LETTERS TO THE EDITOR.

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The Blondlot n -Rays.

SINCE the date of my last letter on this subject, published in your columns on January 21, I have made further numerous endeavours to confirm M. Blondlot's experiments.

It is by no means difficult to obtain some of the effects that M. Blondlot describes, but, so far as my observations go, these effects, when obtained, are in every case due simply to heat.

As mentioned by a previous correspondent, the luminosity of calcium sulphide is considerably affected by minute differences in temperature. For instance, a coin taken from one's pocket and held at the back of a calcium sulphide screen will, in a few seconds, show through the screen as a disc of increased luminosity, the effect being due to the warmth of the coin; or again, when two small calcium sulphide screens are placed upon two pieces of similar metal differing in temperature by only about 2° F., it is easy to discover which of the two pieces of metal is the warmer by the superior luminosity of the screen placed upon it.

This, I think, is the explanation of the experiment described in the advertisement columns of your issue of February 18, where it is stated that "if one of these screens be laid on the floor when it is very feebly fluorescing it will be invisible, but its light will increase when it is placed on the top of the foot and the muscles put into action."

I have repeated this experiment with home-made screens with entire success, my method being to use two screens each about 16 mm. by 2 mm. in size, of normally equal luminosity. When one is placed on the foot it brightens up considerably as compared with the other. This experiment is at first sight most convincing, but unfortunately for the n -ray theory I find no necessity for the presence of the foot at all. A boot newly taken off and still retaining some warmth, or any other warm object, acts equally well, while if one screen be placed on the foot and the other upon a can of water heated to the same temperature as the foot, no difference between the luminosity of the two screens can be detected. Again, the foot experiment does not succeed if a good thickness of paper or cardboard is placed between the foot and the screen so as to prevent the transference of warmth to the latter.

Prior to the date of my last letter, I had tried a similar experiment to that described by Mr. J. B. Burke in your issue of February 18. In my case a large calcium sulphide screen was exposed to a high power Nernst lamp, one half being shaded with lead and the other with several thicknesses of black paper, so that only half was exposed to the n -rays. Visually no difference could be detected in the brightness of the two halves of the screen, but on exposing a gelatino bromide photographic film in contact with the screen for some three minutes it was found on development that the portion of the photographic film that was in contact with the half of the screen that was shaded by the paper only was considerably more fogged than the other half. Here again, however, the result was clearly due to heat, the black paper being perceptibly warm to the touch, as when, in place of paper, a thin aluminium sheet was employed and the experiment repeated, no difference at all could be noted between the two halves of the developed photographic film.

Since making this experiment I have, when using two very small separate screens, one shaded only by very thin aluminium and the other by thick lead, succeeded in observing some slight excess in brightness in the former over the latter, but this has been discernible only when the aluminium had become appreciably warmed by the heat radiated from the lamp, so that the difference in temperature would, in the light of my other experiments, entirely account for the effect.

It is, indeed, very difficult altogether to eliminate the heat coming either from a Nernst lamp or an Auer burner except by using materials such as, for instance, water,

which, according to M. Blondlot, is opaque to the n -rays. This in itself is instructive, as is also the point noted by M. Blondlot that the brightening of the screen under the influence of the n -rays is not instantaneous but is gradual, as also are most thermic effects.

During the past fortnight there have been published details of some new investigations made by M. Gutton and communicated by Prof. Poincaré to the French Academy of Sciences, according to which the luminosity of calcium sulphide screens is increased by their being placed in a non-uniform magnetic field. It is stated by M. Gutton that only a weak field is necessary, and that the effect is very sensitive.

Having spent considerable time in endeavouring to confirm this observation without the slightest success, it would interest me to know whether anyone else has tried it and with what result.

