Correspondence—Mr. E. Ray Lankester.

_ELEPHAS MERIDIONALIS IN THE NORWICH CRAG._

Sir,—I must beg you to allow me space for a few additional remarks—Firstly, Mr. Gunn's "evidence" is, I may venture to say, without offence, undeniably _no evidence at all_, and the way in which Mr. Fisher uses it in building a theory is an example of a common method of the growth of error. Mr. Fisher is quite right in saying that Mr. Whincopp's collection does not contain _E. meridionalis_, nor do other equally fine collections known to me. Mr. Fisher abandoning _E. meridionalis_ as a Red Crag fossil, observes—"The species, however, is abundant in the Norwich Crag, which is sufficient for my argument." I would ask here, what exactly is the mode of occurrence of _E. meridionalis_ in the Norwich Crag? How many molars have been found, and in what parts of the Norwich Crag? The headquarters of _E. meridionalis_ in this country are undoubtedly in the Forest-beds, and the few specimens which appear to have come from the Norwich Crag, may have been derived, or have come from a representative horizon of the Forest-bed. Why does Mr. Fisher speak of "Miocenes of the south" as furnishing derivata to the Suffolk bone-bed? Surely Miocenes of the north will satisfy the required conditions better.

Some of Mr. Fisher's paragraphs lead me to suppose that I have been understood as wishing to dispute the identity of the Red and Norwich Crags. This was not my intention. I quite believe that they shade off into one another—the more northern beds of the Upper Crags being newer than the southern; this rule holding good for the various localities of the Red Crag, as well as the Norfolk Crag. My object was merely to get the facts rightly stated. The truth is, that nothing is known of the terrestial mammalia of the Coralline, or Red Crag period, i.e., of a fauna coeval with the marine fauna of those deposits, and I believe the same is true for the Norwich Crag. The contents of Mr. Gunn's stone-bed have no more to do with the Norwich Crag than have the contents of the Suffolk Bone-bed (two species of _Mastodon, Rhinoceros_, etc., Cetacean bones and nodules of Plio-mioocene¹ age,) to do with the Red Crag. I should much like to see a list of Mammalian remains in addition to the _Mastodon_ teeth, found in Mr. Gunn's stone-bed. The _Mastodon_ does not occur in this country with _Elephas meridionalis_ at all—or in France—and we may doubt if it does so even in the Val d'Arno, since the strata may have belonged to different horizons which furnished the one to the other. The relations of—1st, the _Mastodon_-fauna of the Suffolk bone-bed and Norfolk stone-bed; 2nd, the _E. Meridionalis_-fauna of the Forest-bed; and 3rd, the Marine-fauna of the Crags, have still to be worked out, and this can only be done by keeping the three quite distinct and adhering to fact. I think I have clearly shown that the _Mastodon, Cetacea_, etc., of the Suffolk bone-bed are older even than a deposit (the sandstone nodules) containing _Conus, Cassidaria, Pyrula_, and _Isocardia_, in place of the more boreal forms of the Crags. The question arises as to whether

¹ This compound is used to avoid offence.
the same is true of the Mastodon of the Norfolk stone-bed. The re-
mains of the Forest-bed are in the hands of Mr. Boyd Dawkins, who
doubtless will not allow them to be mixed up with Crag or Bone-
bed specimens.

HAMPSTEAD.

SUGGESTIONS ABOUT DENUDATION.

Sir,—Your number of this month (p. 109) contains a clever paper
by Mr. Kinahan. With one exception, I agree with everything that
he has said. The exception relates to what Mr. Mackintosh has
dubbed "My hard-gorge and soft-valley theory." I think that Dr.
Hooker's terraces are patches of alluvial plains (or river haughs)
sliced into terraces, and not filled-up lakes. Alluvial plains, pro-
perly so called, are deposited by the overflow of rivers upon flat dry
ground, and not in hollows like filled-up lakes. Take the engraving
of Dr. Hooker's terraces. On the left of the river, as you look at it,

Diagram of the Glacial Terraces at the Fork of the Yangma Valley (copied, slightly reduced in

are four terraces. Number them 1, 2, 3, 4 from the river. No. 1 is
now being formed in precisely the same way as all alluvial plains,
and as all the preceding terraces have been formed. That is, by
deposit from the overflow of the river on to the dry flat surface
of the terrace, which also receives the waste of the sides of
the valley and of the old terraces. No. 2 forms the banks of the
river when in flood, and is vanishing now in precisely the same way
as the preceding terraces have vanished. That is, the flooded river
pulls the loose banks down, till No. 2 is driven against the side of
the hill as No. 3 has been driven there. No. 1 then extends to the
hill-side, and is added to by every flood till the bed of the gorge is
lowered. Then No. 1 shares the fate of No. 2, 3, 4, and a new
alluvium is formed at a lower level and at the expense of No. 1.
Mr. Kinahan asks "what causes the barrier?" Any comparatively
hard strata which cross the stream below softer strata. Even the