

(No. 86A.)



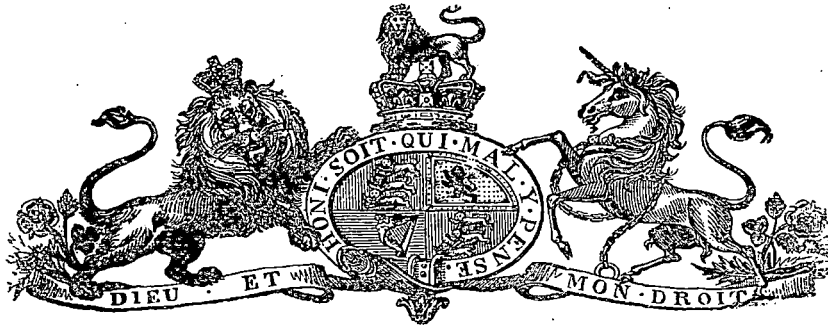
1891.

PARLIAMENT OF TASMANIA.

SANITATION OF A MINING SETTLEMENT :

PAPER BY ENGINEERING INSPECTOR, CENTRAL BOARD
OF HEALTH.

Presented to both Houses of Parliament by His Excellency's Command.



The Honourable the Premier, President of the Central Board of Health.

SIR,

I BEG to inform you that the Committee of the Engineering Section of the Seventh International Congress of Hygiene and Demography, to be held in London in August, has done me the honour to request that I should become one of its Vice-Presidents, and that I should take part in its proceedings. I have accepted the honour, and have contributed a paper to be read.

As the request reached me while at Zeehan, I have taken the subject of the Sanitation of a Mining Settlement for the Paper; and as it contains, as tersely as I could put it, an account of what I have done at that place during my recent stay, I have to request that the Board will also accept it as the Report of my work there.

I have the honour to be,

Sir,

Your faithful Servant,

A. MAULT,

Engineering Inspector and Secretary.

Hobart, 10th June, 1891.

THE SANITATION OF A MINING SETTLEMENT.

By A. MAULT, *Engineering Inspector of the Central Board of Health, Tasmania, Vice-President of the Engineering Section of the Seventh International Congress of Hygiene and Demography at London, August, 1891.*

IN the neighbourhood of Mount Zeehan, on the West Coast of Tasmania, there occur immense deposits—perhaps the largest in the world—of lead and silver ores. These deposits are attracting a large population. Six months ago there were about 400 people in the district, either working the mines or prospecting the country: to-day there are more than 4000; and the number is continually increasing.

Under the existing mining laws it is impracticable to constitute any municipal authority in the district, as the inhabitants of municipal towns acquire rights that would interfere with mining. This law is to be amended in the next Session of Parliament. In the meantime the Government has undertaken the more urgently needed of the works required at the rapidly growing town. A Local Board of Health has been appointed. It has no rating powers, but has ample authority to compel the carrying out of such works as are usually done by owners or occupiers of property in their individual capacity: the works usually done by a community in its collective capacity are those undertaken by Government.

The principal part of the settlement has taken place along three quarters of a mile of the road leading from Trial Harbour—a small inlet available only in fine weather—through Zeehan to Mount Dundas. It began, as all mining settlements begin, with a few huts and tents on each mining claim. Publicans, tradesmen, and store dealers followed. The surveyors of the Lands Department laid out a township on what they considered a suitable site, and the whole of the building lots upon it were immediately bought. But as it is about a mile and a half from the principal mines yet developed, hardly any building has taken place upon it. What has induced building has been—not suitability of site or of ground—but proximity to work; and consequently the great majority of the houses are built upon land quite unfit for such occupation.

At a height of about 550 feet above the sea, and thirteen miles distant from it, there is a little valley, traversed by several rivulets flowing into the Little Henty River, covered with thick forest, and surrounded with hills that shelter it from every wind. The prevailing rock is slate, which comes up close to the surface in most places; and what little soil there is on the swampy flat forming the bottom of the valley is the retentive clay produced by the weathering of the slate. The forest is of what would be extraordinary density in any place outside Tasmania. On an acre of it—and not an exceptionally densely covered acre—there were counted 96 trees girthing from five feet to 22 feet; 1560 spars and saplings, girthing from one foot six inches to five feet; and the undergrowth was of “tea-tree” (*Melaleuca*) with its upright spear-like stems growing so thickly together as to be impassable without chopping a track. The yearly rainfall is probably over 110 inches. The rivulets traversing this swamp were so blocked up with fallen trees and branches as to render it difficult, except in very dry weather, to determine which were their real beds. And in the midst of this the settlement was formed.

In its beginnings a mining settlement is not a savoury place. The huts or tents are usually not kept scrupulously clean. They are surrounded with emptied and partly emptied preserved meat and jam tins and bottles, with bones and potato-parings in addition if fresh meat and vegetables are to be had. There are no latrines, and the surrounding bush is polluted with ordure. If horses are kept, the manure is never removed. When the huts and tents are replaced by houses, the refuse is still simply thrown out of the back door, and the latrine is often a seat with or without a hole dug in the ground. There are no drains, and the slops are thrown on the ground close to the door. At Zeehan all this naturally greatly aggravated the original unwholesomeness of the swamp. Yet in it houses, hotels, and shops were built as fast as materials could be procured. Some of the numerous hotels accommodate more than a hundred guests each; and others still larger are being built.

