as applied to motive power, and without any wish to underrate the immense value and importance of a large and permanent water supply to this field.

The plan I would suggest is that adopted by water companies in California, and proved to be all that was expected or required. The printed extract which I enclose, and which is part of an article showing the failure and defects of the Victorian water supply scheme, comparing it with the Californian plan, will explain itself:—

"Let us see how they manage similar pipes in California. A private company of miners have lately carried a pipe across a creek, similar to Back Creek except in depth and width, the Californian gully being upwards of 12,000 feet wide, and 1,050 feet below the inlet end of the pipe, and 900 feet below the outlet, the pressure of the water being 385 lbs. to the square inch. The pipes are 30 inches diameter, and as the difference of level between the inlet and outlet is 15 feet, the velocity of the water, and consequently the volume discharged in a given time, is very great. The most remarkable thing in the construction of the Californian pipe is that it is made of malleable iron in sheets bent round, double rivetted in the longitudinal seams and single rivetted in the circular seams, each length being dipped in boiling asphalte as a protection against rust. From the lightness of these, they are cheaper than cast iron. This is not a mere experiment on the 'trial and error' principle. They were first used by the Spring Valley Water Company. After ten years' use the pipes are as good as when first laid down. The carriage of the pipes was a matter for serious consideration in a mountain region, and the projectors could not afford to waste any iron. They accordingly used light plates where the pressure was light, and heavy plates only where the pressure was great. No. 14 iron was used for the first 150 feet of pressure; No. 12 for 275 feet, No. 10 for 350 feet, No. 7 for 425 feet, quarter-inch for 800 feet, five-sixteenths for 850 feet, and three-eighths for 900 feet. The equivalent thickness of cast-iron for the greatest pressure would have been three inches, or eight times the thickness of the malleable plates. The pipe was laid in a trench five feet deep, and well covered with earth to protect it from changes of temperature, no failure being anticipated, and none having occurred. The way in which the work was done was worthy of the spirit in which it was planned. The *Scientific Press* says that 'the pipe was made at the rate of 1,100 feet per day, giving employment to a large number of men. The punching and shearing was done by machinery expressly designed for this pipe, and worked as high as 30 tons of iron daily, 87,000 feet of pipe being manufactured and laid in place, and the water run through, in four months from the commencement of the enterprise'."

It seems hardly credible that the Americans, essentially a wood-working people, who apply wood to hundreds of purposes where others use iron, should see the advantage of using iron, whilst we, belonging to the largest iron-producing and iron-consuming country in the world, are content to adopt in our public works systems and plans obsolete with them many years ago, and use wood for our tramways and waterworks, at double the cost it would be to them.

The advantages apparent to me in the Californian system, as applied to the Thames water supply, are perfect immunity from the accidents and contingencies before alluded to; a supply of pure water for the town, for domestic and sanitary purposes and for fire; a constant and reliable water power suitable for turbines or water engines, and battery supply; a considerable saving in distance, as regular gradients would not be requisite; a saving of the fall lost in the necessary gradient of flumes or races; a wider choice of route; capability of extension to higher levels, if required in the future; and a saving in the cost of construction—besides being an engineering work, if carried out properly, that would be a large source of revenue to the Government, and a lasting monument of its fostering care and foresight.

I have, &c.,

The Hon. the Minister of Public Works. JOHN GIBBONS.

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Mr. J. HIGGINS to the Hon. J. D. ORMOND.

SIR,— Brighton G.M. Co., Grahamstown, 7th July, 1872.

I herewith reply to your several inquiries respecting the water supply to the Brighton Co.'s Battery:—

1. 35 horse-power steam engine, driving 20 head stampers.
2. Only one-half sufficient water for present battery with power for driving 20 head more; the present water cost, £25 per annum.
3. Three sluice heads from high level.
4. Water power is preferable.
5. £40 per annum per horse power. Batteries to receive the water after giving the motive power.
6. From the creek, not constant, and of bad quality.
7. Doubtless it would increase the yield, but how much I cannot say.
8. Pure water would materially assist in making our poor mines pay.
9. ½ oz. per ton will pay working expenses in the present state; ¼ oz. per ton with water power.
10. I believe the numbers of mines would be doubled; as to my opinion on this head, judging from the yield of large and continuous reefs in the present state nearly pays expenses, a slight increase from pure water would overcome the deficiency.
11. Water can be used to advantage lower down the creek for a motive power for two or three batteries.

I have, &c.,

The Hon. the Minister of Public Works. JAMES HIGGINS.

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Mr. J. BROWN to the Hon. J. D. ORMOND.

SIR,— Grahamstown, 8th February, 1872.

I received a circular from you requesting me to furnish answers to a series of questions on the water supply scheme for the Thames. The following are my answers:—