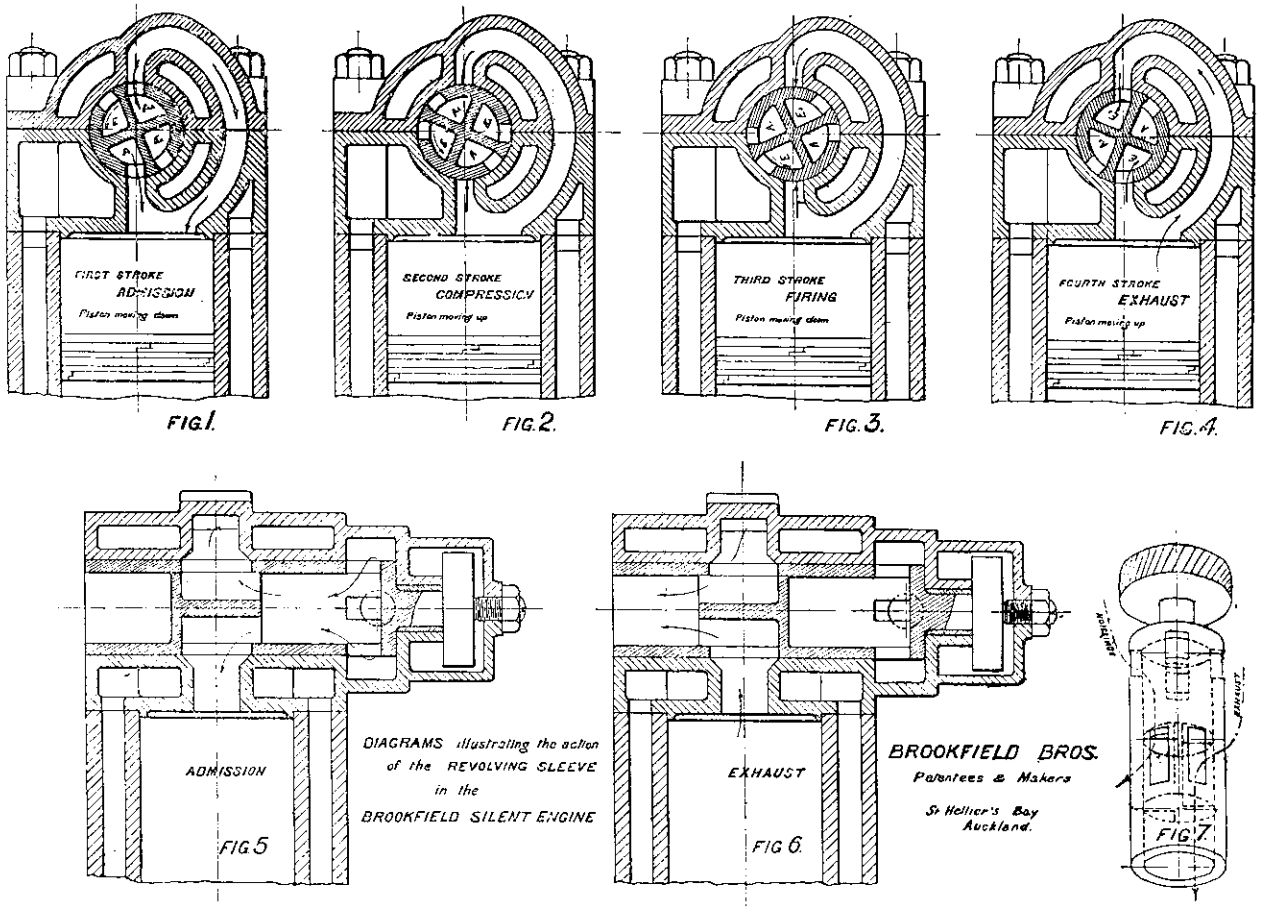
By Chas. C. Allen, Wh.Ex., A.M.I.M.E., Auckland

The adoption of the Daimler Motor Co. of the Silent Knight engine marked a new era in the history of motor car engineering. For years the leading motor car manufacturers had spared neither time nor expense in attempting to make cars more silent, apparently without realising that much of the noise was due to the impact of the cam and spring actuated valves. The possibilities of the silent engine were, however, fully appreciated by the Daimler Company who, after careful experimental investigation, did not hesitate to discard, in the case of their most up-to-date cars, the elaborate and expensive tools they had made to facilitate the interchangable manufacture of an engine thoroughly efficient and satisfactory except as regards silence. The Silent Knight car, when put upon the market, was a revelation to the motoring world.

Up to the present, however, very little seems to have been done in connection with silent engines for marine purposes. Messrs. Brookfield Bros., of St. Helier's Bay, Auckland, are, after exhaustive tests, putting upon the market a silent engine specially designed for launch work. They have just completed a 30 h.p. launch engine, and are now engaged upon the adaption of their design to motor car work.

The following advantages are claimed for the new Engine:—1. Perfect silence of all working parts. 2. Economy in fuel. 3. Durability. 4. Reliability. 5. Total absence of springs. 6. More powerful (taking like dimensions). 7. Flexibility. 8. Perfectly steady running.

The design is totally different from that of the Silent Knight engine. In the latter the valves are replaced by a reciprocating cylindrical sleeve encircling the cylinder. In place of this Messrs. Brookfield Bros. employ a balanced revolving valve placed on top of the Cylinder and driven from the crankshaft by means of two pairs of helical gears and a vertical shaft. The explosive gases are ad-



mitted at one end of the sleeve and the products of combustion are exhausted at the other.

The manner in which the explosive and exhaust gases are controlled is shown by the accompanying diagrams. The sectional views represent vertical sections through the centre of the cylinder.

Separate pairs of ports are employed for admission and exhaust, the large port area provided allowing the gases to pass to and from the cylinder very freely. Fig. 7 illustrates the arrangement of the ports.

Figs. 1 and 5 illustrate the admission stroke.

The downward movement of the piston tends to cause a partial vacuum in the cylinder, and the explosive gases enter through the admission ports which simultaneously open and close at the beginning and end of the stroke respectively.

Fig. 2 illustrates the compression stroke.

The upward movement of the piston compresses the explosive charge. As the ports in the valve casing are exactly opposite each other and equal in area the pressures on the two sides of the revolving sleeve balance and there is no tendency to cause any frictional resistance to the rotation of the sleeve during this stroke.

Fig. 3 illustrates the firing stroke.

Upon the explosion of the compressed charge by the electric spark the piston is forced downwards. The pressures on the two sides of the revolving sleeve balance each other and no frictional resistance is caused.

Figs. 4 and 6 illustrate the exhaust stroke.

As the two ports open simultaneously the exhaust gases commence to leave the cylinder and the upward stroke of the piston completes the discharge.

The sleeve casing is water jacketed in the same way as the engine cylinder. This prevents overheating and makes the efficient lubrication of the sleeve a simple matter.

The passages in the sleeve casing are traversed by both the explosive and exhaust gases. The latter during their journey heat up the metal to a certain extent. The explosive gases, which follow immediately, absorb a portion of this heat and become completely vaporised, a considerable cooling effect being produced. Owing to the complete vaporisation of the charge the firing stroke is more powerful than in the case of the ordinary type of engine, and fuel is saved.

The ordinary tappet valves are subject to many disadvantages, such as pitting, wear, broken stems, broken springs, etc. In many cases engines are kept at work as long as they will run, although much power may be lost and fuel wasted owing to valve defects. In the revolving sleeve engine such disadvantages are altogether absent. The sleeve is simply made a working fit in the casing, both cylindrical surfaces being ground, the only clearance provided being that sufficient to admit the film of lubricant. As the sleeve is perfectly balanced at all times there is practically no friction, and, therefore, practically no wear. Valve troubles are quite eliminated.

In the ordinary type of engine a considerable amount of power is absorbed in driving the valves which are held in position by springs. When opening the exhaust valve the pressure on the valve head has to be overcome, in addition to the spring resistance. In the Brookfield engine there is no such waste of power developed in the cylinder, as the balanced sleeve revolves quite easily at all times.

