

Our... Industries

Written for PROGRESS

Dunedin Works of the Milburn Lime and Cement Co., Limited.

THERE are very few industries connected with building materials or engineering construction which have undergone such a rapid development during recent years as Portland cement. A generation ago it was almost unknown, and it was applied to very few of the uses which are now closely associated with the very name of the material. The immense utility of the product has led to a close study of the methods of manufacture, and enormous capital has been employed throughout the world in making improvements, both as to process and plant. The net result is that Portland cement is now looked upon by engineers and architects as one of the most important articles in building construction, more especially since the advent of re-inforced concrete, i.e. a combination of iron or steel with Portland cement concrete.

The quality of the product has been vastly improved. A few years ago a tensile strength of 200lb. per square inch was looked upon as satisfactory. At the present day 600 to 800lb. is frequently imposed by engineers. It is interesting to review how this change has taken place, and we have an evidence of step-by-step advancement at the Dunedin Cement Works.

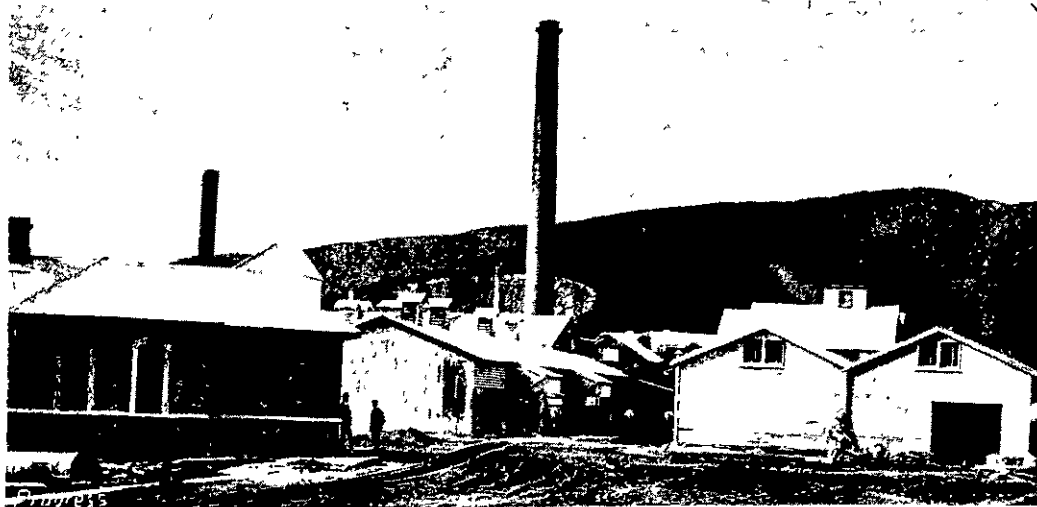
A brief history of this company is worthy of note. In 1888 the valuable and well-known lime deposit at Milburn, together with a small cement works, was acquired by a syndicate of Dunedin gentlemen. This syndicate at once formed a powerful company with a capital of £30,000, registered as

This was a distinct improvement on the old process, but costly in wear and tear. It was run with more or less success until 1897, when, after a visit to America, the Old Country, and the Continent, the manager elected to replace this grinding plant with a newer process of ball and tube mills, the great advantage of these machines being that the whole product is ground up and reduced to the necessary fineness without sifting. The Milburn Company were the first cement makers south of the Line to adopt the tube mills, which are still in vogue and looked upon by cement experts as the best method of grinding

The company owns a dredge and complete equipment for clay dredging, and the works are well served with a siding from the main trunk line directly into the warehouse.

The coal used for rotary burning is Westport slack, which is dried and ground to a powder before being injected into the kiln. The site of the works comprises upwards of four acres, one-half of this being occupied by the various factory buildings.

This company has always made a point of storing its cement for some weeks before being sent out, which is considered prudent and in the interests of the consumer. The volume of business has



DUNEDIN WORKS OF THE MILBURN LIME AND CEMENT CO.

To meet the increasing demands for Milburn cement further additions and improvements became necessary in the burning department. In 1900 the manager was sent to America to report on the American process of manufacture by the rotary kiln, with instructions that if he was satisfied to order a plant without delay. The advantages of the rotary process of burning were so apparent that a kiln was installed that year. The Milburn Coy. was again the first company south of the Line to adopt this modern process, and the experience of the past few years has demonstrated the wisdom and efficiency of the selection.

As there appears to be no finality in the progress of the industry, the company is again compelled by the increasing demand to lay down more plant for dry grinding, and mills of the most powerful and successful type made are now on the water and will be shortly installed.

A description of the processes at the works at the present time will be of interest to PROGRESS readers.

