LETTERS TO THE EDITOR.

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The Range of the Garefowl (*Alca impennis*).

IN 1856 the late Dr. Gray obtained for the British Museum an example of this extinct species from the collection of the late Prof. van Lidth de Jeude of Utrecht, and for some reason unknown to me had the locality "Labrador" painted on its stand. As I had been informed with certainty by the late Prof. J. T. Reinhardt that this specimen was one of those sent to Copenhagen from Iceland, I corrected the error in *The Natural History Review* of October 1865 (vol. v. p. 473, note), and the correction has since been generally accepted. It is therefore with some regret that I find the old error repeated in the recently published volume of the "Catalogue of the Birds in the British Museum" (vol. xxvi. p. 564), and the error is rather a serious one in the absence of evidence of the species having inhabited the coast of Labrador, as well as that of any skin of proved Transatlantic origin. I may also mention that on the same page of the "Catalogue," the date of Bullock's Orcadian specimen is wrongly given as 1812 instead of 1813.

ALFRED NEWTON.

Magdalene College, Cambridge, December 3.

Asymmetry and Vitalism.

THIS must be my last word on this subject, and it is only written because Prof. Japp asks me to correct him if I consider him wrong in his interpretation of my illustration of the separation of tetrahedral atoms. I apologise to him as a chemist if I used the word "compound" where I ought to have used "substance" or "mixture," although it seems to me Messrs. Kipling and Pope use the word compound in a perilously like sense in the eighth paragraph of their letter. The use of the word has nothing to do with the main argument, the chance production of the optically active "mixture," and then the production from the "mixture" of the optically active "compound" with only one enantiomorph. By the by, will Prof. Japp guarantee that all vital optically active substances are "compounds" in this sense, and not largely preponderating "mixtures"? I only put the question, rather irresponsibly in passing, owing to something a distinguished biologist let fall in my presence the other day. I am quite prepared to be told that this is as well demonstrated as the law of gravity. Now as to my illustration, I was certainly thinking of a spin from rest so that the tetrahedra start with an impulse relative to the fluid and further experience its resistance relative to their motion. Let us take the simplest possible case for an example. Suppose z' somewhat larger than y' , both considerably larger than x' and h negligible to a first approximation. Then I should expect y' to set itself nearly in the wake of z' , and x' to turn in towards the axis. Thus z' , y' , x' would be in a plane perpendicular to the axis; this would bring h above for one type of tetrahedron and below for the other type, or we have differentiated the positions of right- and left-handed tetrahedra. However, I do not lay stress on the illustration, for whatever we do now to separate left- and right-handed tetrahedra, I take will be asymmetrical relative to the sense of the original spin, and accordingly if I am correct, I am only inventing a clumsy illustration of non-vital asymmetric force, of which Prof. Fitzgerald has already given a much better illustration in the earth's rotation. Will any physicist having the apparatus at his disposal kindly spin with great but irregular speed a couple of tetrahedra in a viscous fluid, the axis of the churn being horizontal? The balls at the angles of the tetrahedra, being arranged right- and left-handed and of masses somewhat as above, we should be able to settle whether a differentiation of position would or would not take place. I should not be surprised to hear that the two tetrahedra moved to opposite ends of the churn.

KARL PEARSON.

A Shag's Meal.

THE following observation on the habits of the shag (*Phalacrocorax graculus*), which frequents our coasts, is probably of interest in itself and not without bearing on the subject-matter of Mr. Lowe's letter (November 24)

On August 15 last, when at anchor in Wicklow harbour, in the course of a cruise, we noticed a shag alight upon the water at a short distance from our yacht. It was a very calm, bright day. What follows occurred within a distance of a cable's length or thereabouts of our boat; and as I observed the proceedings throughout by the help of a powerful "trièder binocle" ($\times 9$) of Goerz, and my companion, Dr. H. H. Dixon, possesses unusually keen sight and closely followed the events, there is no doubt as to the reality of what is here recorded.

The shag, after swimming about for a little, dived once or twice—apparently fruitlessly—but finally appeared with a large eel in his beak. The eel was big and strong, and twisted into the form of a figure 8, evidently an awkward morsel. The bird kept snapping and shifting it in his beak, till at length with a few violent gulps it swallowed the eel, the latter evidently going down alive. It was to be inferred, in fact, that the shag was not happy with so large a live eel in his crop, for he swam restlessly about, twisting and stretching his neck incessantly. Presently he dived again, was down perhaps twenty seconds, and came up with an eel as large as the first one. This writhed and twisted like its predecessor, and, after much snapping, finally suffered the same fate. The same uneasiness was displayed by the bird, and the bird once more dived.

Dixon and I were expressing some surprise at the rapidity with which our friend had caught the two eels, and also at his very considerable capacity to hold two such large eels—certainly not less than 15 inches long each—when the bird reappeared bearing a third eel, as big as its predecessors and engaged in the same violent resistance. The same snapping, same gulping, same uneasiness and down for a dive once again! This was the third eel.

While we were taking sympathetic breaths with the insatiable shag, the latter reappeared—yet again with a 15-inch eel. Evidently the harbour was so full of 15-inch eels that a shag had only to dive to pick one up. It was also evident that no language could be too strong in which to condemn such unmeasured license. Four 15-inch eels—all swallowed alive—within the space of about four minutes!

But this was only the beginning, as will presently appear. The bird went down again almost immediately after the fourth. We determined to keep careful count and, if possible, get the measure, in eels, of a shag's capacity. Would he bring up another? Yes, there he was again with another 15-inch eel! A very vigorous eel—just like the others in size and appearance, and swallowed in the same manner, after about 30 seconds' resistance. This made five eels.

The question now arose as to what would be the end of this bird. Was he going to die the death of King Henry I. before our eyes? We called him King Henry to distinguish him from other shags.

To make a long story short, we counted twelve eels!—all stout 15-inchers. The twelfth seemed, perhaps, rather feeble than the others, but still it nearly got away. For King Henry dropped it in a too vigorous snap, and only recovered it by a prompt plunge forwards. H.R.H. now seemed to reflect that this last misadventure was a warning, swallowed his twelfth, and took flight; disappearing in an easterly direction whence he had come.

There is, of course, only one explanation of all this: the twelve eels were one and the same eel. To suppose the bird caught and devoured twelve eels of this size in as many minutes appears to us incredible. His final appearance as he flew astern of us betrayed no signs of surfeit. He would have had at least two pounds' weight of eel within had he really eaten twelve such eels.

The peculiar procedure of ejecting the prey under water appears very remarkable. Perhaps the head-downward attitude of diving is requisite to effect this.

Has this mode of weakening or playing with his prey been recorded of the shag (or, indeed, of any animal) previously?

Trinity College, Dublin, November 27.

J. JOLY.

Periodic Tides.

ATTENTION has lately been called by Mr. H. C. Russell, of Sydney Observatory, to what may be termed a tide of short period, which he has detected in the enclosed harbour of Sydney.

Mr. Russell traces a connection between this interesting