point of its axis and the straight line joining the centres of ends of same. How absurd then it is to increase this distance by transverse loading!

Finally, to show what impracticable ideas of bridge designing both Dr. Levy and his translator are possessed of, let me quote from p. 31 of the translation a couple of lines:—"It is to be remarked that for bridge girders the most favourable ratio of the depth to the span lies between the limits from $\frac{1}{4}$ to $\frac{1}{3}$ or from $\frac{1}{10}$ to $\frac{1}{2}$.

Anybody at all posted in modern practice must know that the economical depths are almost twice as great as above stated. I have investigated this subject systematically in a paper on "Economy in Highway Bridges," published in the Proceedings of the Engineers' Club of Philadelphia, by making over one hundred actual designs, and have conclusively shown that the economical depth varies from one-fifth of the span for spans of one hundred feet to one-seventh of the span for spans of three hundred feet.

This subject of economy in bridge trusses, although a favourite one with mathematicians, is altogether too complicated to be handled by pure mathematics; and it would be greatly to the advantage of the engineering profession if chronic mathematicians were to let bridge designing and kindred subjects alone.

Yours very respectfully,

J. A. L. Waddell.

Tôkyô, February 13th, 1886.

(Feburay 23rd, 1886.)

Sir,—I see that my small letter has come in for a large share in Mr. Waddell's last two letters, clearing things up as he calls it. He might have, among other things, cleared up why he calls it a "discussion," seeing it is entirely one sided and that no Englishman took up the merits of the case. The English letters merely commented on the want of courtesy in Mr. Waddell's preface. My own letter was to prevent my ex-pupil from being publicly put in a false position, though I mentioned Dr. Levy's book as antagonistic to Mr. Waddell's, and gave a quotation from the trade list of Matheson and Grant directly the converse of what had been stated.

This letter is written to put those parties, Dr. Levy and Messrs. Matheson and Grant upon their feet again, in the eyes of the Yokohama public; as they have been "cleared up" in the most unscrupulous way. In fact it has been stated that Matheson and Grant are liars in a mercantile sense upon the authority of a respectable anonymous firm of merchants in America. I would point out to the public that Matheson and Grant are a respectable English firm, whose business dealings are open before the public, and suggest that the opinion of the American anonymous firm may be worthless or worse.

An amusing little imaginary biography of Dr. Levy is given as a good mathematician, implying that he is no engineer. Allow me to correct this by saying that Dr. Levy has long been Engineer-in-Chief in the Department of the Seine, and that he is more than a good mathematician; that