

of powder and by the darkness, verified and coincided with extraordinary precision, whilst the meeting of the workings was exact.

Very little trouble has been experienced in ventilating the workings of this tunnel; no artificial means having ever been either needed or resorted to, except an occasional fire at the feet of the shafts, or in their man holes. The working shafts having been sunk in pairs, 15 feet clear apart, and joined by suitable man holes. There was never any difficulty in producing a circulation of air by the aid of fire, or in directing the pneumatic current at will, either up or down a particular shaft. And so pure was the air in the *heading*, at 1500 feet in from the south or open portal, where no air shaft or artificial ventilation was ever required, that I entertain not the least doubt that a tunnel of the dimensions of this one, might be driven in such material, from an open portal, near half a mile under ground, without other ventilation than would be produced by the natural currents of air from the open end.—The British miners, in their coal workings, regard 300 yards lineal as the maximum length to be given to drifts without air shafts; but experience here indicates that, in works of this size, penetrating a material, which engenders no deleterious gas, 500 yards lineal, may be driven with entire safety, and perhaps even far exceeded.

In November, 1839, when the two main workings had approximated within 600 feet of each other, and were, respectively, 325 and 310 feet deep under ground, the sound of the blasts in both workings was reciprocally heard in each, through the intervening mass of solid rock, resembling a dull tap with a hammer; and when they had attained a distance of 150 feet apart, the sound of the advancing hammers of the miners could be heard through.

The drainage of this tunnel has never been very great, not having, at any time, exceeded an average of *four* cubic feet of water per minute.

As but 1,502 feet lineal of the full section of *bottoming* now remains to be done, the tunnel excavation is in such a state of progress that, by pressing it vigorously, there would be no difficulty in bringing it alone to completion in 18 months; and inasmuch as the arching could and ought to be commenced before the excavation is all removed, (because the packing behind and over the arch is to be supplied by the spoil of the *bottoming*,) if the manufacture of brick, which has been too