Before the revolving sleeve was adopted most extensive tests were made as to reliability. In one case the engine was run continuously for several hours without oiling the sleeve and without allowing the circulating water to pass around the sleeve casing. The experimental engine has been running continuously at full load from six to twelve hours a day for the past 15 months, and the sleeve is as good as when first put to work.

## The Electrification of Coal Mines

By W. Leonard Parker, B.E.

(Continued from page 38)

Some nineteen miles up the coast is the quiet little township of Ngakawau, a settlement which has grown since the opening of the Stockton Colliery in 1905. The conspicuous object of the town is a long white building with a tall black chimney. This indeed is the power-house of the Stockton mine, from whence energy is sent six miles inland to the substations on the hilltops directly over the mine itself. Behind this building and nestled under the hill is the great coal bin, with that semi-circular roof which makes it look like a garrison hall on stilts. It is here that the coal is deposited when brought from the mine, and from beneath this structure issues a stream of waggons, laden with "Stockton" on its way to the shipping depôt at Westport.

The Power House is built of ferro-concrete, and accompanied by a steel stack 120ft. high. The main engine room contains two generating sets of equal size, and there is room (in case of extension) for two more. The units are each 300kw. alternators by the British Thomson-Houston Company, and are directly connected to triple expansion Bellis-Morcom steam engines, which run at 400 r.p.m. Though situated in wild surroundings those machines are of modern design, being fitted with automatic compound governors. They are supplied by four Babcock and Wilcox boilers.

On the electrical side of this equipment, the alternators are excited by two steam driven dynamos, which is transmitted through slip rings to the rotating fields. Power House lighting and workshops power is provided for by a motor-generator set running off the 6600-volt mains, and generating 100-kw. direct current at 250 volts.

The bins are fitted with conveyors and screens for handling the coal, and all are separately driven by direct current motors.

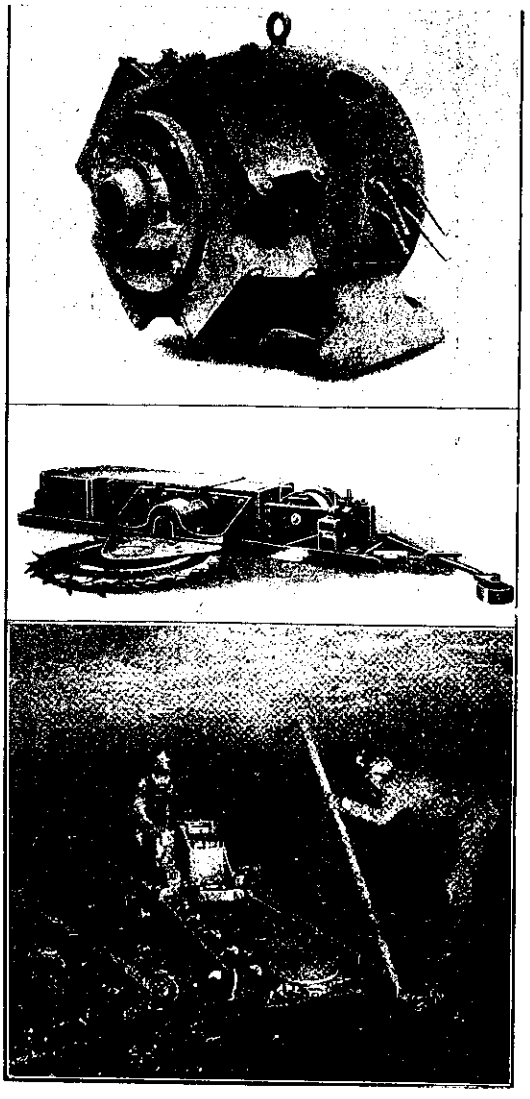
Immediately behind the bins and connected therewith by a short bridge is the entrance to the Ngakawau tunnel, in which a third of a mile of single track pieces the first range of foot hills. The grade is one in sixty, sloping towards Ngakawau.

At the tunnel mouth is an electrically driven winding engine, by which the coal, in races of 25-tubs, is conveyed through the tunnel to the bin tips. Thus coal can be conveyed through the tunnel at the rate of 250 tons per hour. A brief walk through the tunnel brings us out suddenly at the bottom of a deep gully, across which is a short bridge. Up the opposite side through a long ribbon of cleared bush, stretches a double track cable road. At the base where we stand we hear the clang of clip-chains as the rope boys busily detach coal from the "full" road, and send up empties on the other track. In this manner a stream of loaded tubs is being collected, and sent through the tunnel, while the rope is replenished by empties sent back in return.

The incline is 33 chains in length, and has a grade of one in three. From the foot it runs straight up to the sky line, where the long row of tubs, looking small in the distance, disappears over the brow.

The locality is surrounded by splendid bush, and to the left can be seen, nestled in the shade, a saw mill for cutting the mine timber. But the cable road has no eye for scenery, and goes straight on, past this spot, soon diving into a tunnel speckled with glow-worms. A short run (or climb, for the grade is one in five) brings us out into daylight again, with bush on either side, and Top Brake just out of view over the next ridge. This latter part of the incline is 40 chains long, and the summit is 1000ft. above sea level. At this point the rope road connects with an electric railway, which winds up over the flat tussock-covered tableland by a tortuous route, with grades usually regarded as unworkable by pure traction. The gauge is 36", and 65-lb. rails are used, there being a centre rail for the Fell Brake, which is used when descending. This line extends for five miles further inland to within the mine workings. There are three sub-stations connected with the 6600-volt three-phase transmission line from Ngakawau. These are situated along the railway line, and each contains a motor-generator set consisting of a squirrel-cage induction motor of 290 h.p., and a six-pole direct current generator developing 200 kw. at 250 volts. A quarter of a mile from the Top Brake No. 1 sub-station is supplemented by a running shed with workshops and smithy. It forms the head quarters of the line, and in the running shed are facilities for the regular overhaul of the electric locomotives. Thus they are rendered very reliable, and trouble caused by breakdowns is seldom, if ever, heard of, in spite of the severe treatment to which the motors are subjected.

The locomotives themselves are of the type peculiar to mines, made by the General Electric Company. The frame is of rigid iron castings, fitted closely together, and carrying the four axle boxes. It contains two motors each of 100 h.p, controlled by the Sprague system. The draw-bar pull at 8 m.p.h. is 7500lbs. These motors do splendid work against grades of one in ten, and erratic curves, on mountain railway the like of which it would be difficult to find in New Zealand. Being intended for work underground, they are built low, and stand 39" above the rail, and the total weight 40,000lbs. Besides three such locomotives for the main line, there are two smaller ones exerting one-third of the tractive effort, and used for feeding and shunting in the mine workings. While the larger locomotives are fitted with Fell Brakes, these are not, but each carries the usual hand-brake, and is fitted with a large flat reel of cable, lying horizontally on the top of the locomotive frame. When entering any section in which no overhead wire is



(Top) Gas Tight Motor of the General Electric Co.
(Centre) Electric Coal Cutter of the Rotating Disc Type
(Bottom) Electric Coal Cutter of the Chain Type used in Stockton Colliery

fitted, this cable is trailed behind as a substitute for the trolly wire. It may also be re-wound automatically on the return of the locomotive.

*(To be Continued)*

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The total quantity of Portland cement produced in the United States last year was 78,528,637 barrels, equivalent to 13,321,822 tons, the value of which was 4.97 dollars per ton.

# ONE AND A HALF TONS OF GAS A MONTH

## Acetone Gas (Dissolved Acetylene) and Oxygen

It is astonishing how these two gases are coming into use nowadays, general engineering, motor car and marine lighting each offer a large field for their use.

Engineers and shipbuilders use perhaps more than others, and it is surprising how these gases, which a few years ago were only known in the laboratory, are being used by the manufacturers at the present day.

If the spirits of scientists and chemists of bygone days could only return and see what a change the work they commenced has wrought on the methods of their day, it should place their souls in peace for evermore.

The Acetone Illuminating and Welding Company, Ltd., of Napier (who are the sole manufacturers of the above gases in the Dominion), are at present turning them out at the rate of 1½ tons in weight each month, and they expect to double this output in the near future.

