

AUSTRALIAN COAL AND TIMBER.*

THE best coals from Newcastle, a port at the mouth of the River Hunter, seven hours' steam north of Sydney, are said to equal the average of English North Country coals for steam-raising purposes, but are inferior to Welsh coal. In Australia, for marine engines, Newcastle coal is preferred; but for locomotive engines, half of Newcastle and half of Bellambi coal is used. This latter coal is said to be the better fuel, but cakes, and gives much more trouble to the firemen. Bellambi is situated in the Illawarra District, another coal-field five hours' steam south from Sydney; this coal is also cheaper than Newcastle coal, 7s. as against 9s. 3d. per ton shipped.

There is, however, no good harbour for large ships along the Illawarra Coast, and the trade is now carried on by small coasters. A harbour is being made at Wollongong, the capital of this district, but it will not be finished for some time: the entrance, too, hardly seemed to me safe for large vessels in bad weather, and practically Newcastle coal will, for some time to come, be the only Australian coal available for export to India and China.

Newcastle has a fair harbour and large wharf fitted with steam-cranes, along which ten large ships can load or unload at one time, and connected by rail or tramway with the various coal-mines in this neighbourhood. The entrance to this harbour is also difficult in bad weather, as may be seen from the accompanying circular of Messrs. Charles F. Stokes and Co., the Shipping Agents at Newcastle, from whom much of my information regarding price of freight, &c., is derived. The price of the best Newcastle coal delivered at Bombay would vary from 36s. to 46s. per ton, in ordinary times, all charges included, except cost of landing at Bombay; and if, as I believe, the price at Bombay of English North Country coal exceeds this figure (say from 50s. to 60s. per ton), the question of importing Australian coal in preference to English and Scotch coals (not Welsh) for marine, stationary, and locomotive engines, is worth considering. Of the Newcastle coals, those from the Walls-end and Minimi mines gave the most favourable results in the trials made in England; but at Newcastle, the Lambton, Warlah, and Australian agricultural coals are much esteemed; while the Four-mile Creek coal, further inland, is said to be of superior quality, and as they all come from the same field, there is probably not much difference between them when tried on the spot. As some kinds of coal may, however, deteriorate more than others by a long sea voyage, I should not be inclined to accept the results of the experiments made in England or Australia as final for India, and would suggest that a cargo of samples from the various mines at work at or near Newcastle be sent to Bombay, and be there tried and compared with English, Scotch, Welsh, and Indian coals.

The present course of trade is for ships to bring out cargo from England to the large sea-ports of Australia, take ballast, coal or timber to India or China, and thence take cargo back to England. The shipping arrangements for coal could be made either in London or at Newcastle; the former would ensure more regularity in the supply from Australia to India.

The Peninsula and Oriental Steam Navigation Company, and the British India Steam Navigation Company, are said to have commenced using Australian coal in the Indian Ocean and China Seas, and some appears to have been sent to the Bombay and Baroda Railway. Should anything like a steady demand for Australian coal set in in any part of India for any purposes, such as Railways in which the Government is immediately interested, the latter should insist upon the Railway Companies having an experienced and trustworthy Engineer Agent resident at Newcastle, to see in person that the coal shipped was clean and screened, and of the desired quality.

About timber for sleepers, the kinds preferred on the Railways in New South Wales are iron-bark and box, though stringy bark and gum are used, where the former are scarce, or of inferior quality. The peculiarity of these Australian woods is, that the trees are evergreen, and shed their bark annually; and the wood being close-grained, and of great density and hardness, it takes several years to season properly. Most of the wood is, therefore, unseasoned when used; and sleepers put down in this state are said to last twelve years, if of iron-bark and box; and nine years, if stringy bark and gum. All these

four woods are liable to be attacked by white ants. There is a remarkable difference in the quality of these woods when grown on various soils, and local knowledge is necessary to determine whether the growth of any particular forest is suited for Railway sleepers or not. Speaking generally, iron-bark and box-wood are the best timber available; but, in parts of the same district, their quality is inferior, and unfit for Railway sleepers. A trustworthy agent, resident on the spot, would be necessary to examine, test, and select in person the timber offered for sleepers, if a regular supply of the latter be exported annually from Australia to India.

The extract of Colonel Ward's report shews the elasticity and strength of these woods; the figures in each line are the mean results of three or four trials of the same wood, and each piece tried was 4 feet long between bearings and 2 inches square.

Sleepers could at present be exported in large ships from Sydney, Newcastle, and Brisbane, whence railways and rivers extend to some distance into the interior. Small coasters might also bring sleepers to these ports from the other outlets on the coast, where timber is procurable.

The present price of sleepers delivered at these ports is from 3s. to 4s. each for sound timber, 10' + 10' x 5", but under the strict system of selection, which would be absolutely necessary, may be expected to increase to as much as 4s. to 5s. each.

Taking eight sleepers to the ton, the cost of this Australian timber at Bombay, Madras, or Calcutta, would be from 62s. to 75s. per ton, including all charges, except cost of landing at port of delivery, and price of each sleeper would then be from 8s. to 9s. 6d. each.

The local government may possibly levy some duty on sleepers thus exported, and the price of timber is also liable to further increase from the large demand for timber and sleepers on Australian railways, gold-fields, and mines. In Tasmania some good woods for railway sleepers abound in the large forests on the Western Coast, but large ships would hardly go to a place so far out of the regular channel of trade. In New Zealand, also, there are extensive and thick forests of fine timber along the Western Coast, where the gold-fields have been recently discovered, but there is no good harbour yet known along this shore.

ON BUILDINGS FOR EUROPEAN OCCUPATION IN TROPICAL CLIMATES, ESPECIALLY INDIA.*

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THERE exists nothing of a physical nature which causes such an entire revolution in our feelings and habits, in ourselves and in our surroundings, as the addition or withdrawal of a few degrees of heat. Even within the limits of our own temperate climate, we know no contrast so strong as that between a sweltering harvest heat, and the cold of a keen black frost—the sunny life of a brilliant summer day, or the bound-up torpor of a deep winter snow-storm; and when we carry our inquiries to the climates which lie at the extreme limits of human endurance either of heat or cold, we find almost every condition of life reversed. The food, the dress, the dwellings, and the habits of the Esquimaux, have hardly a single thing in common with those of the Hindoo, and both differ widely from our own.

Many of the countries, where the heat of the sun is far greater than in England—and especially the East Indies—are so connected with us by commerce or colonization, that from time to time English architects are called on to design buildings, to be erected within their limits. Not fewer than eight fellows of this institute, and four or five other architects, practising here have been, within my own knowledge, lately called on to prepare designs for proposed buildings in Bombay; two others, Messrs. Owen Jones and Digby Wyatt, have, within the same time, been called to act as advisers, respecting a large proposed building for the same city, the plans of which I had to prepare; and they, in that capacity rendered me cordial and most invaluable assistance, which I am happy to seize this opportunity of publicly acknowledging. Some five or six English architects also are, or lately were, residing and practising in that one city, facts which shew that buildings for such countries as India, may be fairly considered as not too remote from our own possible practice to be treated here. If then the conditions of life, in a tropical climate, are very far removed

* From Captain R. De Bourke, Superintending Engineer to the Secretary to the Government of India, Public Works Department, dated the 18th October, 1867.

* Read before the Royal Institute of British Architects.