

made for its reception. Every evening a large lantern with powerful burner and reflector was set up on the station where the altazimuth instrument has been placed as a back sight and which had been decided to be the boundary deflection point on the north west branch. The transit instrument was set and levelled and centred on this light, the telescope was then turned over in the direction of the line towards the next ridge or prominent point — (the cutting party having made their way through the woods during the day to the point) burnt a torch which was easily moved to the exact spot under the centre wire by flashing gun-powder. The signals were thus, one flash — are you ready? which, when answered by a flash, was an affirmative. Then we had one flash, move east, two flashes, move west, three, wait a while, four, all right, go home. Each signal was answered by a corresponding number of flashes from the other party. The flashes were made at first with a quantity equal to two charges of a fowling piece, then three charges, and at the last or greatest distance four charges. With these charges every flash could be distinctly seen, and the party could be moved almost as easily as by speaking to them. Rockets were tried for a while but many of them were never seen, and when seen they were not as good as the gun powder. The torches were made of birch bark saturated with turpentine and rosin and were distinctly visible at the greatest distance, the $42\frac{1}{2}$ mile point. When the sun shone a heliostat was used for lining in. When this was visible through the last opening in the woods crossing a ridge the men could ascertain the position of the line on the ridge ahead and get the point near enough to be ready for the signals. For the first six or seven miles the line was opened out as the work proceeded, intended to be straight but this was too slow and was never sufficiently correct when within sight of the directing transit, so that system was abandoned and the party directed to go ahead from ridge to ridge as best they could with compass bearings, and on the top of each hill where the torch had been lined in, good stout poles with boards nailed across were set up as guiding points between which the sappers' theodolites could direct the