To the man in the street it seems incredible that this quantity could be consumed in a month, but times have changed, and to-day any system that is a labour-saver must go ahead.

It is interesting to follow where all this gas is consumed, as, although the engineers are the largest users they have not got the whole field to themselves, for the motorist largely uses dissolved acetylene for lighting his car, the up-to-date garage proprietor consumes a fair amount with his welding apparatus for motor repairs, the plumber uses oxygen combined with coal-gas for leadburning, the jeweller also finds a use for the same appliance in his business, doctors and dentists both use oxygen in their professions, and even the picture showman is commencing to consume his quota on account of the brilliant light the combination of these gases give.

Last but not least is the consumption for coast lights and buoys, and already several of our coast lights are equipped with the acetone-gas apparatus, which, owing to its ingenious design, produces flashes of light every few seconds, and as the gas store is replenished every six months or longer period if necessary, this apparatus continues to throw its warning flashes to mariners, doing this mechanically, and thereby relieving the coastal authorities of the necessity of providing someone to bury himself for long periods on desolate spots to watch the apparatus.

Acetylene is a gas which expands and contracts to a marked degree as the temperature rises and falls, therefore when cylinders are being refilled the pressure shown by the gauge is not sufficient check on the quantity of gas in the cylinder. The cylinders are therefore weighed when empty and charged until they contain their full complement of gas by weight. Two hundred cubic feet of dissolved acetylene weighs approximately 14lbs., and oxygen is slightly heavier. This gives anyone caring to go into figures an idea of the amount of these gases used in the Dominion for industrial purposes.

Considering the industry is practically in its infancy, the manufacturers, from present indications, hope to turn out their peculiar material at the rate of a ton a day in the course of the next few years.

Acetone Gas Light Beacon Fitted with Flashing Apparatus

It certainly would be a shock to the scientific spirits we referred to previously if they could now see the gases which they experimented with in litre measures, being turned out by the ton in weight much as a miller turns out flour.

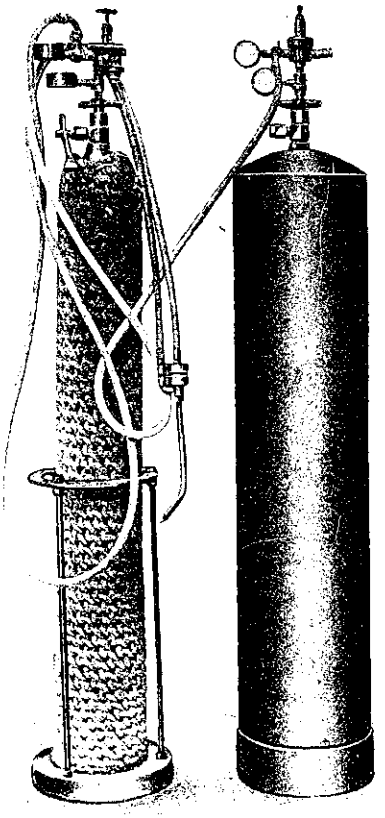
# ASTRONOMICAL NOTES FOR OCTOBER

By the Hon. Director Wanganui Observatory

THE SUN is in the constellation Virgo during the month. His declination is now south of the equator, increasing from 3.1 deg. on the 1st, to 14 deg. on the last day of the month; his altitude at noon will be greater by the difference of 11 deg. during the same period. The Sun's surface has been practically free from spots during the past month, but as we are now past the period assigned for its inactivity of this nature, a good look-out should be kept, as large spots may break out now at any time.

ECLIPSE.—There will be a total eclipse of the Sun on the 11th, but this will not be visible in New Zealand. The line of central contact passes across South America and the Southern Ocean, but does not reach to our longitude.

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 Mars and Mercury on the 11th; Venus on the 13th, in the morning, but will be seen near the bright evening star on that and the preceding evening; near Jupiter on the 14th and 15th, and near Saturn on the 24th. Her path through the constellations visible in our evening skies at about 8 p.m. is as follows:—As a crescent in Libra on the 13th; Scorpio on the 14th and 15th, and nearest



The Apparatus employed in Autogenous Welding

the bright red star Antares on the 14th; Sagittarius on the 16th, 17th, and 18th; Capricornus on the 19th and 20th; Aquarius on the 21st and 22nd; Pisces on the 23rd, 24th, and 25th; Aries on the 26th and 27th; Taurus on the 28th and 29th; and nearest the bright star Aldebaran on the 29th; Gemini till the end of the month.

THE PHASES OF THE MOON in New Zealand mean time—

| | | |
|---|---|---|
| Last quarter ..... | 4 days 8hrs. | 18min. a.m. |
| New Moon ..... | 11 days 1hr. | 11min. a.m. |
| First quarter ... | 18 days 1hr. | 36min. p.m. |
| Full Moon ..... | 26 days 1hr. | 32min. p.m. |
| Perigee ..... | 8 days 6hrs. | 18min. a.m. |
| Apogee ..... | 20 days 1hr. | 30min. a.m. |

MERCURY is a morning star at the beginning of the month in Virgo. He is in superior conjunction on the 4th, after which he will be east of the Sun. He will be in con-

Night Photograph taken from Car Lighted with Dissolved Acetylene.

junction with the Moon on the 11th; in conjunction and very close to Mars on the 14th; in his descending node on the 16th, and in Aphelion on the 26th.

VENUS is now an evening star shining brightly in the western evening sky. She is in her descending node on the 9th, in conjunction with the Moon on the 13th, and setting later night by night as the month advances.

MARS is still east of the Sun, but too close to our luminary to be observed at this time. He will be in conjunction with the Moon on the 11th, and will make a close conjunction with the planet Mercury on the evening of the 14th.

JUPITER is still an attractive object in the evening sky, in Scorpio, and well over to the west of the meridian in the early evening hours. He is in conjunction with the Moon on the morning of the 15th, and may be seen near our satellite on that and the preceding evening. His "belts" still form a very attractive spectacle when the planet has not got too near the horizon in the early evening, and the most interesting eclipses, transits, and occultations of his satellites may be viewed on the following evenings:—1st, 2nd, 3rd, 7th, 8th, 9th, 10th, 12th, 16th, 17th, 18th, 19th, 25th, 26th, and 28th.

URANUS is a evening star in Capricornus, and is stationary on the 10th. He is in conjunction with the Moon on the evening of the 18th, and in quadrature on the evening of the 23rd.

NEPTUNE is in Gemini. He will be in conjunction with the Moon on the 5th.

THE CONSTELLATIONS for the middle of the month at about 8 p.m. are placed as follows:—The great square of Pegasus is prominent in the north, with Aquarius and Capricornus over it; Pisces Australis is over those again, the fine star Fomalhaut being near the zenith. In the east, Cetus, the sea monster, is now well above the horizon, while Pisces is more to the north, with Aries rising under the Fisher. Towards the south-east the long trailing shape of Eridanus and the fine star Achernar is seen. East of south is Argo and the great Canopus, now rising well up in the sky. The Cross and "Pointers" are well down in the south-west, with the Triangle and Paro over them. The Scorpion is getting down in the western sky, followed by Sagittarius, while the last of Ophiuchus and Serpents are over the western point. Cygnus and Lyra are moving down to their setting in the north-west, with Aquila over them and the Dolphin.

# Motoring and Yachting

## HERE AND THERE.

Wireless telegraphy has developed so quickly, and now attracts so little attention, except when it is the means of announcing some catastrophe, that its simplicity is hardly realised by most people. "Complete wireless installations," says "The Era," "for sending and receiving messages over short distances, are now so compact and so cheap, that it is quite easy to equip a motor car, so that it can communicate with wireless stations, or with similarly-equipped vehicles up to a distance of about twenty miles. The cost would probably range from £10 to £20." This new adaptation of the "wireless" opens up the question as to whether cars that are used for touring will yet carry their own means of communication. There's no doubt, many a motorist, when he is stalled on the roadside, miles from assistance, would welcome such means of communicating with the nearest garage.

Some little time back attention was drawn to the risks attending motor cyclists carrying a passenger suspended over the back wheel of their machines. The practice is evidently proving popular in England, for many of the fair sex are to be seen at week-ends, being carried pillion fashion, sitting on a cushion, which is strapped on the luggage carrier. The leading English cycling journal has now taken the matter up, and strongly condemns the practice on the grounds of personal risk, and as one—owing to its inelegance—not likely to popularise motor cycling.

