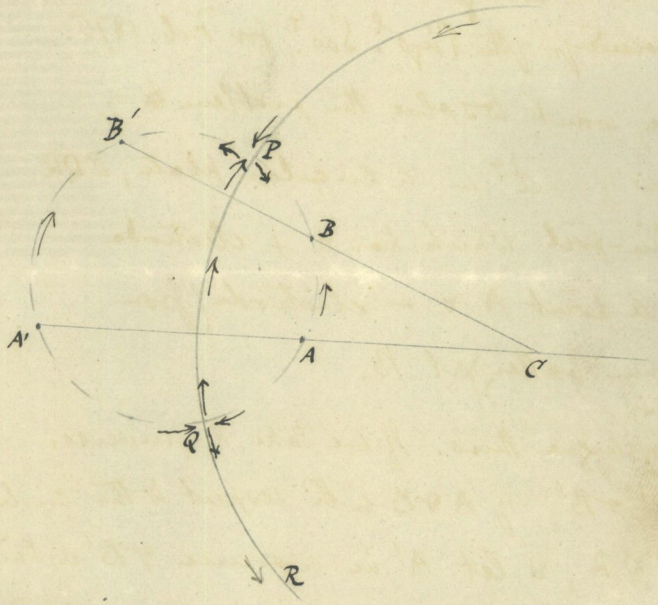
10/98

31, Cobeshill St., Sloane Sq., S. W.
Apl. 18.

Φ,

I am puzzled at a result in a paper by Lodge & Foster in The Proceedings of the Phys. Soc. for Feb. 1875. They want to solve the problem of flow of elect. in a circular plate, PQR, of tin-foil which has a + electrode at a point A & − electrode (from same battery) at B.

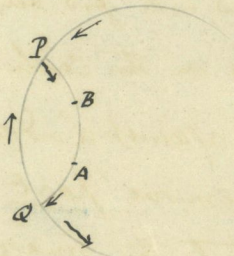


They argue thus. If we take the inverses, A' & B', of A & B with respect to the circle PQR, & let A' be a source & B' a sink of same strengths as A & B, the ⊙ PQR is known to be a line of flow.

Here I demur. The complete line of flow is this ⊙ + the circle AA'BB', as is easily seen. (Lodge admits this). Moreover, with this system of 4 points, the velocity = 0 at P & also at Q. This is curious, & somewhat puzzling, but I have drawn arrows indicating the motion of the fluid in such a way that we see how the resultant velocity at P & Q = 0. (I am by no means satisfied with this explanation, though. I don't understand how the fluid at P is kind enough to branch off in this manner).

Well, Lodge & Foster say that the circumstances in their limited circular sheet, PQR, with the two poles A & B, may be calculated (are the same) by supposing the 4 poles in the unlimited sheet; & hence things follow smoothly enough.

But I deny this. In the limited sheet, I don't see how vel. at P & at Q can possibly be zero. Now, with zero vels at P & Q can the elect. that was once on the circle ever get off it?



I maintain, against Lodge, that we have no business to remove part of a flow channel at all, & that the image theory is misapplied to this case. What say you? Lodge thinks he's right, & says that there are two pts. P & Q of zero vel. in his limited plate; but I await second reply from him, & he is taking a long time about it. Give me your view.

M.