1895.

NEW ZEALAND.

CELLULOSE INDUSTRY

(REPORT ON THE).

Mr. W. FRIEDLEANDER to Sir WESTBY B. PERCEVAL, K.C.M.G., 13, Victoria Street, S.W.

DEAR SIR,— 60, Fenchurch Street, London, 15th February, 1895.

I now beg to hand you the desired report on the cellulose industry, and shall be glad if you will look through same to see if there is all the information you desire.

Should you wish for any further information I am always with pleasure at your disposal.

I remain, &c.,

W. FRIEDLEANDER.

REPORT ON THE CELLULOSE (WOOD-PULP) INDUSTRY.

IN giving any information regarding the cellulose industry, it is first necessary to describe the different kinds which are manufactured, and the purposes for which the same are used.

Cellulose or wood-pulp is therefore to be divided into three distinct groups—viz., mechanical, sulphite, and soda or sulphate, and in this order I propose to deal with them.

Mechanical pulp may be described as wood ground by an ordinary mechanical grinding process, and compressed into more or less thick sheets. It goes without saying that pulp produced in this manner cannot have any fibrous qualities to speak of, and therefore this pulp is used more in the manufacture of common papers, or as a "filling" to give weight or opaqueness to paper. There are various kinds of mechanical pulp, varying in colour and quality from the light, almost white, pulps produced from the wood of the aspen, poplar, spruce, pine, and fir, and used largely in the manufacture of common "news," to the quite brown pulps which are used in the manufacture of brown or buff papers.

Sulphite pulp is produced by the reducing of wood to fibre by boiling with bisulphite of lime. This pulp is made in a variety of qualities, chiefly under two systems—respectively, the Ritter-Kellner and the Mitscherlich systems. Most of the factories have, however, their own especial systems, which contain, nevertheless, the salient points of one or other of the above systems. The sulphite pulps have at once this advantage over the soda and sulphate pulps, in that the pulp is turned out in its unbleached state already so white in colour that for "news" and such papers it is sufficiently white to be used right off without bleaching; and, seeing that the process of bleaching must necessary tend, however little, to weaken the fibre, the advantage of a pulp that can be used right off without bleaching (saving the labour and expense of that process) in papers where strength is the great desideratum will at once be perceived. Besides this, pulp made by a sulphite process is naturally much stronger in fibre than that made by the other methods. When bleached, the sulphite pulp of choice pure quality can be used with the best and highest results in the manufacture of the finest "writings," book, and plate papers.

Soda and sulphate pulps: These are mostly delivered in an unbleached state, and, according to the quality of the pulp, are used in the manufacture of almost all classes of papers, inclusive of "news" and "writings," as well as for envelopes and cartridge-papers, for which purposes this class of pulp is eminently suitable. The soda pulp, which was the first of the chemical pulps in the field, is obtained by boiling the raw wood with caustic soda.

The sulphate pulp is somewhat similar in appearance to the soda pulp, and is the outcome of a combination of the soda and sulphite processes. The chief characteristic of this class of pulp is its extreme feltiness, and it is also contended that it bleaches easier than the soda pulp. Both soda and sulphate pulps are produced in a great variety of qualities, some makes being much cleaner and stronger than others, whilst other differences arise through the raw wood used. This is especially noticeable when comparing the Scandinavian pulps with those of German origin, the fibre of the former being soft and fluffy, wasting in use, whilst the latter pulps possess hard, tough fibres yielding much better returns. This difference arises from the fact that the Scandinavian pulps are manufactured from the wood of the common pine, whilst those of German origin are made from the young wood of the Scotch fir, which it is well known yields the best wood for the purpose, and also from the fact that the Germans are better chemists than the Scandinavians.

The following are the best woods for the production of cellulose, stated in their order of merit—viz.: *Pinus sylvestris*, *Pinus abies*, and *Pinus pioca*, and these yield in the soda and sulphate systems about 35 to 38 per cent. of cellulose, whilst in the sulphite system they yield about 50 to 55 per cent. cellulose. Besides the above-mentioned, the wood of the following trees can also be used in the production of cellulose with advantage—viz.: *Populus alba*, *Pinus austriaca*, and *Pinus larix*.

With regard to the advisability of erecting a wood-pulp factory in New Zealand, the following points would require your most careful consideration: (1) Is the pulp to be produced for export to paper-making countries? or (2) is the pulp to be used for paper-making in New Zealand?