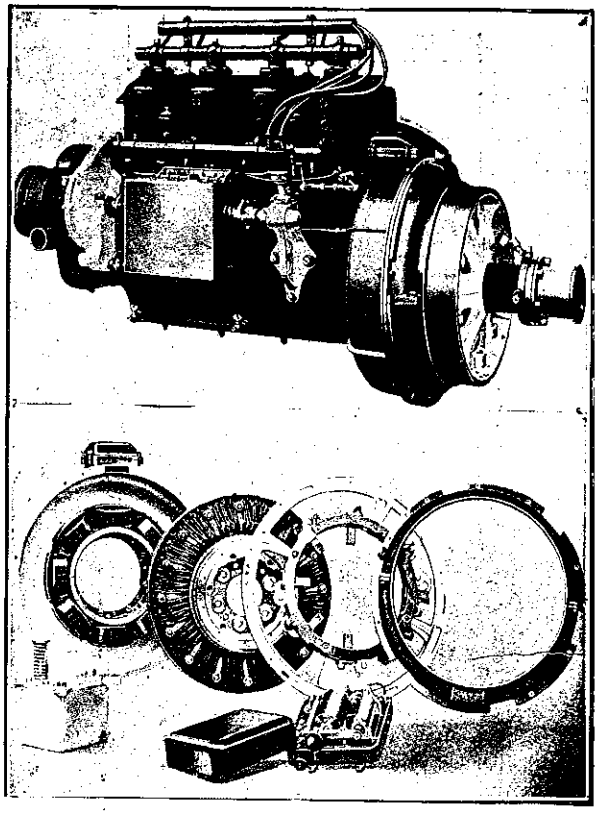
That the American car has caught on in Australasia is very evident by watching the different makes running about on our roads, but few motorists realise to what an extent the American car is pouring into this country. Official figures from the United States show that out of 2222 motor cars exported in March last, 364 cars came to Australasia, of a total value of £66,875. This is for one month only. The export of American cars to Australasia in March, 1911, was valued at £16,779, so that in the comparatively short time of twelve months Australasia's imports of American cars have quadrupled. From the look of things this country is going to prove a very profitable market to the American motor industry.

## NOTES

By Our London Correspondent

We are all very disturbed at this end of the world because of the high price of motor spirit. The ruling figure charged in the larger cities is 1/6 a gallon, while "out west" and in the Scotch Highlands one often has to pay up to and over 1/9. Indeed I, myself, was bled a couple of shillings for a gallon of this precious fluid only last week. It is not as if petrol had reached top price, there are indications that it may still go higher. Hence the panic.

The leading motoring organisations are looked to to find a panacea, but they are by no means hopeful of doing so. Well, if motor spirit is going to become more of a luxury it will not be much use to the motor industry, and this suggests the feas-



(Top) Rambler Unit Gasoline and Electric Motor for Starting, Lighting and Ignition
(Bottom) Parts of Rambler Motor—Generator Unit

ability of developing and popularising other fuels of lower grade and price. Kerosene has been used with certain carburettors, and can be shown to be a perfectly practicable source of power. The chief obstacle to its use, as a writer in the (English) "Motor" points out, is prejudice and a complete misunderstanding as to its value and utility. To tell one's friends that the commoner grade of kerosene keeps the engine cooler and the interior of the cylinders in an ideal state of cleanliness, and that it increases slightly the power and flexibility, is to provoke mirth. Yet this is actually so. There is no doubt that the complications resulting from the difficulty of starting upon kerosene are more

visionary than real; none the less it is they which daunt the amateur and private owner. The contributor to the "Motor," to whom I have referred, says, *inter alia*, "One of the principal drawbacks (if it is a drawback) to the use of kerosene, is the absence of any device to start up the engine from cold, and this conveys the idea of unnecessary complication." He then goes on to point out how the motorist can avoid all trouble by having his car fitted with both petrol and kerosene carburettors, thus becoming absolved from all chance of being stuck for fuel, since he can, assuredly, obtain supplies almost anywhere.

Hydroplane "Ferro" built by Mr. Levy, North Shore, Auckland, for Mr. H. T. Whitson
Dimensions: 20ft. long, 3ft. 6in. beam, 17½h.p. Ferro Engine. Measured speed on 3 knot course, 20.25 knots or 23.32 miles per hour.

Another well-known English authority contends we are but beating the air in our present efforts to utilise kerosene or to force the petrol interests to reduce prices by getting our motor organisations to institute a campaign of wholesale purchase and resale on behalf of motorists. What is really required, declares this authority, is that we should *develop the use of alcohol as an alternative fuel.* This means nothing short of a redesign of engines and carburetting devices and, most important of all, the removal of the present Government restrictions on the manufacture and production of alcohol, which hamper and prevent the possibility of development.

However, this would not directly interest the well-to-do and pleasure motorist, for he probably would stick to motor-spirit. What it would do, would be to give a huge impetus to the motor industry generally, since alcohol at a few pence a gallon opens a huge field of industrial usage.

It must not be thought that the present high price of petrol is solely the result of Trust manipulations. This is not so, for it, undoubtedly, is largely due to the fact that the huge demand for petrol is leaving on the manufacturers' hands a vast supply of by-products, the very quantity of which leaves them a drug on the market. Hence the petrol user has to have his own special fuel charged with a proportionate amount of the unmerchantable value of these.

Let us therefore turn our eyes to the inventor and implore him to give us simple and automatic kerosene vapourisers, and also reasonably efficient alcohol engines. With these latter in our possession it should not be long ere the Government removed their embargo on the production of alcohol from potatoes and other forms of vegetation.

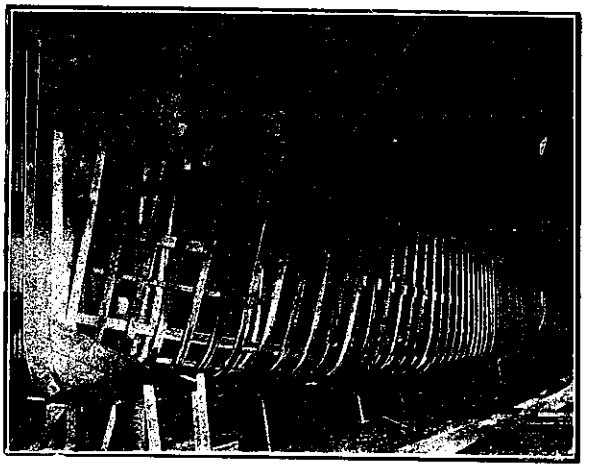
## THE RIGHT TO WALK

The precocious season of 1912 is already anticipating that period when the Big Gooseberry and the Sea Serpent supplement the lack of exciting news. A discussion which, in all fairness, should have been reserved for the Silly Season has already broken out in a portion of the London Press on the question of "The Right to Walk." Of course the fundamental reason for the discussion is the motor car; be it a taxi, bus, business van or private vehicle.

How to diminish the number of accidents which occur in London and which have shown an appalling increase since the adoption of motor traffic is a very vexed question. Moreover questions of a similar, though less grievous nature will, some day, no doubt be raised in most cities. A tremendous number of school children are killed annually, and this, incidentally is evidence that the majority of the accidents are due, not so much to the drivers of vehicles, as the poor unfortunate victims themselves.

With a view to improving matters, if only to a small degree, a writer in the "Palladium" (England), suggests that in every school the children should be taught this one rule:—"When crossing "the road, first look to the right: on reaching the "middle of the road, look to the left."

