

the needles are not all equally
strongly magnetised it would be
well to have them all as nearly
as possible in the plane of the
correctors in order to get over an
error due to the vertical component
of Terrestrial magnetism. For instance
if the two magnets on one side were
equal and both stronger than those
on the other side and these two equal
there would be no error due to the
vertical component in Moore's
argument - while there would be
an error if they were all in the
plane of the card. There is also a
slight advantage in having all four

7 Ely Place
3 Feb. 1889

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My dear Maurice

I was in London from
Friday night till this
morning so only got your
letters today.

I am afraid there is very
little magnetic difference
between putting his needles
on or under the card in
Moore's compass. There
can't be difference as
regards heeling because

heeling produces no change in their relative positions in either case. Of course as regards heeling as depicted in Moore's sketch there is a difference between fixing the magnets to the compass box and to the ship so that his arrangement differs essentially from the other arrangement he depicts as the ordinary method of adjustment. I don't say which is best, but there is a difference. As regards

the difference between the action ~~than~~ of the correctors when the needles are under or on the card it is very slight indeed. There are just two slight differences 1^o The needles are acted on more strongly by the correctors when they move in the plane of the correctors than if they moved in a parallel plane, as is evident if one considers the effect of removing them even so far off. This applies even though it were proposed to bring the quadrantal correctors closer to the card than ~~as~~ as shown in the figure for unless they were put outside the card they could not be in the planes of the needles. 2^o If

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common centre of gravity because any error depending on an inequality in ^{the} strengths of the magnets would be less if they are all as near as possible to their common centre and they are nearer it when arranged in a square than when arranged in a line.

In the first point, I have made the average distance of the magnets from the correctors is less in Moore's arrangement than when they are arranged in a plane.

I would not make an

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affidavit that these differences are important but I am quite willing, if I am sent before-hand the usual fee for expert evidence, to make an affidavit that these differences exist.

1^o. That in Mr. Moore's compass box as constructed by him the effective distance between the correctors and the needles is less than if he had placed the needles on the card and that in consequence the ~~correctors need not be so large~~ action of the correctors on the needles is greater

with the arrangement adopted than if he had placed ~~the needles~~ on the card.

2^o. That if there is a ~~difference~~ in the moments of the magnets used there ~~is less risk of introducing~~ a difference in the effects produced that would be ~~introduced~~ and that in particular if the two magnets on one side were ~~stronger~~ than those ~~which were likewise equal~~ on the other (the vertical component of terrestrial magnetism would produce no effect on the ~~magnets~~ as arranged by Mr. Moore but would produce an effect if the needles were placed ~~up~~ on the card). That in general less effect would be produced by inequalities in the