SECT. II.—OTHER SELECTED PAPERS.

(*Paper No. 4290.*)

“Permanent Way on Steel Sleepers.”

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ON the Author's recommendation, the Egyptian State Railways obtained a small consignment of steel sleepers about 9 years ago, for carrying out tests, and, some 5 years later, a larger consignment was received for a similar purpose. In the first consignment the sleepers, which weighed 50 kilos. each and cost 5s. 6d., delivered in Egypt, were designed and supplied by a Belgian firm. The second consignment was supplied by an English firm to the Author's design, which followed closely on the lines of the Belgian design. In this case each sleeper weighed 60 kilos., and cost, delivered in Egypt, 8s. 6d.

Fig. 1 shows details of the heavy sleepers and of the fastenings used with a Vignoles rail, 95 lbs. per yard, British Standard Section. The rails are 12 metres long and eighteen sleepers are required for each rail length. It will be noticed that the gauge can be widened on curves by turning the rail clips over, on one or both rails. One kilometre of the main line to Alexandria was laid in Lower Egypt with the first-mentioned type of sleeper, one half in shingle ballast with a high proportion of sand, and the other half in ballast of clean broken basalt. After 9 years' service, the sleepers in the shingle ballast show considerable deterioration by rust, and their life is estimated at 25 years. In the basalt ballast a better result is obtained, as ventilation is improved, and it does not hold the damp to the same extent as the shingle and sand. The life of the sleepers in this ballast is estimated at 30 to 35 years. Under similar conditions the life of well-seasoned pine sleepers in their natural state is estimated at 13 years. In Upper Egypt, heavy

line and level very well. No appreciable wear of sleeper and rail at seating is noticed. The Vignoles rail used has a broad foot, providing ample wearing area at this point. The fastening connecting rail and sleeper has proved quite efficient, not a single case of failure having been reported up to date, nor is there any sign of wear beyond the slight oxidization that might be expected.

Upon the result of these trials, it is probable that a large order will shortly be placed for steel sleepers.

The Paper is accompanied by one drawing, from which the Figure in the text has been prepared. A slight alteration has been made in the length of the sleeper since the Paper was received.