Such a rule might attain to legendary value, if it were inscribed in bold letters on the walls of our



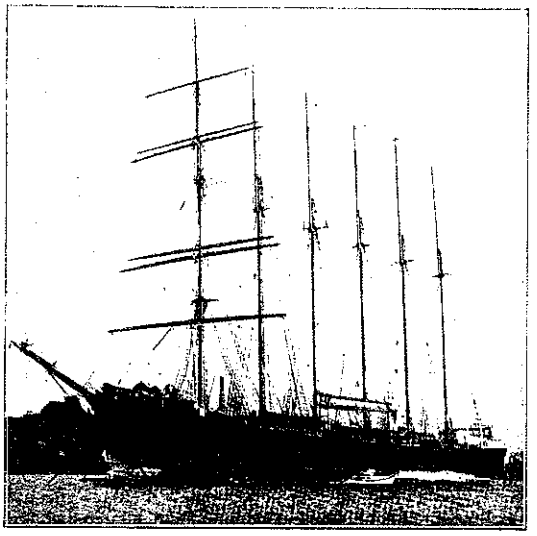
Building at Messrs Harvey & Lang's, Auckland. (see p. 100)

primary schools. Furthermore, if the public generally could be induced to an observance of it, it is no exaggeration to say that a full half of the accidents to pedestrians would never take place. All of us motorists in London, aye, and in the world at large, have had dozens of uncomfortable thrills because of fearsome acts of careless folly on the part of foot passengers. I refer, of course, to instances where it has required the exercise of instant presence of mind (and muscle, too) on the part of the motorist to avoid colliding with purblind pedestrians.

## THE DUST NUISANCE

It may not be amiss if I recall that other grievance of the non-motoring public; to wit the dust nuisance. The tons of printers' ink which were spilled over this grievance; the millions of angry protests; the ponderous discussions which were held, including international conferences on the subject—all these are of such recent memory, yet at the same time so distant that one wonders where are all these things now. Out of the chaos of recriminations the fundamental source of the trouble—the dust itself—has been "discovered," and a fundamental remedy applied. The roads must suit the traffic, not vice-versa. As easy for Canute to order the tide to cease advancing as for the anti-motorist to command the stay of the car's progress. Yes, and equally futile.

Road dust means the disintegration of the road surface. Ergo, alter the constitution of the road surface. Make it dustless. This has been done throughout the length and breadth of the land,



An Ocean-Going Timber Schooner Fitted with Wireless Telegraphy

principally out of the special funds derived from "super" motor taxation. And the result is excellent. Incidentally it proves the insufficiency of water-bound macadam for roads where motor traffic is heavy.

## An Ocean-Going Timber Schooner Fitted with Wireless Telegraphy

It is interesting to see a mere sailing ship fitted with wireless when thousands of passenger steamers have not that wonderful yet comparatively cheap means of communicating with help in case of accident.

The six-masted schooner "Everett G. Griggs," spoke Sydney the other day when 1500 miles away, and her messages were heard perfectly clearly.

She arrived in Sydney some 16 days after with 2½ million feet of lumber on board from Puget Sound. The illustration shows her lying at anchor in Johnston's Bay, Sydney Harbour. As will be seen, she is square rigged on the foremast and fore and aft on the rest of the sticks. The "Everett C. Griggs" was built at Belfast by the famous firm of Harland and Wolff. Her dimensions are 308ft. 2in. length over all, 42ft 9in beam, and 25ft. 1in. depth, and her tonnage is 2518 tons.

She is spoken of as a good seaboat, handy and particularly fast on a wind. Captain Stirling, her master, is very proud of her.

## Yachting Notes

Messrs. Collings and Bell, of St. Mary's Beach, Ponsonby, have their works full of orders at present. During the last two months they have completed a 30ft. launch fitted with a 10 h.p. Doman for Mr. Woolley; a 30ft. launch, 10 h.p. Doman for Mr. Ayling; a 32ft. x 8ft. auxiliary also fitted with a 10 h.p. Doman, for Mr. Mansfield; a 28ft. launch, fitted with an 8 h.p. Stanley engine, for Mr. Pegley; a 20ft, runabout launch, 5 h.p. Perfection engine, for Mr. Robinson. They have on the stocks nearing completion two 32 x 8 cruising launches being fitted with 15 h.p. Doman engines; a 26ft. launch to be powered with a 10 h.p. Doman; and have sent quite a number of Doman and Perfection engines to different parts of the Dominion.

The firm have a large number of engines and quantities of accessories to arrive soon by early steamers.

Messrs. Harvey and Lang's new shed in Freeman's Bay presents a lively appearance just now, there being abundant work in hand and on order. Amongst the principal work is a fifty-foot tunnel launch for passenger service in shallow waters. This vessel is remarkable for the unusual style of her construction. The usual practice followed in New Zealand in the building of a single skin boat, is to plank her first on moulds and then steam-bend the timbers or ribs into place, afterwards removing the moulds as the timbers are fastened off. In this tunnel launch the practice of the American and English builders is being followed, viz., the ribs have been put in first and fastened to the keel and gunwhale stringers, and the vessel is being planked up on the ribs and fastening proceeds with the planking. The illustration shows her in frame with the garboards and one streak on. She looks a fine substantial job and is a fair sample of this firm's excelent work. The firm have just completed a 22ft. Mullet boat for Mr. Parker, of Auckland; she has 3ft. 4in. beam, and is a handy looking craft and should develop a fair turn of speed. A 26ft. launch for Mr. Lorrens, of Ponsonby, is just about completed; she is to be fitted with a 5 h.p. Regal engine.

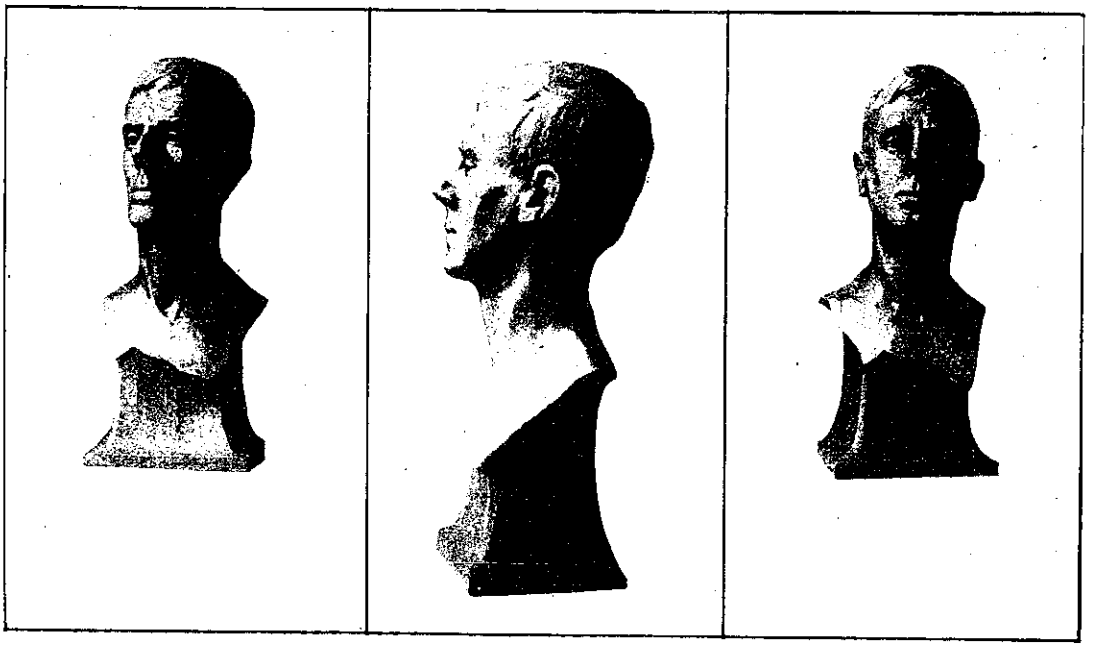
The keel has been laid for a 35ft. tuck stern launch with 8ft. beam, to the order of a local firm, whose specifications call for a pretty good fit-out in the way of cushions, skylight, ventilators, mast, sail, etc. She is to be fitted with a 14 h.p. Silent Rotor. This is something new, and we hope to have some further particulars and perhaps an illustration for our readers next month.

# About the Home

## The Bronze Bust of the Late T. E. Taylor, Esq.

We illustrate a life-size bust of the late Thomas E. Taylor, Esq., which was recently cast in Wellington from moulds made by Mr. Joseph Ellis, Modelling Master at the Technical School.

