

the necessary plant will be about 12 to 15 cwt. Connected with the receivers is a series of pipes passing backwards and forwards in the truck; the gas that the receivers are charged with is permitted to pass through an automatic valve into the pipes before mentioned, the result being that as soon as the gas becomes expanded it extracts the heat from the pipes, reducing the temperature as low as 30" to 40" below zero, the result being that the warm air laden with moisture, comes into contact with the pipes; the gas at first is allowed to expand rapidly until the air becomes cooled to such a low degree that it is robbed of all moisture. This moisture is deposited upon the pipes, not as ice but as frost, the cold air falling to the floor of the truck drives the warmer air against the pipes until the moisture the air contains is drawn from it. The cold surrounding a Thermostat operates a valve, causing the metal to expand and contract, and so close or open the aperture through which the gas passes. The air being once cold does not so rapidly expend the gas which is already in the pipes, and with a small expenditure their surface remains cold enough to retain and keep an equal temperature for hours, nay, not for hours only, but it can be so regulated that the temperature can be kept for days, with a variation of three degrees only, and this simply by regulating the Thermostat electric valve to the temperature required. This, gentlemen, I trust before long will engross the attention not only of the Government but of the people also, for it must be clear to you where it is possible to kill the stock in the interior and convey it to the metropolis in the manner I have suggested, that it is not only for the best interests of the squatter who grows the cattle, but to the interest of the people who consume them, that this system should be adopted. We all know the disadvantages in this line which the people of the cities have to contend with, and I trust at an early date these disadvantages will be a thing of the past. This then is another channel in which engineering skill will be brought to bear.

We have again another field for the engineer's skill, where there is ample scope for thought and action, in the alterations of our tram system. I desire to make no comment as to which is

the best system to adopt, but I have no hesitation in saying, and I am sure you will agree with me, that the sooner engineering skill is brought to bear either to improve the present system, or introduce one which will be more beneficial to the travelling public, the better. It is the intention of the Government to make some alterations at an early date in the tram system, and it is to be hoped before anything definite is done the cable system will have careful consideration.

We have also a great field for the engineering community in the mining industries of the colony. Those who have travelled in the interior and have had facilities for examining various mines will bear out what I say, that the future of the colony in a very great measure will depend on her mineral resources. In almost every portion of New South Wales minerals are to be found, and it simply wants engineering skill, coupled with capital, to take from the earth wealth with which we can develop various other industries. At the present time the colony must lose large amounts of wealth in a year by sending minerals to various parts of the world to be treated instead of treating them on our own shores. With the enormous amount of raw material we have at hand I am disposed to think that some practical and energetic men could take the question of extracting wealth from our ores without the great expense and loss of time entailed by sending them to various parts of the world to be treated. My practical experience of mining in this colony induces me to believe that the great future of Australia will rest in her mineral resources.

None can deny that the resources of New South Wales are indeed great, if we can only get men to bring her mining industries on to a sound and legitimate basis, a basis which will give the public confidence to invest their money in speculations of this kind and help to develop them. But I say until we can get it on to an honest footing, it is impossible to expect anything like good results. How many instances have come under our notice where mines have been floated into public companies, large amounts of money collected together and spent in some form or other, resulting in a complete crash; not a single dividend, nor a single item visible that would

induce the shareholders to invest in similar speculations again. No doubt the mineral resources will be worked, but it will take a long time to give the public of New South Wales that confidence they should have before investing their capital in these ventures. How often do we find directors of companies, instead of getting the best machinery on their mines, buying any worn out article that can be got cheaply, and then enormous amounts of money have to be spent, large portions of it go through specific channels, the directors are satisfied, but the people are robbed. If the public could be interested in mining industries it would no doubt open up large fields for mining and pumping machinery and appliances for treating the ore, and the engineering community would derive considerable benefit. It would open up channels in which the rising generation would have facilities for learning trades and qualifying themselves to fill good positions in life to their own advantage and to the increased benefit to the country.

Whilst speaking of the mineral resources of the colony it may not be out of place to make some remarks upon the recent discovery of natural gas in New South Wales. I have had the opportunity of visiting the bore and ascertaining the facts connected with it, and with the land surrounding it. No doubt many of you observed in a recent issue of one of the papers an extensive article upon the gas bore, and although it is the first natural gas which has been struck in New South Wales, yet I have every reason to think there are several parts of the colony where the same results may be obtained. It is impossible on this occasion to treat the subject at length, and I trust in the near future those gentlemen who have had the energy and enterprise to put a bore down to the extent they have on speculation, may reap a rich reward for their undertaking. In the event of a rich gas mine or oil well being struck in that district it is evident there will be opened out a large field, not only for the theoretical engineer, but for the practical one also, as it will in a measure revolutionize many of the recognised systems of to-day in the various parts of the colony. Summing up the few industries I have named, there is evidence clear and decisive that there is an extensive field for engineering skill. But before engineering skill

can be brought to bear on new industries it is evident the capitalist must come to the rescue; when both are combined with full confidence in each other, large works will be undertaken and gigantic fortunes made by the persevering and energetic.

I would now glance at the Patent Laws, and I trust that whatever steps may be taken in the present year with regard to them, that the members of this institution will give them their earnest attention. I have always been imbued with the idea that it is a great hardship to men who have carried out any new idea to be taxed for their perseverance and intelligence in each of the Australian colonies, and I hope the Governments of the various colonies will see their way clear to so regulate the laws relating to patents, that in the event of a patent being secured in one colony it shall hold good in any of the Australian group by registration only. It does seem to me most extraordinary that people all belonging to the one nation, speaking the same language, ruled by the same powers, should, simply because there is an imaginary line dividing their territories, compel a man, who has perhaps spent years of time and large sums of money in perfecting some new idea, to pay additional sums in whatever part of Australia he is desirous of securing his invention. I again ask should this patent law come prominently before the people that you will with your pens and your voices urge upon the Government to grant the inventor this privilege.

Before concluding my remarks there is one subject I must allude to. It is a resolution, which was moved by myself in September last, discussed by this Association, and carried. I allude to the resolution asking that the Government should invite competitive designs for all large public works. I take no exception, nor do I wish to say one unkind word concerning the management of any department in the Government service, but in the early part of my address I have expressed myself clearly with regard to technical education, and we know the Government are spending large sums of money every year for the purpose of training the rising generation to the highest possible standard. If it is wise on the part of the Government to expend

the money, and if it is essential that the coming men should be educated to that standard so as to hold their own with people from the other parts of the world, why should not the Government give them the opportunity of thinking out and designing our large public works and buildings? If the rising generation have no opportunities, and comparatively speaking they have had very few, how then is the world to know what they are capable of doing? My view of the matter is this, should there be any large public works likely to be carried through by the Government, they should call for competitive designs not from men outside the office only, but allow those who are in the various Government Departments to compete in their own time as ordinary citizens and not as civil servants. How often do we find men filling subordinate positions, designing, carrying out works, checking all calculations, in fact taking all responsibility, and yet when the work is complete their names are never heard of. I believe in allowing the man who has won the honour to wear it.