[London,] 28.5.73

J. W. Eames to Henry Fischer[1]

The Controller—

The trial of Mr. Edisons Automatic instrument commenced on Friday the 23rd inst at 2 pm—

It was found practically impossible to carry out the trial strictly according to the instructions laid down,[2] owing to the limited supply of prepared paper, and from the fact that a large quantity had been consumed in the preliminary experiments—[3]

Instead therefore of a column showing the time occupied in sending a thousand words, a column was made with the heading "No of words received" and the time occupied in receiving a given number was entered under the heading "Total[a] time"—

During the first day of the trial no adjustments were made after starting at 2.8 pm.[4] The speed attained each half hour exceeded 500 words per minute, with the exception of one instance when 455 words only were received— This reduced speed was however evidently caused by the sender at Liverpool[5] miscalculating the number of revolutions made per minute by his sending gear and not by any defect of the wire or apparatus.

The marks in each trial were good but manifested a tendency to run together— this tendency was however much less marked when the receiving band was made to travel faster—

On the second days trial the speed was in three instances[a] below 500 owing as on the first day to the sender not properly computing the rate of speed at which he was propelling the punched band—

~~During~~ Between[b] the fifth and sixth trial the wire was used three minutes by Mr Edison in obtaining a score or two of words from L'pool, which resulted in his making a readjustment occupying but a second— Two other adjustments were made [--]between the two following half hourly trials but they did not occupy more than a fraction of a second each—

The stock of prepared paper having run out on the previous

days trial, a fresh supply had been made, but this paper[a] was very wet, and unsuited for immediate use—

It is believed that the adjustments mentioned were made solely with the view of shunting part of the current[6] in order to remedy this evil as far as was possible—

The average speed maintained through the day was 501 words per minute—

The third and last days trial was commenced by the two first half hourly results indicating a speed of 467 and 482 words per minute— The three following results shewed that the rate had exceeded 500 words per minute— The character of the marks in each of these five trials could not be said to be good, but they were readable—

The wire was changed before[a] the sixth trial, and a marked improvement took place, the signals being very good and clear— With one exception the marks were recorded at the rate of 500 words per minute, and that exception was caused by the difficulty of precisely fixing the actual speed of transmission—

It appears to me that the sole advantage of this system over the Wheatstone is the established fact of its much higher speed—[7] It has the disadvantage that the prepared paper being damp is easily torn by the accidental pressure of the fingers or by other untoward means— The marks also are not durable, vanishing from the paper in a few hours[a] and liable by contact to become transferred to other portions of the same band—[8] Should it however become advisable to work at a higher rate of speed in preference to increasing the number of wires I should consider these objections of but minor importance— The punched paper could be preserved for record, and the chemically prepared paper thrown aside—

It is perhaps right to point out to you that by this system it would be necessary to maintain a staff of writers of sufficient strength always in readiness to deal with the greatest amount of work likely to be sent through at any one time—

An accumulation of slip for[a] even a few minutes whilst additional hands were being brought up to meet the momentary pressure, would be—for the reasons previously mentioned—fatal to the work—

Bearing in mind these conditions I can see no reason why with a proportionate increase of staff over the Wheatstone complement there should not be proportionally increased results—

I think that I should not be under = estimating the proper

working speed on our L'pool wires to be 400 words per minute, at which rate the marks have invariably been perfect—

I might mention that no adjustment appears to be necessary beyond that of the shunt—and that the instrument can readily be worked[a] by an ordinary good Morse clerk, and by care being taken that the prepared paper is neither too wet nor too dry—

J. W Eames[9]

ALS, UKLPO, ATF, Item 73. On paper headed "TELEGRAPHS." in upper left corner under embossed seal. "Enclosure to Mr. Fischer's report of 30 May 1873—Report (with 4 enclosures) from Mr Eames to the Controller of the Central Telegraph Office ~~with~~ ~~ene~~" written in an unknown hand at top of first page. [a]Repeated at end of one page and beginning of next. [b]Interlined above.

1. Henry Fischer was controller (i.e., financial officer) of the central office of the British telegraph service in London.

2. On 22 May, Culley wrote out the "Conditions of the final trial of the Little Automatic System" (Item 73, ATF). The test was supposed to determine the time needed to transmit 1,000 words; instead, the receivers recorded the number of words sent in two minutes.

3. The paper for receiving that Edison brought with him. Compare the explanation given by David Lumsden in Doc. 319.

4. That is, 2:08 P.M.

5. The sender was Jack Wright (n.d.), who had come from America with Edison for the tests. Wright, a telegrapher since 1862, had been night manager of the Western Union office in Boston and had roomed with Edison when Edison worked there in 1868–69. He had come to work for the Automatic Telegraph Co. in New York in 1872. Cat. 299, Lab. (*TAEM* 6:133); Brief for Field, p. 61, *Wiley v. Field.*

6. Edison put shunts around both the receiver and the transmitter; see the diagram in Doc. 319.

7. See Chapter 12 introduction, n. 3.

8. By the end of 1873, Edison had developed a chemical solution that made permanent marks on the paper. Sir James Anderson to Scudamore, 5 Jan. 1874, Item 67, ATF.

9. J. W. Eames was a staff member in the central office of the British telegraph service assigned to monitor the tests. Henry Fischer to the Secretary, 20 May 1873, Item 67, ATF.