As everyone who has experimented on similar lines is aware, investigations of these descriptions are full of pitfalls, and it is very easy to see what one expects. For instance, if two or more faintly but equally luminous calcium sulphide screens of small dimensions, placed two or three inches apart, are observed, one will occasionally appear to become dim, and it is quite easy with a little practice, while looking directly at the screens, to make any one of them actually disappear at will, this being due to certain portions of the retina being much less sensitive to these weak radiations than other portions. However, one can scarcely suppose that a man of science of M. Blondlot's antecedents and experiences can have deceived himself or have been deceived by others in regard to the numerous positive results that he has obtained, and those who have unsuccessfully tried the experiments can only imagine that, assuming that the phenomena observed are really objective, they are only visible to certain individuals. Whether the persons who can or those who cannot see these effects have abnormal sight further investigations alone can show.

66 Victoria Street, London, S.W., February 23.

A. A. CAMPBELL SWINTON.

Chalk-stuff Gas.

IN his notice of my "Papers on Education," in taking exception to my nomenclature, Prof. Smithells has touched on a question of much importance to teachers. "Chalk gas seems unnecessary," he says, "even as a temporary name for carbon dioxide. Why not 'Fixed air,' which is both descriptive and historical?" A young student (about eighteen years old) who went through my course two or three years ago, who has read the article, writes to me unsolicited a letter on the subject, from which I may be allowed to quote the following passage:—"One remark struck me. The reviewer wants to know the advantage of calling CO_2 chalk-stuff-gas and suggests that the classic old 'Fixed air' would be better. He does not seem to appreciate that by calling the gas 'Fixed air' you must presuppose that it is fixed and hence all that the word 'Fixed' entails of a knowledge of the gas; whereas, your name is eminently descriptive and entails no knowledge of the gas at all but simply describes the source from which it was first obtained."

I could not state my case more happily. I regard the use of names which are obviously appropriate at the time when the work is done, which do not involve giving the case away, as of extreme importance. In these days we are somewhat spoilt by the use of names which are significant of composition if not of structure; we are too prone to introduce them without consideration when teaching beginners; it is often desirable to give names temporarily. It must not be forgotten that the Germans, even at the present day, openly speak of acid-stuff and water-stuff; we do likewise in using the names oxygen and hydrogen, although our devotion to classics leads us perhaps to disguise the fact. In teaching beginners I advisedly speak of the gas from chalk (or limestone) *stuff*, because chalk has a definite geological connotation: we deal only with the substance of which it chiefly consists.

HENRY E. ARMSTRONG.

IN alluding to the subject of names in the notice of Prof. Armstrong's book, my chief object was to deprecate the excessive violence of the objections which I have so often

heard in reference to his terminology. I agree with Prof. Armstrong that there is some advantage to be gained during early stages of instruction by using names that do not prejudge the chemistry of the problem that is being investigated. But I think history usually supplies a good provisional name, such as inflammable air, calx of lead, spirit of nitre, and personally I should keep to the historical name where possible.

To call carbon dioxide chalk-stuff gas asserts that it comes from chalk, or that, in other words, it is a kind of air fixed somehow in chalk. I confess I cannot see that any greater presupposition is involved in calling it fixed air than in calling it chalk-stuff gas. Historically it was called fixed air, and I value the name because Black's clear perception and proof that a gas could be fixed in a solid and be a weighable material part of it was the means of inspiring Lavoisier with the right view of the part played by air in the calcination of metals, and so led to results of revolutionary importance. ARTHUR SMITHELLS.

Variation in Oat Hybrids.

AMERICAN and English observers have shown that the principles enunciated by Mendel are applicable to hybrid wheats. From observations carried out at St. Andrews, I have been able to demonstrate that the same principles are applicable to hybrid oats.

In 1901 I crossed a few white varieties of oats one with the other, and also black varieties with white ones. The progeny was in all cases characterised by very great vigour and prolificness. The hybrid characters were most easily distinguishable in the crosses between black and white varieties, the unilateral ear and dark grain of the one parent, and the pyramidal ear and light-coloured grain of the other, being so blended in the respective hybrids as to result in a somewhat one-sided ear and rich brown grain. It should be mentioned that by the colour of the grain is meant that of the closely adherent flowering-glume.

The grains of the four hybrids given below, after being classed according to their position in the spikelets, were sown singly in rows of one hundred each. At harvesting the ears of each plant were tied together, and the product of each row made into a separate bundle.