The bust was cast by what is known as the "A Cire-perdue," or lost wax process. This method has at least two advantages over casting in sand, inasmuch as the artist can work on the wax model after it is taken from the piece-mould and re-touch any part of the model which may have been damaged during the casting process. This is the second and perhaps greater advantage, especially in work in the round—that there is no cutting up of the original model into many parts and subsequent joining and bracing together, no matter how intricate the model may be, it is possible to mould and cast it in metal by the lost-wax method.



A Bronze Bust of the late T. E. Taylor, Esq. (cast in Wellington)

How exciting and what anxious work the casting itself is, has been described by Benvenuto Cellini, when he cast his statue of Perseus. Cellini and his contemporaries adopted the wax method when they wished to reproduce their models in bronze, and there seems to be no doubt but that this process, so much used by the Italians is the best way of converting into bronze a model which has many intricacies, much undercutting or free places—*i.e.*, pieces projecting from the model.

We will give a summary of bronze casting by the "A Cire-perdue" method, which may make it easier to understand its possibilities: In the first place a bust or figure is modelled in clay and a plaster of Paris or gellatine mould is made, from the finished bust. This impression is then filled with plaster, and when it has set the outer shell is removed. The next operation is the making of a piece-mould from the plaster model, so that the different parts may be removed; the pieces are fixed in an outer case and covered with a liquid wax to the required thickness, for it has to be remembered that the place of the wax will afterwards be taken by the metal.

Before the wax cast is taken from the piece-mould it is filled with a special composition of brick dust and plaster made to a paste consisteney with water; this forms the "core" or model of the inside of the wax cast; it also serves to support the wax and prevent it from twisting, as the "core" is built over an iron armature. When the brick-dust composition has become sufficiently set, the outside mould is taken away and the sculptor proceeds to remodel any parts which may have been damaged during the casting; especially where the mould has left seams at the joints.

When the wax model has been touched up, it is necessary to insert small rods of bronze through the wax into the "core," and to let them stand out in order to join the outer model to the "core," and so sustain the latter in place when the wax form has been melted.

A few "ducts" are inserted for the outflow of the wax, which does not get absorbed by the mould and "core"; also "vents" for the escape of air during the casting; wax tapers are usually employed for this purpose, and lastly, the "ingates," through which the liquid metal is to flow into the mould. Then the figure is covered by a carefully prepared mixture of clay, brick-dust and plaster, laid on in several layers, and bound with iron bands so as to form a strong shell. When thoroughly dry the whole is placed in the casting pit and through the application of continuous heat the wax is melted and driven out of the prepared channels. Part of it, however, is absorbed by the mould and "core," and helps to strengthen them. Next the mould is packed all round with sand to hold it firm, when the metal is being poured. When the mould is sufficiently cool it is filled with the molten metal, and, if no accidents occur, the metal will rise and fill all the parts left vacant by the wax. When the metal has cooled the outer shell and core are removed, and the casting exposed with its pins, ducts, air jets, and runners; these are trimmed with saws and chisels. The work is then cleaned in a weak bath of sulphuric acid, and eventually in a bath of clean water. The final touching up is done with small chisels, rifles and scrapers. It may be mentioned that this is the first work of art in the round that has been cast in New Zealand by the lost-wax process. The clay model for Mr. Taylor's bust was made by Mr. Mansfield, of Christchurch, and the metal mixing and pouring by Mr. George Stewardson, of Wellington, to whom the commission of casting the bust was entrusted.

The photographs were taken by our Mr. C. M. West.

## A Kitchen which solves the Servant Problem

Under the above heading C. C. Leffingwell makes some pertinent remarks in "Country Life in America" that will interest all women. He says:—

"The subject of this article is the kitchen of a small suburban home which was planned, not by an architect, but by a young housewife, who, having had some training in domestic economy in connection with her college course, spent one year after her marriage in a city apartment, and two years in an average suburban house, which experience gave her some idea of what a kitchen should not be. Now, with this kitchen and the woodwork of the entire house made as smooth as sandpaper and wax can make it, with no fancy mouldings and dust-catchers, she rejoices in the absence of a hired girl from her household.

"The fundamental idea of this kitchen did not come from the old-time kitchen, but rather from a laboratory. The shelves are not covered with pink paper with fluted edges, but are made of glass with nickel fixtures; the dish-cloth racks are nickel; the floor is covered with light blue inlaid linoleum. There are as many windows as the wall spaces would permit, even the doors having Florentine glass panels. The nickel electric light fixtures are placed where every housekeeper knows light is needed—on the wall directly over the sink, and on the ceiling between the table and the stove. There is no labour and dirt-making coal range in the room, nor any unsightly water-boiler and heater. The latter are in the basement, the boiler being connected with the heating plant in winter. All cooking is done with a gas range and fireless cooker. There is a completely equipped laundry in the basement. The kitchen chimney is used only for ventilation; the hood and large register help carry away all cooking odours before they are allowed to diffuse through the room.

"All these improvements contribute to the attractiveness of the kitchen, but the point in which it differs from most architect-planned kitchens is in arrangement. Note carefully the position of every piece of furniture, and their relation one to the other. All the cooking utensils are kept in the lower cabinets, while above them are all the other kitchen dishes and such stores as are in constant use. The refrigerator and general stores are in the cold pantry. Neither the grocery man nor butcher enters the kitchen, but they make all their deliveries through a half-door at the left of the refrigerator.

"One of the greatest conveniences is the slide opening between the kitchen and the dining-room, just between the upper and the lower cupboards. In the dining-room is a built-in china cabinet with leaded glass doors, corresponding to the cupboards in the kitchen. Through the slide opening come all the dishes from the dining-room that receive the food; back again through it they go. to be served; through it again to the kitchen to be washed, arriving near the sink; then when they are washed and wiped. without moving at all, the housekeeper places them through it, ready to be replaced in the dining-room cabinet. This opening might properly be called the step-saver. Both the architect and contractor were disposed to consider this a fussy woman-like contraption, but up to date there have not been recorded any but enthusiastic signs of approval from women who have seen it.

"The sink is set six inches higher than they are ordinarily placed, for the prevention of bending backaches, but it came near to requiring police supervision to get the plumber to place it so high. He had 'never done it before,' and to the average workman that is an unanswerable argument.

"If this kitchen proves anything, it proves that by thoughtful arrangement and planning a kitchen can be made as neat in appearance and as attractive as any room in the house; that the preparation of food can be put on a basis where it will be enjoyed as much as performing experiments in a college laboratory; and last, but not least, it should prove to any woman that she is losing a rare opportunity if she leaves the planning of any detail of the kitchen in her new home to an architect to whom such details are not of vital importance."

## A House in Surrey, England

In our last issue we stated that Mr. E. A. Williams, architect, of Napier, was the designer of a house erected in Surrey, England, for G. L. Sutcliffe, Esq. Mr. Williams writes to say that Mr. G. L. Sutcliffe was the architect for the house, and that he (Mr. Williams) was at that time in Mr. Cutcliffe's employ, and supervised the work. He in no way claims credit for the drawings, which were Mr. Sutcliffe's.

## Situations Open

For the position of Foreman to take charge Oleo Department at Waitara Freezing Works. Close October 16. T. Borthwick and Sons, Box 247, Christchurch.

For the position of Borough Engineer and Town Surveyor for the Borough of Greymouth, at a salary of £390 per annum. Applications, accompanied by credentials and endorsed "Application for position of Borough Engineer," will be received by the undersigned, 17th October, 1912.—F. H. Denton, Town Clerk.



## Building Notes

### WELLINGTON

The following building permits have been received and approved by the City Engineer:—

From 20/8/12 to 3/9/12:—29 applications received for permission to erect; 14 plans examined and approved. City district £3554; Melrose district £1923; Northland district £450.

From 3/9/12 to 17/9/12:—21 applications received for permission to erect; 26 plans examined and approved. City district £17,218; Melrose district £2641; Onslow district £300.

WILLIAM FIELDING, Lic.R.I.B.A., architect, reports: Residence at Lyall Bay for Mrs. Mathewson, R. Moffatt, builder; residence, etc., at Masterton for Mr. B. W. Fowle; residence, Hataitai, for Mrs. Edwards; brick motor house, Coromandel Street, Newtown; and bungalow at Muritai for Mr. A. A. Phelps.

