

By the theoretical speed of a cable the Committee understand the maximum number of words which can be transmitted in a minute so that an experienced operator can certainly and easily read them. The practical speed is the proportion of that maximum number which remains after certain deductions have been made for the transmission of words for which no revenue is received, and for loss of time.

28. The Committee ascertained that these deductions were made on account of—(1) Service indications and prefixes, such as station of origin, number of message, time, date, &c.; (2) repetitions, errors in transmission, corrections; (3) necessary intervals between the messages, time lost by clerks, &c.; (4) administrative messages connected with the traffic. There are, of course, other administrative messages which must necessarily be sent on the business of the line, but these could in most cases be left for periods when there was no traffic for transmission.

29. It must also be borne in mind, in considering this question, that, though the speed of a cable is usually stated as being a certain number of words per minute, these words are "reputed" words of five letters each. In actual practice a word averages eight letters, the increase being due to the use of code-words and to the omission of many conjunctions and prepositions when messages are sent "in clear."

30. The so-called "words," however, which have to be added to each message as service indications and prefixes do not consist generally of more than two or three letters each.

31. After weighing all the evidence carefully the Committee are of opinion that a deduction of 33 per cent. from the theoretical speed is amply sufficient to give the practical speed, or the paying traffic.

32. This estimate is a cautious one.

33. There is no apparent reason why, with good management, the "dead" traffic on a Pacific cable should not be kept much nearer to the level which obtains on the Atlantic than to that which obtains on the eastern lines. In addition, however, must be taken into consideration unavoidable losses of time in each working-hour, and the fact that the use of code-words (usually long ones) is increasing.

34. It has also been stated in evidence that possibly a Pacific cable would have to comply with the regulations of the International Telegraph Convention, but in the case of a line touching only British territory this necessity may perhaps be avoided.

35. The estimate of 33 per cent. has been arrived at with the desire to include an allowance for every possible deduction from the earning-power of the cable. If the experience of the Atlantic cable companies can be relied on the percentage would be considerably reduced.

Number of Working-hours per Diem.

36. In this matter, again, the expert evidence was somewhat conflicting, but the Committee consider that an estimate of eighteen hours per diem, during which the cable could be worked, would be a moderate one. A very small allowance for duplex working has been made in this calculation.

37. Duplex working is the system under which the same cable is made to transmit messages from both ends at the same time. It can be applied so as to add about 80 per cent. to the traffic sent by simplex working. But full advantage can only be taken of this system when the business hours are substantially the same at both ends of the cable. This, for instance, is the case between, say, London and Lisbon; as between London and New York, where the difference in point of time is about five hours, duplex is only regularly available for the few hours which may be considered part of the working-day in both places; while as between this country and the east of Australia, where the difference is about ten hours, so that night here is almost synchronous with day there, duplex working would only be resorted to to a small extent.

38. The conclusion the Committee have arrived at is that the core of 552 lb. copper and 368 lb. guttapercha might reasonably be expected to give forty paying letters a minute.

39. The core of 650 lb. copper and 400 lb. guttapercha similarly would give forty-eight paying letters per minute.

40. To get the carrying-capacity of these cables in a year the above numbers of letters should be multiplied by sixty (minutes to the hour); then by eighteen (working-hours per day); then by three hundred (working-days in a year). The totals on this basis would be: At forty paying letters, or five paying words, 1,620,000 words; at forty-eight paying letters, or six paying words, 1,944,000 words.

41. Thus the lowest of these totals considerably exceeds the whole of the Australasian traffic in any year except 1895.

Cost of Laying.

42. The Indiarubber, Guttapercha, and Telegraph Works Company has offered to lay the whole cable over the route recommended, with the first of the above-mentioned types for the long section, for the sum of £1,517,000, this sum including the erection at each station of a suitable dwellinghouse and operating-room, with duplicate sets of all proper instruments; also the use of two cable-repairing ships, with the cost of maintaining them as well as the cables themselves for three years.

43. This estimate included an allowance for 10 per cent. slack.

44. This allowance of slack is, in the opinion of the Committee, a reasonable one for actual laying, but they are of opinion that another 10 per cent. should be manufactured, which would be properly chargeable to the repair and maintenance fund to be hereinafter mentioned.

45. The condition as to maintenance for three years was laid down by the Canadian Government in inviting tenders, but, though there is some convenience in thus having maintenance guaranteed for the first three years, the Committee consider that such a period is unnecessarily