Long continued wet weather had damaged the plants so seriously as to render the working out of certain points impossible, e.g. the variation in the ears. From what has been noted in the available examples studied, the form of the ear will no doubt be found to be a constant character in the Mendelian sense. Sufficient material has been secured to show the dissociation of the colour of the grain.

The numbers of plants bearing respectively black, brown, white or yellow grain in the several bundles varied considerably. The totals only are given in the subjoined tables, the brown being classed with the black grain, and the yellow with the white. The distinction between the two classes thus tabulated was in all cases so marked as to offer no difficulty in sorting out, and they are therefore briefly put as black and white.

Goldfinder ♀ × Black Tartarian ♂ (two plants).

	No. of grains sown	No. of plants saved at harvesting	No. with black grains	No. with white grains	Ratio of black and white
(1)	1000	567	433	134	3.23 : 1
(2)	900	566	415	151	2.75 : 1

Black Tartarian × White Canadian (one plant).

890	532	379	153	2.48 : 1
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Black Tartarian × Abundance (one plant).

600	274	209	65	3.21 : 1
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The Black Tartarian oat is thus shown, in respect of the character in question, to be dominant, whether serving as pollen or seed parent. It is impossible to say whether the destruction done by bad weather affected one type more than another. If all the plants had survived, the proportion of black to white forms shown in the above tables

might have been somewhat altered, but for several reasons it may safely be assumed that, at most, the alteration would not have materially affected the conclusion so clearly pointed to, namely, that the dominant and recessive characters in hybrid oats, as in many other self-fertilised plants, assert themselves in the second generation in a ratio closely approximating 3 : 1. JOHN H. WILSON.

Agricultural Department, St. Andrews University.

Visitors from the High North in Central Italy.

THAT *vexata quaestio* the migration of birds presents strange anomalies which confound the best informed theories on the subject. Last winter we had a surprise in the appearance in central Italy of the great white-billed diver, *Colymbus adamsi*, G. R. Gray, two of which were captured, a big ♀ on the Lake Chiuse or Montepulciano on December 2, 1902, and a large-billed ♂ on the 19th of the same month on Lake Trasimeno. Both were adults in autumn plumage, and are now in the central collection of Italian vertebrata in this museum. It is the first time that this sub-polar and eastern species has been noted in Italy.

This winter we have had a considerable invasion of that beautiful northern bird, the waxwing (*Ampelis garrulus*, L.). During December and January last they appeared in hundreds in our northern provinces, and from Vicenza, Padova, and Verona spread in flocks westward and southward. I received the first specimens on December 18, 1903, from Vicenza, and the last from Barberino di Mugello (Florence) and from Fano (Marche) on January 1 and 15. I also heard from Nice that more than 200 specimens, said to have come from Corsica, had been sold in the market.

HENRY H. GIGLIOLI.

R. Zool. Museum, Florence, February 22.

THE NEW BUILDINGS AT CAMBRIDGE.

THE King, accompanied by the Queen and Princess Victoria, visited Cambridge last Tuesday to open the new Law School and Science Laboratories which have recently been completed on the site the university acquired from Downing College a few years ago.

On reaching Cambridge, the royal party proceeded to the Senate House, where, in the absence of the Chancellor, the Duke of Devonshire, who was prevented from attending by illness, the Vice-Chancellor, Dr. Chase, president of Queens' College, presented an address, which was graciously replied to by his Majesty. In the course of his reply, the King remarked that he earnestly desired the well-being of the university and "the extension and development of all branches of study and research which are essential to the maintenance and the greatness and the welfare of my Empire." There must, he added, be "new endowments for education if my realm is to be kept up to its proper standard of efficiency." The Vice-Chancellor then gave a short description of the buildings, and an account of the Cambridge Association, whose benefactions had enabled the university to build them. He also dwelt upon the pressing need for buildings for the department of agriculture, and for proper provision for housing the ethnological and archæological collections of the university.

When the ceremony was over the King and Queen were entertained at lunch by the university in the large gallery at the Fitzwilliam Museum. The royal lunch party was strictly limited in number, and the university entertained a number of distinguished guests in the halls of Gonville and Caius and of King's College.