Messrs. ATKINS & BACON, architects, Wellington, have prepared tentative plans for a fine five-storeyed building in Queen Street for the Bank of Australasia, who find their present premises quite inadequate. The building is to be erected as speedily as possible, and to be ready, if possible, for the Exhibition next year.

Mr. C. ROBB, Lic.A.R.I.B.A., architect, is now erecting a large factory for C. Cathie and Sons.

Messrs. C. TILLEARD NATUSCH & SONS, architects, report:—The new Picture Theatre in Manners Street for the People's Picture Palace Co. is now nearing completion. The main hall itself is practically finished, but the approach from Manners Street, which will be a corridor having a street frontage of 15ft. 9in. has yet to be built. The building will seat 500 people.

Messrs. TURNBULL & SON, architects, have in hand plans for a store for J. Staples and Co.

McARTHUR MILLIKIN & CO., of Kaiwarra, Wellington, report that they have secured the contract for the Defence Department for the erection of artillery depots to accommodate the new Field Batteries under organisation at the following centres: Auckland, Hamilton, Palmerston North, Napier, Dunedin, and Invercargill. Each depot will consist of a stable capable of accommodating 16 horses, a building for accommodating the guns and wagons, with forage store attached. In the ground floor of the administrative block there is the public office, general store, and harness room, and in the upper floor accommodation, consisting of barrack room, kitchen and bath-room, is provided for 14 men, who will form the permanent staff at the depot.

At Auckland, Napier, Dunedin, and Invercargill there is also a drill hall 100ft. long by 50ft. span

The whole of the buildings are built entirely of steel framework of the usual type turned out by us. The contract price is about £20,000.

### LEVIN

Mr. C. J. HARVEY, architect, reports a two-storey brick building—pressed brick tuck-pointed—site 40 x 66. On the ground floor two stores are lighted by skylights and divided by a vestibule and well staircase leading to a large studio and chambers. Contractor, Mr. W. Pringle. Price £1222.

Our representative noticed a fair amount of building activity here the other day, particularly among the suburban dwellings. Competitive designs are to be called for an Old People's Home at Awapuni, to cost approximately £5000.

Messrs. LEWIS and KUHTZE have just completed joinery for alterations to Post Office, Palmerston North; also joinery and timber for three cottages, Government advance to workers.

### CARTERTON

The tender of Messrs. Coradine and Whittaker has been accepted for the new building for the Bank of New South Wales. Messrs. Crichton and McKay are the architects.

### MASTERTON

Mr. W. R. VARNHAM, architect, reports that the Nurses' Home is now nearing completion under his supervision. It is of brick construction and is costing £1070. Messrs. Taylor and Hodges are the contractors.

The additions to the Waingawa Freezing Works are having further additions carried out at a cost of £7000. Messrs. Taylor and Hodges are the contractors.

It is understood that a theatre is to be built here in the near future.

Messrs. WELCH and HOPE, Builders, Masterton, report:—Brick premises, Eketahuna, for "Express" Office, press room, linotype room and conveniences. Cow-woolshed, cottage and stable, Matahiwi, for Mrs. Holmes. Stewards' Stand, etc., for Masterton Racing Club. Additions woolshed for Mr. C. Matthews, near Martinborough. Cottage, 5 rooms, etc., Upper Plain, Masterton, for Mr. W. Pemstone.

A. R. POWER, Builder, Eketahuna, reports in construction new wing to Eketahuna Post Office, extension to mail room and a 'phone room. Kaiporaro: For Education Board, 5-roomed cottage for teacher. Alfredton: for Education Board, 5-roomed cottage for teacher.

Messrs. F. KING and SONS were the contractors for the new Courthouse recently constructed at a cost of £6660. The building is of brick and Oamaru stone.

Mr. J. D. WILSON, architect, Pahiatua, reports:—A start has been made with the erection of the Pahiatua Convent; Messrs. F. Craven and Co. are the builders; the building is of concrete foundations and asbestos tile roof, cost £1350. A modern 6-roomed dwelling for Mr. W. J. Smith, of Hamua, is in progress; S. E. Bluett, contractor. Tenders are called for the erection of a Cheese Factory at Papatawa, also dismantling the Old Konini Hotel and converting it into two dwellings.

### DANNEVIRKE

An example of very pleasing architectural treatment is the home of Mr. J. K. Gilmour, at Dannevirke. In designing this building the architect, Mr. S. D. Lamb, had to provide for 12 rooms, including a large reception room, dining room and study, bedrooms and the usual domestic offices and conveniences. Metal work has been introduced in the principle rooms with great success. The Marseilles tiled roof, with its gables and dwarf tower, is a well-thought-out piece of work with a distinctive beauty all its own. From the tower windows there is a fine view of the town and of the distant hills. F. Craven and Co. were the builders. Amongst other work Mr. Lamb has in hand is the new Fire Brigade Building, now nearing completion

### HASTINGS

Messrs. Rush and James, Hastings, report:—The large additions being erected at Woodford School are now completed at a cost of £2000, under their direction as architects for the school. Mr. H. H. Campbell, who built the school, was entrusted also with these additions. Further accommodation is now given for 15 extra pupils, the number of music and class rooms has been increased, and the servants' quarters, etc., have been enlarged correspondingly.

### FOXTON

During the last few months a plague of fire has visited Foxton, some twenty buildings, mostly business premises, having being totally devastated. The fire marks a new era in building operations in Foxton, the premises which are now being erected on the ruins being all in reinforced concrete. It is expected that other intending builders will follow on the same progressive lines.

### PALMERSTON NORTH

Tenders are being called for an annexe for the female consumptive ward of the Hospital.

Messrs. C. TILLEARD NATUSCH and SONS' Palmerston North office have let contracts for shop and dwelling for Mr. E. Healey, chemist, at £1480; business premises for Mr. A. Fraser, at £798; and a large shop for Mr. G. H. Stiles. The above buildings are all in reinforced concrete.

### WAIROA, H.B.

The competition for the Wairoa Borough Council Chambers was won by Mr. RENE NATUSCH, in charge of Messrs. C. Tilleard Natusch and Sons' Napier office. The building as designed was a single-storey building, with Council Chamber and Town Clerk's and Engineer's office. An upper floor has since been added. This is to contain library and reading room. The building is to be of reinforced concrete, the contract having been secured by Messrs. Pemberton, Davis and Arnott, of Wairoa.

Mr. R. A. Wilson's block of shops and offices over is now completed. This building has also been built in reinforced concrete.

### NEW PLYMOUTH

FRANK MESSENGER, F.N.Z.I.A., architect, New Plymouth, reports:—In course of construction—Extension to freezing works, Waitara, for Messrs. Thomas Borthwick and Sons, Ltd., in brick and reinforced concrete; £2079; contractors, Roberts and Son. Golf Club house and caretaker's cottage; £750; contractors, Greyling and Cliffe. Completed works:—Egmont Hostelry, £2000; contractors, Boon Bros.; lighting arrangements by Turnbull and Jones, Ltd. A semi-detached dwelling is provided for guide, who is the caretaker. Boarding establishment for High School, reinforced concrete, consisting of four dormitories, containing seven beds in each, dining hall, master's room, sick room, kitchen, and appurtenances, £2075; contractors, Roberts and Son.

Messrs. SANDERSON & GRIFFITHS, architects, report they have recently completed additions to "Herald and Budget" premises, £655; contractors, Boon Bros. Large school buildings at Stratford for Education Board, in brick, roof Calmon's asbestos; £3600. In course of construction: Additions to warehouse for Mr. Newton King, £650; contractors, Coleman and Son. In course of construction in New Plymouth, to design of Mr. J. Campbell, in brick and plaster relief, for the Public Works Department, a building with practically fire-proof and burglar-proof arrangement of deed search, documents, stamp rooms, being divisions of a reinforced chamber, 30ft. x 48ft., in expanded metal and laced with galvanised wire, and provided with Brady's revolving shutters; also chambers intended for two Departments, District Registrar and Agriculture, with spacious corridor, etc. The plans provide for another storey in the expansion of business; roof, Marseilles tiles; £3600 present contract; contractors, Coleman and Son.