In reply to the first question, both chemical and mechanical pulps are largely produced now in Austria, Germany, Scandinavia, and America. Scandinavia is obliged to export most of its production, turning only a small portion of it into paper, which again goes into export. Austria and Germany are protected by duties against the entry of pulp and paper, which, however, does not prevent Scandinavia from supplying some parts of Germany largely with various kinds of pulps. The quantities made in Austria and Germany are, however, far too large to be taken up by the paper industries in those countries, and very large quantities must absolutely be exported. In former years America was a large consumer of foreign pulps, and was supplied from Europe with its requirements. The trade in general has been so bad of late in America, as well as in Europe, besides which the great strides the pulp industry has made in the United States and Canada have been so really enormous that America is now able to produce all its requirements, and does so with the exception of infinitesimal quantities of fine pulps, mostly bleached, which still go over there.

The consequences of America falling off as a buyer has had the most disastrous effect on the wood-pulp trade of Europe; prices, which a few years ago ruled from £13 to £14 per ton, have fallen away rapidly till very fair and good sulphites are now offered delivered in England at £8 per ton. Nor is there, in my opinion, any substantial rise possible under the circumstances till half of the existing pulp-mills are ruined or closed. I think this sufficiently answers the first question, and that to start a pulp-mill in New Zealand for the purpose of export would end in the total loss of every farthing invested in that industry.

In reply to question No. 2, what we have to consider is how far it is advisable to erect a wood-pulp mill to supply New Zealand with its wants. By the figures given to me regarding the import of paper into New Zealand in 1893, the two items that can only interest us here are the printing- and writing-papers. The value of the writing-papers was £16,000, and I at once put it out of the question that in New Zealand a new industry could be started that could in less than twenty years produce a high-class writing-paper as made now in this country, as well as in Austria and Germany, where paper-making has been followed by generations of the same families, so that they are thoroughly imbued with it from their youth. The manufacture of printing-paper also requires, of course, certain skill and knowledge, but there would be no great difficulty in producing common "news," though much more difficulty in producing fine "printings" in New Zealand. As the matter must, however, be looked at from a commercial and paying standpoint, I will give figures which will prove it a risky undertaking.

To erect a paper-mill for making between £65,000 and £80,000 worth of paper per annum you would require a mill costing at least £150,000, delivered and erected in New Zealand. (I am taking an extremely low figure.) To erect a cellulose-mill for the purpose of making but ten tons per day, the least you would have to calculate would be £30,000 to £40,000, delivered and erected in New Zealand. You would then have to calculate that you would have to get your constant supply of chemicals from Europe; you would want very large water-power, first-rate and skilled labour, which in New Zealand would be three times as expensive as in Scandinavia, as well as in most parts of Austria and Germany; and after you had done all that, and even put a heavy duty on paper, I doubt if even then you could stand against the competition of European manufacturers, especially where protective duties exist, and where certain surplus quantities must be exported, at whatever price they will fetch, for the purpose of upholding prices in their own home countries. As an example of this, we have, during the whole of last year, seen American manufacturers throw enormous quantities of both pulp and paper into this country simply because they had to go on manufacturing, and, as trade was too bad, they had to come over here and sell below cost to get cash. This is not of course the normal state, but with the constant recurrence and always breaking-out of crises somewhere in Europe or America, there is an almost constant supply of material under cost price sent to this country. I understand that a very good mill in Australia—*i.e.*, the Barwon Paper-mill Company, of Geelong, Victoria, actually received from Australian newspapers ¾d. per pound of paper above the price at which they could purchase a foreign supply, simply for the purpose of being kept supplied with paper in the event of war breaking out and supplies from other sources thus cut off. Three farthings per pound means £7 per ton, which, *plus* £1 10s. per ton freight and insurance on foreign, is equivalent to £8 10s. per ton above what foreign mills were prepared to accept on the Melbourne market for the same class of paper, and yet, in spite of this subsidy, this mill could not stand against European competition, and I understand is now making brown papers.

Description of the Samples of Sulphite, Sulphate, and Soda Wood-pulps accompanying Cellulose Report.

No. 1.—Choice quality bleached sulphite pulp; present value, £15 to £16 per ton.

No. 2.—Choice quality unbleached sulphite pulp; present value, about £10 10s. per ton.

No. 3.—Good useful quality unbleached sulphite pulp; present value, about £8 per ton.

(The above sulphite pulps are manufactured on the Ritter-Kellner system.)

No. 4.—Choice quality unbleached sulphite pulp, manufactured by the Mitscherlich system; present value, about £10 per ton.

No. 5.—Choice quality unbleached sulphite pulp; present value, about £9 10s. per ton.

No. 6.—Choice quality unbleached sulphate pulp, not quite so light in colour as No. 5, but rather harder character of fibre; present value, about £9 per ton.

No. 7.—Choice quality unbleached soda pulp; present value, about £9 10s. per ton.

(The above-mentioned prices are all to be understood "delivered England.")

Approximate Cost of Paper.—Preparation, not given; printing (1,200 copies), £1 6s.

By Authority: Samuel Costall, Government Printer, Wellington.—1895.

Price 3d.]