The first work done was to clear out, straighten, and lower the beds of the two principal rivulets. This was not a very easy work to do satisfactorily, as the ground, when not rock, was one mass of tangled roots of all sorts. None of the forest trees here have taproots, and, consequently, the whole surface of the ground is covered with a ramification of roots, some of enormous size. The following of definite lines, and the making of clean slopes is, therefore, very difficult. The work has already produced a marked improvement. The level of the ground-water, which was formerly practically identical with that of the surface, has been lowered three or four feet; and it is now possible for the inhabitants to drain off the large quantities of stagnant water that covered much of the surface in wet weather, and left a corresponding surface of green fetid slime in dry. Many of the houses were built on short piles on land in this condition.

With respect to the sewerage, the preliminary difficulty was to procure material. The thirteen miles of road to Trial Harbour is of such a nature and in such a condition that not only does haulage at present cost £5 a ton, but it is practically quite impossible to secure the safe transport of any breakable material. Earthenware pipes were therefore out of the question. The use of wood was discarded for various reasons, and that of riveted wrought-iron pipes adopted. Sheet-iron of No. 18 gauge was employed in six-foot lengths, the ends being very slightly spigoted and fauceted so that the joints might overlap about two inches—the spigot end being left unriveted for that length. After riveting, the pipes were heated and plunged into a bath of boiling pitch and tar, which, when dry, formed a hard adherent coating sufficiently elastic to form a practically watertight joint for sewers not subject to the pressure of a head of water. The junction pieces were easily made with branch pipes at an acute angle, each one having also a short vertical branch to serve as an inspection hole, and large enough to remove any matter that would choke a four-inch house drain. While being laid the position of each inspection-hole was permanently marked on the surface, and also fixed by recorded cross measurement. Curved pipes were expensive to make, so their use was as much as possible avoided by putting a manhole at every change in the direction of the sewers.

Zeehan is a mining town, and the whole district is a mining district; consequently, when lead-concentrating work is largely carried on it will be quite impracticable to prevent the metallic poisoning of the streams running through it, rendering their waters unfit for animal consumption. But such water does not give off the noxious emanations of sewage. So, though it has not been thought worth while at present to purify the sewage before its discharge, care has been taken to make provision that the eventual outfalls shall be at a distance from all settlement.

As no good bricks are yet made in the district, and the bad ones made cost £10 a thousand, the manholes and the trapped and ventilated catchpits for house and yard drainage were made of wood. Huon pine (*Dacrydium Franklinii*) is an admirable wood for these purposes, being almost imperishable. Water-troughs laid partly in the ground for intermittent irrigation work are still quite sound after forty years' use; and the slabs of it set up instead of headstones on the graves at Settlement Island, Macquarie Harbour, though dated 1825 and 1826, are quite good both above and below ground, the arrises only being very slightly weathered. Blue-gum—the wood of *Eucalyptus globulus*—is nearly equally imperishable, and was much used.

While the sewerage works were being carried on, the Local Board of Health, having obtained from the Government the grant of a suitable piece of land for a depositing ground, entered into arrangements for the periodical removal and burial or destruction of all refuse. As there is no water supply at present available for water-closets, notices were issued to every householder to construct and maintain a proper earth-closet of a certain pattern, and to provide suitable receptacles for house refuse; and the weekly cleansing of both these forms part of the arrangements above referred to. Notices were also served for the thorough cleansing of all yards and outbuildings. As the sewers were being designed, the details of all house drains were also settled, and the owners of all property were called upon, immediately a sewer was available, to construct the drains accordingly.

Nothing was done by Government with regard to water supply, as a private company is promoting a Bill in Parliament for establishing waterworks. At present nearly all the houses have galvanised iron roofs and large tanks, and the great rainfall ensures a pretty constant supply.

Apart from the population settled in houses, there is an almost equally large population dwelling in huts or tents. Where these are occupied by miners, and erected upon the claims of the companies for whom they work, the companies are held, under the bye-laws of the Local Board of Health, to provide for their sanitary condition. The difficulty is with people otherwise employed, and apparently too poor to build or to rent houses. They are allowed to pitch tents on the unoccupied parts of mining claims. These tents and their surroundings are usually indescribably squalid and filthy. Where a Government reserve or other land is available for the purpose, it is arranged that camping shall be permitted only upon it, and under the control of the Local Board, which sees that proper sanitary provision is made, in return for a small weekly payment. Hitherto this has not been possible at Zeehan, but some of the tents have been dealt with. They had been put upon ground already polluted with filth and sewage. They were taken down, the ground levelled, the surface burnt, and then the site to be actually occupied by the tents covered with a layer of charcoal—very easily procurable here—a wooden platform or floor made, and the tents re-erected thereupon.

All this is not a record of engineering difficulties overcome, but a narrative of how the exceptional condition of things which is sometimes met with in new communities, and which urgently required to be immediately dealt with, was so dealt with in a simple, economical, and, above all, effectual manner. Some of the work done is necessarily of a temporary character, but none of it is useless, and all of it is well worth what has been spent upon it. When the railway is completed to Zeehan other means will be available, and the work will have to be greatly extended, commensurately with the extension of the settlement.