The lime, which is obtained from Milburn, and clay, dredged from the harbour in close proximity to the works, are mixed together in a manner protected by Letters Patent. The usual method of supplying heat to evaporate the moisture from the clay is avoided. Thence the raw materials are ground successively in pan and tube mills, thence elevated to a storage bin (24 hours capacity) and conveyed, after being slightly damped, into the kiln. As this revolves it gradually forces it from the back to the front, getting hotter and hotter until it reaches the calcining stage. From there it is discharged in the form of small clinkers. It is picked up by an elevator and conveyed automatically to the clinker store where it is allowed to cool and cure. It is then ground practically to an impalpable powder in ball and tube mills, the discharge of the tube mill being in the bulk store.

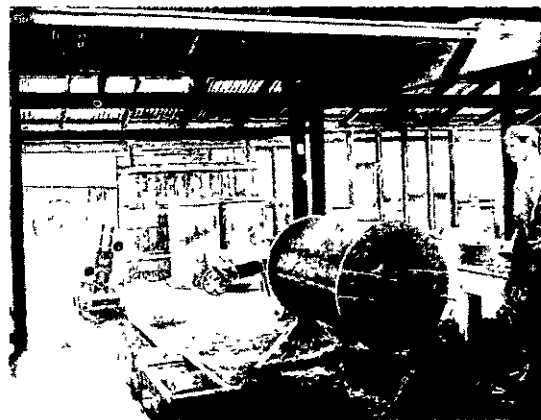
The power is obtained from compound jet condensing engines of 250 h.p. In addition there are auxiliary engines for electrically lighting rotary kiln drive.



KIELBERG FACTORY

steadily increased from 10,000 to 150,000 bags per annum. The works are fully employed, the Company having large and important contracts with the Drainage Board, Dunedin Corporation Tramways, Public Works and Railways, Otago Dock Trust, Water Supply, etc. In addition to the cement-making business the company has a large lime business, two pipe factories (Monier & Kielberg) and phosphate deposits.

We hope on a future occasion to describe these industries.



MONIER FACTORY.

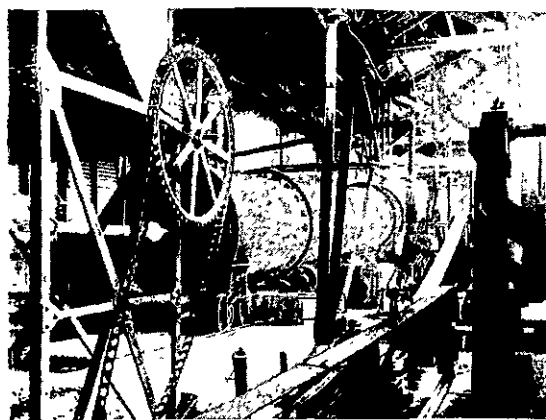
PATENT ORE CRUSHER.

Messrs. A. & T. Burt, Limited, engineers, have recently turned out of their Dunedin workshops a very powerful ore crusher, designed by Mr. G. Calder, proprietor of the Valley quarries. The crusher is a distinct advance on any type of stone breaker at work in New Zealand. The design embodies the best features of imported machines, with improvements which Mr. Calder has carefully thought out in his long and extensive experience with ore-crushing machines.

The most important improvements consist of the double-acting cam motion, giving two crushing strokes to each revolution in place of one, as in other reciprocating machines, also the lever operated by the cam shaft is of great length, which the design readily permits, thus giving a very low and economical horse power to drive the crusher at full capacity.

In daily work the machine puts through 15 tons of road metal per hour, the mouth opening being 12in by 18in. Generally, the machine is well proportioned in all details, first-class materials and workmanship characterising its construction. The main frame is a massive casting weighing over 4 tons, which, being self-contained, does not require expensive foundations. This new crusher should commend itself to all users of this class of machinery.

Messrs. A. & T. Burt, Limited, who are the sole agents for this patent crusher, would be pleased to arrange for those interested to inspect and view the machine at work in Mr. Calder's quarry.



ROTARY KILNS.

the Milburn Lime & Cement Company, Ltd. The quality of the lime was too widely known to cause the directors any anxiety, and from the start a satisfactory business was done; but with the other branch, viz., cement making, difficulties came.

The works were then situated at Walton Park, about five miles from Dunedin, a site that seemed to possess every disadvantage, involving costly carriage of clay, lime, coke, general stores, and finished cement, combined with unsuitable machinery. After a few months' working the directors recognised the gravity of the position and called a special meeting of shareholders to decide whether the company should retire from cement making, or acquire a new site and erect modern works. The "modern" works then erected were designed after the English practice, viz., Johnson kilns, with chambers, millstones for grinding both wet and dry, the process adopted being known as the semi-wet process. The materials, lime and clay, were mixed together in a wash-mill, thence ground in a wet state and pumped on to chamber floors. The burning off of the previously loaded kiln supplied the necessary heat to dry the mixture for the following kiln. At that time this was considered to be a most economical method of manufacture.

The next step was to produce a finer ground cement to meet the requirements of better work demanded by the engineers. The millstones were thrown out and a complete plant known as Askham's pulverising plant was adopted.