### INGLEWOOD

Messrs PERCIVAL & MESSENGER, architects, Inglewood, report additions and extensions to factories for cheese manufacturing industry in butter factories. In course of construction:—Rebuilding, in concrete and reinforcement, the Okato Butter Factory, the Bihama Works, and Kainato Cheese Factory with plant; the Okau Butter Factory for treating home-separated cream; the total cost of work being £12,000, including buildings and plant.

J. C. ROWE, builder, Inglewood, is building a cottage of five rooms; cost, £400. He has just completed a five-roomed cottage—sitting-room 15ft. x 18ft., bath 15ft. x 7ft., kitchen 18ft. x 14ft., bedroom 14ft. x 16ft., 6ft. passage, etc., with a verandah on one side, costing £500.

### AUCKLAND

There has been great activity in the building trade lately in residential houses, and a large number of houses of the bungalow type have been erected, also some fine residences at Stanley Bay, Takapuna, and Devonport. Notwithstanding this, houses are very difficult to obtain by those requiring summer residences on the seashore.

The plans for the buildings to be erected for the next year's Exhibition in the Domain are now nearly ready, and it is hoped the positions of the various structures will be at once allocated, so that work may proceed without delay.

Mr. Edward D. McLaren, late of Swanson Chambers, Swanson Street, has moved to 221 Victoria Arcade as, owing to his increasing business, he had to move to more commodious premises.

HAMILTON

In Hamilton during the last five years £200,000 has been spent in the erection of new buildings. Within that time 10 two-storeyed brick buildings, including the Bank of Australasia, have been erected. Two large blocks are now nearing completion for shops and the New Zealand Government local departmental branches. Several more are to be built in the near future, and there are signs of great activity in the building trade in this growing centre.

DUNEDIN

The Board of Managers of the Technical School resolved to accept the tender of Mr. J. E. White of £30,199 for the erection of the new school on the Stuart Street site, Dunedin. There were nine other tenderers, one of whom quoted a price lower than that accepted.

The Criterion Hotel in Moray Place has now been taken over by Mr. Jas. Murphy, and its appearance is much admired, as it has been thoroughly renovated inside and out. Mr. E. W. WALDEN was the architect, and the principal work has been carried out by Mr. W. Farquharson, contractor; Messrs. Brinsley and Co., steel work; Dunedin Timber Co., fittings; Messrs. A. and T. Burt, lifts and fire escapes; Messrs. A. Lees and Co., painting; Messrs. Turnbull and Jones, electric lighting; and Mr. Clarke, plumbing.

Messrs. EDMUND ANSCOMBE & LESLIE D. COOMBS, A.R.I.B.A., architects, Union Bank Buildings, Dunedin, report as follows:—The following works are under construction:—The Methodist Central Mission's new hall building in the Octagon, which has an auditorium with a seating capacity of 1,400. The Hanover Street Baptist Church, in Hanover Street. Extensive additions to the Arts Building, University of Otago. Town Hall Buildings at Palmerston; a large brick residence at Anderson's Bay; also, a residence at North-east Valley, a residence at Kew, a residence in Rattray Street, a residence at Ravensbourne, a residence at Karatane, a residence at Mosgiel, a residence at Balclutha, residence at Heriot, additions to residence at Anderson's Bay, and new buildings in Castle Street for the Waitaki Dairy Company, Ltd. They have at present in hand, and for which tenders will shortly be called, the following:—A large block of stone buildings at the University of Otago, a new warehouse block in the city, a new Science building at Otago Boys' High School, business premises at the corner of Castle Street and Railway Station, a large residence at Anderson's Bay, a residence at St. Kilda, a large residence at West Taieri, a residence at Mornington, a residence in Royal Terrace, a residence at Benhar, Station buildings at the Lakes, and a residence at Mosgiel, a Sunday School building at South Dunedin, extensive alterations to business premises in Princes Street, extensive additions and alterations to business premises in George Street, extensive additions to a private school building, a residence at Maori Hill, and other works of minor importance. Amongst the most important buildings this firm have recently completed are the Young Men's Christian Association building, and the large additions to the North-east Valley Presbyterian Church. The same firm report that they have in hand at their Invercargill office the following:—Homestead buildings near Otautau, two residences at Gore three new residences and alterations and additions to residence at Invercargill.

INVERCARGILL

The number of building permits issued in Invercargill during the last twelve months was 232, amounting to £156,000 for the year ending 31st March last. For the last five months ending 31st August permits for new buildings have been issued to value of £47,155—a remarkable testimony of the development of the district.

The members of the Hospital and Charitable Aid Board had before them recently the tenders for the King George Coronation Memorial House for Incurables, and eventually accepted the tender of Mr. Joseph Taylor of £10,450, although this was nearly £1500 in excess of the Board architect's estimate.

Messrs. J. E. WATSON, Ltd., have recently imported to the order of Messrs. Kilkelly Bros., sawmillers, of Grove Bush, what we suppose is the largest portable engine ever imported into Southland. It is of 100 h.pp., and carrying a working pressure of 140 lbs. to the square inch. It shows the enterprise of the purchasers, and is also a sign that the building trade is likely to be more active than ever in this district. It also shows these merchants are quite able to meet all requirements.

CHRISTCHURCH

The Christchurch City and Building Investigation Co., Ltd., is making a handsome addition to the architecture of Christchurch in the shape of a three-storey building situated in Cathedral Square. The architect is Mr. C. J. Mountford, who has adopted the latest ideas throughout in connection with the work, such as, for instance, the use of "Poilite" asbestos fireproof sheets for the ceilings of the lower storey.

## Building Tenders

For erection of students' buildings (stone), Otago University, close October 15. Plans and specifications may be seen at our offices, where tenders are to be lodged.—Edmund Anscombe and Leslie D. Coombs, A.R.I.B.A., architects, Union Bank Buildings, Dunedin.

For a residence at Remuera; close October 16.—G. W. Allsop, A.R.I.B.A., architect, Victoria Arcade, Auckland.

For the erection (in wood) of a nine-roomed bungalow at Paeroa; close October 12. Plans and specifications may be seen at my office, or can be obtained on request.—E. E. Gillman, architect, Paeroa.

For the new Opera House, Manners Street, Wellington. Plans and specifications at the office of the Company at 324 Bank of New South Wales Buildings, Lambton Quay; close 21st of October, 1912.—William Pitt, F.V.I.A., architect.



## Engineering Tenders

For the supply of wrought iron gates and fencing for entrances to Queen Street and Railway Wharves. Specifications, drawings, and conditions of contract may be seen at the office of the Board's Engineer, Quay Street; close October 22.—H. B. Burnett, Secretary, Auckland Harbour Board.

For the supply of plant for the Invercargill electric supply scheme, as follows:—Two steam alternators and electric plant; one steam boiler and piping; electric meters; wires and cables; 4000 porcelain insulators; 50 ironbark poles. Specifications from Tramways Engineer, Invercargill; close October 31.—T. W. Walker, Town Clerk.

For the supply and erection of suction gas plant, gas engine, and dynamo of 100 k.w.; close October 28, 1912.—Alfred M'Clure, Town Clerk, Municipal Chambers, Ashburton.

For the supply of steel standards and poles for the Lake Coleridge hydro-electric scheme. Drawings, specifications, and particulars may be seen at the Public Works Offices, Auckland, Wellington, Christchurch, and Dunedin; close January 6, 1913.—H. J. H. Blow, Under-Secretary, Public Works Office, Wellington.

For electric lighting plant for the Corporation; close 12th December, 1912.—T. W. Walker, Town Clerk, Invercargill Corporation.

Miramar Borough Council invite tenders for the supply, delivery, and erection of Diesel oil engines, generators, etc., in connection with the water, sewerage, and power schemes. Specifications at Council's offices; close December 16.—R. E. Bennett, Town Clerk.

For the supply of 250 direct-current electricity meters (contract No. 9). Copies of the specifications may be obtained from me upon deposit of 10s. 6d., returnable when a tender is lodged; close November 6, 1912.—M. Murray, Town Clerk, Napier.

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