## LETTERS TO THE EDITOR.

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### Science in the Public Schools.

IN NATURE, vol. lxvi. p. 320, I directed attention to the insignificant place which science still holds in comparison with languages in our secondary education, as indicated by the results of the last matriculation examination at the University of London, the term "science" being limited to the sciences of experiment and observation, as distinguished from mathematical science. It was recognised at the time that the majority of the great public schools of England were only slightly represented in that examination. We have now, however, the results recently published of the examination for higher certificates conducted by the Oxford and Cambridge Schools Examination Board, which is a far better index of the real position of science in schools of the class mentioned. An examination of these lists is not found to be very reassuring. Eton College, for example, with its thousand boys, gains forty-five certificates, yet I cannot find a single name of an Eton boy who has passed in any scientific subject. The following list (with results) contains six of the largest and most representative of such schools :—

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| Eton ... ... | 45 | certificates | ... | 0 | passes in science. |
| Winchester ... | 48 | ,, | ... | 4 | ,, ,, |
| Rugby ... | 58 | ,, | ... | 6 | ,, ,, |
| Cheltenham College ... | 32 | ,, | ... | 7 | ,, ,, |
| Clifton College | 23 | ,, | ... | 8 | ,, ,, |
| Marlborough | 18 | ,, | ... | 4 | ,, ,, |

The case of Rugby is the more remarkable, since in the '70's we looked upon that school as a pioneer, the importance of science teaching having been recognised by its great head-master, Dr. Temple, now Primate of All England. It is only fair to state that several of the great public schools, such as Harrow, Wellington and Charterhouse, are not represented.

If we turn now to the published analysis of the results of the whole examination for all the schools concerned, we find 2844 passes in the four languages Latin, Greek, French and German, with 160 (or 5·6 per cent.) first classes; while for the five branches of science allowed by the Board we find only 422 passes, with 98 (or 23·2 per cent.) first classes. These figures again tell us of the great preponderance of language teaching estimated numerically; on the other hand, a comparison of the percentages of first classes is highly complimentary to the science-teaching, where it is allowed free quarter.

Speaking generally, the figures quoted may be fairly taken as representing the general attitude towards science of those who have charge of the education of the majority of the boys drawn from the best blood of England. They suggest (1) that the superstition that science forms no part of the education of a gentleman still holds the field; and (2) that the real study of science involves too much trouble in places where the interest in games dominates the whole school-life. There is not a doubt that the state of things disclosed would be to a large extent remedied if the Universities would insist upon an elementary knowledge of some one branch of science for a pass degree and the Army entrance examinations were so adjusted as to require every candidate to take up at least one science subject in the competitive examinations. The present movement in a circle leads us nowhere, with the supineness of the governing bodies of the public schools. The published results of the Army competitions do not enable us to extend the above investigation to them, since they do not tell us from what schools the several successful candidates come; but it is to be feared that even at Woolwich there is still truth in what was said to me a few years ago by one who knew, that science is looked upon as something "less than the fifth wheel of the coach"; while in the entrance examination for the Staff College, science has still, I believe, no place at all. Thus we go on dreaming, while Germany, America and other countries are wide awake, and the first rule with our leading statesmen seems to be to "shift responsibility," as they cast about them in their feeble attempts at educational legislation for "light and leading." The universities and the War Office have the power, if only they had the will, to act in the way here suggested; and it can scarcely be doubted that a speedy reform in our secondary education would come about simply through the transfer (in the magisterial mind) of science from the category of things to be *tolerated* to the category of *educational essentials*.

An experience of public-school work extending over more than a quarter of a century entitles me, I think, to venture to express strong views on this matter, which is one of natural and imperial concern. Surely, those of our scientific giants who have places on the governing bodies of our public schools might wake up to their responsibilities, look into things more closely, and do something to strengthen the hands of those who, as science masters, often labour under grave disadvantages in the stress of the conflict of interests, which must be found in every corporate society such as a great public school. There are, however, to my knowledge cases of enlightened head-masters struggling to move their governing bodies to the necessary expenditure, though insufficiently supported by the pressure of public opinion from the outside. As things are in this country, it seems hopeless to look to the "Conference of Head-Masters" (a sort of educational Vatican Council) for a broad and fair-minded dealing with this question.

This letter is not written in any spirit of hostility to classical and literary studies, the culture derived from which is too often lacking among men of science, but under the conviction that, with a keener spirit of *work* in the public schools and a better correlation and graduation of studies, science might lift up its head more than it does at present. A. IRVING.

Bishop's Stortford, September 3.

### Animal Intelligence.

ALTHOUGH the terms "ass" and, at any rate in Germany, "ox" (*Ochs*) are very generally applied to stupid persons, those who have observed the bovine and asinine genera know that this is an injustice to those animals; and the following instances of particular intelligence displayed by two of the thus maligned beasts seem worth recording.

A donkey that was kept here learnt to open, not only the gate of its own field, but other gates. One day, having left its own abode, accompanied by two ponies, it went to another field half a mile off, opening three gates on the way, liberated the occupants of this field, a mare and her foal, and a yearling, old friends of the donkey's, as they used to live together, and the whole party, which had been joined by a mastiff, proceeded to wander through the world. About two miles from here the horses were recognised and secured, and the donkey eventually returned with the mastiff; but after this exploit it was thought advisable to get rid of the donkey, as being too zealously devoted to the cause of emancipation.

A Scotch bullock, which had been in the park here for about two years, was sold to a butcher at Derby Market (fourteen miles south of this place) and taken by train to Darley (nine miles north of here). A day or two afterwards the bullock found its way back here, having escaped from its would-be slaughterer, but had, alas! to be sent back to him. It is incredible that the animal can have observed the road from the railway, and the only explanation is that it was brought along the road from Darley when driven here originally from Scotland; but in any case this is a striking instance of tenacious memory and strong attachment to home or comrades.

L. C. HURT.

Alderwasley, Matlock, Derbyshire, September 4.

### Variation of Common Copper Butterfly.

IN August, I took a rather large specimen of *Polymatus phloeas* (the common copper butterfly), which has a row of four faint silver-blue spots inside the copper band on the posterior margin of the upper surface of the hind wings.

I should be very glad if any of your readers could tell me if this variation is common, as I can find no mention of it in the book I use, and have never seen another case, though I have examined many of the same species.

With apologies for troubling you. PH. T.

September 4.